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SAS® Field Quality Analytics 6.1

Administrator's Guide

SAS® Documentation

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SAS® Field Quality Analytics 6.1: Administrator's Guide

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About This Book

Audience

This book helps you perform installation, management, administration, and configuration tasks to help end users of SAS Field Quality Analytics. This book is intended for administrators. For additional information about how to use SAS Field Quality Analytics, including accessibility information and how to get additional help, see the *SAS Field Quality Analytics 6.1: User's Guide*.

What's New in SAS Field Quality Analytics 6.1

Overview

SAS Field Quality Analytics is part of the SAS Quality Analytic Suite, which provides you with an enterprise view of quality performance to help you manage the cost of quality, achieve quality excellence, and increase customer satisfaction. The SAS Quality Analytic Suite also provides an integration point with other solutions, such as SAS Asset Performance Analytics. In addition to providing access to all SAS Field Quality Analytics features, the SAS Quality Analytic Suite application provides access to common features such as the **Report Library** workspace.

The following workspaces in SAS Field Quality Analytics 6.1 have been redesigned to enhance the user's experience in monitoring and analyzing warranty data:

- **Early Warning** workspace
- **Data Selection** workspace
- **Analysis** workspace
- **Report Library** workspace
- **Administration** workspace

Early Warning Workspace

The **Early Warning** workspace enables you to create and manage enterprise analytic, ad hoc analytic, and ad hoc threshold issues. Alerts can be assigned to specific users, Early Warning e-mails contain direct links to alert output, and Enterprise Analytic alert groups can be deleted.

For more information about the **Early Warning** workspace, see the *SAS Field Quality Analytics 6.1: User's Guide*.

Data Selection Workspace

The **Data Selection** workspace enables you to create and manage data selections and data selection templates. Data selection templates replace product and event templates. They are created during data selection creation and are optional. It is no longer required

to store the underlying filtered data for data selections. You can also transfer ownership of a data selection.

For more information about the **Data Selection** workspace, see the *SAS Field Quality Analytics 6.1: User's Guide*.

Analysis Workspace

The **Analysis** workspace enables you to create and manage projects and analyses. There are significant performance enhancements for analysis run times. Exporting information has enhanced speed and flexibility. An Event Forecasting analysis with improved models replaces the Forecasting analysis. Display option updates are applied immediately and do not require rerunning. Additional files can be stored in projects. Analyses and files can be moved across projects. Also, comments can be created and maintained for analyses.

For more information about the **Analysis** workspace, see the *SAS Field Quality Analytics 6.1: User's Guide*.

Report Library Workspace

The **Report Library** workspace enables you to manage all the reports that summarize your business data and to provide both technical and non-technical users access to that information. SAS Warranty Analysis version 4 reports have been replaced with expanded analyses. The **Report Library** workspace includes integration with SAS Visual Analytics and other external reporting tools, as well as support for the LASR reporting mart and SAP HANA data mart.

For more information about the **Report Library** workspace, see the *SAS Field Quality Analytics 6.1: User's Guide*.

Administration Workspace

The **Administration** workspace enables you to manage administrative tasks in SAS Field Quality Analytics. It is available to users with administrative permissions. You can use the **Administration** workspace to maintain most of the underlying configuration, import and export configuration information, and perform a partial or complete migration.

For more information about the **Administration** workspace see "Overview of the Administration Workspace" on page 221.

Part 1

Introduction to SAS Field Quality Analytics

Chapter 1

About SAS Field Quality Analytics

What Is SAS Field Quality Analytics?

Quality and reliability are the most significant prerequisites for profitability. Warranty data and other types of data about field failures are becoming increasingly important for manufacturers and resellers to analyze and to understand. In most practical situations, warranty information provides the closest representation of how a product operates in customers' hands. However, simply reporting on warranty data is not sufficient. Such reporting is reactive and time-consuming, and it can be misleading. Instead, successful enterprises are proactive with warranty data and use analytics to bring issues to light and to accelerate problem identification and root cause analysis.

SAS Field Quality Analytics is an integrated reporting and analysis tool that provides the flexibility and functionality to perform warranty-related problem identification, prioritization, and definition for root cause analysis. The components of SAS Field Quality Analytics are the results of more than 30 years of experience helping leading manufacturers take full advantage of the data that they collect. SAS Field Quality Analytics provides the foundation for incorporation of multiple data types (for example, call center, customer survey, and end-of-line audit data) to produce a more comprehensive representation of a product's field performance.

SAS Field Quality Analytics is part of the SAS Quality Analytic Suite, which provides you with an enterprise view of quality performance to help you manage the cost of quality, achieve quality excellence, and increase customer satisfaction. The SAS Quality Analytic Suite also provides an integration point with other solutions, such as SAS Asset Performance Analytics.

In addition to providing access to all SAS Field Quality Analytics features, the SAS Quality Analytic Suite application provides access to common features such as the **Report Library** workspace.

Benefits to Using SAS Field Quality Analytics

SAS Field Quality Analytics empowers you to report on and analyze your field quality or warranty data. With SAS Field Quality Analytics, you can easily create and save specific filtering criteria to apply to any of the base analyses in the solution. These criteria, called data selections, include product attributes, such as production date and model, and event attributes, such as claim date and failure code. Analysis results are not static; you can interact with your results in a number of ways. The feature-rich set of analytics ensures not only that you have a clear view of the warranty-related events that have occurred, but also that you have a better understanding of the underlying causes.

Here are a few of the goals that you can accomplish using SAS Field Quality Analytics:

- You can integrate customer, supplier, and organizational data with warranty data in one convenient location.
- You can create and automate an early warning process.
- You can perform statistical analyses to investigate the root cause of warranty issues.
- You can efficiently and effectively communicate key metrics, goals, and performance measures throughout the organization.

You can interact with analysis results in various ways, including the following:

- You can dynamically filter the results for many of the analyses.
- You can drill into the subset of information for an individual bar on a Pareto chart for more information.
- You can get a list of customer comments related to a spike on a trend and control chart.

The feature-rich set of analytics provides a clear view of not only what happened but also why it might have happened.

Launching SAS Field Quality Analytics

Perform the following steps to log on to the SAS Field Quality Analytics application:

1. In the address bar of your web browser, enter the URL for the SAS Quality Analytic Suite, and press Enter. For example, this URL typically takes the following form:

   ```
   http(s)://hostname:port/SASQualityAnalyticSuite
   ```

   Note:

   - Contact your system administrator if you do not have the URL for the SAS Quality Analytic Suite.
   - It is recommended that you launch SAS Field Quality Analytics using either the SAS Visual Analytics Hub or the SAS Quality Analytic Suite. You can launch SAS Field Quality Analytics from the SAS Visual Analytics Hub by clicking **Manage Quality Analytics**. The URL of the SAS Visual Analytics Hub typically takes the following form:

     ```
     http(s)://hostname:port/SASVisualAnalyticsHub
     ```

2. Enter a user ID and password. Your user ID might be case sensitive, depending on the operating system that is used to host the application server. Your password is case sensitive.
3. Click **Sign In**.

   The SAS Field Quality Analytics application appears.

Note: You cannot log on to the SAS Field Quality Analytics application until the server is completely up and running (for example, all caching done during server start-up must be complete).

Navigate to the SAS Portal

To navigate to the SAS Portal, select **File** ⇨ **Go to SAS Portal** from the main menu after you have logged on to the SAS Field Quality Analytics application.

SAS Field Quality Analytics can also be launched from the Portal.

Exit SAS Field Quality Analytics

To exit the SAS Field Quality Analytics application, select **File** ⇨ **Sign Out** from the main menu.

Chapter 2

Overview of Administration Tasks in SAS Field Quality Analytics

Overview of Administration Tasks in SAS Field Quality Analytics

As an administrator for SAS Field Quality Analytics, you can perform the following types of tasks:

- install and configure SAS Field Quality Analytics. For more information about installing and configuring SAS Field Quality Analytics, see "Overview of Installation and Configuration" on page 11.
- manage Early Warning alerts. For more information about managing Early Warning alerts, see "Overview of Managing Early Warning Alerts" on page 183.
- manage data selection information. For more information about managing data selection information, see "Overview of Managing Data Selection Information" on page 209.
- manage analysis information. For more information about managing analysis information, see "Overview of Managing Analysis Information" on page 215.
- perform a variety of administrative tasks from the **Administration** workspace in the SAS Field Quality Analytics application. For more information about performing administrative tasks from the **Administration** workspace, see "Overview of the Administration Workspace" on page 221.
- perform data and system administration. For more information about performing data and system information, see "Overview of Data and System Administration" on page 255.
- view additional information that might be helpful when administering SAS Field Quality Analytics. For more information about viewing additional information, see the appendixes to this book.

Part 2

Installation and Configuration

Chapter 3

Overview of Installation and Configuration

Overview of Installation and Configuration

The following chapters in this part explain how you can perform installation and configuration tasks for SAS Field Quality Analytics:

- Chapter 4, “Pre-installation Requirements and Tasks for SAS Field Quality Analytics,” on page 13
- Chapter 5, “Installing and Configuring SAS Scalable Performance Data (SPD) Server,” on page 17
- “Installing and Configuring SAP HANA” on page 25
- Chapter 7, “Installing and Configuring SAS Field Quality Analytics,” on page 27
- Chapter 8, “Migration,” on page 63
- Chapter 9, “Extract, Transform, and Load (ETL) Process,” on page 109
- Chapter 10, “Users, Groups, and Roles,” on page 153
- Chapter 11, “Setting Up Access for the Report Library,” on page 167
- Chapter 12, “Diagnostics,” on page 171

Chapter 4

Pre-installation Requirements and Tasks for SAS Field Quality Analytics

About the Pre-installation Requirements and Tasks

Before you begin to install SAS Field Quality Analytics, review the pre-installation checklist that is provided with your deployment plan. This checklist provides a detailed list of the pre-installation requirements. It also enables you to record important information that you will need when you are installing the software. Perform the following pre-installation tasks before you install SAS Field Quality Analytics:

1. “Verify Operating System Requirements” on page 14
2. “Install Prerequisite Software” on page 14
3. “Create Standard User Accounts” on page 14
4. “Obtain a Deployment Plan and SAS Installation Data File” on page 15
5. “Download Your Software and Create a SAS Software Depot” on page 15
6. “Installing and Configuring SAS Scalable Performance Data (SPD) Server” on page 15
7. “Adding SAS Field Quality Analytics to a SAS Asset Performance Analytics Deployment ” on page 15

8. "UTF-8" (See page 16.)
9. "Migrating SAS Scalable Performance Data (SPD) Server Content" (See page 16.)

The following topics provide details about each of the preceding steps.

Verify Operating System Requirements

Ensure that you meet the minimum requirements that are described in the SAS Field Quality Analytics system requirements documentation. System requirements are unique for each operating system. They include software requirements, hardware requirements, space requirements, specific product requirements, and graphics hardware and software compatibility. Information about requirements is available at http://support.sas.com/resources/sysreq/index.html.

Install Prerequisite Software

Before you install SAS Field Quality Analytics, install the following prerequisite software products:

- SAS Scalable Performance Data (SPD) Server 5.1. For details, see "Installing and Configuring SAS Scalable Performance Data (SPD) Server" on page 15.
- (Optional) SAP HANA. SAS Field Quality Analytics uses SAS/ACCESS Interface to SAP HANA to store and access data in a SAP HANA system. For information about the supported levels of SAP HANA, see the System Requirements for SAS 9.4 Foundation. Select **SAS/ACCESS Interface to SAP HANA** as the product, and then select the requirements document for your platform.

The following software is also required:

- Adobe Flash Player. This software is required on each client machine that will access SAS Field Quality Analytics. For supported versions of browser plug-ins for your operating system, see Third-Party Software for SAS 9.4.
- (Windows only) PowerShell. Information is available at SAS 9.4 Support for Additional Software Products.
- Python. Information is available at SAS 9.4 Support for Additional Software Products.

Create Standard User Accounts

As a pre-installation task, you must create the following user accounts in the operating system:

- an account for the user who will install and configure the SAS software
- an account to run the spawned SAS servers

You should also create a SAS Server Users group on Windows and a sas group on Linux.

For information about setting up these users and groups, see the pre-installation checklist for your deployment and “Setting Up Users, Groups, and Ports” in the *SAS Intelligence Platform: Installation and Configuration Guide*.

Obtain a Deployment Plan and SAS Installation Data File

Before you can install your SAS software, you must obtain a deployment plan and a SAS Installation Data (SID) file. The deployment plan, which is in a file named plan.xml, specifies the software that you will install and configure on each machine in your environment. The plan serves as input to the SAS Deployment Wizard. SAS Field Quality Analytics requires a custom deployment plan.

The SID file contains license information that is required to install SAS. For more information about deployment plans and SID files, see the *SAS Intelligence Platform: Installation and Configuration Guide*.

Download Your Software and Create a SAS Software Depot

Use the SAS Download Manager to download the software that is listed in your SAS Software Order. The SAS Download Manager creates a SAS Software Depot from which you will install your software. For details, see “Creating a SAS Software Depot” in the *SAS Intelligence Platform: Installation and Configuration Guide*. You can then use the SAS Deployment Wizard to install your software.

Installing and Configuring SAS Scalable Performance Data (SPD) Server

SAS Scalable Performance Data Server (SPD Server) must be installed and running before you begin configuration tasks in SAS Field Quality Analytics.

Adding SAS Field Quality Analytics to a SAS Asset Performance Analytics Deployment

If you are adding SAS Field Quality Analytics to a SAS Asset Performance Analytics deployment, be sure to perform post-SPD Server installation instructions in the chapter Chapter 5, “Installing and Configuring SAS Scalable Performance Data (SPD) Server,” on page 17 before using the "Add SAS Products That Require Configuration" section of the *SAS 9.4 Intelligence Platform: Installation and Configuration Guide*.

Note: If you are using SPD Server with your deployment, there are additional post-installation steps that are required. For more information, see “Update the License for SPD Server” on page 43.

UTF-8

The ETL job that identifies the languages of text comments for text analysis performs dramatically better when the SAS session encoding is UTF-8. Please consider this when selecting the encoding for your installation.

Migrating SAS Scalable Performance Data (SPD) Server Content

Manually added SAS Scalable Performance Data (SPD) Server content cannot be migrated automatically through SAS Field Quality Analytics Server configuration. SPD Server content needs to be manually migrated.

Before installation, you need to copy SPD Server data from the source to the destination with the following:

```
LIBNAME source SASSPDS  LIBGEN=YES  IP=YES  Serv='5400'
HOST='na.exampleSource.com'  SCHEMA="wrnaspds"  USER="spdsfqa"
PASSWORD="examplePassword" ;
proc cport lib =source file="c:\Data\source.dpo"
run;

LIBNAME wrnamart SASSPDS  LIBGEN=YES  IP=YES  Serv='5400'
HOST='na.exampleDestination.com'  SCHEMA="wrnaspds"  USER="spdsfqa"
PASSWORD="examplePassword" ;
proc cimport lib=wrnamart file="C:\Data\source.dpo";
run;
```

Note: This code uses hypothetical source and destination addresses, passwords, and paths. Before running the code, you must update these values to match what is on your system and check variable values to see whether they are appropriate for your system.

Chapter 5

Installing and Configuring SAS Scalable Performance Data (SPD) Server

About Installing and Configuring SAS Scalable Performance Data (SPD) Server

You should use SAS Scalable Performance Data (SPD) Server for high-performance delivery of the large amounts of data that are used by SAS Field Quality Analytics. The SPD Server delivers data to applications rapidly by organizing SAS data sets into a streamlined file format. The server uses parallel processing to exploit the threading capabilities of servers with multiple processors.

You should install the SPD Server and configure it before you install SAS Field Quality Analytics.

Follow these steps to install the SPD Server and to configure it for use with SAS Field Quality Analytics:

1. “Install the SPD Server” on page 18
2. “Adding SPD Server User Accounts to the SPD Server Password Manager Database” on page 18
3. “Create Physical Directories on the SPD Server Host for the SAS Field Quality Analytics Data” on page 20
4. “Edit the SPD Server LIBNAME Parameter File” on page 21
5. “Make Necessary Changes to the SPD Server Parameter File” on page 22

6. "Create the SPD Server Service (Windows Only)" on page 22

The following topics provide details about each step.

Install the SPD Server

Use the SAS Deployment Wizard to install SAS Scalable Performance Data (SPD) Server. For instructions, see the *SAS Scalable Performance Data Server: Administrator's Guide*.

Adding SPD Server User Accounts to the SPD Server Password Manager Database

The SAS Scalable Performance Data (SPD) Server uses its own layer of user accounts and access controls. User account information is stored in the SPD Server Password Manager database. You must add at least one administrative user and one database user to the SPD Server Password Manager database.

To add user accounts to the database:

1. Invoke the SPD Server Password Manager utility.
   - Windows: Select **Start** ⇨ **All Programs** ⇨ **SAS** ⇨ **SAS SPD 5.1 Account Manager**
   - Linux: From the ***SAS-installation-directory*/SASScalablePerformanceDataServer/5.1/site** directory, enter **pwdb *path_to_password_manager_database***. You can also specify a path for a password manager database that has not yet been created.
2. Create a group for SPD Server administrative users by answering the SPD Server Password Manager utility prompts as shown in the following table.

Prompt	Entry	Notes
Enter command	groupdef	
Enter groupname to define	admingrp	This name is the suggested group name, but you can use any name that you want.

3. Create at least one administrative user and one database user for the SPD Server by answering the SPD Server Password Manager utility prompts as shown in the following table.

Prompt	Entry for Administrative User	Entry for Database User	Notes
Enter command	add	add	

Prompt	Entry for Administrative User	Entry for Database User	Notes
Enter username to add	spdsadm	spdsfqa	These names are suggested user names, but you can use any name.
Enter password for user-name	spds123	spds123	Enter a temporary password. The password must be 6–8 characters in length and must contain at least one numeric character.
Verify password	spds123	spds123	Enter the temporary password again for verification.
Enter authorization level (0 to 7) for user-name	7	0–3	Enter the level of access that the user needs. Enter 0–3 to specify a normal, non-privileged user. Enter 4–7 to specify a special user who can update the Password Manager table and override access control list (ACL) restrictions.
Enter IP Address or <Return>			Enter the IP address of the client machine from which the user is authorized to access the server. If you do not want to limit access in this way, press Enter to skip this step.
Enter password expiration time in days			Enter the number of days that you want the password to be valid. If you do not want the password to expire, press Enter to skip this entry.
Enter group name or <Return>	admingrp		For the administrative user, enter the name of the group that you created in Step 2 on page 18.
Enter the maximum allowed time (in days) between successful logins <Default = infinite>			Enter the maximum number of days that are allowed between successful logins for this user. If you do not want to impose a limit, press Enter to skip this entry.

Prompt	Entry for Administrative User	Entry for Database User	Notes
Enter the maximum allowed login failures <Default = infinite>			Enter the maximum allowed number of login failures for this user. If you do not want to impose a limit, press Enter to skip this entry.
Enter user-name performance class (1=LOW 2=MED 3=HIGH carriage return for LOW)	3	3	Specify level 3 so that the user will be able to create and modify clusters.

The administrative user has credentials to update the Password Manager database and override any access control list (ACL) restrictions. The database user's credentials are used to access SAS Field Quality Analytics data on the server.

4. You should change the password for each user. Enter **`chgpass`** in the SPD Server Password Manager utility and enter the user name, old password, and new password.
5. When you have finished using the SPD Server Password Manager utility, enter **`quit`**.

Note:

- For more information about using the SPD Server Password Manager utility, see "The Password Manager Utility psmgr" in *SAS Scalable Performance Data Server: Administrator's Guide*.
- Instead of using the SPD Server Password Manager utility to add users, you can use the SPD Server Management plug-in for SAS Management Console after you install and configure SAS Field Quality Analytics. For details, see "Administering and Configuring SPD Server Using the SAS Management Console" in the *SAS Scalable Performance Data Server: Administrator's Guide*.

Create Physical Directories on the SPD Server Host for the SAS Field Quality Analytics Data

On the SPD Server host machine, you must create physical directories for the SAS Field Quality Analytics fact tables, SPD Server metadata, and SPD temporary data.

To create the directories:

1. Log on to the SPD Server machine as the SAS installer user.
2. Create a high-level directory for the SAS Field Quality Analytics data. For example:

   Windows: **`C:\WRNA_SPDS_DATA`**

   Linux: **`usr/local/WRNA_SPDS_DATA`**
3. Under the high-level directory, create the following directories:
   - Two directories for the fact tables (for example, **`WRNA_SPDS_DATA/WRNAMART`** and **`WRNA_SPDS_DATA/WRNAMART1`**). If you create a second directory for the

fact tables, data can be stored there in the event that the first directory's storage limits are exceeded.

- A directory for the fact table index (for example, **WRNA_SPDS_DATA/WRNAMART_IDX**).
- A directory for the SPD Server metadata (for example, **WRNA_SPDS_DATA/SPDSDATA**).

4. Create a directory for SPD Server temporary data. For example:

   Windows: **C:\spdstmp**

   Linux: **usr/local/spdstmp**

   Later in the configuration process, you must secure these directories.

Edit the SPD Server LIBNAME Parameter File

Edit the SAS Scalable Performance Data (SPD) Server LIBNAME parameter file to specify the location of SAS Field Quality Analytics data on the server.

To edit the LIBNAME parameter file:

1. Open the following file in a text editor:

   SAS-installation-directory/SASScalablePerformanceDataServer/5.1/site/libnames.parm

2. On a new line, add a LIBNAME statement that specifies the directory locations of the SPD Server metadata and the fact tables. These directories are the ones that you created in "Create Physical Directories on the SPD Server Host for the SAS Field Quality Analytics Data" on page 20.

   Note: The format of the LIBNAME statement is presented here for clarity. However, when you add the LIBNAME statement, make sure that you enter the statement on one line, with no line breaks.

   Use the following syntax:

   ```
   LIBNAME=spds-domain-name PATHNAME=path-to-SPD-Server-metadata
   OPTIONS="DATAPATH=('path-to-first-fact-table-directory'
      'path-to-second-fact-table-directory')
   INDEXPATH=('path-to-fact-table-index')"
   DYNLOCK=YES;
   ```

   The value for **spds-domain-name** specifies the LIBNAME domain that the SPD Server uses to resolve references to the physical directories in which the fact tables for SAS Field Quality Analytics reside. The domain name must follow standard SAS LIBNAME nomenclature rules. This value is also required by the SAS Deployment Wizard during the installation of SAS Field Quality Analytics.

   Windows example:

   ```
   LIBNAME=wrnaspds PATHNAME=C:\WRNA_SPDS_DATA\SPDSDATA
   OPTIONS="DATAPATH=('C:\WRNA_SPDS_DATA\WRNAMART' 'C:\WRNA_SPDS_DATA\WRNAMART1')
   INDEXPATH=('C:\WRNA_SPDS_DATA\WRNAMART_IDX')"
   DYNLOCK=YES;
   ```

   Linux example:

```
LIBNAME=wrnaspds PATHNAME=/usr/local/WRNA_SPDS_DATA
OPTIONS="DATAPATH=('/usr/local/WRNA_SPDS_DATA/WRNAMART'
   '/usr/local/WRNA_SPDS_DATA/WRNAMART1')
INDEXPATH=('/usr/local/WRNA_SPDS_DATA/WRNAMART_IDX')"
DYNLOCK=YES;
```

3. On a new line, add a LIBNAME statement that specifies the directory that you created for SPD Server temporary data. For example:

   ```
   LIBNAME=spdstmp PATHNAME=C:\spdstmp;
   ```

   Note: Do not delete the **`libname=tmp`** entry at the beginning of libnames.parm.

   For more information, see "Setting Up SPD Server Libname Parameter Files" in *SAS Scalable Performance Data Server: Administrator's Guide*.

   Note: If you edit this file with a text editor on a Linux system and then transfer the file to a Windows system with FTP, do not include carriage returns.

Make Necessary Changes to the SPD Server Parameter File

The command that starts the SAS Scalable Performance Data (SPD) Server uses parameters from the file spdsserv.parm. This file is located in the following path:

SAS-installation-directory/SASScalablePerformanceDataServer/5.1/site

To use SPD Server with SAS Field Quality Analytics, make the following changes to the spdsserv.parm file:

1. Set **`MINPARTSIZE`** to **`256M`**. For example:

   ```
   MINPARTSIZE=256M;
   ```

2. Set **`FMTDOMAIN`** to **`spdstmp`**. For example:

   ```
   FMTDOMAIN=spdstmp;
   ```

If these parameters are not already in the spdsserv.parm file, add them.

Make any additional needed changes to the default settings that are specified in this file. For instructions, see "Setting Up SPD Server Parameter Files" in the *SAS Scalable Performance Data Server: Administrator's Guide*.

Note: If the SPD Server is already running when you change the spdsserv.parm file, you must stop and restart the server in order to include your changes.

Create the SPD Server Service (Windows Only)

To install the Windows service for the SAS Scalable Performance Data (SPD) Server, select **Start ⇨ All Programs ⇨ SAS ⇨ Utilities ⇨ Install SPD 5.1 as a Service**.

CAUTION:

Do not use the Windows Services Manager or Windows service commands to start or stop this service.

To start and stop the service, the system administrator must use one of the following methods:

- Select **Start** ⇨ **All Programs** ⇨ **SAS** ⇨ **Utilities**, and then select **Start SPD 5.1 Service** or **Stop SPD 5.1 Service**.
- Directly execute spdsstartsvc.bat or spdsstopsvc.bat, which are located in ***SAS-installation-directory*/SASScalablePerformanceDataServer/5.1/site**.
- Use desktop shortcuts to execute spdsstartsvc.bat or spdsstopsvc.bat.

Chapter 6

Installing and Configuring SAP HANA

Installing and Configuring SAP HANA

Overview of Installing and Configuring SAP HANA

SAP HANA is an in-memory computing platform that performs analytic and transactional processing on large data sets. To store asset data in a SAP HANA system, you must install and configure SAP HANA before you install SAS Field Quality Analytics.

To use SAP HANA with SAS Field Quality Analytics:

- Install the SAP HANA Server for Support Package Stack 08 of the SAP HANA platform. For information about how to obtain and install the software, see *SAP HANA Master Guide* at http://help.sap.com/hana_appliance/.
- Install the 64-bit ODBC driver for SAP HANA, which is provided with the SAP HANA client. For information about how to install and configure the ODBC driver, see *SAP HANA Client Installation Guide* at http://help.sap.com/hana_appliance/.
- Configure the ODBC data source for use with SAS/ACCESS Interface to SAP HANA. For details about creating this data source, see *Configuration Guide for SAS 9.4 Foundation* for your operating system. This documentation is available with the SAS 9.4 Install Center Documentation at http://support.sas.com/documentation/installcenter/94/.

Prerequisite Steps to Install and Configure SAP HANA for SAS Field Quality Analytics

Perform the following prerequisite steps to install and configure SAP HANA for SAS Field Quality Analytics:

1. Verify that SAS Access to SAP HANA exists.

2. Verify that the SAP HANA client is installed on the server.

Steps to Configure SAP HANA for SAS Field Quality Analytics

Perform the following steps to configure SAP HANA for SAS Field Quality Analytics:

1. Go to SAS Management Console and create a new group called **Field Quality Analytics - HANA SERVER USERS**, with the **MEMBERS** and **GROUPS AND ROLES** tabs similar to **Field Quality Analytics - SPD SERVER USERS**.
2. On the **Accounts** tab of **Field Quality Analytics - HANA SERVER USERS**, add an account. Add the user name (**<HANA User>**) and password (**<Password>**), and create a new authentication domain called **HANAAUTH**.
3. Click **Finish**.
4. Go to the library Manager and delete or rename the existing SPD Server library name.
5. Click **New Library** on the library manager, select **SAS HANA library**, and click **Next**.
6. Specify the library name as **WRNAMART**, click **Next**, and select **SASAPP** from the available servers list. Click **Next**.
7. Specify the libref as **WRNAMART**, and click **Next**.
8. Create a new database server, specify the server name as **HANAServer**, and click **Next**.
9. On the SAP/HANA Connection options page, click **Server Information**, and then click the **Options** button. Specify the server as **<HANA Server>** and the instance.
10. Select the Authentication domain as **HANAAUTH** and complete the wizard.
11. On the New library page, click on the default login and search for the **<HANA User>**. Select the user and complete the wizard.
12. Make WRNAMART a preassigned library.

Verify SAP HANA

After you perform the configuration steps, run the following LIBNAME statement in a SAS session to verify that the library to SAP HANA exists:

```
libname wrnamart sasiohna user=<HANA User> password=<Password>
server='<HANA Server>' instance=<HANA Instance> insertbuff=1000;
```

Chapter 7

Installing and Configuring SAS Field Quality Analytics

Installing SAS Field Quality Analytics

About the SAS Deployment Wizard

You use the SAS Deployment Wizard to install and configure the SAS software and related products that are included in your deployment plan. When you execute the SAS Deployment Wizard, you select the deployment type that you are performing. You can install and configure the software in a single execution of the wizard, or you can install

and configure the software in two separate executions. The latter approach gives you the opportunity to test the SAS license before the configuration step.

The SAS Deployment Wizard prompts you to perform a variety of tasks, including the following:

- specify the software order, the deployment plan, and the SAS software products that you are installing and configuring
- specify the directory paths for third-party products that you have installed
- specify host machine information
- specify information about user accounts that you created in the pre-installation phase
- for multiple-machine configurations, install the server-tier, middle-tier, and client-tier software on the appropriate machines

For more information, see "Installing and Configuring Your SAS Software" in the *SAS Intelligence Platform: Installation and Configuration Guide*.

Note: The ETL job that identifies the languages of text comments for Text Analysis performs dramatically better when the SAS session encoding is UTF-8. Please consider this when selecting the encoding for your installation.

Single-Machine versus Multiple-Machine Installations

You can install SAS Field Quality Analytics on one or on several machines. This choice is determined when you order SAS Field Quality Analytics and is detailed in the deployment plan (plan.xml).

For multiple-machine installations, you must first install SAS Field Quality Analytics on the server-tier machine. You can then install SAS Field Quality Analytics on additional machines that are part of a middle tier in your configuration. For guidelines on installing SAS on multiple machines, see "Installation Order Rules for Multiple Machine Deployments" in the *SAS Intelligence Platform: Installation and Configuration Guide*.

The server tier consists of a set of SAS servers that are installed as a part of the SAS Intelligence Platform. These servers host (and can be used to load) SAS Field Quality Analytics data. In addition, they execute SAS analytical and reporting processes. The SAS Workspace Server, SAS Stored Process Server, and SAS Metadata Server enable this capability. The middle tier hosts the web application, which is deployed on a web application server. The web application server sends data to and receives data from the web browsers on the client tier. It then organizes the data for storage on the data tier and for use on the server tier. The client tier, on which users perform day-to-day tasks, is also part of the SAS Field Quality Analytics configuration.

Products Installed with SAS Field Quality Analytics

Your deployment plan for SAS Field Quality Analytics includes additional SAS products that support and complement SAS Field Quality Analytics functionality. The SAS Deployment Wizard prompts you to install and configure each of these products, which include the following:

- SAS Deployment Manager
- SAS Application Server context
- SAS Field Quality Analytics data server
- SAS Management Console

- SAS Web Infrastructure Platform data server configuration
- SAS object spawner
- operating system services scheduling server
- SAS DATA step batch server
- SAS OLAP Server configuration
- SAS Pooled Workspace Server
- SAS Stored Process Server
- SAS Workspace Server
- SAS/CONNECT server configuration
- SAS BI Report Services workspace configuration
- SAS BI Lineage scheduling server
- SAS Web Infrastructure Platform scheduling services
- SAS BI Report Services
- SAS Environment Manager enablement kit server
- SAS Field Quality Analytics server configuration
- SAS Environment Manager agent configuration
- SAS Deployment Tester - server

Note:

- When installing the SAS Web Infrastructure Platform the **SAS Web Infrastructure Platform: JES file logging** option is selected by default. This option is fine for a non-clustered setup. However, if you are using a clustered setup, you should select the database option for logging.
- If the middle tier is deployed in a clustered environment, SAS logs must be configured to use database table storage instead of the default filesystem storage option.

Run the SAS Deployment Wizard

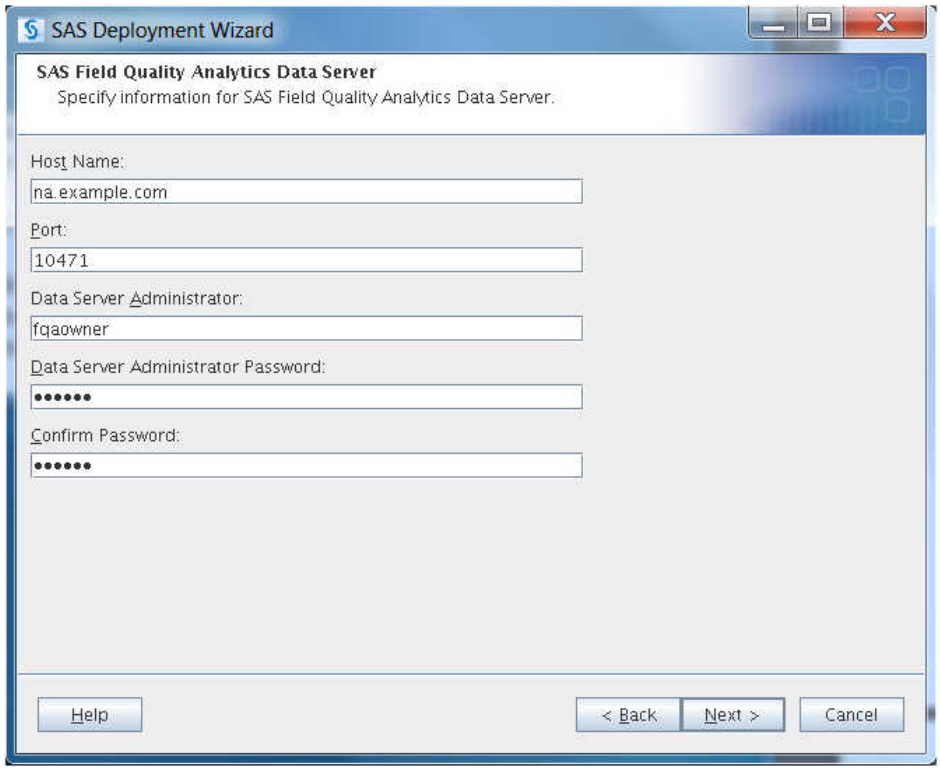
To run the SAS Deployment Wizard, follow the instructions in "Install and Configure SAS Interactively" in the *SAS Intelligence Platform: Installation and Configuration*.

Note:

- Although the SAS Deployment Wizard contains steps for all the products that are part of your deployment, the information in this section describes only those steps that pertain to SAS Field Quality Analytics.
- To ensure adequate capacity for SAS Field Quality Analytics, select **Large System** in the **Size Estimate** field on the **Estimated System Size** page of the deployment wizard.

To provide information that is required for SAS Field Quality Analytics:

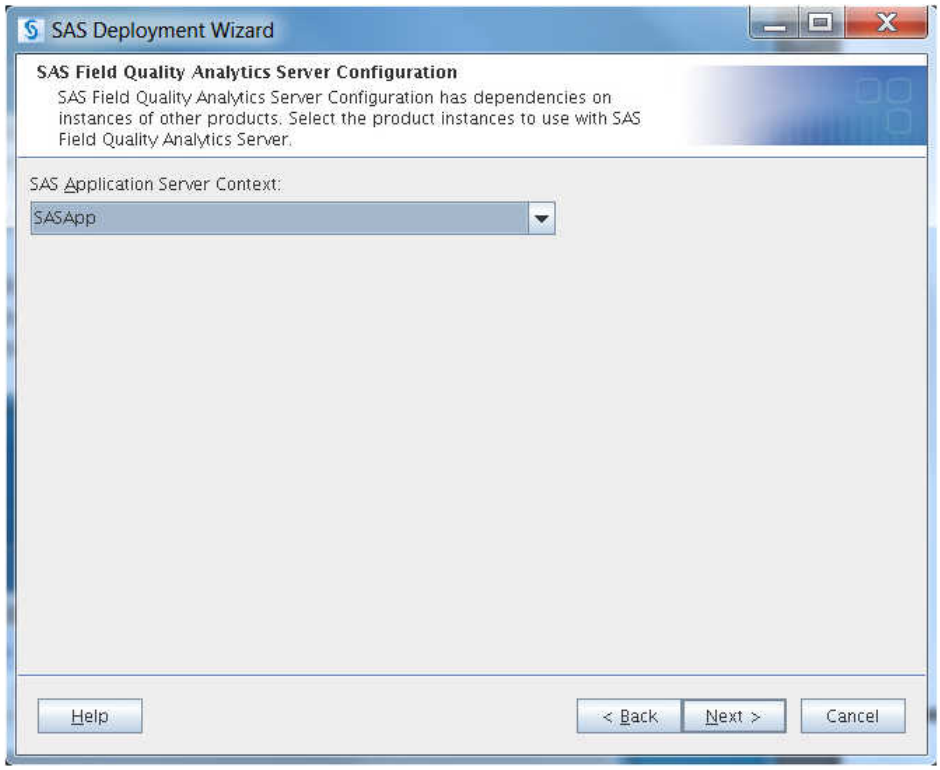
1. On the following wizard page, specify the credentials that are used for internal access to the database for SAS Field Quality Analytics. These credentials are created during the installation process and provide administrative access only to the SAS Field Quality Analytics database.



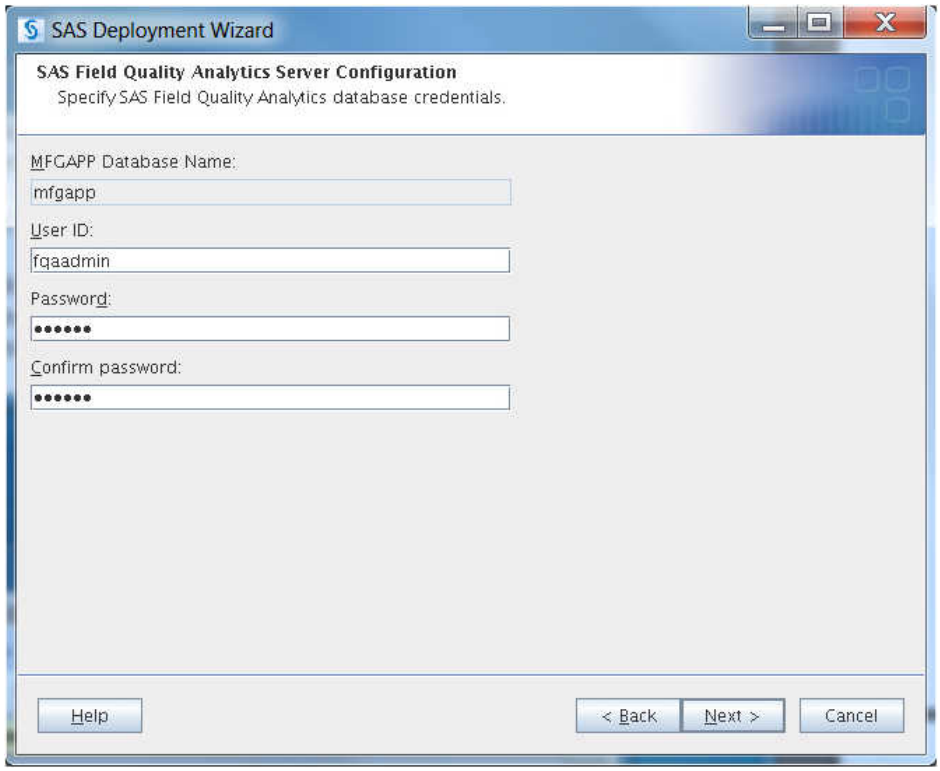
Data Server Administrator
Specify the ID of the database user whose credentials provide internal access to data in SAS Field Quality Analytics.

Data Server Administrator Password and **Confirm Password**
Specify the password of the database user whose credentials provide internal access to data in SAS Field Quality Analytics.

2. Click **Next**.
3. Select the SAS Application Server context if prompted.

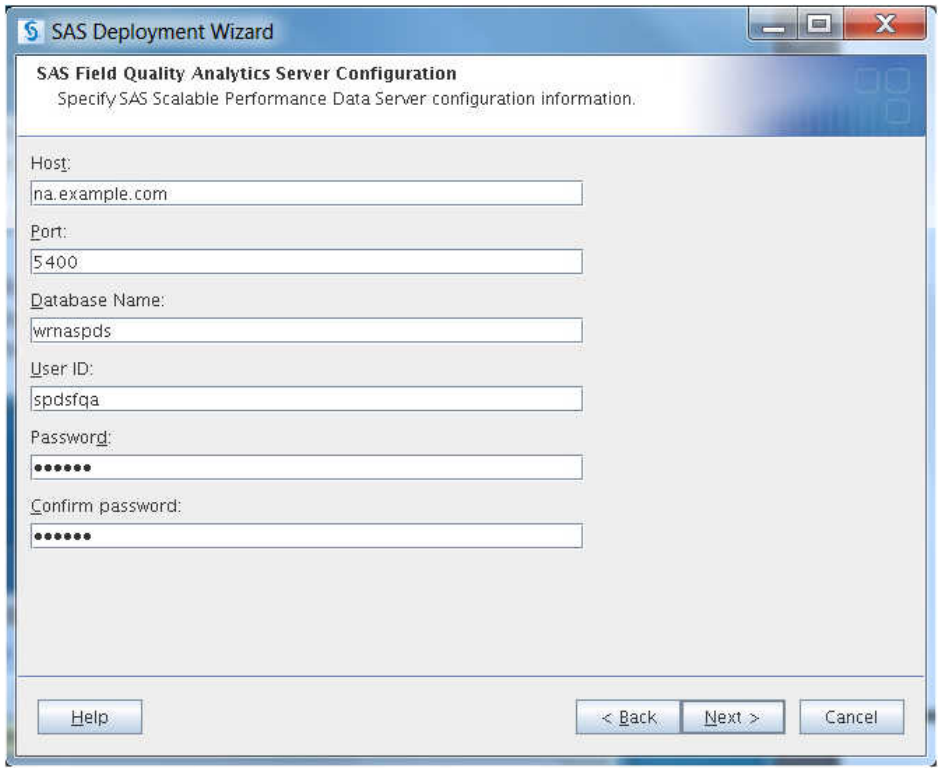


4. Click **Next**.
5. Specify credentials for the **`mfgapp`** database that will be configured by the SAS Deployment Wizard.



Note: For more information about users, see Chapter 10, "Users, Groups, and Roles," on page 153.

6. Click **Next**.
7. Specify information for the SAS Scalable Performance Data Server configuration.



Note: The SPD Server user ID was created when you performed the instructions in Chapter 5, "Installing and Configuring SAS Scalable Performance Data (SPD) Server," on page 17.

Host
Specify the fully qualified name of the host machine on which the SPD Server is installed.

Port
Specify the port on which the SPD Server is listening.

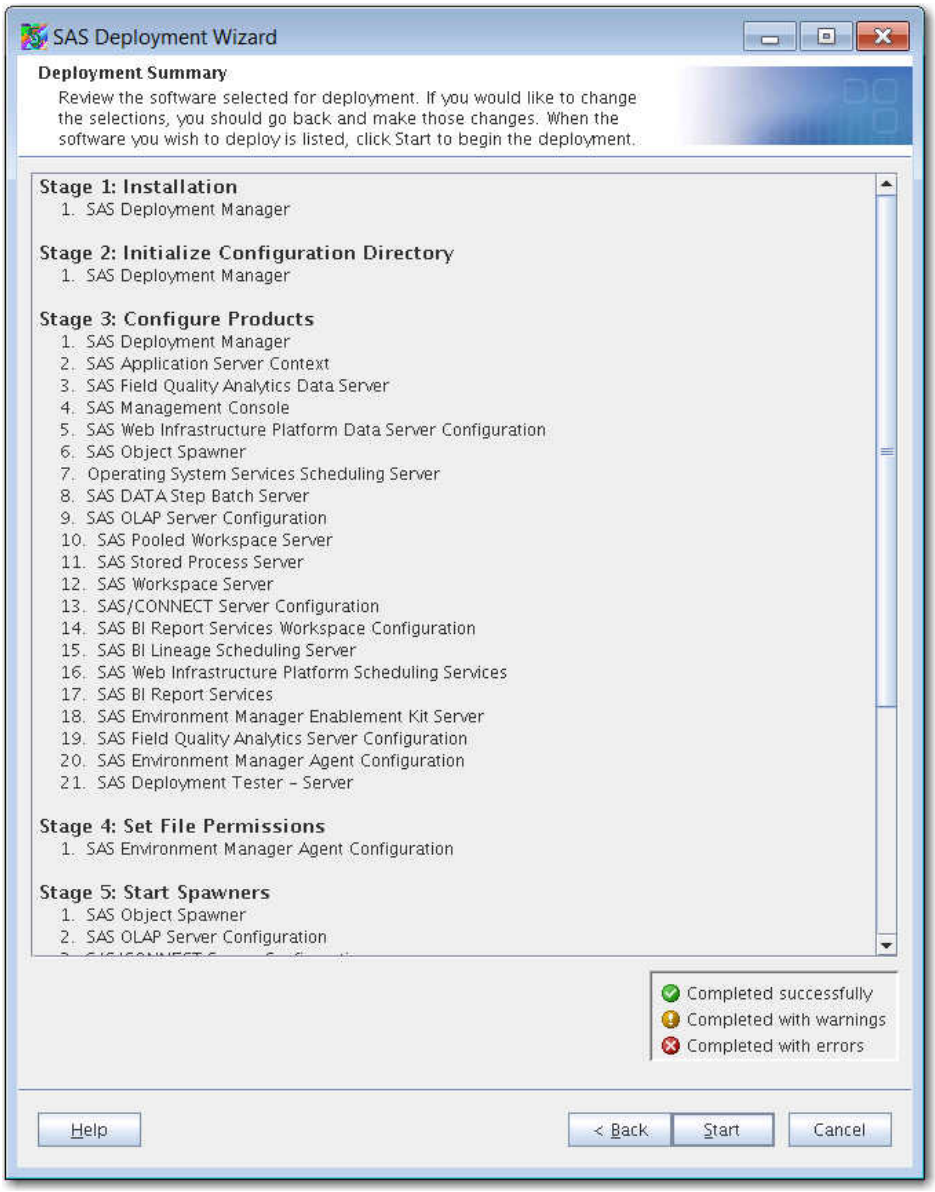
Database Name
Specify the LIBNAME domain (for example, spdsfqa) that is used for the SPD Server metadata and the fact tables.

User ID
Specify the ID of the database user whose credentials are used to access SAS Field Quality Analytics data on the server.

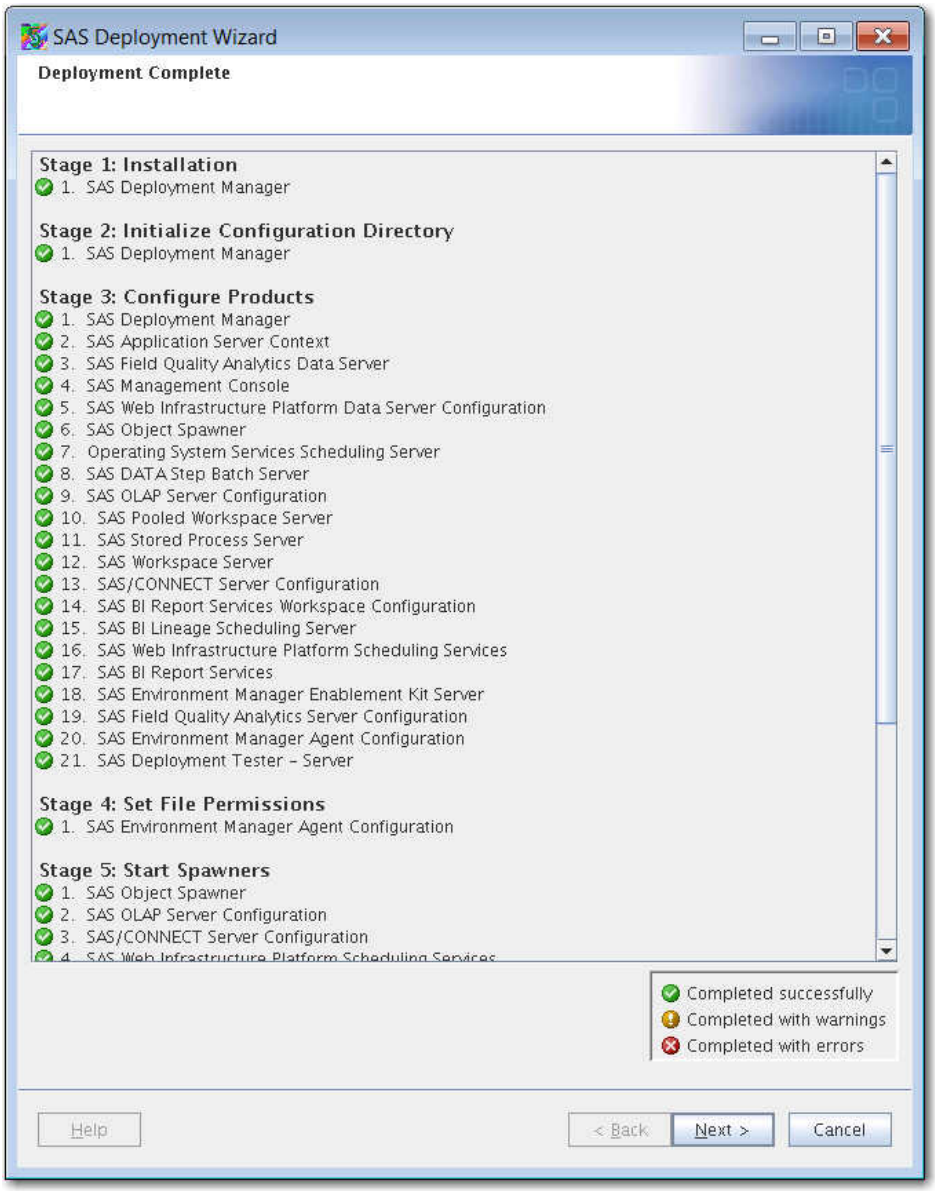
Password and **Confirm password**
Specify the password of the database user whose credentials are to access SAS Field Quality Analytics data on the server.

Note: This database software must be installed before you install SAS Field Quality Analytics.

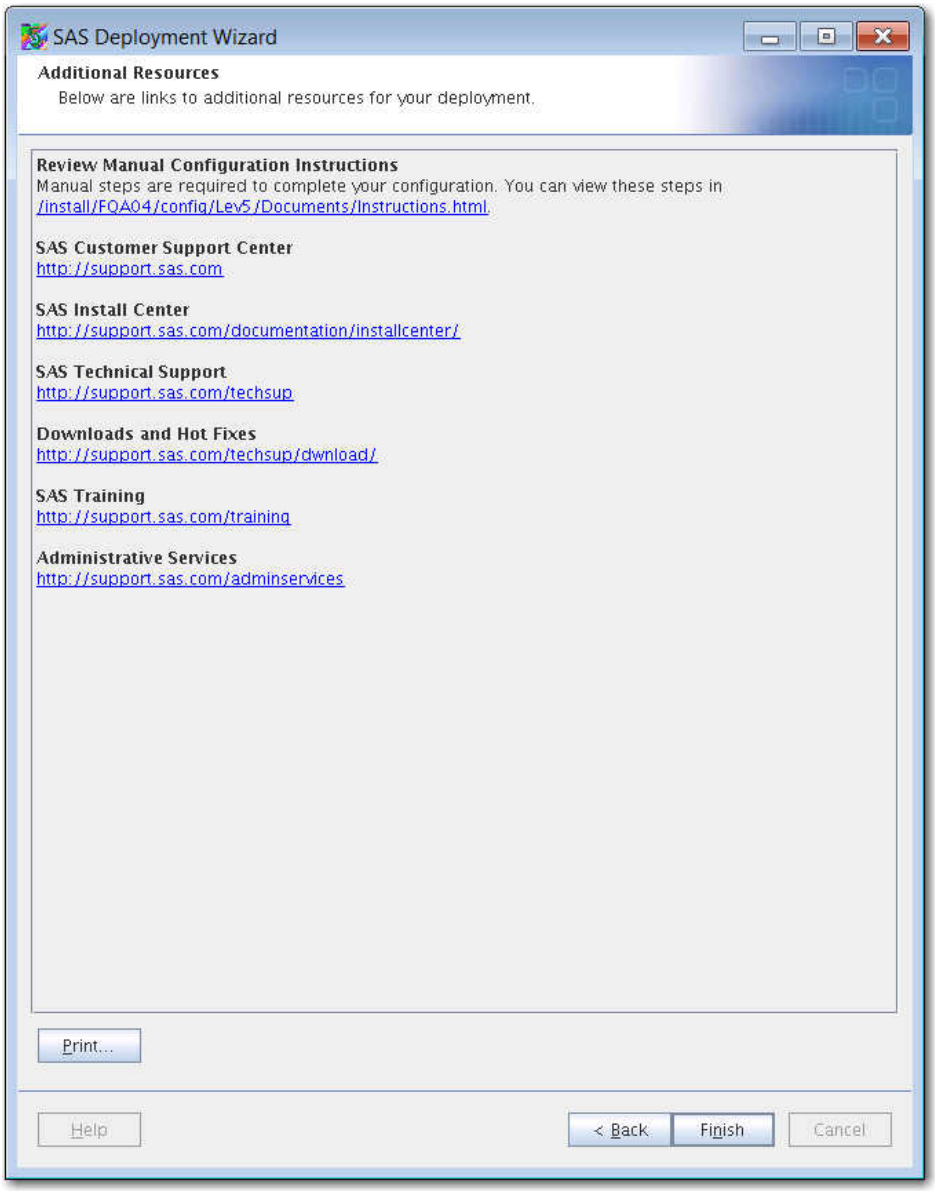
8. Click **Next**.
9. Review summary information.



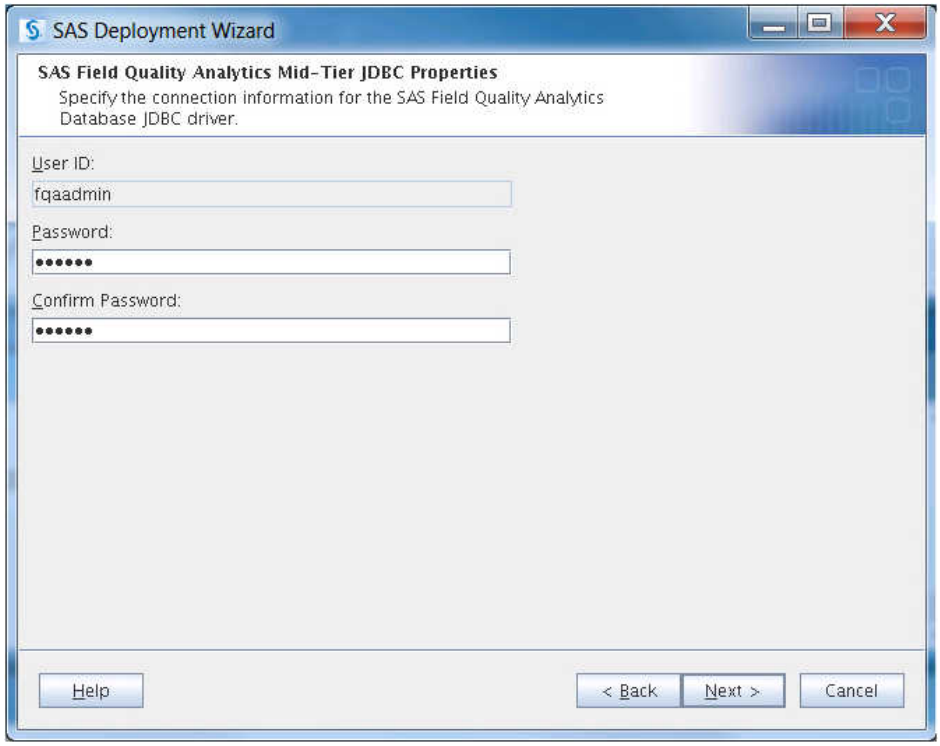
10. Click **Start**.
11. Review installation progress.



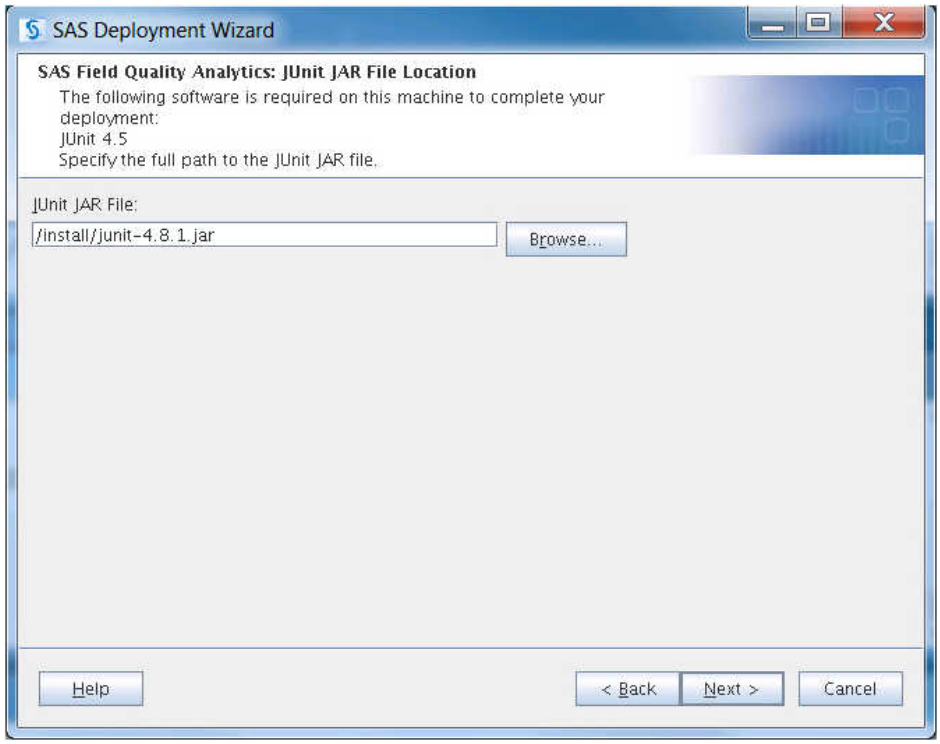
12. Click **Next**.
13. Review additional resources.



14. Click **Finish**.
15. If your middle tier is on a separate machine, you will have SAS Deployment Wizard dialogs for SAS Field Quality Analytics on this machine.
    a. Specify credentials that you previously entered on the SAS Application Server machine for the MFGAPP database that will be configured by the SAS Deployment Wizard.



b. Specify the location of the JUnit JAR file.



Post-installation Tasks for SAS Field Quality Analytics

Overview of Post-installation Tasks

After you install and configure SAS Field Quality Analytics, complete the following post-installation tasks:

1. "Apply Hot Fixes"
2. "Start Servers for SAS Field Quality Analytics"
3. "Follow Instructions in Instructions.html "
4. "(Optional) Stop Servers for SAS Field Quality Analytics" on page 39
5. "Perform Security Tasks for SAS Field Quality Analytics"
6. "Permissions" on page 41
7. "Post-installation Steps for LINUX or UNIX" on page 41
8. "Enable Search from the SAS Visual Analytics Hub to Find Favorites" on page 41
9. "Add the Server Context to Use with SAS Field Quality Analytics Jobs If There Are Multiple Server Contexts" on page 42
10. "Configure the SAS Web Application Server for Secure Session Cookies" on page 43
11. "Update the License for SPD Server" on page 43
12. "(Optional) Verify Installation" on page 44

The following topics provide details about each of the preceding tasks.

Apply Hot Fixes

Apply any hot fixes that are suitable for your environment. To determine which hot fixes you need to install, you can use the SAS Hot Fix Analysis Download and Deployment Tool (SASHFADD). The SAS Hot Fix Analysis Download and Deployment Tool analyzes a SAS 9.2, SAS 9.3, or SAS 9.4 deployment. It then creates a customized list of hot fixes that are available for the installed SAS products. Finally, it generates scripts that automate the download of the necessary hot fixes. You use SAS Deployment Manager to install hot fixes for SAS 9.3 and SAS 9.4.

To locate the SAS Hot Fix Analysis Download and Deployment Tool and to download the most recent hot fixes for all SAS products, go to the SAS Technical Support Hot Fix site at http://ftp.sas.com/techsup/download/hotfix/hotfix.html. Hot fix announcements and other important news from SAS Technical Support are posted to the listserv TSNEWS-L. For more information, and to subscribe, go to http://support.sas.com/techsup/news/tsnews.html.

Note: If you are using SAS Scalable Performance Data (SPD) Server with SAS Field Quality Analytics, ensure that you apply the most recent hot fix for SPD Server. To download the hot fix, go to the SPD Server 5.1 Hot Fix site at http://ftp.sas.com/techsup/download/hotfix/HF2/N49.html.

Start Servers for SAS Field Quality Analytics

In order for clients to access SAS Field Quality Analytics, several servers must be running. Because of dependencies between servers, you must use the order described here when you start the servers.

Note: This information describes only those servers that are required by SAS Field Quality Analytics. If you are using other SAS products in your environment, there might be additional servers that you must start. For more information about server operation, see *SAS Intelligence Platform: System Administration Guide*.

To start the servers:

1. Start the SAS Scalable Performance Data (SPD) Server if it is included in your deployment. You must start this server before you start the SAS Web Application Server (SASServer1).

   You can use the following UNIX command to check to see whether the SPD Server is running:

   ```
   ps | grep spds
   ```

   The list of processes that should be running include the following:

   ```
   spdsnsrv
   spdslog
   spdsserv
   spdslog
   spdssnet
   spdslog
   spdsbase
   ```

   To start the SPD Server on Windows, do one of the following:

   - Select **Start** ⇨ **All Programs** ⇨ **SAS** ⇨ **Utilities**, and then select **Start SPD 5.1 Service**.
   - Execute spdsstartsvc.bat, which is located in ***SAS-installation-directory*/SASScalablePerformanceDataServer/5.1/site**.

   CAUTION:
   Do not use the Windows Services Manager or Windows service commands to start or stop this service.

   Note: Ensure that the installed service for this server is configured as a manual service.

   To start SPD Server on Linux, execute rc.spds, which is located in ***SAS-installation-directory*/SASScalablePerformanceDataServer/5.1/site**.

2. Start the following servers if they are not already started:

   - SAS Metadata Server
   - SAS Web Infrastructure Platform data server
   - SAS OLAP Server
   - SAS object spawner
   - SAS/CONNECT spawner
   - JMS broker

- cache locator
- SAS Web Server

You can use the following command in UNIX to determine whether servers are running:

```
SAS-configuration-directory/Levn/sas.servers status
```

Note: Web application servers can be checked on Windows using the Windows Services dialog box.

3. If it is not already started, start the application server for the SAS Information Delivery Portal and BI Services (usually SASServer1).
4. If it is not already started, start the SASServer2 application server.
5. If it is not already started, start the application server for SAS Field Quality Analytics (usually SASServer8).
6. (Optional) Start any other application servers that are configured. For example:
   - SASServer7: SAS Business Rules Manager, SAS Workflow Studio, SAS Decision Manager
   - SASServer11: SAS Enterprise Miner

Follow Instructions in Instructions.html

At the end of the installation process for SAS Field Quality Analytics, the SAS Deployment Wizard produces an HTML document named Instructions.html. If your server tier and middle tier are hosted on separate machines, there are separate Instructions.html files for each machine. Follow the instructions that are provided for SAS Field Quality Analytics in the HTML documents.

Note:

- The middle-tier Instructions.html document provides steps for verifying access to the SAS Field Quality Analytics web application. If you use SAS Demo User for this purpose, remove SAS Demo User from the Asset Perf Analytics – ETL Administrators metadata group after you complete the validation steps.
- The server-tier Instructions.html document provides steps for verifying your installation with the SAS Deployment Tester. The Deployment Tester contains several test suites, including the SAS Installation Qualification Tool (SAS IQ) test suite. If you are using SAS Scalable Performance Data (SPD) Server, the SAS IQ tests might indicate problems with SPD Server files such as libnames.parm, spdsserv.parm, or tkdef.so. These errors are expected and can be ignored.

(Optional) Stop Servers for SAS Field Quality Analytics

When you stop the servers, stop them in the reverse order that you started them. To stop the servers and services:

1. (Optional) Stop application servers for related products. For example:
   - SASServer11: SAS Enterprise Miner
   - SASServer7: SAS Business Rules Manager, SAS Workflow Studio, SAS Decision Manager

2. Stop the application server for SAS Field Quality Analytics (usually SASServer8).
3. Stop the SASServer2 application server.
4. Stop the application server for the SAS Information Delivery Portal and BI Services (usually SASServer1).
5. Stop the following servers in the order shown:
   - SAS Web Server
   - cache locator
   - JMS broker
   - SAS/CONNECT spawner
   - SAS object spawner
   - SAS OLAP Server
   - SAS Web Infrastructure Platform data server
   - SAS Metadata Server

   You can use the following command in UNIX to determine whether servers are running:

   ```
   SAS-configuration-directory/Levn/sas.servers status
   ```

   Note: Web application servers can be checked on Windows using the Windows Services dialog box.
6. Stop the SAS Scalable Performance Data (SPD) Server if it is included in your deployment.

   You can use the following UNIX command to check to see whether the SPD Server is running:

   ```
   ps | grep spds
   ```

   To stop SPD Server on Windows, do one of the following:

   - Select **Start** ⇨ **All Programs** ⇨ **SAS** ⇨ **Utilities**, and then select **Stop SPD 5.1 Service**.
   - Execute spdsstopsvc.bat, which is located in ***SAS-installation-directory*/SASScalablePerformanceDataServer/5.1/site**.

   CAUTION:
   Do not use the Windows Services Manager or Windows service commands to start or stop this service.

   To stop SPD Server on Linux, execute killrc, which is located in ***SAS-installation-directory*/SASScalablePerformanceDataServer/5.1/site**.

Perform Security Tasks for SAS Field Quality Analytics

To set up security for SAS Field Quality Analytics, including users and file permissions, see:

- Chapter 10, “Users, Groups, and Roles,” on page 153
- Chapter 24, “Data Security,” on page 229
- Chapter 25, “Object Security,” on page 233

Permissions

The following are permissions tasks, or permissions-related information that you should be aware of:

- A SAS Field Quality Analytics user needs an operating system user account. On Windows, the user account can be a local or network account.
- On UNIX, SAS Field Quality Analytics user accounts should be members of the group to which the SAS Installer user account belongs. Refer to the pre-installation checklist for information about this group. It should be the primary group of all SAS Field Quality Analytics user accounts to have proper permission to required directories and files.

Post-installation Steps for LINUX or UNIX

SAS Field Quality Analytics stores solution metadata in the MFGAPP library, a Postgres database, and one of the SAS ETL jobs updates this table. The encoding of the MFGAPP Postgres database is UTF-8, and a conversion to UTF-8 is needed if the SAS session encoding is not UTF-8. For LINUX, the Postgres Access engine does not automatically account for or detect the SAS session encoding. Therefore, you have to assign the PGCLIENTENCODING environment variable so that the conversion is made properly to the UTF-8 encoding of Postgres. In the following paragraphs, "Postgres Client Encoding" corresponds to the encoding of the SAS session in which the Postgres library has been assigned.

The following steps, which add the Postgres Client Encoding to the PGCLIENTENCODING environment variable, should be performed before doing any Migration or ETL work on LINUX or UNIX if the SAS session encoding is not UTF-8. The PGCLIENTENCODING environment variable is defined in the client's environment, and that client encoding is automatically selected when a connection to the server is made.

Add the following to the ***SAS-installation-directory/SASFoundation/9.4/bin/sasenv_local*** file:

```
PGCLIENTENCODING=<Encoding Value>
export PGCLIENTENCODING
```

For the correct value to substitute in <Encoding Value>, See “Encoding Name Aliases” on page 289: From this table, substitute the "Postgres Character Set" encoding value that corresponds to the "SAS Character Set" encoding value. For example, you should add the following to the sasenv_local file for a SAS session encoding of latin1:

```
PGCLIENTENCODING=LATIN1
export PGCLIENTENCODING
```

Enable Search from the SAS Visual Analytics Hub to Find Favorites

Perform the following steps for SAS Visual Analytics 7.1:

1. In SAS Management Console, navigate to **Application Management** ⇨ **Configuration Manager** ⇨ **Search Interface to SAS Content 3.4**.
2. Right-click **Search Interface to SAS Content 3.4** and select **Properties**.
3. Click the **Advanced** tab.

4. Copy the text value of the property **searchsas.excluded.object.types** into Notepad. It has comma-separated values of SAS types.
5. Remove the entries that contain the word “Document” (for example, 'DocumentCSS' and 'DocumentCSV'). Make sure that you also remove any extra comma after removing these values.
6. Update the property **searchsas.excluded.object.types** with this modified text in Notepad.
7. Delete all the files at the following location:

   ```
   \Config\LevN\Applications\SASInformationRetrievalStudioforSAS\work\index
   ```

8. Restart the SAS Information Retrieval Studio Server.
9. Restart the web application server that hosts the Search Interface to SAS Content 3.4 web application.
10. After the web application server is running, execute the following script:

    ```
    SAS-configuration-directory/LevX/Web/Applications/SearchInterfacetoSASContent/
    loadindex.sh
    ```

    This script ensures that the content is pushed to your index again.

Add the Server Context to Use with SAS Field Quality Analytics Jobs If There Are Multiple Server Contexts

When multiple server contexts are set up on a SAS installation and used in the Job Execution Service (JES), SAS Field Quality Analytics jobs that are submitted to JES run using any of those contexts. This can result in an error. They should be run with the specific server context meant for SAS Field Quality Analytics. For a site that has multiple contexts configured in the SAS installation, the server context to use for SAS Field Quality Analytics jobs can be specified by adding a property (key/value pair) to the SAS Field Quality Analytics software component as follows:

1. Using SAS Management Console, add a property for the SAS Field Quality Analytics 6.1 software component.
   a. Navigate to **Application Management** ⇨ **Configuration Manager** ⇨ **SAS Application Infrastructure** ⇨ **Field Quality Analytics 6.1**.
   b. Right-click and select **Properties**.
   c. Click the **Advanced** tab.
   d. Click **Add** to add a property for the SAS Field Quality Analytics 6.1 software component:

      ```
      Propertyname: "JobExecution.ServerContext"
      PropertyValue: The default server context name for the FQA deployment
         (usually it is SASApp)
      ```

      Note: You need to verify the property value on your system.
2. Refresh the SAS Field Quality Analytics application cache, or restart the SASServer hosting the SAS Field Quality Analytics application.

Configure the SAS Web Application Server for Secure Session Cookies

To use SAS Field Quality Analytics with an HTTPS connection, you must configure the SAS Web Application Server to set the secure attribute for cookies. This attribute ensures that the web browser does not send cookies over an unencrypted connection.

To set the secure attribute for cookies:

1. Edit the server.xml file for the application server for SAS Field Quality Analytics (usually SASServer8). The server.xml file is located in the ***SAS-configuration-directory*\Levn\Web\WebAppServer\SASServera_b\conf** directory.

   Note: You need to check the location of server.xml on your system. For example, **Levn** could be **Lev1**, and ***SASServera_b*** could be **SASServer8_1**.

2. Add the following property to the **<Connector>** element:

   ```
   secure="true"
   ```

3. Update the **<session-config>** element in the web.xml file to add a **<cookie-config>** element. The web.xml file is located in the ***SAS-configuration-directory*\Levn\Web\WebAppServer\SASServera_b\conf** directory. For example:

   ```
   <session-config>
       <session-timeout>30</session-timeout>
       <cookie-config>
          <secure>true</secure>
       </cookie-config>
   </session-config>
   ```

   Note: You need to check the location of web.xml on your system. For example, **Levn** could be **Lev1**, and ***SASServera_b*** could be **SASServer8_1**.

4. Save your changes.

Note: Because the server.xml and web.xml files apply to all applications in that instance, these changes also affect any other products that are deployed in the same server (for example, SASServer8_1).

For more information about configuring security for the SAS Web Application Server, see *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Update the License for SPD Server

Note: These steps are required if you added SAS Field Quality Analytics to an existing deployment of SAS Asset Performance Analytics and you are storing data for both products in SAS Scalable Performance Data (SPD) Server.

When you install SAS Field Quality Analytics into an existing deployment that uses SPD Server, the SAS Deployment Wizard updates the license for SPD Server with the license that is provided with SAS Field Quality Analytics. Before you can use SPD Server with SAS Field Quality Analytics, you must update the SPD Server configuration for the new license.

To update the configuration:

1. Log on to the SPD Server machine as the user who installed the SPD Server software.
2. Depending on your operating system, update the license information:

   * Windows: Edit the spdsnsrv.bat file in the ***SAS-installation-directory*** **\SASScalablePerformanceDataServer\5.1\site** directory, and update the **-licensefile** option to reference the location of the license file.

   * Linux: Edit the rc.spds file in the ***SAS-installation-directory/*** **SASScalablePerformanceDataServer/5.1/site** directory, and update the **LICFILE** variable to reference the location of the license file.

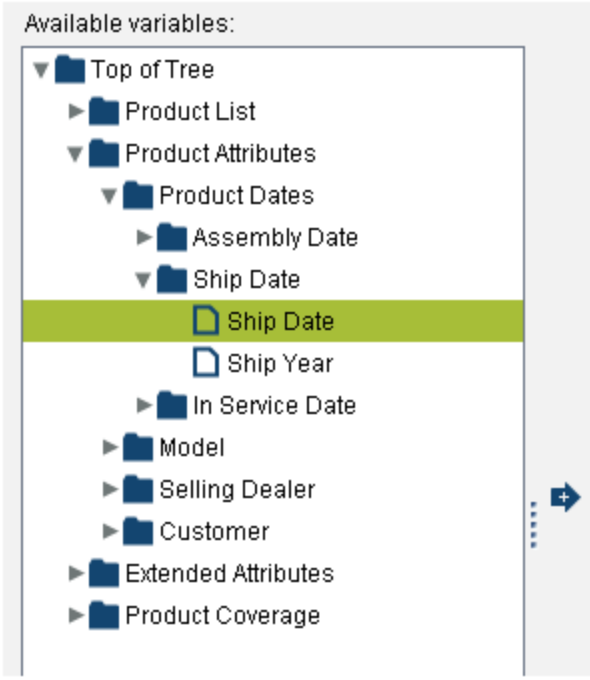
   License files are located in the ***SAS-installation-directory*****\licenses** directory.
3. Save your changes.

The new license is effective the next time you start SPD Server.

(Optional) Verify Installation

Perform the following steps to verify the installation:

1. Sign in to SAS Field Quality Analytics.
2. Navigate to the **Data Selection** Workspace.
3. Click  .
4. Keep the default type of **Simple Data Selection**.
5. Enter a name if you want to use something other than the default name.
6. Select **CLAIM** for the data type.
7. Click **OK**.
8. Open **Top of Tree** ⇨ **Product Attributes** ⇨ **Product Dates** ⇨ **Ship Date**.
9. Click **Ship Date** (with the page icon) under the **Ship Date** folder.



10. Click  .

    The **Ship Date** variable is added to the **Selected Variables** list.
11. Click **Ship Date** in the **Selected Variables** list.
12. Select the **Predefined** option.
13. Select **Last 2 years** from the menu.
14. Click the **Event Selections** tab.
15. Open **Top of Tree** ⇨ **Claim Attributes** ⇨ **Payment**.
16. Select **Total Claim Amount**.
17. Click  .

    The **Total Claim Amount** variable is added to the **Selected Variables** list.
18. Click **Total Claim Amount** in the **Selected Variables** list.
19. Select the **Greater than (and including)** option.
20. Enter `10`.
21. Click **Save** to create the new data selection.
22. Click **Analysis** to open the Analysis workspace.
23. Click on the **My Content** folder.
24. Select **New Project** from the Project Menu ()

    The New Project dialog box appears.
25. Provide a name for the project.
26. Click **OK**.
27. Make sure the project that you just created is highlighted in the **My Content** folder.

28. Click  .

    The New Analysis dialog box appears.

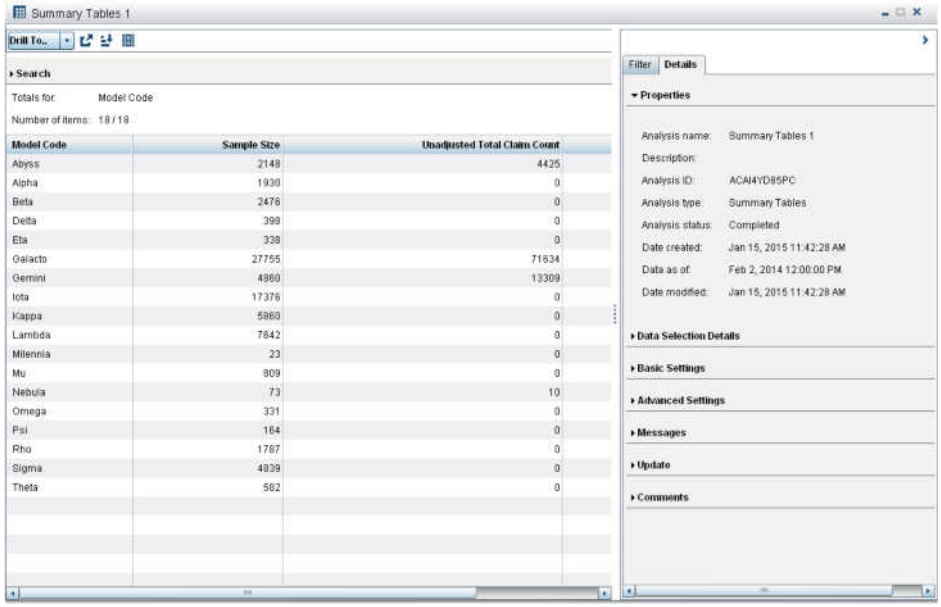
29. Select the data selection that you previously created.
30. Click **Summary Tables** in the **Available Analyses** list.
31. Click  .

    The **Summary Tables** analysis is added to the **Selected Analyses** list.

32. Click **OK**.

    A window appears where you can specify options for the summary tables analysis.

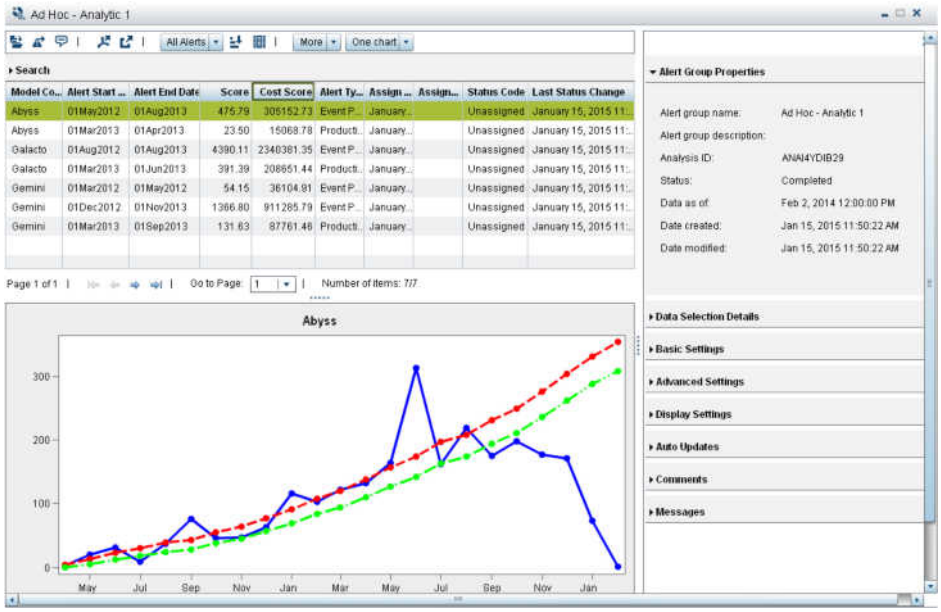
33. Click **Save and Submit** to run the analysis.
34. When the analysis is complete, double-click it to open it and view the results.



35. Click  to close the summary tables analysis.
36. Click **Early Warning** to open the **Early Warning** workspace.
37. Click **Ad Hoc - Analytic**
38. Click  .
39. Select the data selection that you previously created.
40. Click **OK**.

    A window appears where you can specify options for the ad hoc analytic analysis.

41. Click **Save and Submit** to run the analysis.
42. When the status of the ad hoc analytic analysis changes to `Completed`, double-click it and view the results.



Click  to close the ad hoc analytic analysis.

Configuring SAP HANA for SAS Field Quality Analytics

Overview

In order to configure SAP HANA for SAS Field Quality Analytics, the solution must first be installed with SPD Server. After SAP HANA is configured, the main Field Quality Analytics data mart that contains products, events, and child tables will reside in SAP HANA.

The advantage of using SAP HANA is that the data mart is stored in memory. Using SAP HANA can lead to performance improvements, especially when there is a good network connection between the server-tier machine and the SAP HANA server. The SPD Server data mart is updated regularly via the extract, transform, and load (ETL) process, and then the SPD Server mart tables are written to the SAP HANA mart. Therefore, the SPD Server cannot be removed.

Before you can store data in SAP HANA, you must update the SAS metadata to define the SAP HANA server and change the database type for SAS Field Quality Analytics.

Create an Authentication Domain and Server Definition for SAP HANA

To update the SAS metadata:

1. Create an authentication domain to use with SAP HANA.
   a. On the **Plug-ins** tab in SAS Management Console, select **Environment Management** ⇨ **Server Manager**.
   b. Right-click **Server Manager**, and select **Authentication Domains**.

c. Click **New**, and enter a name for the authentication domain (for example, **`FQASAPHANA_Auth`**). You can also provide a description to more clearly identify the authentication domain.

d. Save your changes.

2. Create a user group for the SAP HANA database.

a. On the **Plug-ins** tab in SAS Management Console, select **Environment Management** ⇨ **User Manager**.

b. Select **New** ⇨ **Group** from the **Actions** menu.

c. Enter a name for the new group (for example, **`Field Quality Analytics – SAP Hana Users`**).

d. Click the **Members** tab, and add the following groups:

- Field Quality Analytics – Administrators
- Field Quality Analytics – ETL Administrators
- Field Quality Analytics – Users
- SAS General Servers

e. On the **Accounts** tab, click **New**, and enter the user ID and password for the new group to use when accessing the SAP HANA database. In the **Authentication Domain** field, select the authentication domain that you created for SAP HANA (for example, **`FQASAPHANA_Auth`**).

f. Save your changes.

3. Create a server definition for SAP HANA.

a. On the **Plug-ins** tab in SAS Management Console, select **Environment Management** ⇨ **Server Manager**.

b. Select **New Server** from the **Actions** menu.

c. Select **Resource Templates** ⇨ **Servers** ⇨ **Database Servers** ⇨ **SAP HANA Server**, and then click **Next**.

d. Enter a name to identify the SAP HANA server definition (for example, **`FQASAPHANAServer`**), and then click **Next**.

e. In the **Associated Machine** field, select the server on which SAP HANA is installed, and then click **Next**.

Note: If the server is not listed, click **New** to enter the fully qualified host name for the server and add it to the list.

f. Click **Server Information**, and then click **Options**. Specify the following information:

- the fully qualified host name or IP address for the SAP HANA server
- the full path to the ODBC driver
- the instance number for the SAP HANA server

Click **OK** to save the server information.

4. In the **Authentication domain** field, select the authentication domain that you created for SAP HANA (for example, **`FQASAPHANA_Auth`**).

5. Click **Next** to verify your settings, and then click **Finish** to create the server definition.

Change the Database Type to SAP HANA

Complete the following steps to activate the library for SAP HANA and deactivate the libraries for SPD Server:

1. Activate the library for SAP HANA.
    a. On the **Plug-ins** tab in SAS Management Console, select **Environment Management** ⇨ **Data Library Manager** ⇨ **Libraries**.
    b. Open the properties for the FQAFACT_SAPHana library, and click the **Options** tab.
    c. Change the value of the **Libref** field to `fqafact`.
    d. Click **Advanced Options**.
    e. Select the **Library is Pre-Assigned** check box, and then select **By native library engine** from the **Pre-Assignment Type** menu.
    f. Save your changes, and close the FQAFACT_SAPHana Properties window.
2. Deactivate the fact library for SPD Server.
    a. On the **Plug-ins** tab in SAS Management Console, select **Environment Management** ⇨ **Data Library Manager** ⇨ **Libraries**.
    b. Open the properties for the FQAFACT_SPDS library, and click the **Options** tab.
    c. Change the value of the **Libref** field to `fqaspds`.
    d. Click **Advanced Options**, and then clear the **Library is Pre-Assigned** check box.
    e. Save your changes, and close the FQAFACT_SPDS Properties window.
3. Deactivate the temporary library for SPD Server.
    a. On the **Plug-ins** tab in SAS Management Console, select **Environment Management** ⇨ **Data Library Manager** ⇨ **Libraries**.
    b. Open the properties for the SPDSTMP library, and click the **Options** tab.
    c. Click **Advanced Options**, and then clear the **Library is Pre-Assigned** check box.
    d. Save your changes, and close the SPDSTMP Properties window.
4. To ensure that the configuration changes are applied, restart the following servers:
    1. SAS object spawner
    2. SASServer8 or, for single-server deployments, SASServer1
5. Confirm that you can access the SAP HANA database from SAS.

Update Configuration

Importing the Data Elements Workbook (DEW)

To update the configuration, you need to make required changes to DEW spreadsheets, import the DEW, and run the alter data mart job. For more information about this process, see "Data Elements Workbook" on page 66.

For additional information about migration, see Chapter 8, "Migration," on page 63.

Alter Warranty Configuration Variables

Overview of Update Configuration

Once the DEW has been used to update the mart, the Warranty Configuration should be reviewed and updated to match the data.

To manage warranty configuration variables, select **Warranty Configuration** in the **Administration** workspace. This section contains the following information about how you can manage warranty configuration variables:

Note: To view or modify warranty configuration variables, you must have administrator user permissions.

Edit Warranty Configuration Variables

Perform the following steps to edit the warranty configuration variables in the **Administration** workspace:

1. Click **Warranty Configuration**.
2. Click  .

   A configuration window appears.
3. Select the warranty type that will apply to your configuration.
4. Click **Next**.

   Sales date estimation variables appear.

5. Select or specify column name or variable values for each variable.
6. Click **Next**.

   Usage profile and usage type information appears.
7. Select or specify column name or variable values for each usage profile variable.

   Note: All values should always be entered in upper case and in the same way as in the TABLECOLUMN_META table.
8. Modify usage type information.
   a. Select the cell in the code column for a usage type that you want to modify, and then modify the value.
   b. Select the cell in the label column for a usage type that you want to modify, and then modify the value.
   c. Select the cell in the column name column for a usage type that you want to modify, and then modify the value.
9. (Optional) Add usage type information.
   a. Click  .

      A new row appears in the table.
   b. Specify values in each column for the new usage type.
10. (Optional) Remove a usage type.
    a. Select the usage type that you want to remove.
    b. Click  .
11. Click **Next**.

    Time-in-service variables appear. You can select the values or edit the column names of product and event-related time-in-service variables.
12. Modify the column name or value for each time-in-service value that you want to change.
13. Click **Next**.

    Calculation method variables appear.
14. Specify whether you want to include the adjusted calculation method.
15. If you specified to include an adjusted calculation method, select the column name or value from the menu.
16. Specify whether you want to include the extrapolated calculation method.
17. If you specified to include the extrapolated calculation method, select a column name or value for each variable.
18. Click **Next**.

    Claim submit lag variables appear.
19. Specify whether you want to include claim submit lag variables.
20. If you specified that you want to include claim submit lag variables, provide a column name or value for each variable.
21. Click **Next**.

Parameter lookup information appears.

22. Specify parameter lookup information.

    a. Select **Languages Used in SAS Text Miner**.

    You can add, remove, or modify a language code. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  . To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

    Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

    b. Select **Inter-occurrence Time for Failure Relationships**.

    You can add, remove, or modify inter-occurrence time for failure relationships codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  . To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

    Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

    c. Select **Maturity Level**.

    You can add, remove, or modify maturity level codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  . To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

    Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

    d. Select **Maximum Exposure**.

    You can add, remove, or modify maximum exposure codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  . To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

    Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

    e. Select **Warranty Time Lengths**.

    You can add, remove, or modify warranty time length codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select

the row for the code that you want to remove, and then click  . To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

f. Select **Warranty Lengths for Event Forecasting**.

You can add, remove, or modify warranty lengths for event forecasting codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  . To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

g. Select **Alert Status**.

You can add, remove, or modify alert status codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  . To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

h. Select **Projected Values TIS**.

You can add, remove, or modify projected values time-in-service codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  .

To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

i. Select **Warranty Usage Maximum Mileage**.

You can add, remove, or modify warranty usage maximum mileage codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  . To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

When specifying this warranty program usage limitation option, the value needs to be in the following format:

```
MMM(-UNLIMITED(-LLL))
```

Here, **MMM** is numeric and is the warranty maximum usage (for example, 36,000 miles). **LLL** is numeric and is the warranty length (for example, 12 months).

The following are some possible values to illustrate this format:

- **36000** — Warranty covers until 36,000 miles.
- **36000-UNLIMITED** — Warranty covers any usage (in this case 36000, or whatever is before the first '-' is ignored).
- **36000-UNLIMITED-12** — Warranty covers unlimited mileage for the first 12 months, and then only up to 36,000 miles.

Specify the unlimited option as the last in the list and use the move up and move down arrows to reorder the rows in the table.

Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

j. Select **Forecast Warranty Usage Mileage**.

You can add, remove, or modify forecast warranty usage mileage codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  .

To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

When specifying this warranty program usage limitation option, the value needs to be in the following format:

MMM(-UNLIMITED(-LLL))

Here, **MMM** is numeric and is the warranty maximum usage (for example, 36,000 miles). **LLL** is numeric and is the warranty length (for example, 12 months).

The following are some possible values to illustrate this format:

- **36000** — Warranty covers until 36,000 miles.
- **36000-UNLIMITED** — Warranty covers any usage (in this case 36000, or whatever is before the first '-' is ignored).
- **36000-UNLIMITED-12** — Warranty covers unlimited mileage for the first 12 months, and then only up to 36,000 miles.

Specify the unlimited option as the last in the list and use the move up and move down arrows to reorder the rows in the table.

Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

k. Select **Projected Values Mileage**.

You can add, remove, or modify projected values mileage codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  . To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

l. Select **Warranty Usage Maximum Hours**.

You can add, remove, or modify warranty usage maximum hours codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  .

To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

When specifying this warranty program usage limitation option, the value needs to be in the following format:

`MMM(-UNLIMITED(-LLL))`

Here, **`MMM`** is numeric and is the warranty maximum usage (for example, 36,000 miles). **`LLL`** is numeric and is the warranty length (for example, 12 months).

The following are some possible values to illustrate this format:

- **`36000`** — Warranty covers until 36,000 miles.
- **`36000-UNLIMITED`** — Warranty covers any usage (in this case 36000, or whatever is before the first '-' is ignored).
- **`36000-UNLIMITED-12`** — Warranty covers unlimited mileage for the first 12 months, and then only up to 36,000 miles.

Specify the unlimited option as the last in the list and use the move up and move down arrows to reorder the rows in the table.

Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

m. Select **Forecast Warranty Usage Hours**.

You can add, remove, or modify forecast warranty usage hours codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  .

To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

When specifying this warranty program usage limitation option, the value needs to be in the following format:

`MMM(-UNLIMITED(-LLL))`

Here, **`MMM`** is numeric and is the warranty maximum usage (for example, 36,000 miles). **`LLL`** is numeric and is the warranty length (for example, 12 months).

The following are some possible values to illustrate this format:

- **`36000`** — Warranty covers until 36,000 miles.
- **`36000-UNLIMITED`** — Warranty covers any usage (in this case 36000, or whatever is before the first '-' is ignored).
- **`36000-UNLIMITED-12`** — Warranty covers unlimited mileage for the first 12 months, and then only up to 36,000 miles.

Specify the unlimited option as the last in the list and use the move up and move down arrows to reorder the rows in the table.

Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

n. Select **Projected Values Hours**.

You can add, remove, or modify projected values hours codes. To add a code, click  , and then provide a code and label for the new row. To remove a code, select the row for the code that you want to remove, and then click  . To modify a code, select the cell for the column that you want to modify, and then modify the text that is highlighted.

Note: You can reorder the relative position of codes by selecting a code and then clicking  or  .

23. Click **Next**.

General configuration variables appear.

24. Provide a column name or value for each general configuration variable.

Note:

- Some variables require that you provide the value.
- The value for **Ship Date** should be blank for BUILD-TO-SALE configurations and populated with a valid mart column for SHIP-TO-SALE configurations.

25. Click **Next**.

The changes that you have made to your configuration appear.

26. Click **Finish**.

Refresh Warranty Configuration Variables

Perform the following steps to refresh warranty configuration variables in the **Administration** workspace:

1. Click **Warranty Configuration**.
2. Click  .

Configure Time-Based Warranty with Complete Sales Data

After installation, perform the following steps to perform a one-dimensional warranty (time-based warranty) configuration:

1. Ensure there are no usage-related columns.
2. Run alter data mart and ETL without usage-related columns in the stage area.
3. Click **Administration** in the SAS Field Quality Analytics 6.1 application.

The Administration workspace appears.

4. Click **Warranty Configuration**.
5. Click  .

The Configure SAS Field Quality Analytics 6.1 window appears.

6. Select **Warranty Type 1**.
7. Select **Sale Date Estimation**.
8. Set the values for all sale lag columns to blank.
9. Select **Usage**.
10. Set the values for all the columns to be blank.
11. Delete any existing usage types.
12. Select **Time in Service**.
13. Set the values for all build, sale and ship columns to blank.
14. Click **Claim Submit Lag**.
15. Set the values for all build, sale and ship columns to blank.
16. Click **Parameter Lookups**.
17. Update the values of the parameters.
18. Select **General Configuration**.
19. Set the value for **Maturity Criteria Percentage from Build**, **Maturity Criteria Percentage from Sale** and **Maturity Criteria Percentage for Usage** to `0`.
20. Set the value for **Maturity Criteria Column** to `75` (or desired percentage).
21. Click **Finish**.
22. Click **Data Variables**.

    The Data Variables window in the **Administration** workspace appears. Data variables are presented by table. You might need to first change your table selection from the **Table Name** menu to find the variable that you are looking for.
23. For all BUILD, SALE and SHIP variables, set **Always Include in Filtered Data** to **No**.
24. For any of the following variables that exist, use the Data Variables window to remove it from **Reporting Variable** and **Group Variable** lists and remove it from **Filtered Data**.

    Note: To select a variable, click **Select** by the **Variable Name** field, select the variable in the dialog box that appears, and then click **OK**. To save your changes to a variable, click **Apply**.

    - USAGE (in EVENT tables, like CLAIM or CALLCENTER)
    - USAGE2 (in EVENT tables, like CLAIM or CALLCENTER)
    - USAGE_TYPE_CD (in EVENT tables, like CLAIM or CALLCENTER)
    - USAGE_PROFILE_CATEGORY (in the PRODUCT table)
    - USAGE_PROFILE_LOCATION (in the PRODUCT table)
    - USAGE_PROFILE_SCALE (in the PRODUCT table)
    - USAGE_PROFILE_TYPE (in the PRODUCT table)
25. Click **Select** by the **Variable Name** field, select the variable name (for example, USAGE) in the dialog box that appears, and then click **OK**. Make sure that **Reporting Variable** and **Group Variable** fields are blank. Select **None** for the **Always Include in Filtered Data** field. Click **Apply**.

Configure Time and Usage-Based Warranty with Complete Sales Data

After installation, perform the following steps to configure a time and usage-based warranty with complete sales data:

1. Click **Administration** in the SAS Field Quality Analytics 6.1application.

   The Administration workspace appears.

2. Click **Warranty Configuration**.
3. Click  .

   The Configure SAS Field Quality Analytics 6.1 window appears.

4. Select **Warranty Type 2**.
5. Select **Sale Date Estimation**.
6. Set the values for all sale lag columns to blank.
7. Select **Usage**.
8. Modify the usage profile parameters.
9. Add the usage types that need to be supported.
10. Select **Time in Service**.
11. Set the values for all build, sale and ship columns to blank.
12. Click **Claim Submit Lag**.
13. Set the values for all build, sale and ship columns to blank.
14. Click **Parameter Lookups**.
15. Update the values of the parameters.
16. Click **General Configuration**.
17. Set the value for **Maturity Criteria Column** to `75` (or desired percentage).
18. Set the value for **Maturity Criteria Percentage from Build** and **Maturity Criteria Percentage from Sale** to `0`.
19. Click **Data Variables**.

    The Data Variables window in the **Administration** workspace appears. Data variables are presented by table. You might need to first change your table selection from the **Table Name** menu to find the variable that you are looking for.

20. For all BUILD, SALE and SHIP variables, set **Always Include in Filtered Data** to **No**.

Configure Time-Based Warranty with Incomplete Sales Data

After installation, perform the following steps to perform a one-dimensional warranty (time-based warranty) configuration:

1. Ensure there are no usage-related columns.
2. Run alter data mart and ETL without usage-related columns in the stage area.
3. Click **Administration** in the SAS Field Quality Analytics 6.1 application.

   The **Administration** workspace appears.

4. Click **Warranty Configuration**.

5. Click  .

   The Configure SAS Field Quality Analytics 6.1 window appears.
6. Select **Warranty Type 4**.
7. Select **Sale Date Estimation**.
8. Modify the values for the respective data mart column name.
9. Select **Usage**.
10. Set the values for all the columns to be blank.
11. Delete any existing usage types.
12. Select **Time in Service**.
13. Modify the values for the respective data mart column name.
14. Click **Claim Submit Lag**.
15. Modify the values for the respective data mart column name.
16. Click **Parameter Lookups**.
17. Update the values of the parameters.
18. Select **General Configuration**.
19. Set the value for **Maturity Criteria Column** to **MATURITYCRITERIA**.
20. Set the value for **Maturity Criteria Percentage from Build**, **Maturity Criteria Percentage from Sale** and **Maturity Criteria Percentage for Usage** to `0`.
21. Click **Finish**.
22. Click **Data Variables**.

    The Data Variables window in the **Administration** workspace appears. Data variables are presented by table. You might need to first change your table selection from the **Table Name** menu to find the variable that you are looking for.
23. For any of the following variables that exist, use the Data Variables window to remove it from **Reporting Variable** and **Group Variable** lists and remove it from **Filtered Data**.

    Note: To select a variable, click **Select** by the **Variable Name** field, select the variable in the dialog box that appears, and then click **OK**. To save your changes to a variable, click **Apply**.

    - USAGE (in EVENT tables, like CLAIM or CALLCENTER)
    - USAGE2 (in EVENT tables, like CLAIM or CALLCENTER)
    - USAGE_TYPE_CD (in EVENT tables, like CLAIM or CALLCENTER)
    - USAGE_PROFILE_CATEGORY (in the PRODUCT table)
    - USAGE_PROFILE_LOCATION (in the PRODUCT table)
    - USAGE_PROFILE_SCALE (in the PRODUCT table)
    - USAGE_PROFILE_TYPE (in the PRODUCT table)
24. Click **Select** by the **Variable Name** field, select the variable name (for example, USAGE) in the dialog box that appears, and then click **OK**.
25. Make sure that **Reporting Variable** and **Group Variable** fields are blank.
26. Select **None** for the **Always Include in Filtered Data** field.

27. Click **Apply**.

Configuring Time Interval-Based Variables for an Analysis

For a Time of Event analysis, all reporting variables must be configured in SAS_TOC_REPORT_VAR. The columns REPORT_VAR_NM, CLAIM_PERIOD_NM, SALE_PERIOD_NM, BUILD_PERIOD_NM and INTERVAL_PERIOD_NM should all be populated appropriately.

For a Trend and Control, Trend by Exposure, and Summary Tables analysis, reporting variables can be configured as interval in SAS_TOC_REPORT_VAR. The columns REPORT_VAR_NM and INTERVAL_PERIOD_NM should all be populated appropriately. This will add in any missing periods between the maximum and minimum period in the data.

All mart columns named in the CLAIM_PERIOD_NM, SALE_PERIOD_NM and BUILD_PERIOD_NM columns of the SAS_TOC_REPORT_VAR table should also be flagged as **Always include in filtered data** in the **Data Variables** section of the **Administration** workspace in the SAS Field Quality Analytics application.

Configuration Notes

For DATA labels, your SAS Professional Services and Delivery (PSD) representative can update the Data Elements Workbook (DEW), which contains labels for the tables, columns, and data selection groups. The import DEW and alter data mart process will update the labels in the MFGAPP tables (TABLE_META, TABLECOLUMN_META and DATA_SEL_GRP). The import DEW and alter data mart process will update the default locale labels and the SASHELP tables (WRTYANL_TABLE_META, WRTYANL_TABLECOLUMN_META and WRTYANL_DATA_SEL_GRP). Your PSD representative will need to manually edit the SASHELP tables if multiple locales are being supported.

For analysis option labels, your PSD representative will use the **Administration** workspace in SAS Field Quality Analytics to update your specific analysis parameters and enter a default label. The **Administration** workspace in SAS Field Quality Analytics updates the MFGAPP table and ANALYSIS_PARAM_LOOKUP_VALUES.

Note: These labels are not used by the SAS Field Quality Analytics application, but the labels from the SASHELP data sets are. Therefore, your PSD representative must manually edit the SASHELP table WRTYANL_ANALYSIS_PARAM_LOOKUP for any altered or added labels.

To maintain labels, you will need to manually edit the MFGAPP and SASHELP data sets and keep them in sync.

At least one appropriate variable (reporting variable, analysis variable, or group variable) should be configured for each analysis for each event type (claim, call center, and so on).

Any variable that you want to analyze in a Failure Relationships analysis must also be configured as a variable that can filter on data selections.

Export Warranty Configuration Information

Perform the following steps to export warranty configuration information in the **Administration** workspace:

1. Click **Warranty Configuration**.
2. Click  .

   A dialog box appears.

3. Click **Open** or **Save** to download the configuration file.

Search for a Variable

Perform the following steps to search for a variable:

1. Type terms that you want to search for in the **Search** text box.

   Items that match what you have typed so far are displayed in the table. To return to the complete list of variables, clear the text that you have entered in the **Search** text box, or click  .

2. (Optional) Click **Save Search** to save your search terms for a future use.

   a. The Save Search dialog box appears.

   b. Provide a name for the search.

   c. Provide a description for the search.

   d. Click **Save**.

   Note: To use a saved search, click  , and then select a search from the list of saved searches. To delete a saved search or adjust the order of saved searches, click  and select **Manage Saved Searches**. The Manage Saved Searches dialog box appears. Select a saved search, and then click  to delete, or use the  and  buttons to reorder the relative position of saved searches.

Remove Internal Administrator Role

The **Field Quality Analytics: Internal Administrator** role must be deleted from metadata by using SAS Management Console after installation and configuration is completed. This role enables an internal administrator to set up and configure SAS Field Quality Analytics 6.1 initially at a site. Once all setup work is complete, this role should be deleted using SAS Management Console to help prevent a regular administrator from accidentally modifying the configuration of SAS Field Quality Analytics in an undesirable way.

Chapter 8

Migration

Overview of Migration

This chapter describes the steps that are needed to migrate content from a 4.x installation of SAS Warranty Analysis to a 6.1 installation of SAS Field Quality Analytics. There is also information for migrating from SAS Field Quality Analytics 6.1 to SAS Field Quality Analytics 6.1 (for example, from a development or test to a production environment).

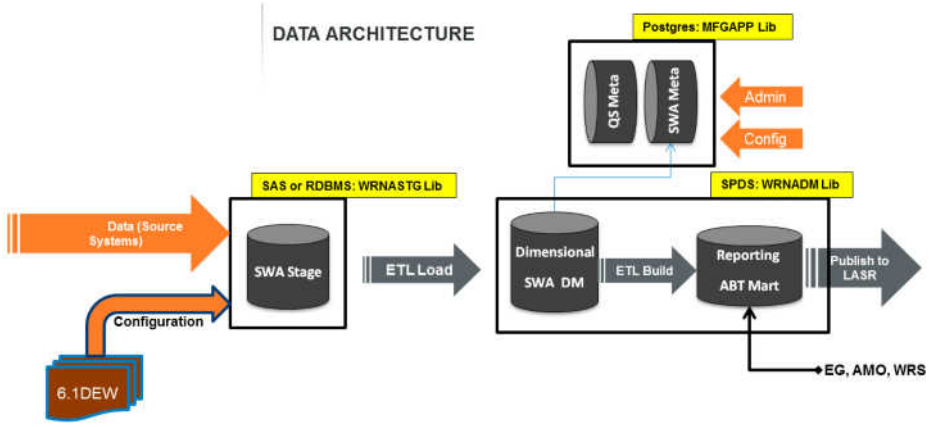
SAS Field Quality Analytics contains a new dimensional data model and architecture. You can also use a new **Administration** user interface to perform a partial promotion of your content.

The content that can be migrated includes the following:

- data selection definitions
- analysis definitions

  Note: A migrated event forecasting analysis must be reviewed and updated.
- projects and project nodes
- subset definitions
- report definitions

The following diagram provides an overview of the migration process:



The following steps provide an overview of the migration process:

1. Create a SAS Migration Utility package on a SAS Warranty Analysis 4.x system to include users, groups, and platform BI content.
2. Deploy a SAS Field Quality Analytics 6.1 development environment, choosing the SAS Migration Utility package to bring in users, groups, and platform content.
3. Log on to the SAS Field Quality Analytics 6.1 application to make sure that the system is healthy.
4. Convert a 4.x Data Elements Workbook (DEW) to the 6.1 DEW format.
5. Run the import DEW macro from the SAS Field Quality Analytics 6.1 development environment.
6. Run a create content package macro on the SAS Warranty Analysis 4.x system.

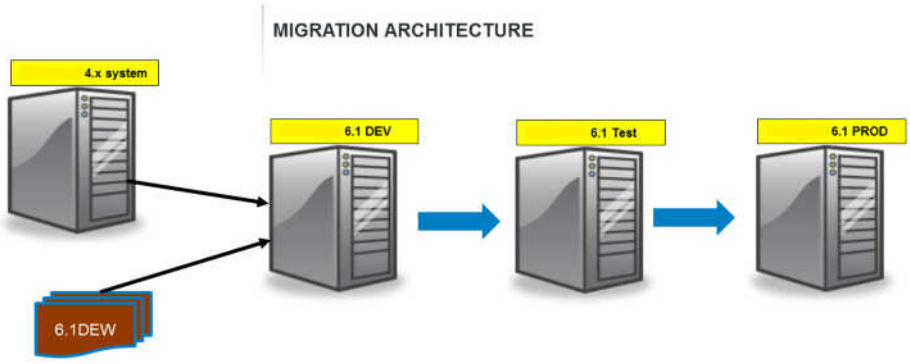
7. Run a migration job from the SAS Field Quality Analytics 6.1 development environment to bring in 4.x data into the 6.1 stage tables.
8. Use the **Administration** workspace in the SAS Field Quality Analytics 6.1 development environment to migrate warranty content.

Note: The progress of migration activity is preserved in memory and is lost after the servers are restarted. The last migration run logs can be viewed, or received in an e-mail, until the server is restarted.

How to Migrate from SAS Warranty Analysis 4.x to SAS Field Quality Analytics 6.1

Overview

The following diagram illustrates how you can migrate content from a SAS Warranty Analysis 4.x environment to a SAS Field Quality Analytics 6.1 environment:



This section describes the various steps that are needed to migrate content from SAS Warranty Analysis 4.x to SAS Field Quality Analytics 6.1.

Pre-migration Steps

Before you perform migration steps to migrate from a 4.x system to a 6.1 development environment, a 6.1 development environment needs to be deployed using a SAS Migration Utility package that includes users, groups, and platform content.

Migrate from a 4.x System to a 6.1 Development Environment

The following steps provide an overview of how to migrate from a 4.x environment to a 6.1 development environment:

Note: Check that the necessary pre-migration steps have been performed before migrating from a 4.x environment to a 6.1 development environment.

1. Convert a 4.x Data Elements Workbook (DEW) to the 6.1 DEW format.
2. Run the import DEW macro on a machine that can read the DEW Excel spreadsheet, typically a Windows computer.

If the 6.1 environment is a Linux or UNIX system, you will need to create a CPORT file with the WRNASTG tables and transfer the file to the Linux or UNIX machine. Then use CIMPORT to import the file into the WRNASTG library on the 6.1 system.

3. Run the alter data mart job.
4. Run a create content package macro on the 4.x environment to create a package folder with 4.x content.
5. Use the **Administration** workspace in the SAS Field Quality Analytics 6.1 development environment to migrate warranty content. View the log.
6. Run a job from your 6.1 development environment to load 4.x data into 6.1 SAS Field Quality Analytics stage tables.
7. Edit ETL jobs, and if necessary, add new ETL jobs.
8. Run ETL jobs to move data into the data mart.
9. Use the **Administration** workspace in the SAS Field Quality Analytics 6.1 development environment to adjust configuration defaults.
10. Generate the customer's ETL process to load the 6.1 stage tables from the source system.

Note: A name that you specify in SAS Field Quality Analytics (for example, the name of a project or an analysis) cannot exceed 60 characters.

The following sections provide more information about these steps.

Data Elements Workbook

Overview

The Data Elements Workbook (DEW) is a Microsoft Excel file that is used to contain customer configuration that you want to import into SAS Field Quality Analytics 6.1.

Required Changes to DEW Spreadsheets

Make the following changes to the DEW tables:

- Modify the table DT_PROPERTIES (the **Tables** tab in the DEW). For each customer table name in CUSTSTG_TABLENAME (in the **Customer Staging Area** section of the tab) map the table to a SAS Field Quality Analytics stage table name in the column TARGET_TABLE_NAME. If there is a customer table that does not match a stage table, then leave TARGET_TABLE_NAME blank.

  All tables, except the product table, are required to have a value entered for the DEW column CUSTSTG_FOREIGNKEY. The product table should not have a value for CUSTSTG_FOREIGNKEY. For example, in the default data model, the foreign key for the CLAIM (EVENT) table is PRODUCT_ID.

  The following display shows the customer staging area in the DEW in the **Tables** tab.

Customer Staging Area

Data Type Description	Table Name	Primary Key	Foreign Key	Product Key
DESCRIPTION	CUSTSTG_TABLENAME	CUSTSTG_PRIMARYKEY	CUSTSTG_FOREIGNKEY	CUSTSTG_PRODUCTKEY
Products	P1_PRODUCTS	SWA_PRODUCT_ID		SWA_PRODUCT_ID
Claims	C1_CLAIMS	SWA_CLAIM_ID	SWA_PRODUCT_ID	SWA_PRODUCT_ID
Included Materials	C1_INCLUDED_MATERIALS	INC_MTR_REC_ID	SWA_CLAIM_ID	SWA_PRODUCT_ID
Labor Codes	C1_LABOR_CODES	LAB_CODE_REC_ID	SWA_CLAIM_ID	SWA_PRODUCT_ID
Fault Codes	C1_FAULT_CODES	FAULT_CD_REC_ID	SWA_CLAIM_ID	SWA_PRODUCT_ID
Comments	C1_COMMENTS	SWA_CLAIM_ID	SWA_CLAIM_ID	SWA_PRODUCT_ID
Coverage	P1_COVERAGE	COV_REC_ID	SWA_PRODUCT_ID	SWA_PRODUCT_ID
Extended Product Attributes	P1_BUILDOPTIONS	SWA_PRODUCT_ID	SWA_PRODUCT_ID	SWA_PRODUCT_ID

- In the new FQA Metadata column FQA Target Table Type (TABLE_TYPE_CD), define the type of table in the warranty data mart. Select **Fact**, **Child**, or **Dimension** from the drop-down list.

  The following display shows the FQA Metadata section in the DEW in the **Tables** tab.

FQA Metadata

Table ID	Data Type Level	Data Source ID	Data Type Group	Data Type Code	Data Type Detail	FQA Target Table Name	FQA Target Table Type
TABLEID	DATATYPELEVI	DATASOUI	DATATYPEGRC	DATATYPE	DATATYPEDETAIL	TARGET_TABLE_NM	TABLE_TYPE_CD
1_P_P	Header	1	Product	P		PRODUCT_STG	Fact
1_E_C	Header	1	Event	C		EVENT_STG	Fact
1_E_C_RP	Detail	1	Event	C	RP	REPL_PART_STG	Fact
1_E_C_LC	Detail	1	Event	C	LC	LABOR_CODE_STG	Fact
1_E_C_FC	Detail	1	Event	C	FC		Fact
1_E_C_CM	Detail	1	Event	C	CM	EVENT_COMMENT_STG	Child
1_P_P_CV	Detail	1	Product	P	CV		Fact
1_P_P_PO	Detail	1	Product	P	PO	EXT_PROD_ATTR_STG	Child

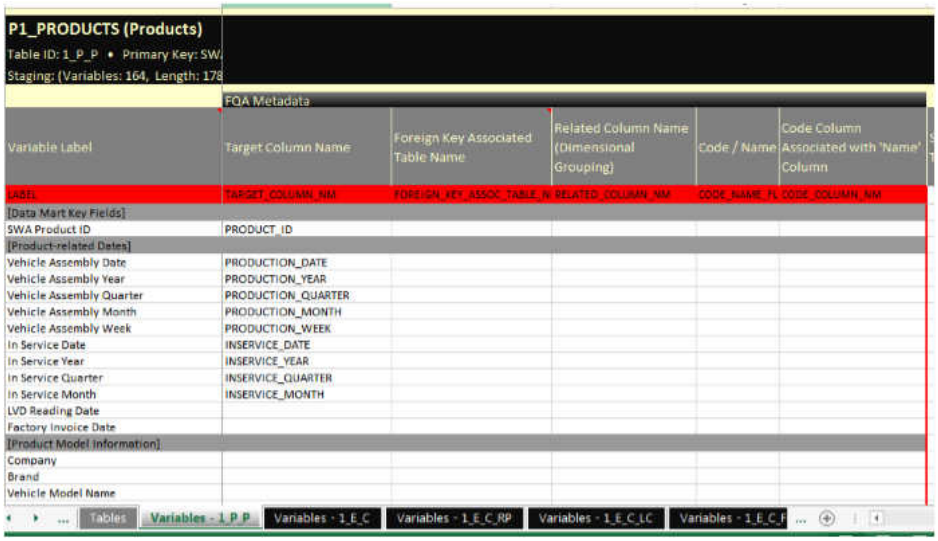
The DEW Spreadsheet Variables Tables

The following are new columns that must be populated in each **Variables** tab in the DEW.

The variables tables are the tables that contain rows defining the columns for each stage table. The names of these tables are on the tabs along the bottom of the spreadsheet and are similar to these: Variables – 1_P_P, Variables – 1_E_C, and so on.

The following display shows the FQA Metadata section in the **Variables** tabs in the DEW.

These new columns are in a section labeled FQA Metadata.



Column	Data Type	Description
TARGET_COLUMN_NM	Character(32)	For data migration mappings from 4.x, specifies the name of the target column in 6.1.
FOREIGN_KEY_ASSOC_TABLE_NM	Character(64)	Identifies this column as a foreign key to a dimension table (TABLE_TYPE_CD=Dimension), or to a primary fact table (TABLE_TYPE_CD=Fact). This is populated with the name of the stage table to which this column is a foreign key. For example, for a primary key column of a child fact table, such as Event Comments, this would be populated with the name of its parent primary fact table that contains this column in its primary key. For the default data model, this would be populated with EVENT_STG. For a column in a primary fact table, such as Event Labor Codes, this would be populated with the name of its associated primary fact table that contains this column in its primary key. For the default data model, this would be populated with EVENT_STG for Key column Event_ID, and PRODUCT_STG for Key column Product_ID.

Column	Data Type	Description
EST_NUM_DISTINCT_VALUES_NO	Numeric(8)	Specifies the estimated number of unique values for character columns. Recommended for fact table character columns that have less than 1000 unique values. This is used to determine whether MASTER_KEY_DIM (less than 1000) is used to store the values for a column, or whether a separate dimension table (greater than or equal to 1000) is created to store the values for a column. This should be populated only for fact table character columns (TABLE_TYPE_CD=F). If the value is blank, and the column has a lookup table, the row count in the lookup table is used in the dimension table determination.
RELATED_COLUMN_NM	Character(100)	Contains the names of the dimension key columns for the grouping of related columns into a dimension. Populate this only for fact table character columns (TABLE_TYPE_CD=F) to define dimension groupings. For example, in table ACTION_CODE_STG, if this has the value ACTION_CD for columns ACTION_CD, ACTION_GROUP_CD, ACTION_GRP_NM, and ACTION_NM, this means that these four columns are grouped into a dimension, and ACTION_CD is the primary key column for that dimension. A key with multiple columns is required to be a space-separated list of columns. For example, if ACTION_CD and ACTION_GROUP_CD define the key for this same dimension grouping, then RELATED_COLUMN_NM should be populated with ACTION_CD_ACTION_GROUP_CD for all the grouped columns.

Column	Data Type	Description
CODE_NAME_FLG	Character(1)	Used to identify code-name column pairs in the data. Value of C or N. Code-name pairs can be identified in all tables (TABLE_TYPE_CD=F, C, D). A value of C signifies that a column is a code, and a value of N signifies that a column is a name that describes a related code column. In primary fact tables (TABLE_TYPE_CD=F), code-name pairs should be grouped via the RELATED_COLUMN_NM column. For data selection flagged variables, the DEW column FILTERVARIABLEYN should be set to NO for a name column (flagged with value N) that is part of a code-name pair. FILTERVARIABLEYN should only be set to YES for the code column (flagged with value C).
CODE_COLUMN_NM	Character(32)	For columns identified as name columns (CODE_NAME_FLG=N), specifies the name of its corresponding code column, which has CODE_NAME_FLG=C.

Each DEW table also needs rows for the columns LOAD_DTTM (date numeric(8)) and ACTION_FLG (character (1)). However, the import DEW macro will create those if they do not exist in the DEW. In many of the DEWs, LOAD_DTTM will be mapped to PROCESS_DTTM.

Note:

- No column should have a name that is longer than 29 characters to allow for ETL suffixing. In addition, any column that is used for text mining should have a name that is no longer than 23 characters.
- Any reporting variables for a Geographic analysis must be populated with codes in the GEOGRAPHIC_COORDINATES table, along with appropriate latitudes and longitudes.
- SAS Field Quality Analytics 6.1 uses a simple coordinate system for plotting Geographic analyses. Each location to be plotted (a city, a state, a country, a building, and so on) needs a unique code and a projected latitude and longitude. SAS Field Quality Analytics 6.1 provides common codes for 247 countries (USA, CAN, and so on) and all US, Canadian and Mexican states and provinces (US-NC, and so on). There are several options for migration.

  If the provided codes suffice for the customer, ensure that the customer's staging data uses the provided codes (they must match exactly, including case).

  If the customer can use the provided codes, but needs to add more (French regions or Japanese prefectures, for example), they can provide those codes in the GEOGRAPHIC_COORDINATES staging table, along with the standard unprojected latitude and longitudes. The ETL job fqa_10020_geographic_coordinates will project the latitude and longitude and populate the proper metadata table.

If the customer needs an entirely different set of codes, then the metadata table MFGAPP.GEOGRAPHIC_COORDINATES should be emptied, the staging geographic coordinates tables should be populated with codes latitudes and longitudes to match the customer's data, and then the ETL job fqa_10020_geographic_coordinates should be run to repopulate the metadata table.

For best performance in the SAS Field Quality Analytics Application, care should be taken to populate the GEOGRAPHIC_COORDINATES table with the smallest reasonable and required set of codes.

Run the Import DEW Macro

After the appropriate changes have been made to the DEW spreadsheet, find the macro wrna_etl_import_DEW.sas from the SASMACROS location in your environment.

Submit a LIBNAME statement to directly read from the DEW spreadsheet data using the views generated by the EXCEL LIBNAME engine on the LIBNAME statement.

The following is an example of how you could read a DEW file using a LIBNAME statement:

```
libname dew excel 'C:\DEW_location\SWA_Data_Elements_Workbook.xlsm';
```

Note: Be sure to modify the preceding path to fit the folder and filenames in your environment.

Submit the macro wrna_etl_import_DEW.sas, and then execute it by running the following statement.

```
%wrna_etl_import_DEW(dew_libref=dew, stagelibref=wrnastg);
```

Note: The previous code assumes that **`wrnastg`** is the libref that is assigned to the SAS Field Quality Analytics stage library.

Check the log for errors.

The wrna_etl_import_DEW.sas macro should create and update the stage tables with your configuration information from the DEW.

After the wrna_etl_import_DEW.sas macro has run successfully, follow the instructions to migrate 4.x content (data selection definitions, analysis definitions, and projects) from USERDL.

Find the alter data mart job (**fqa_00001_alter_data_mart**), and then double-click it to open it. For more information about the alter data mart job, see "ETL Utility Jobs" on page 115.

Click the **Run** button to run the job. There might be errors generated if the DEW is not set up correctly to be imported. If the DEW is not correctly configured, the errors will indicate the items that need to be corrected.

Verification

When the alter data mart job has run successfully, update the table metadata in folders **Data Mart**, **ETL Check**, and **Stage Data** to match the physical source tables. This is done by using the Shift or Ctrl key to select all the tables (do not select the library) in these folders, and right-clicking **Update Metadata**. If any new tables have been added to the data mart, right-click the **Data Mart** folder and select **Register Tables**, and follow the prompts to register the new SPD Server tables. Repeat this step to register the corresponding SAS tables into the **ETL Check** folder and to register the corresponding SAS tables into the **Stage Data** folder.

The data mart tables should now include the default SAS Field Quality Analytics columns as well as the new columns from your DEW. The default columns should have the default attributes (type, length, labels and formats), unless your DEW has matching columns. If your DEW has matching columns, your attributes will override the default settings. New columns from your DEW should be included in the tables and contain the attributes defined in the DEW.

Run Macros to Create the Content Package

Overview of Content Migration

This section describes the steps that are needed to migrate the following:

- content from a 4.x installation of SAS Warranty Analysis to a 6.1 installation of SAS Field Quality Analytics
- content from a 6.1 installation of SAS Field Quality Analytics to a 6.1 installation of SAS Field Quality Analytics

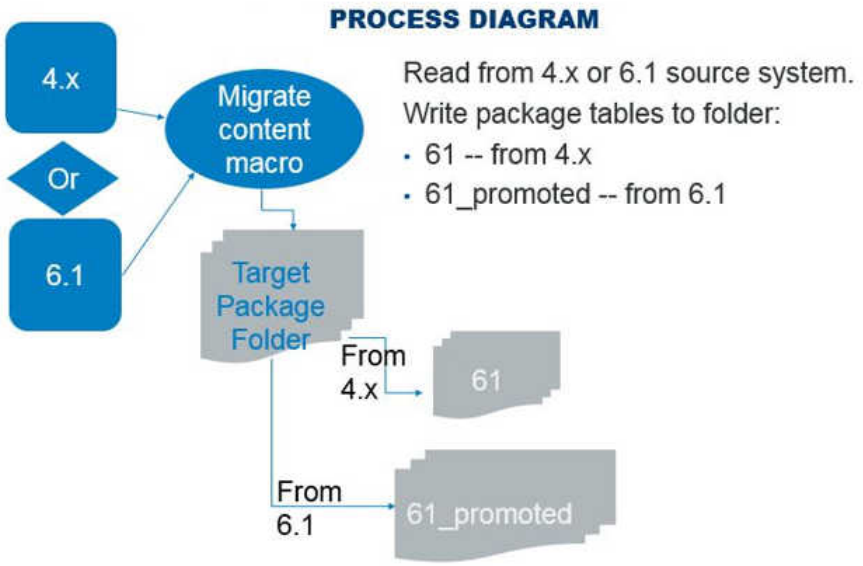
The content that can be migrated includes the following:

- data selection definitions
- analysis definitions
- reports
- projects

In a 4.x to 6.1 migration, content is pulled from a 4.x installation of SAS Warranty Analysis for use in a 6.1 installation of SAS Field Quality Analytics. All content (or content between specified dates) is written to SAS data sets in an intermediate output location (a package folder). When pulling from a 4.x installation of SAS Warranty Analysis, 4.x tables are used as input to a process that creates 6.1 MFGAPP mirror tables, whose names are appended with _pkg. A report file is also created that lists information about analysis definitions, data selection definitions, and projects.

In a 6.1 to 6.1 migration, content is read from MFGAPP tables of the source system and written to an intermediate output location (a package folder) on the source system. The package folder contains MFGAPP mirror tables with _pkg appended to the table names.

The following diagram provides an overview of the migration process.



Note: You must be logged on to the system as a user that has administrator permissions with Read, Write, and Delete permission on the operating system in order to enable all functionality of the migration programs.

4.X to 6.1 Migration

The following steps explain the process to migrate content from 4.X system to a 6.1 system on a new machine:

1. Create a 6.1 DEW for the 4.3 mart.
2. Import the DEW by running macro wrna_etl_import_DEW.sas.
3. If any lookup tables are specified in the DEW, extract these tables from the 4.X system and add them to the 6.1 staging folder (WRNASTG). This is a manual process.
4. If the 4.X system has Usage Profile or Sale Lag Profile tables, extract these tables from 4.X, rename their columns to match the 6.1 column names, and bring these tables into WRNASTG. This is a manual process.
5. Run the alter data mart job.
6. Start or Restart the WebApp Services. For Windows: If the WebApp Services is already started, only SASServer8_1 needs to be restarted.
7. Configure the 6.1 system to match the 4.3 system using the **Administration** workspace in the SAS Field Quality Analytics application (complete sales data, usage profiles, and so on). See "Update Configuration" on page 50 for more information.
8. Create a SAS Field Quality Analytics migration package by running the macro wrna_run_migrate_content.sas, which reads from the 4.3 libraries (USERDL, PARMSL, EIOUT) and writes package tables to a 61 folder.
9. Import the SAS Field Quality Analytics package from the 61 folder using the **Content Migration** facility in the **Administration** workspace in the SAS Field Quality Analytics application.

10. If there are content migration errors related to missing columns or column name differences, modify the DEW to address these column discrepancies, and then repeat steps 2, 3, 4, 5, 6, 7 and 9.
11. Run macro wrna_etl_mig61.sas to load SAS Field Quality Analytics 6.1 stage tables from the SWA 4.x data mart or the customer staging area.
12. Modify and then run the remaining ETL jobs to populate the SAS Field Quality Analytics 6.1 data mart.

6.1 to 6.1 Migration – Migrate All Content

The following steps explain the process of promoting a development system to an identical production system:

1. Create a SAS Migration Utility migration on the development machine.
2. Install SAS Field Quality Analytics 6.1 on the production machine as a migration using the SAS Migration Utility package. There is no need for a SAS Field Quality Analytics migration package or further manual steps.

6.1 to 6.1 Migration – Partial Promotion

The following steps explain the process where there are development and production systems running, and the last few weeks of content is brought forward from development to production:

1. If there are configuration changes on the development machine that need to be applied to production, then export and import the warranty configuration using the **Warranty Configuration** facility in the **Administration** workspace in the SAS Field Quality Analytics application.
2. Create a SAS Field Quality Analytics migration package on the development machine by running the macro wrna_run_migrate_content_61.sas.
3. Import the SAS Field Quality Analytics package on the production machine using the **Content Migration** facility in the **Administration** workspace in the SAS Field Quality Analytics application.

Items and Objects That Are Not Migrated

The following items and objects are not migrated:

- **Results** — Due to the enhanced SAS Field Quality Analytics application and improved display of results, content definitions (without results) are migrated. This provides the benefits of keeping the time to migrate at a minimum and allows users to see the latest results on demand.
- **Sharing information** — Due to the redesign of publishing and sharing (it is no longer required to publish a report to share it, and dynamic analyses can be shared so that users will see any updates), the manage sharing tool should be used to set up appropriate sharing in the new system.
- **Auto-Update** — The new SAS Field Quality Analytics application allows analyses to be automatically updated without publishing or refreshing an entire data node. In addition, users can specify a time frame to update the analysis, so that old analyses and analyses that are no longer needed will not affect the system. To take advantage of these enhancements, a user should adjust update settings in the new system.
- **Subscriptions** — Due to functional enhancements and the fact that Early Warning (formerly Emerging Issues) migration is frequently accompanied by notable data changes, it is appropriate for users to enter their subscription information in the new system.

- **Product and event templates** — The data selection creation process has been streamlined to allow one-step creation of simple data selections, without requiring separate product and event templates. For this reason, product and event templates are not migrated, but can easily be re-created from the migrated data selections, using the **Save as Template** function.
- **Details table** — The Details Table analysis that is executed with the **all datatype** option is migrated, but with a different value stored against the **all datatype** option.
- **Emerging Issue elements** — Due to the underlying redesign and improvements to Early Warning analyses, analyses that are the result of the Analyze in Project option from Emerging Issues, Emerging Issues alert statuses, and Emerging Issues alert notes are not migrated. These should be re-created in the new system after the first Early Warning run.
- **Data selections marked to be stored in 6.1 to 6.1 partial promotion** — Since stored data is not migrated, the indicator of stored data is also not migrated. After migration, users need to reselect data selections that they want to store.
- **Data selection templates in a 6.1 to 6.1 partial promotion** — Data selection templates need to be re-created after migration.
- **Data selections with only product build options** — Data selections with a product component that contains only product build options are not currently supported for migration.
- **Enterprise Analytic (4.3 to 6.1)** — Due to significant enhancements for Enterprise Analytic, including the ability to run it on a data selection, Enterprise Analytic information should be manually re-created so that the new features can be used.
- **Enterprise Analytic (6.1 to 6.1)** — Since the reconciliation process relies on consistent sequential runs, only the Enterprise Analytic definitions are migrated. The first run in the new system provides a baseline. This process will provide the most consistent and accurate results.
- Errors on the **Content Migration** import into the SAS Field Quality Analytics application for the following analysis types can be safely ignored, because SAS Field Quality Analytics does not support migration for these types:
  - EIANALYTIC
  - EIAUTOMATED
  - EIDRILLTO
  - EIDRILLTOA
  - EITHRESHOLD
  - THRESHOLD

Tables Used by the Migrate-Content Process in a 4.x to 6.1 Migration

In a 4.x to 6.1 migration, the migrate-content process reads the following tables from a 4.x installation of SAS Warranty Analysis:

Table Name	Description
USERDL.USR_SFILTERS	This table contains a row for each simple filter data selection. It contains the ID for the data selection as well as the PSC (product component) and ESC (event and claim component) IDs.

Table Name	Description
USERDL.USR_CFILTERS	This table contains a row for each combined filter data selection. It contains the ID for the combined filter and a column with the list of filter IDs that make up the combined filter.
USERDL.USR_ESC	This table contains information about the create date and author of the claim and event component selection.
USERDL.USR_PSC	This table contains information about the create date and author of the product component selection.
USERDL.CSC###_OPTIONS	These tables contain the claim and event component options that were selected for the data selection.
USERDL.PSC###_OPTIONS	These tables contain the product component options that were selected for the data selection.
Individual _OPTIONS tables	The individual _OPTIONS tables are combined into one table with all the options for all the data selections.
USERDL.ANALYSIS	This table contains a row for each analysis definition.
AN###_OPTIONS	These tables are combined into one table with all the options that were selected for each analysis.
USERDL.PROJECT_WORKSPACE	This table contains information for each project.
USERDL.PROJECT_NODE	This table contains a row for each node in a project.

Output

The migrate-content process produces the following output:

- A package folder with SAS tables in 6.1 form that contain the migrated and converted content. The tables PROJECT_ID_PKG and PROJECT_NODE_PKG are not MFGAPP 6.1 tables. Project information in SAS Field Quality Analytics 6.1 is stored in OMR. However, these tables are needed to bring project information into the 6.1 system.
- A report with header information and a listing of IDs for data selections, analyses, projects, and project nodes.

The package folder contains the following MFGAPP mirror tables:

- ANALYSIS_INSTANCE_PKG
- ANALYSIS_INSTANCE_PARAM_PKG
- CHILD_FILTER_PKG
- CHILD_FILTER_VALUE_PKG
- DATA_SEL_COLUMN_PKG
- DATA_SEL_FILTER_PKG

- DATA_SEL_FILTER_VALUE_PKG
- DATA_SEL_MEMBER_PKG
- DATA_SEL_PKG
- DOMAIN_OBJECT_META_PKG
- PROJECT_ID_PKG
- PROJECT_NODE_PKG
- SUBSET_GROUP_PKG

Note: Most of these tables are mirror tables of the 6.1 MFGAPP tables of the same name without the _PKG at the end. These tables are saved in a package folder that is specified in the macro call (by default the folder is named 61 and must exist before running the macro). There is also a formats catalog in the package folder that contains format definitions to convert 4.x variable IDs to 4.x variable names, and 4.x data mart variable names to 6.1 data mart variable names.

The remaining topics in this section explain the steps to configure the warranty data mart to import data, the steps to migrate from SAS Warranty Analysis 4.x to SAS Field Quality Analytics 6.1, and additional steps that are required to migrate from SAS Field Quality Analytics 6.1 to SAS Field Quality Analytics 6.1.

Steps to Configure the Warranty Data Mart to Import Data

Perform the following steps to configure the warranty data mart to import data:

Note: These instructions assume you start with a Data Elements Workbook (DEW) configured for SAS Field Quality Analytics 6.1.

1. Run the macro wrna_etl_import_DEW.sas to read the DEW and configure the warranty stage tables.
2. Run the alter data mart job to configure the warranty data mart tables.
3. Run the migrate content macro to create a package folder that contains the content (data selection definitions, analysis definitions, report definitions and projects) from the 4.x system.
4. In the SAS Field Quality Analytics application, use the **Content Migration** utility in the **Administration** workspace to import the package content. View the log to confirm that supported objects have been imported.
5. Run the macro wrna_etl_mig61.sas to import 4.x data into the SAS Field Quality Analytics stage tables.
6. Modify and run the other ETL jobs to populate the warranty data mart tables with customer data.

How to Migrate from SAS Warranty Analysis 4.x to SAS Field Quality Analytics 6.1

Migrate Content from 4.x to 6.1

To migrate content from 4.x to 6.1, run the driver program wrna_run_migrate_content.sas in a SAS session or as a batch job to pull content from the 4.x system. Running as a batch job is recommended in the case of a very large

USERDL. The program can take up to several hours to complete when the USERDL library is very large, even when running in batch.

The driver program pulls the 4.3 content and creates the 6.1 package tables that are imported to the 6.1 system using the **Content Migration** facility in the **Administration** workspace of the SAS Field Quality Analytics application. A description of the steps and necessary modifications is in the next section.

Workaround for Mixed-Case 4.x Variable Names

In the case where a variable name used in a data selection or analysis option is in mixed-case and that variable has a name change from 4.x to 6.1, then the variable name needs to be manually converted to mixed-case in the MIGRATION_SOURCE_COLUMN_NM column of the table MFGAPP.STAGE_COLUMN_CONF. The variables that are in mixed-case can be found in the 4.x table PARMSL.ANALYSISMACVARS.

Conversion of 4.x Analysis Option Names and Values to 6.1 Values

In a 4.x to 6.1 migration, for certain analyses, some of the analysis option names and values are different in SAS Field Quality Analytics 6.1 than they were in SAS Warranty Analysis 4.x. The conversion of those analysis option names and values for each users' analysis definitions is controlled by the macro wrna_migrate_analysisoptionnames.sas, which is called by the driver program.

The wrna_migrate_analysisoptionnames.sas macro populates a temporary table that is used as a lookup table to convert any of the option names and values that might have changed in each users' analysis definitions.

For example, the following line in the macro is used as a lookup to change the 4.x analysis option name "reportVarID" to the 6.1 name "reportVar" for the Pareto analysis:

```
values("PARETO","reportVarID","reportVar","Reporting variable",
"","","","reportvar : Reporting Variable")
```

The following example shows a change in analysis option value for a Reliability analysis. In SAS Warranty Analysis 4.x, for the option "plotHazard", the possible values were "Y" and "N". In SAS Field Quality Analytics 6.1, the possible values are "TRUE" and "FALSE".

```
values("RELIABILITY","plotHazard","plotHazard","Hazard plot","Y","TRUE","Yes","")
values("RELIABILITY","plotHazard","plotHazard","Hazard plot","N","FALSE","No","")
```

The macro wrna_migrate_analysisoptionnames.sas can be opened and edited if there is a need to add other option names and values to the list. This editing would need to occur before running the driver program wrna_run_migrate_content.sas.

The list of option names and values in the macro is inclusive in that all option names and values for each analysis are listed, even if there is no change from 4.x to 6.1.

Modify the Driver Program wrna_run_migrate_content.sas

Modifications need to be made to the program to conform to your specific setup. There are lines in the program where modifications are needed based on your configuration, including the folder locations for the 4.x folders USERDL, PARMSL and EIOUT. For example:

```
%let userdl=C:\SAS\SASConfig\Lev1\AppData\SASWarrantyAnalysis4.2\userdl;
%let parmsl= C:\SAS\SASConfig\Lev1\AppData\SASWarrantyAnalysis4.2\parmsl;
%let eiout= C:\SAS\SASConfig\Lev1\AppData\SASWarrantyAnalysis4.2\eiout;
```

Note: Your paths could differ based on your configuration and version of SAS Warranty Analysis.

Create folders on the operating system for the destination libraries for the 6.1 package tables. Content that is pulled from a 4.x installation of SAS Warranty Analysis is written to two folders. Both of these folders must exist on the operating system before you execute the driver program wrna_run_migrate_content.sas.

- **`C:\migration_path\43`** – This folder contains the 4.x content with conversions to 6.1. When the driver program and all migrate content macros complete, the tables in this folder are deleted.
- **`C:\migration_path\61`** – This folder contains the final 4.x to 6.1 package tables that are the source for import into the SAS Field Quality Analytics application using the **Content Migration** facility in the **Administration** workspace.

Define the source version of SAS Warranty Analysis: **`42`**, **`43`**, or **`431`**.

```
%let src_version=43;
```

If it is not already assigned, make sure that the 6.1 MFGAPP pre-assigned library is assigned to the 6.1 system that it will be migrated to. The stored macro %WRNA_INIT should define this library.

Specify the content to be migrated. You can specify **`all`** to migrate all content, or one or more of the following: **`analysis`**, **`data_sel`**, **`projects`**. For example:

```
%let content=all;
```

or

```
%let content=analysis data_sel projects;
```

Datetime values can be entered for **`fromDate`** and **`toDate`** to specify a date range from which to pull existing 4.x content. Specify the datetime values in the form 01Jun14:00:00:00. If you leave the date parameters blank, all content will be imported.

The inputs are set in this section of the program:

```
%let src_version=43;
%let dest_path=&pkg43path;
%let content=all;
%let fromDate=;
%let toDate=;
```

Use the Administration Tab in SAS Field Quality Analytics to Import the Content

After you run the wrna_run_migrate_content.sas macro, you can use the **Administration** tab in the SAS Field Quality Analytics application to choose what content to then migrate to the target 6.1 installation of SAS Field Quality Analytics. After logging on to the SAS Field Quality Analytics application, go to the **Administration** tab, and then select **Content Migration**. In the Content Migration section of the **Administration** workspace, click **Import Package** and define the location of the package folder. You can also define the users for whom you want to import content, and a date range if desired.

You must be logged on to the SAS Field Quality Analytics application with a user ID that has unrestricted administrative credentials and the role “Metadata Server: Unrestricted” to perform content migration.

After you click **OK**, the top half of the screen displays the content that is in the package tables. Select some or all of the content to be imported, and then click **Migrate**. The progress of the import is displayed in the lower half of the screen.

When all selected objects have been imported, be sure to view the log to confirm that the objects have been imported.

Note:

- The following analysis types can produce errors in this log. These errors are safe to ignore, since these analysis types are not supported in this release.

  ```
  EIANALYTIC
  EIAUTOMATED
  EIDRILLTO
  EIDRILLTOA
  EITHRESHOLD
  THRESHOLD
  ```

- SAS Warranty Analysis 4.x Forecasting analyses are migrated into SAS Field Quality Analytics 6.1 Event Forecasting analyses. However, this analytic has been changed and improved significantly, so users should examine their new 6.1 analysis options to ensure best results.
- After migrating a Failure Relationships analysis, the date variable that is used for sequencing in a Failure Relationships analysis should be set as a required variable. To find this variable, click **Administration**, and then click **Warranty Configuration**. Next, click  , and then click **General Configuration** in the window that appears. Finally, scroll to the bottom of the screen to see the variable that is listed as the date variable that is used for sequencing in a Failure Relationships analysis. To add this variable as a required variable, click **Data Variables** in the **Administration** workspace. Next, select the date variable that is used for sequencing in a Failure Relationships analysis. Specify **YES** for the option **Always Include in Filtered Data**. Click the **Apply** button. Refresh the cache.
- To ensure that everything a user needs is migrated, more copies of data selections might be migrated than you need. A user can manually remove any unwanted data selection copies in the SAS Field Quality Analytics 6.1 **Data Selection** workspace. A **View Used By** function is available after a data selection is opened to help users know which data selections are currently being used and which are unreferrenced copies that are safe to delete.

Migrate Content from 6.1 to 6.1

6.1 to 6.1 Migration – Migrate All Content

The following steps describe the process of promoting a development system to an identical production system:

1. Create a SAS Migration Utility migration on the development machine.
2. Install SAS Field Quality Analytics 6.1 on the production machine as a migration using the SAS Migration Utility package. There is no need for a SAS Field Quality Analytics migration package or further manual steps.
3. In the **Administration** workspace, export the warranty configuration from the source system.

4. On the target system, in the **Administration** workspace, import the warranty configuration using the **Warranty Configuration** facility.

6.1 to 6.1 Migration – Partial Promotion

The following steps describe the process where there are development and production systems running, and the last few weeks of content are brought forward from development to production.

1. If there are configuration changes on the development machine that need to be applied to production, first export the warranty configuration using the **Warranty Configuration** facility in the **Administration** workspace in the SAS Field Quality Analytics application.
2. On the target system, it is recommended that you first create a backup of the existing target configuration.
3. On the target system, import the warranty configuration by using the **Warranty Configuration** facility in the **Administration** workspace.
4. Create a SAS Field Quality Analytics migration package on the development machine by running the driver program wrna_run_migrate_content_61.sas. See the following section for more information about this program.
5. Import the SAS Field Quality Analytics package on the production system using the **Content Migration** facility in the **Administration** workspace.

Instructions to Edit and Run the Driver Program

The driver program wrna_run_migrate_content_61.sas should be executed in a SAS session (or as a batch job). The program will pull development or test 6.1 content from MFGAPP and create the 6.1 package tables that can then be imported into the promoted (production) 6.1 system using the **Content Migration** facility in the **Administration** workspace in the SAS Field Quality Analytics application.

You need to modify the program to conform to your specific setup. There is an OPTIONS statement in the driver program where you need to specify an unrestricted user to enable the program to read metadata from OMR. This allows retrieving project and analysis information from the 6.1 system.

```
options metauser='sasadm@saspw' metapass=password;
```

Specify folder locations that will contain the source (development or test) 6.1 tables and the migrated (promoted) package tables. These folders must exist on the operating system before running the driver program. The folder specified in the following code will contain the source 6.1 tables:

```
%let pkg61test=C:\migration_path\61_test;
```

The folder specified in the following code will contain the package tables for import by the SAS Field Quality Analytics application.

```
%let pkg61promo =C:\migration_path\61_promoted;
```

The MFGAPP pre-assigned library needs to be assigned for the 6.1 source version when migrating from different environments in version 6.1 to 6.1.

Define input parameters for the macro wrna_create_mig61.sas:

```
%let src_version=61;
%let dest_path=&pkg61test
%let src_mfgapp=&g_mfgapp
%let content=all;
%let fromDate=;
```

```
%let toDate=;
```

Using the Administration Tab in SAS Field Quality Analytics to Migrate Content

After you run the driver program wrna_run_migrate_content_61.sas, you can use the **Administration** tab in the SAS Field Quality Analytics application to choose what content to then migrate to the target 6.1 installation of SAS Field Quality Analytics.

Note: You must be logged on to the SAS Field Quality Analytics application as an unrestricted administrative user to perform content migration.

In the **Administration** workspace, click **Content Migration**. In the window that appears, click **Import Package**, and then define the location of the package folder.

You can select the users for whom you want to import content. You can also select a date range for which to import content.

After you select **OK**, the top of the screen displays the content that is in the package tables. You can select the content to be imported. Click **Migrate**. The progress of the import is displayed in the lower part of the import screen.

Import Customer Data into Stage Tables

Run the macro wrna_etl_mig61.sas to import your data from the SAS Warranty Analysis 4.x data mart into the SAS Field Quality Analytics 6.1 stage tables.

The following is a hypothetical LIBNAME statement to your 4.x Mart:

```
libname my_mart
'C:\SAS\Config\Lev1\AppData\SASWarrantyAnalysis4.2\MyCompany\swadm';
```

Note: Be sure to modify the preceding path to match the folder and filenames in your environment.

Execute the macro with the following statement:

```
%wrna_etl_mig61(sourcelibref=my_mart);
```

Note: Be sure to modify the preceding parameter value to match the libref that you have created.

Check the log for errors.

Run Other ETL Jobs

Open job **wrna_10050_date_dim**, and then open the **User Written** transformation in the job. Click on the **Code** tab and verify the macro parameter values on the macro call. Click **OK**, and run the job to load the date dimension table.

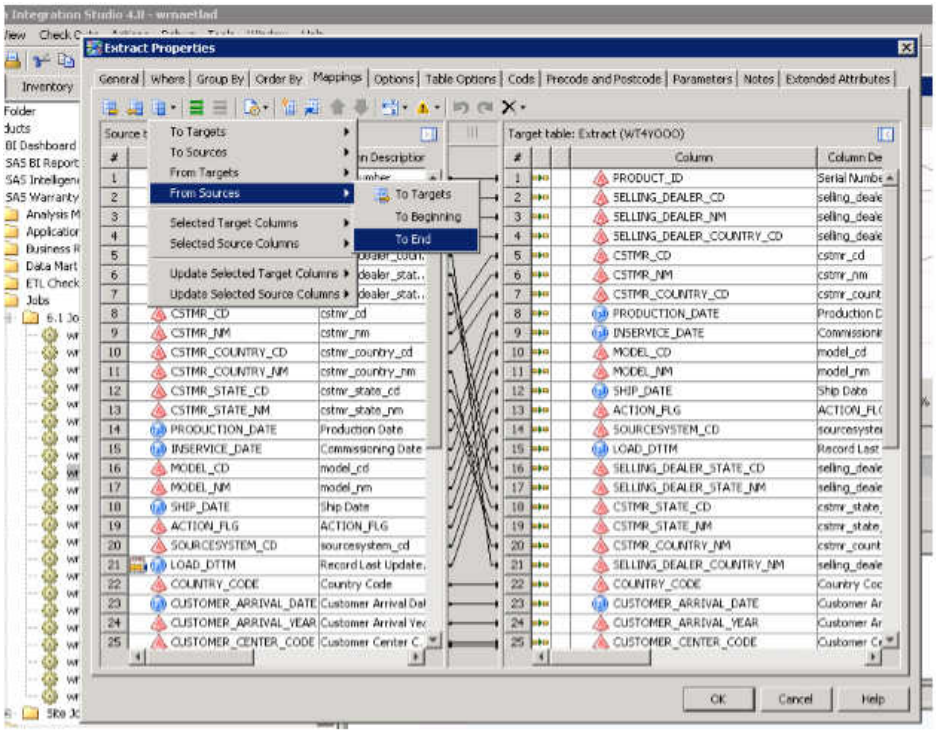
Open and run the job **wrna_10100_dim_tables**. This job loads the dimension tables in the data mart.

The other ETL jobs need to be modified before they are executed. See the next section for how to do this.

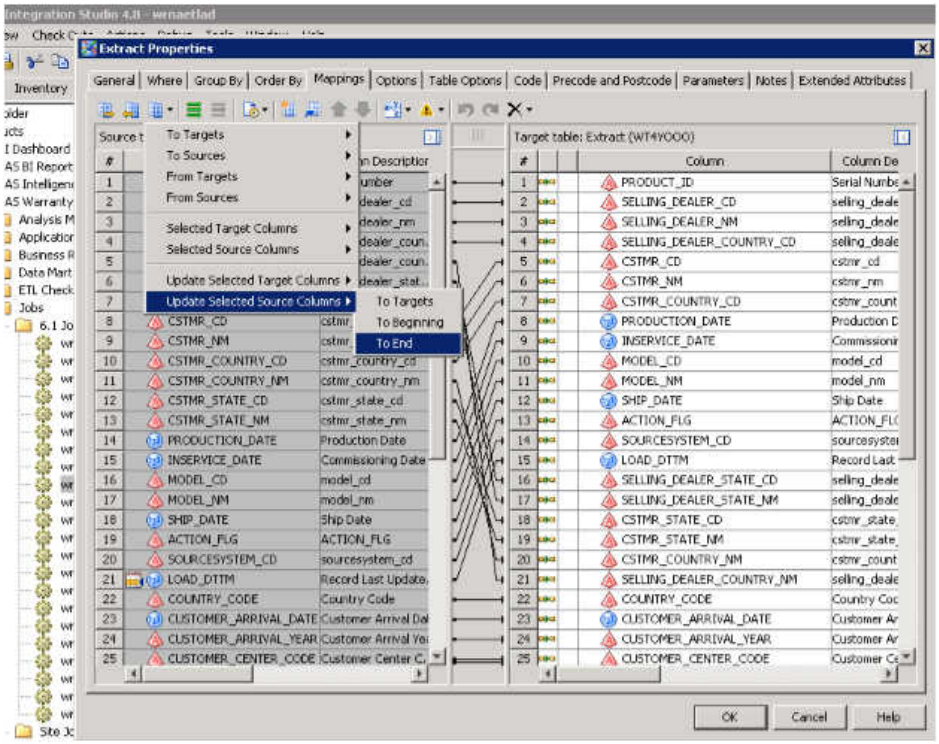
Edit Existing ETL Jobs

Open the job **wrna_10300_product_mart**. You need to propagate new columns to the end of the job in the top branch of the process flow, which loads the PRODUCT_STG data. To do this, right-click the **Extract** transformation and choose **Properties** to open

the properties window. On the **Mappings** tab, click the **Propagate Columns** icon. Select **From Sources** ⇨ **To End**.



The attributes for the columns need to be propagated to the end as well. To do that, use the Shift key and click to highlight all columns. Then click the **Propagate Columns** icon again and select **Update Selected Columns** ⇨ **To End**.



There might be columns in the Extract target table that do not have mappings. These are _NM columns that are delivered with the default data model, but might not exist in the source stage table. The following are the default product _NM columns:

- SELLING_DEALER_NM
- SELLING_DEALER_COUNTRY_NM
- SELLING_DEALER_STATE_NM
- CSTMR_NM
- CSTMR_COUNTRY_NM
- CSTMR_STATE_NM
- MODEL_NM

The _NM columns that do not have mappings can be deleted. To delete the columns, select them, right-click, and select **Delete Target Columns** from the pop-up menu.

Click **OK** to close the window.

Next, right-click the **Data Validation** transformation, and click **Properties** to open the Data Validation Properties window. Click the **Missing Values** tab and verify the default columns. Delete existing columns and add new columns for which missing values should be checked. Click the **Custom Validation** tab and verify the default custom validations. Edit, delete, and add custom validations as necessary. Click other **Validation** tabs to add validations as required.

Click the **Error and Exception Tables** tab. Under the **Error Table** section, make sure **Replace error table** is selected, and click the **Choose Columns** button. If you deleted unmapped _NM columns in the **Extract** transformation, the following warning might be displayed on the **Data Validation** transformation: `- Error table column not found in source table`. To eliminate this warning, move all columns from the **Selected columns** side to the **Available columns** side, and then back again. Click **OK**. Under the **Exception Table** section, make sure that **Replace exception table** is selected, and then click **Choose Columns**. Verify the columns that are selected. If required, using the arrows, remove existing columns from the selected list, and add new columns to the list. Click **OK**. Click the **Mappings** tab. If you deleted unmapped _NM columns in the **Extract** transformation, you can delete those same unmapped columns in the target table mapping. Click **OK** when you are satisfied with all changes to the data validation properties.

Next, right-click the **Dimension Key Lookups** transformation, and click **Properties** to open the Dimension Key Lookups Properties window. Click the **Code** tab. If multi-currency is enabled and currency columns exist in the source data that is being loaded for this job, then provide a name for the date column in the data that is to be used in the currency conversion lookup (if the date column exists) on the currencydatevar parameter of the %WRNA_ETL_LOOKUP macro call. Also, specify either DATE or DATETIME on the datevartype parameter to specify whether the date column is of type DATE or type DATETIME. If no date column is available for currency conversions, then the current date is used.

Click the **Mappings** tab. If you deleted unmapped _NM columns in the **Data Validation** transformation, you can delete those same unmapped columns in the target table mapping. Click **OK** when you are satisfied with all changes to the dimension key lookups properties.

Next, right-click the **Time-in-Service Calculations** transformation, and click **Properties** to open the Time-in-Service Calculations Properties window. Click the **Options** tab, and verify the default option values, making any edits if necessary.

Click the **Mappings** tab. If you deleted unmapped _NM columns in the **Dimension Key Lookups** transformation, you can delete those same unmapped columns in the target table mapping. Also, if ship date is not populated or provided, delete the two product time-in-service (TIS) and BIN ship columns in the target table mappings. These two columns are PRODUCT_DAYS_INSERVICE_SHIP and PRODUCT_TIS_BIN_SHIP. If ship date is provided, there is a configuration change that must be made: Specify the name of the ship date column within the **Warranty Configuration** section, **General Configuration** group, of the SAS Field Quality Analytics **Administration** workspace. For general information about how to configure variables, see "Alter Warranty Configuration Variables" on page 50. If the ship date is not configured, as it is in default, and the time-in-service and BIN ship columns are not deleted as described here, an error results when you run this job. Click **OK** when you are satisfied with all changes to the time-in-service calculations properties.

Next, right-click the **SPD Server Table Loader** transformation, and click **Properties** to open the properties window for the SPD Loader. You need to map each _SK column that does not already have a mapping back to the source table. Some of the _SK columns will already have a mapping. Those can be left as they are. In addition, if multi-currency is enabled, none of the currency columns will have a mapping, so you also need to map all currency columns back to the source table.

To map the unmapped _SK columns back to the source table, use the Ctrl key and click all _SK columns (or a selection of columns at a time) that are to be mapped. Then click the **Propagate Columns** icon and select **Selected Target Columns** ⇨ **To Sources**. Only those _SK columns that were not propagated previously to the source table are selected. If applicable, repeat this propagation process for any unmapped currency columns. Click **OK**.

Repeat the above _SK propagation step for the **Time-in-Service Calculations** transformation. The goal of this _SK column propagation process is to propagate the new _SK columns back to the target mapping of the **Dimension Key Lookups** transformation, since the _SK columns are extracted and populated when the **Dimension Key Lookups** transformation executes. If applicable, repeat this propagation step also for unmapped currency columns. Click **OK**.

The preceding editing steps are for the top branch of the process flow, which loads the PRODUCT_STG data. With the exception of the **Extract** transformation, repeat these steps for the bottom branch of the process flow, which loads the LK_PRODUCT_MART data.

Finally, open the properties of the **Time-in-Service Update** transformation, which is to the right of PRODUCT_MART. This transformation is another instance of the **Time-in-Service Calculations** transformation. Click the **Options** tab, and then verify or modify the option values. The specified option values should be the same as the other **Time-in-Service Calculations** transformations, except that the selected value for option **Is this an ETL Load from Stage?** should be `No`.

No changes are necessary for the final transformation in the process flow: **Update Historical Profiles**.

Click the **Save** icon to save the changes to the job.

Run the job.

Open and edit job **wrna_10400_event_mart**. The procedure to edit the two process flow branches in this job is the same as that for the product mart job.

Note: If ship date is not configured, be sure to delete the event time in service (TIS) and BIN ship column mappings in the **Time-in-Service Calculations** transformations to the left of EVENT_MART. These ship columns are EVENT_DAYS_INSERVICE_SHIP and EVENT_TIS_BIN_SHIP.

The event mart job has the additional **Join** transformation in each branch. These transformations which are to the right of EVENT_MART: **Update FIRST_FAILURE_FLG**, **Bring in Product Data**, and another instance of **Time-in-Service Calculations**. In the properties for the **Update FIRST_FAILURE_FLG** transformation, click the **Code** tab, and scroll up to the section noted with `/ ******Parameter values that change from job to job.*******/`. Verify, and modify if necessary, the assignments to variables prodsk_column, eventdate_column, and martproduct_table.

Next, in the properties for the **Bring in Product Data** transformation, click the **Mappings** tab and verify the unmapped product date columns in the target table. These date columns, which are brought in from PRODUCT_MART, are PRODUCTION_DATE, INSERVICE_DATE, and SHIP_DATE. Modify these column names if they are different for the site's environment.

Finally, in the properties for the **Time-in-Service Calculations** transformation, click the **Options** tab and verify or modify the option values. The specified option values should be the same as the other **Time-in-Service Calculations** transformations, except that the selected value for option **Is this an ETL Load from Stage?** should be `No`.

After propagating unmapped _SK and currency columns in the **Time-in-Service Calculations** transformation, right-click the **Join** transformation and select **Open** to open the **Join** transformation window. Click **Select** in the Navigate window. Select **User Written** from the **Source** table pull-down list, and propagate any unmapped _SK and currency columns from target to sources. Select **PRODUCT_MART** from the **Source** table pull-down list, and verify the date columns that are mapped from the PRODUCT_MART table. By default, the PRODUCT_MART date columns that should be mapped are PRODUCTION_DATE, INSERVICE_DATE, and SHIP_DATE. These mappings must be added if they are missing, or deleted and replaced with different date columns if different date columns are used. Under the **From** folder within the Navigate window, click the **Join** icon. The join criteria uses column PRODUCT_DIM_SK in joining the User Written table to PRODUCT_MART. If the product _SK column is a different column, delete the existing PRODUCT_DIM_SK join criteria, and use the menu buttons to add the correct product SK join criteria. Click the **Up** button when you are satisfied with all changes to the **Join** transformation. When all job edits are complete, click the **Save** icon to save the changes, and run the job.

Edit, save, and run each job that creates the following mart tables in the same manner.

- EVENT_COMMENT_DIM
- LABOR_CODE_MART
- REPL_PART_MART

Open and edit job **fqa_10500_ext_prod_attr_dim**. This job is different from the previous jobs in that it contains one transformation. Right-click the transformation and select **Properties**. This opens the Load Product Attributes Table Properties window. Click the **Code** tab and scroll to the top. In the **Variable Options** section, verify the existing variable values, making any changes as needed. Be sure to add required variable values if a lookup table exists in stage for the product attributes being loaded by this job. Click **OK** when satisfied with all changes, click the **Save** icon to save, and run the job.

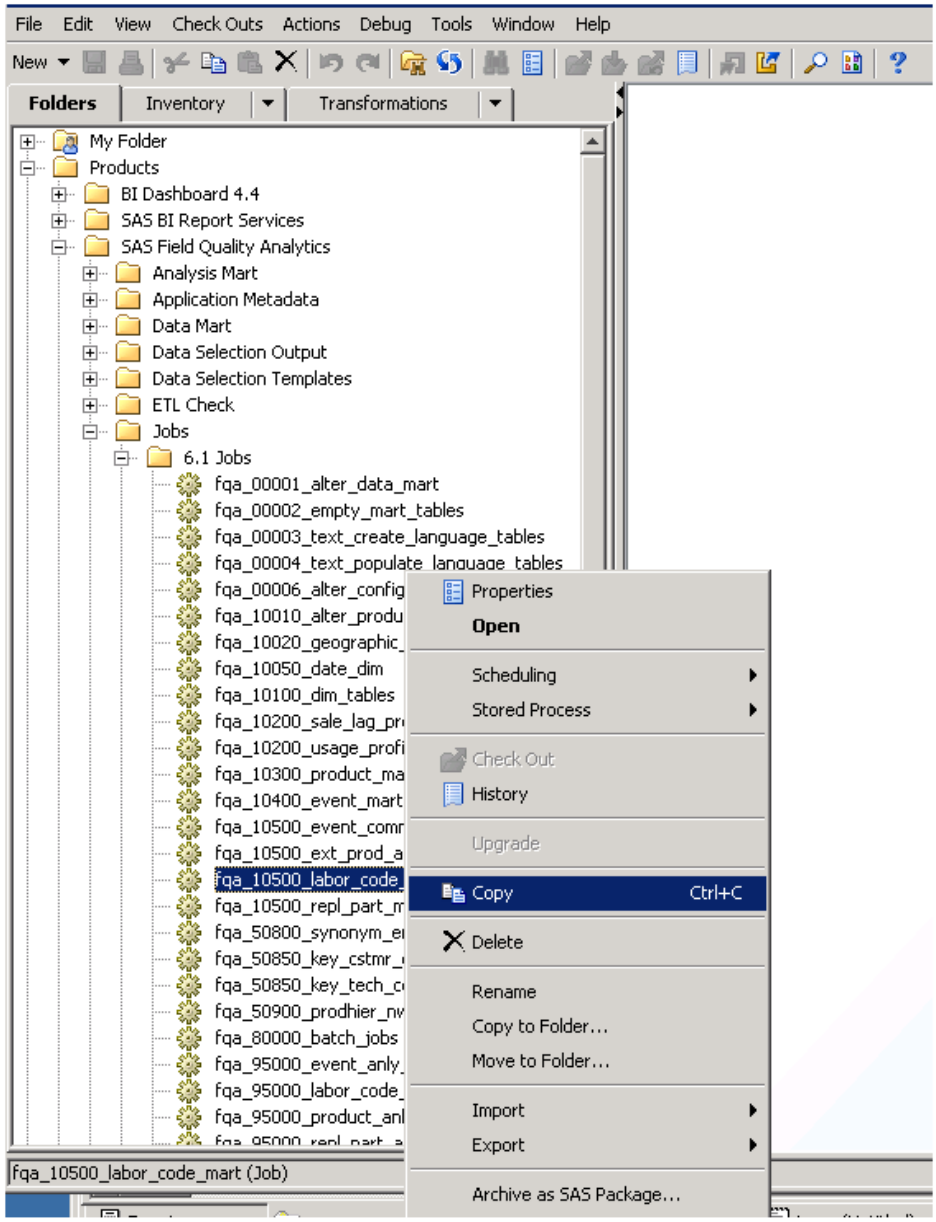
Create New ETL Jobs for Tables That Do Not Exist in the SAS Field Quality Analytics Data Mart

If you have tables that do not exist in the default data model for SAS Field Quality Analytics, it is necessary to create new ETL jobs to load those new tables.

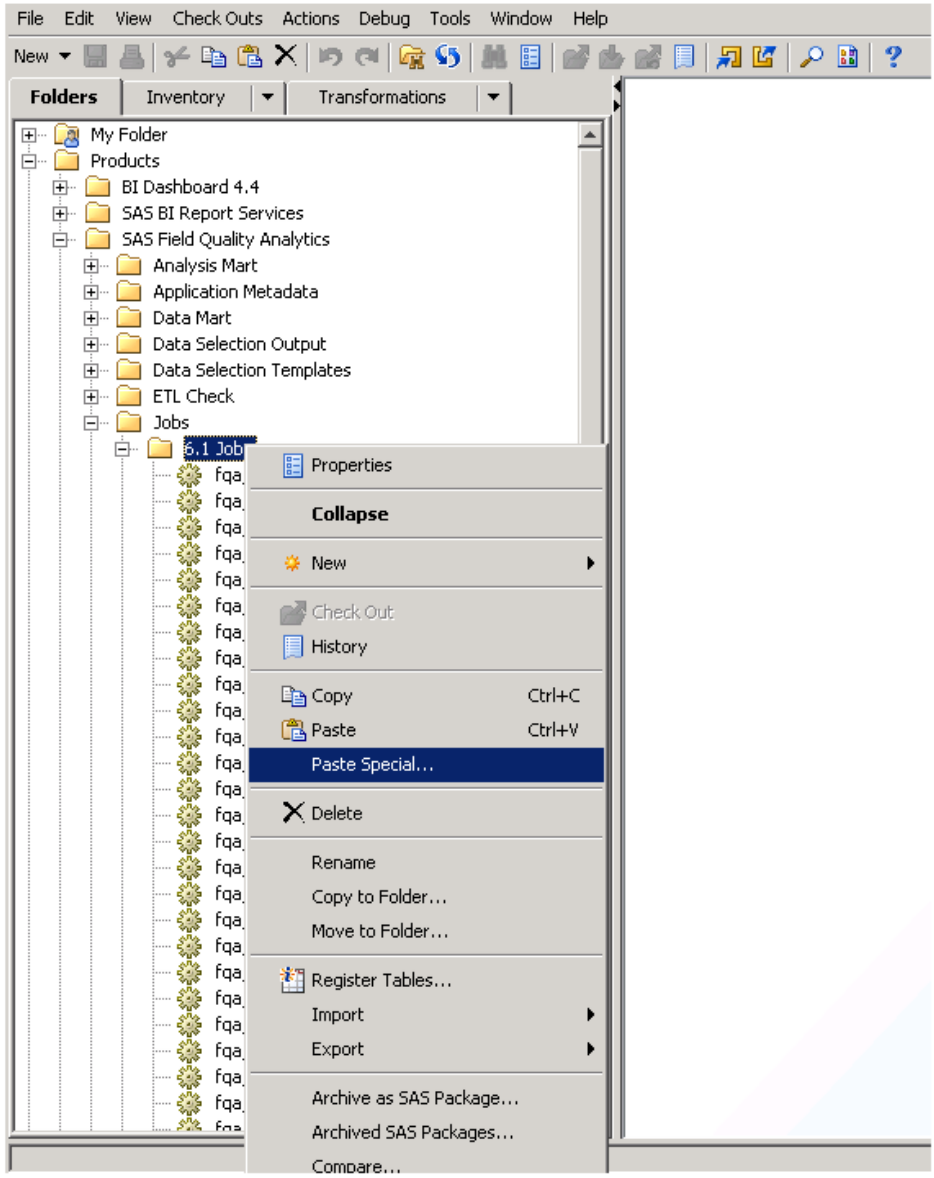
A good method to use to create a new job is to make a copy of an existing job and edit the copy. You should make a copy of a job with similar characteristics to the new table that is being created. For example, if there is a new table in the **Tables** tab of the DEW with values for data type level of **`Detail`** and FQA target table type of **`Fact`**, then this is a table similar to LABOR_CODE_STG and REPL_PART_STG. So you would make a copy of either of those two jobs that loads those tables and rename the job for the new table that is being created.

To make a copy of an existing job:

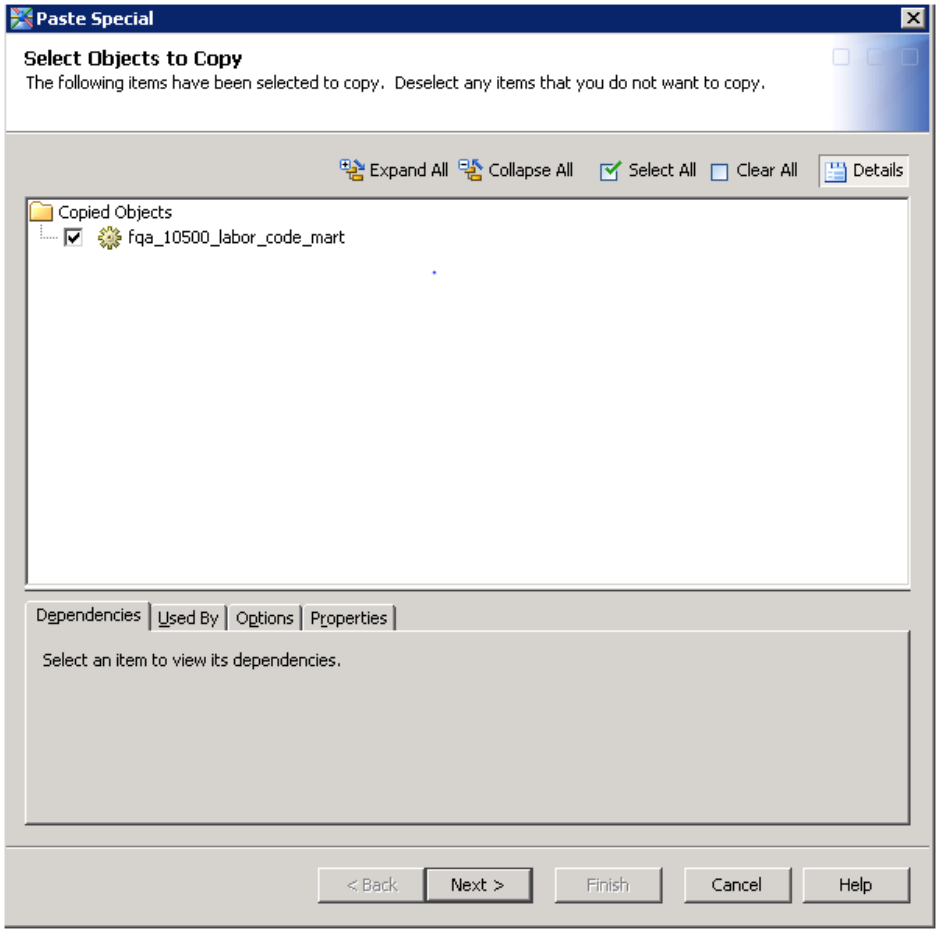
Right-click the job that you want to copy and select **Copy**.



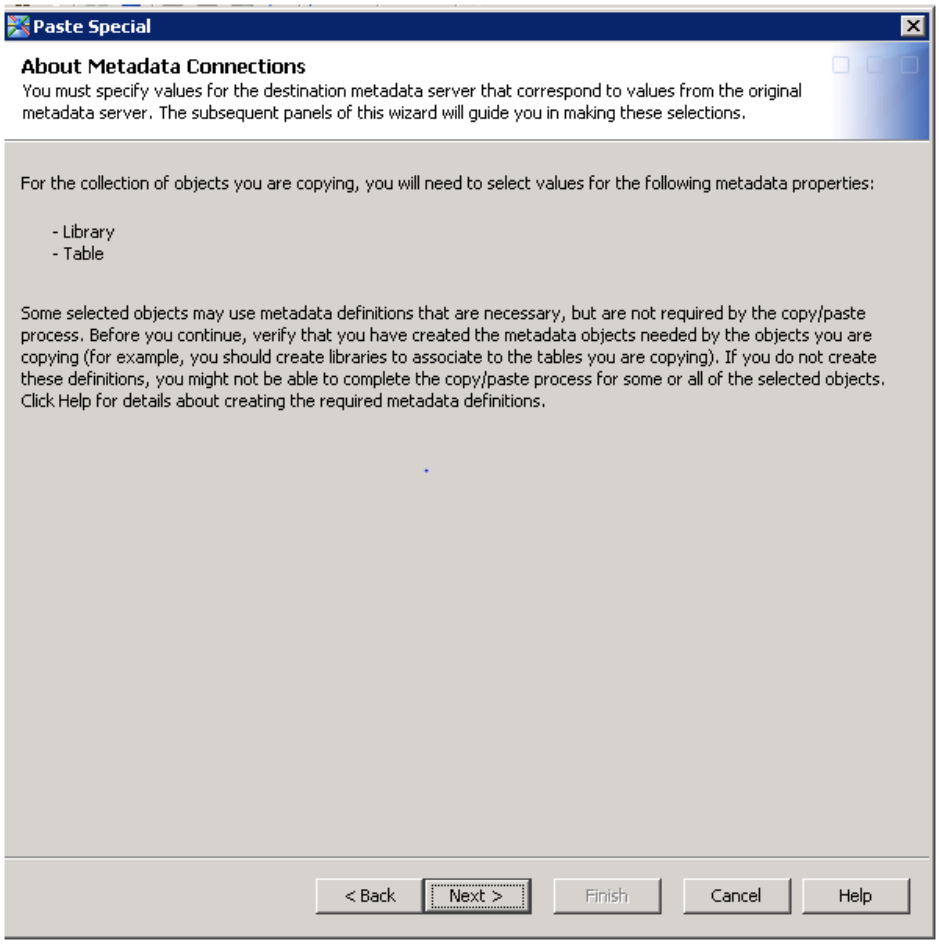
Then right-click **6.1 Jobs** and select **Paste Special**.



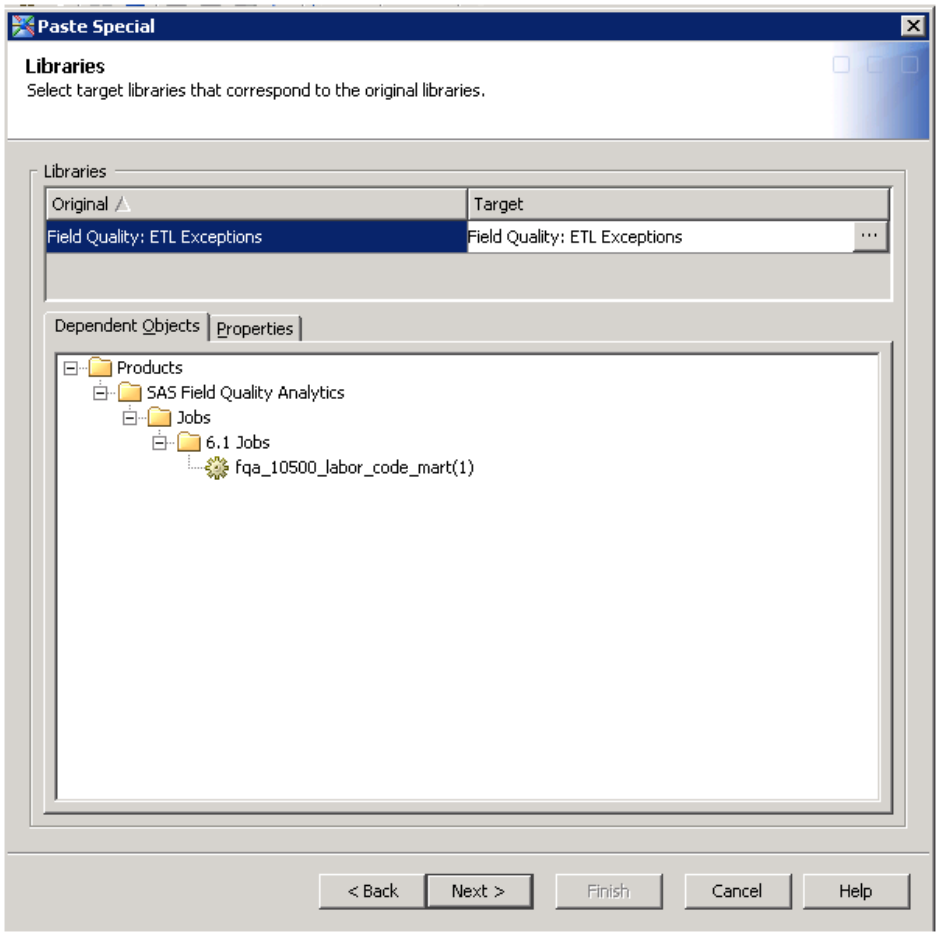
Click **Next** from the dialog box that opens.


Paste Special
Select Objects to Copy
The following items have been selected to copy. Deselect any items that you do not want to copy.
Expand All
Collapse All
Select All
Clear All
Details
Copied Objects
fqa_10500_labor_code_mart
Dependencies
Used By
Options
Properties
Select an item to view its dependencies.
< Back
Next >
Finish
Cancel
Help

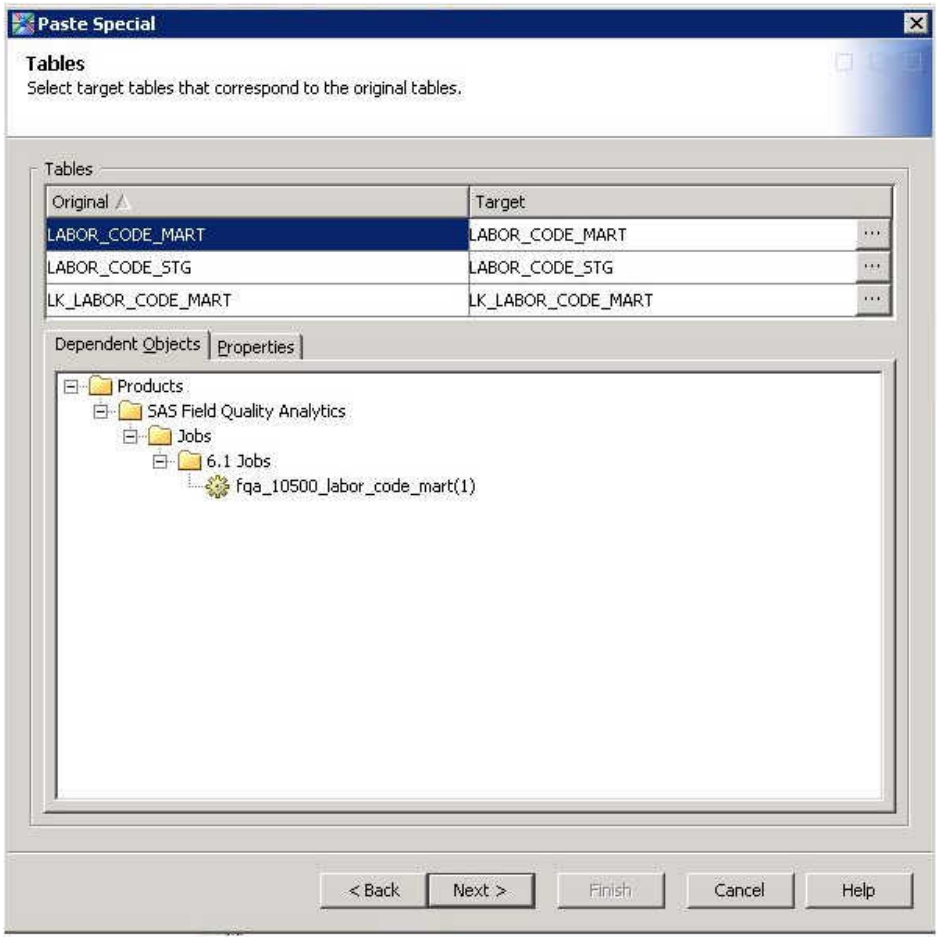
Click **Next**.


Paste Special
About Metadata Connections
You must specify values for the destination metadata server that correspond to values from the original metadata server. The subsequent panels of this wizard will guide you in making these selections.
For the collection of objects you are copying, you will need to select values for the following metadata properties:
- Library
- Table
Some selected objects may use metadata definitions that are necessary, but are not required by the copy/paste process. Before you continue, verify that you have created the metadata objects needed by the objects you are copying (for example, you should create libraries to associate to the tables you are copying). If you do not create these definitions, you might not be able to complete the copy/paste process for some or all of the selected objects. Click Help for details about creating the required metadata definitions.
< Back
Next >
Finish
Cancel
Help

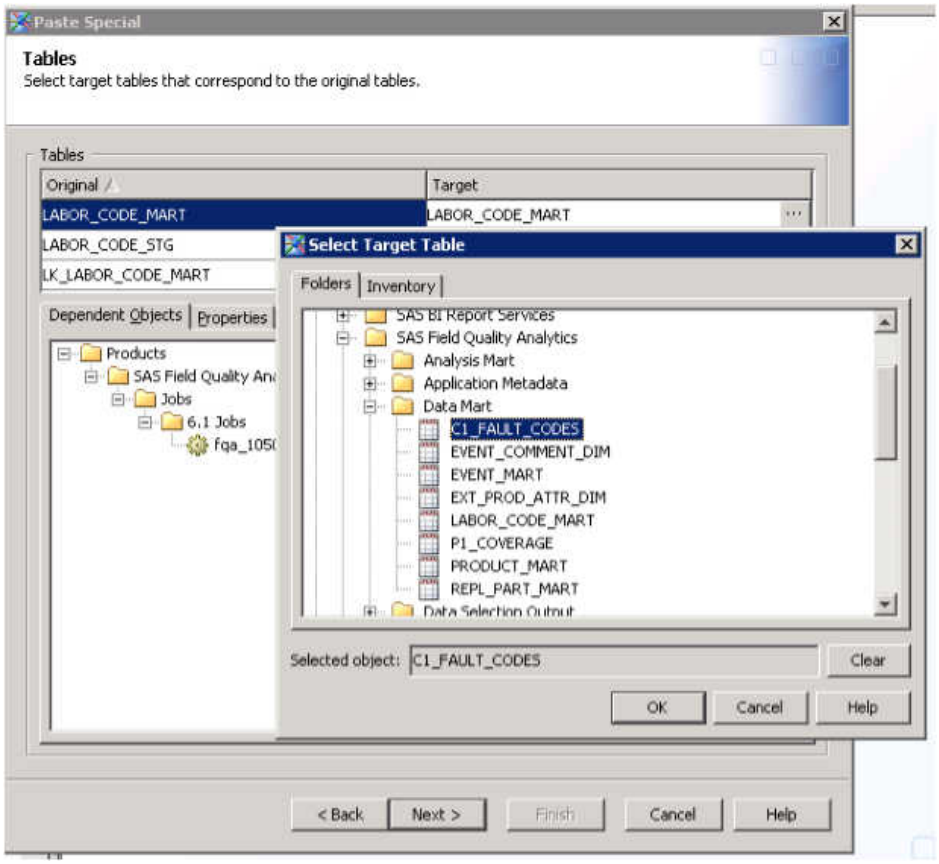
Click **Next**.


Paste Special
Libraries
Select target libraries that correspond to the original libraries.
Libraries
Original
Target
Field Quality: ETL Exceptions
Field Quality: ETL Exceptions
Dependent Objects
Properties
Products
SAS Field Quality Analytics
Jobs
6.1 Jobs
fqa_10500_labor_code_mart(1)
< Back
Next >
Finish
Cancel
Help

Click **Next**.

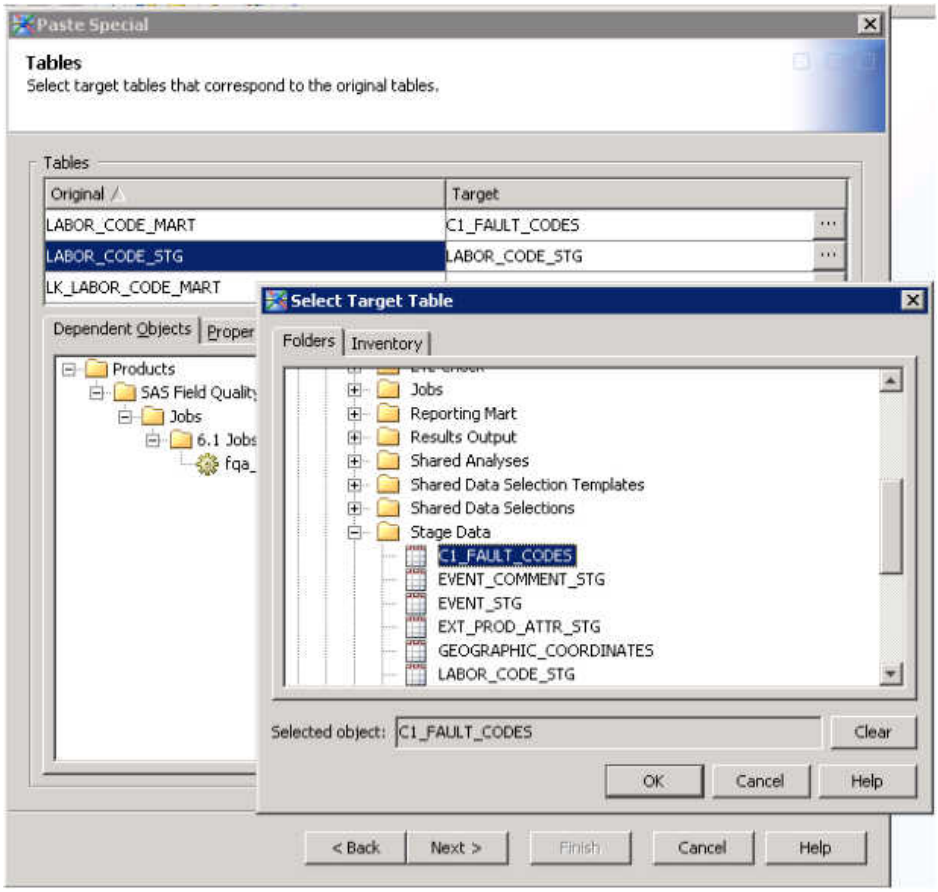


Indicate the new table names that will be included in the job. You do this by selecting the ellipses next to the table names in the **Target** column, and selecting the new table name that should be included in the new job.

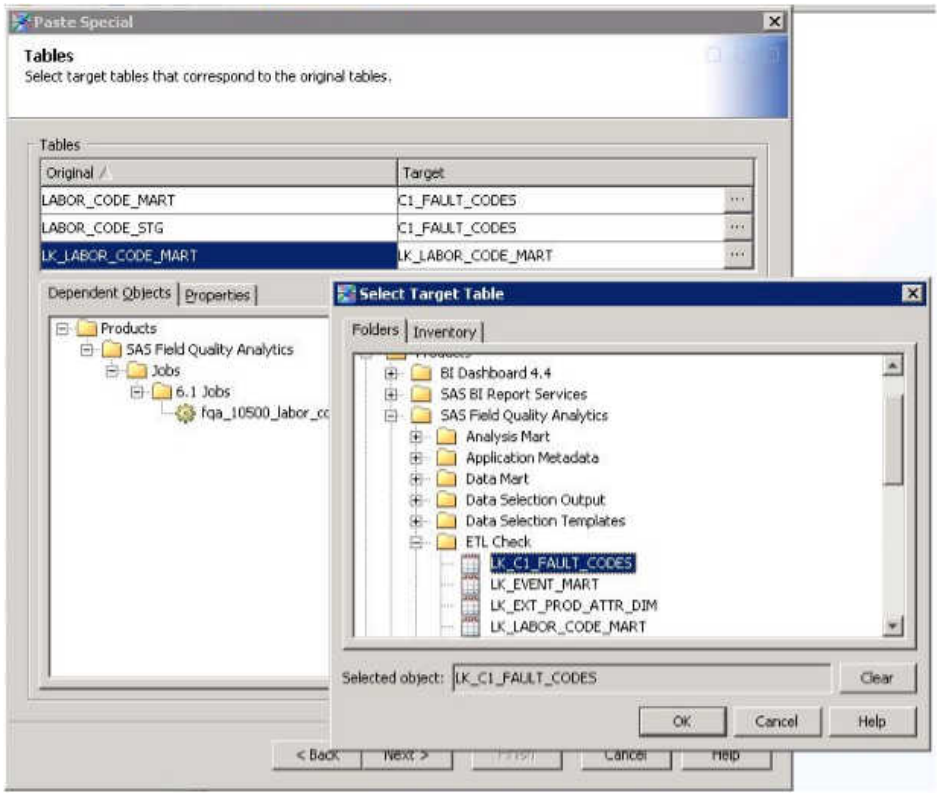


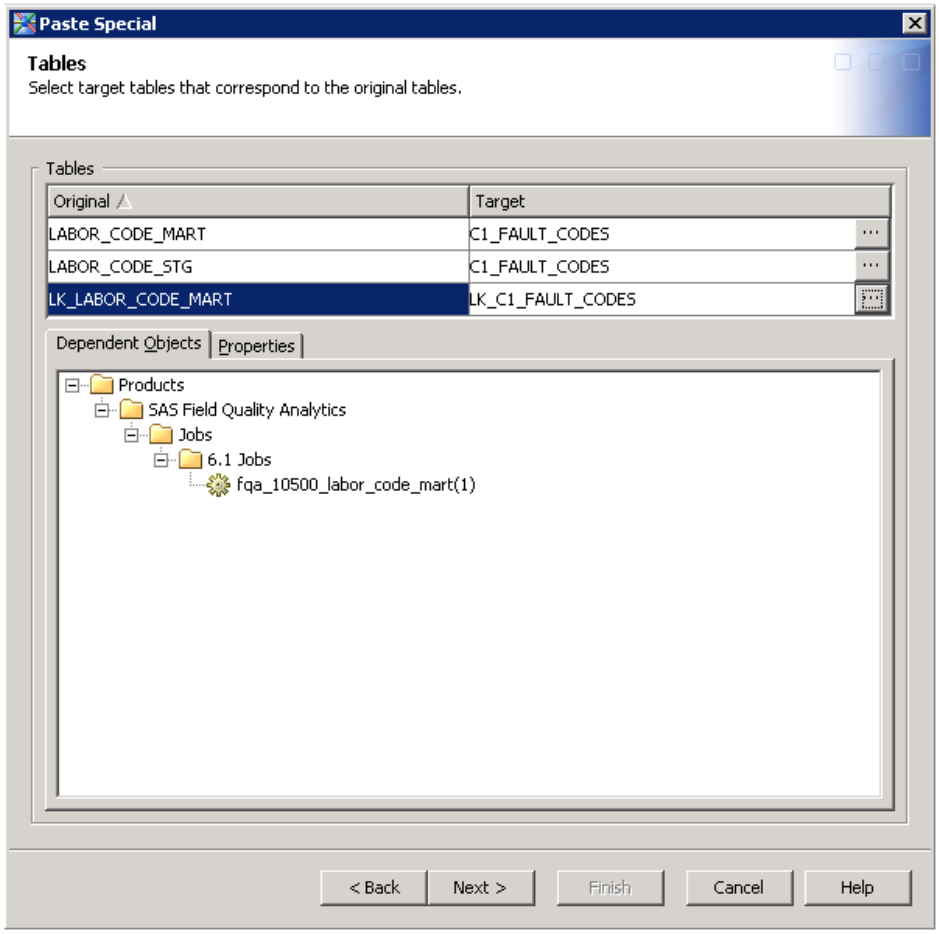
In the Select Target Table dialog box, select the tables that replace LABOR_CODE_MART, LABOR_CODE_STG and LK_LABOR_CODE_MART. Be sure to select the table from the correct library. The _MART table from the Data Mart library, the _STG table from the Stage Data library, and the LK_... table from the ETL Check library. In this example, select C1_FAULT_CODES as the data mart table to replace LABOR_CODE_MART.

Select the table to replace the stage table. In this example, replace LABOR_CODE_STG with the stage data table C1_FAULT_CODES.

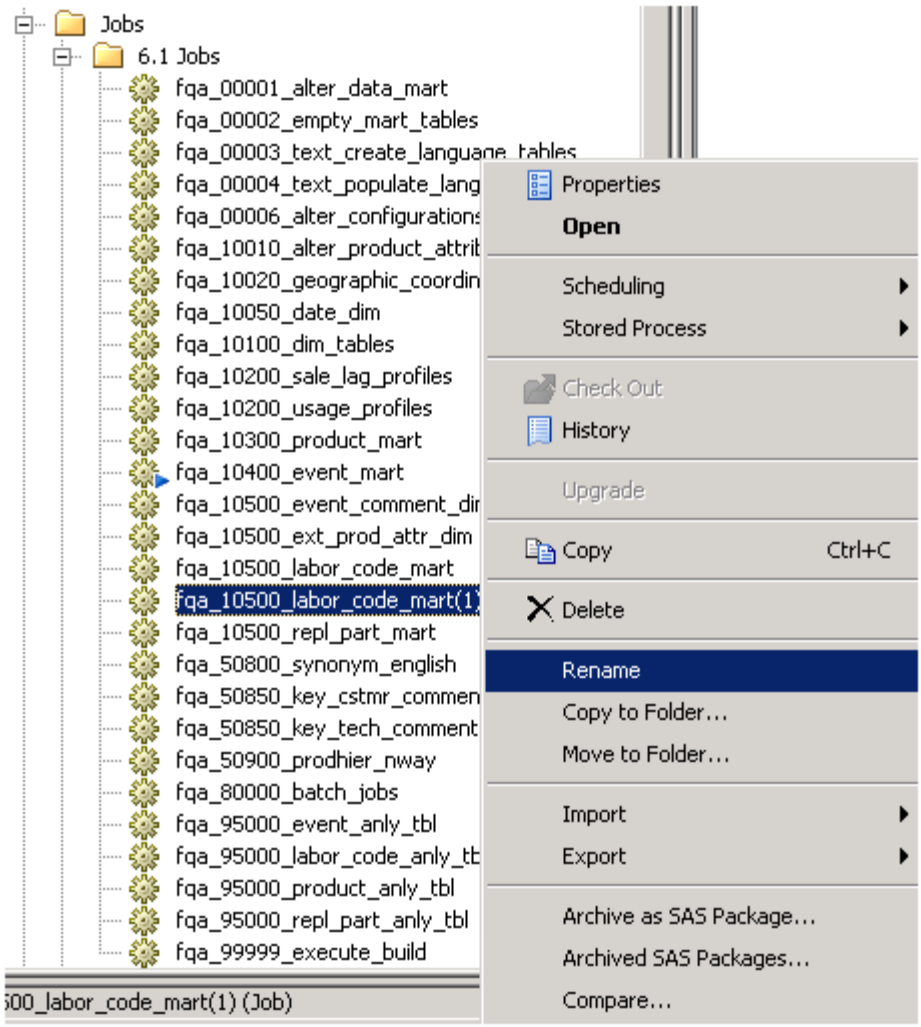


Replace the table LK_LABOR_CODE with LK_C1_FAULT_CODES from the ETL Exceptions library.


Paste Special
Tables
Select target tables that correspond to the original tables.
Tables
Original
Target
LABOR_CODE_MART
C1_FAULT_CODES
LABOR_CODE_STG
C1_FAULT_CODES
LK_LABOR_CODE_MART
LK_LABOR_CODE_MART
Dependent Objects
Properties
Products
SAS Field Quality Analytics
Jobs
6.1 Jobs
Select Target Table
Folders
Inventory
BI Dashboard 4.4
SAS BI Report Services
SAS Field Quality Analytics
Analysis Mart
Application Metadata
Data Mart
Data Selection Output
Data Selection Templates
ETL Check
LK_C1_FAULT_CODES
LK_EVENT_MART
LK_EXT_PROD_ATTR_DIM
LK_LABOR_CODE_MART
Selected object:
LK_C1_FAULT_CODES
Clear
OK
Cancel
Help
< Back
Next >

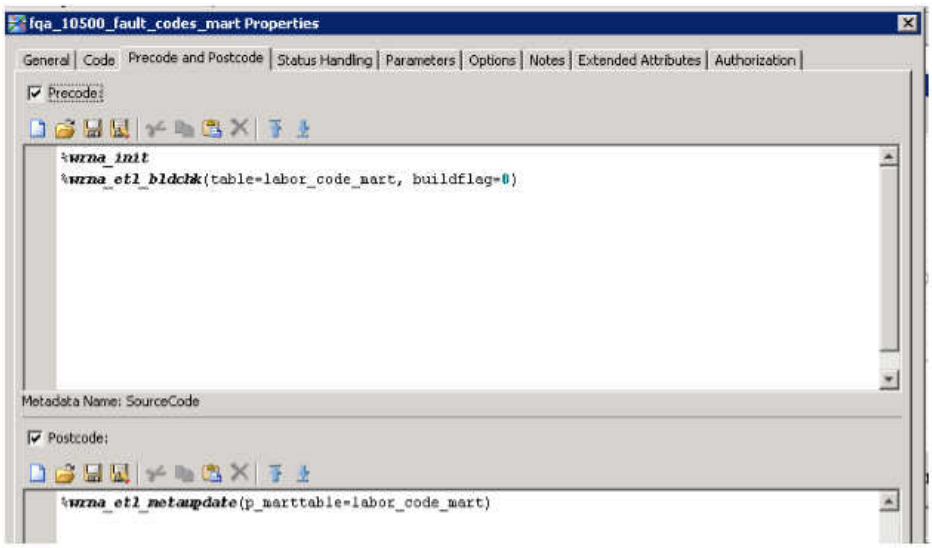

Paste Special
Tables
Select target tables that correspond to the original tables.
Tables
Original
Target
LABOR_CODE_MART
C1_FAULT_CODES
LABOR_CODE_STG
C1_FAULT_CODES
LK_LABOR_CODE_MART
LK_C1_FAULT_CODES
Dependent Objects
Properties
Products
SAS Field Quality Analytics
Jobs
6.1 Jobs
fqa_10500_labor_code_mart(1)
< Back
Next >
Finish
Cancel
Help

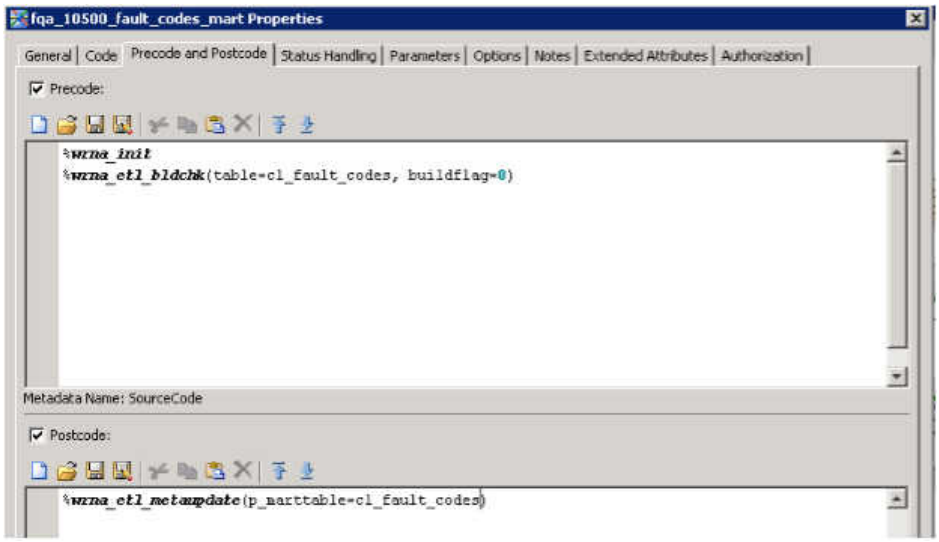
Next, right-click the job that has been copied.



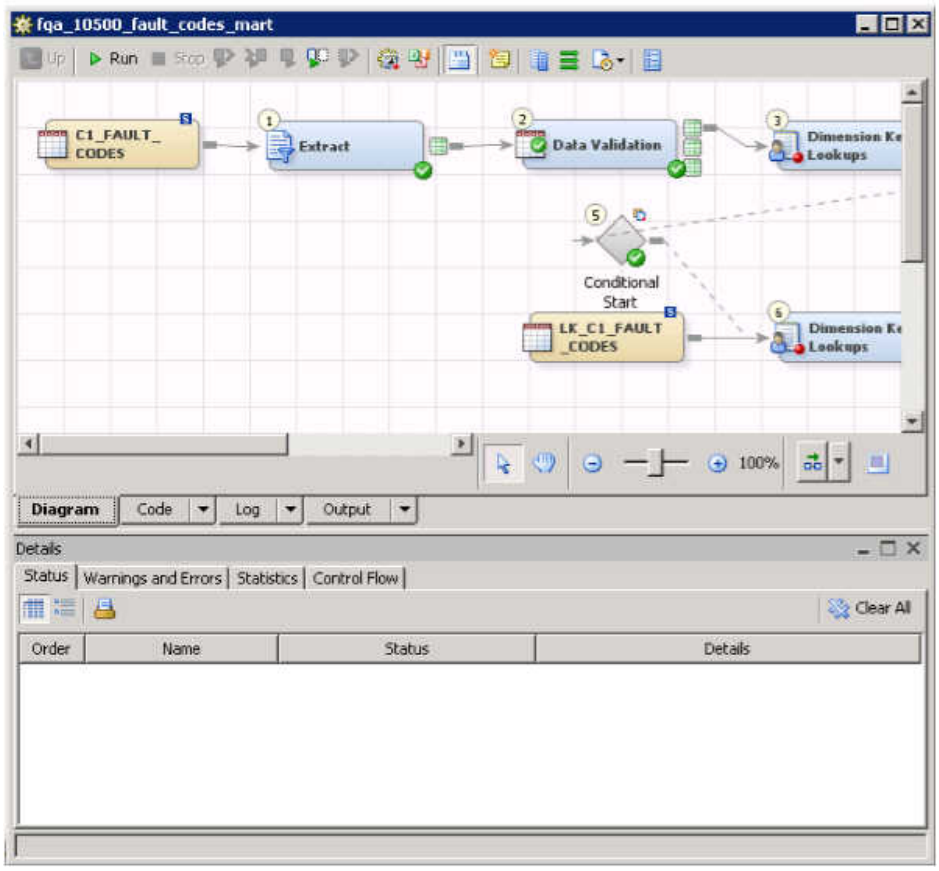
Select **Rename** to rename the job.

Right-click the newly renamed job and select **Properties** to open the job's Properties window. Click the **Precode and Postcode** tab, and change `labor_code_mart` to `c1_fault_codes` in both the **Precode** box and the **Postcode** box. Click **OK**.

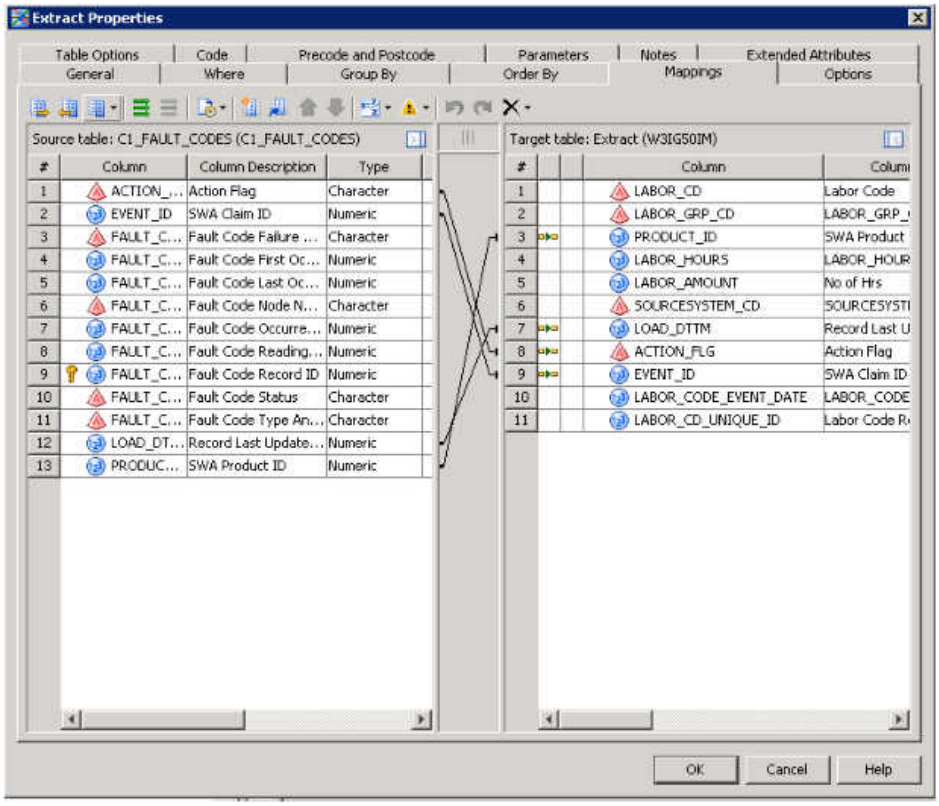




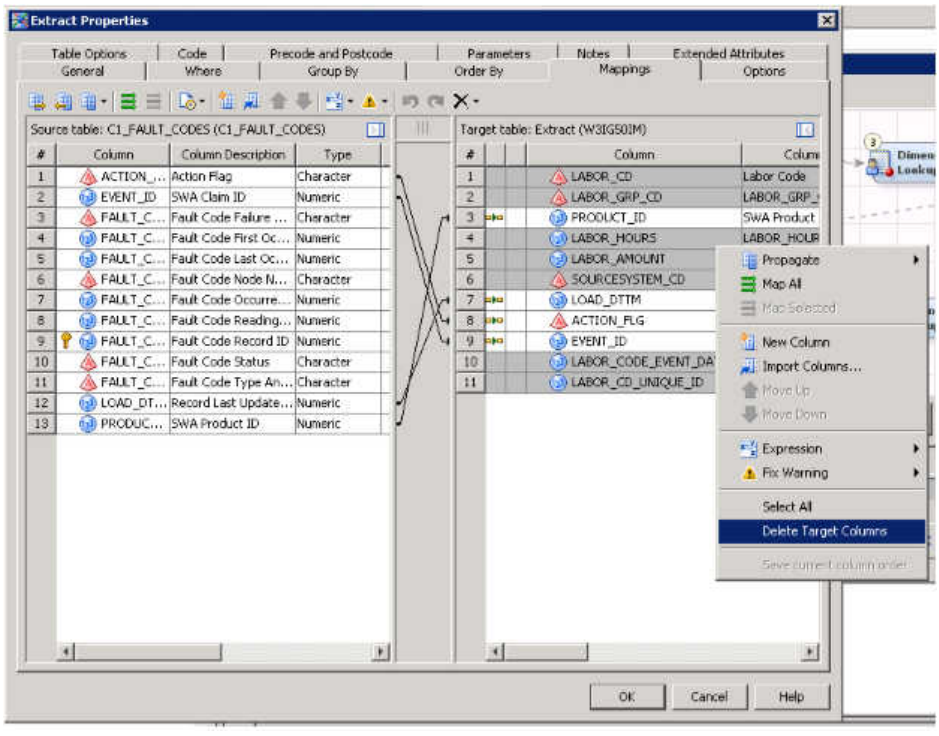
Open the job to make required changes to each transformation.



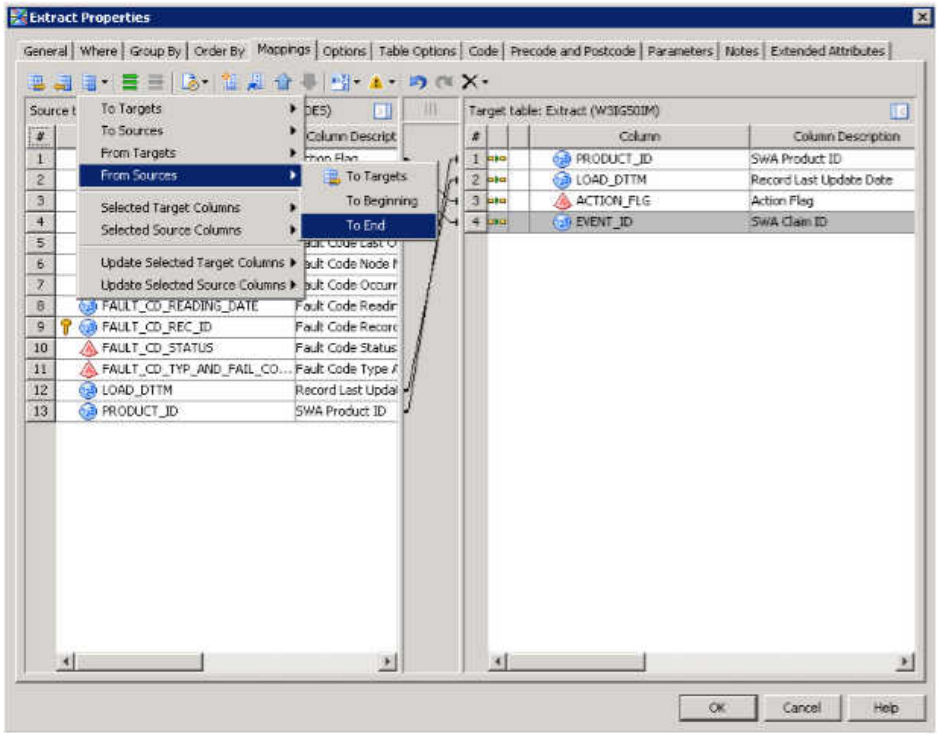
Open the properties for the **Extract** transformation, and click the **Mappings** tab.



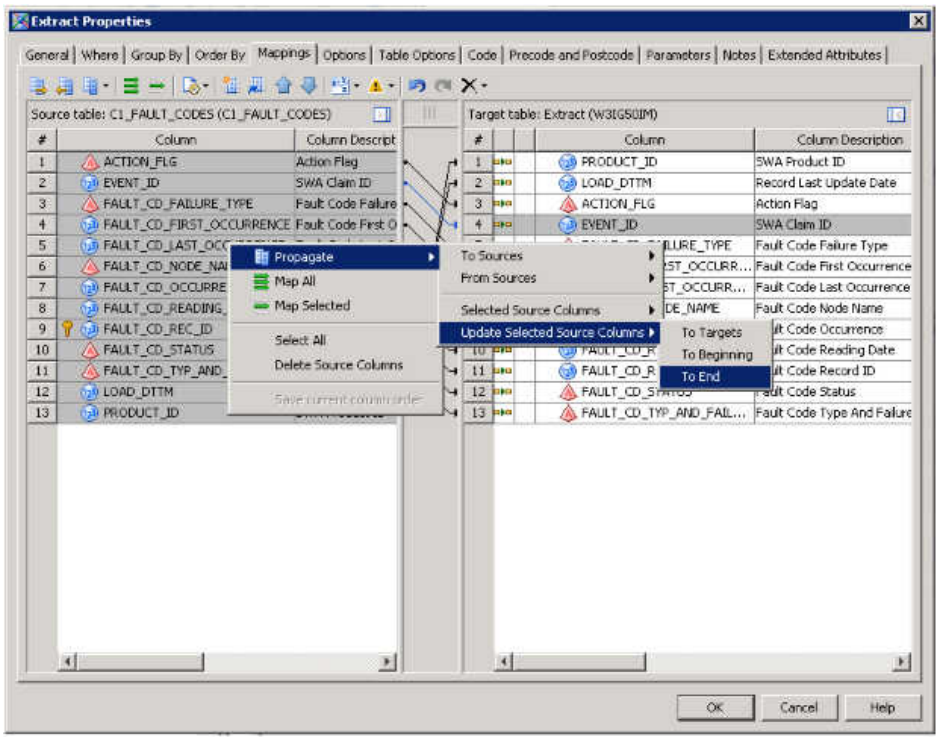
Remove the columns from the target table that are from the copied job. For example, remove LABOR_CD, LABOR_GRP_CD, and so on.



Propagate the new columns from source to the end.

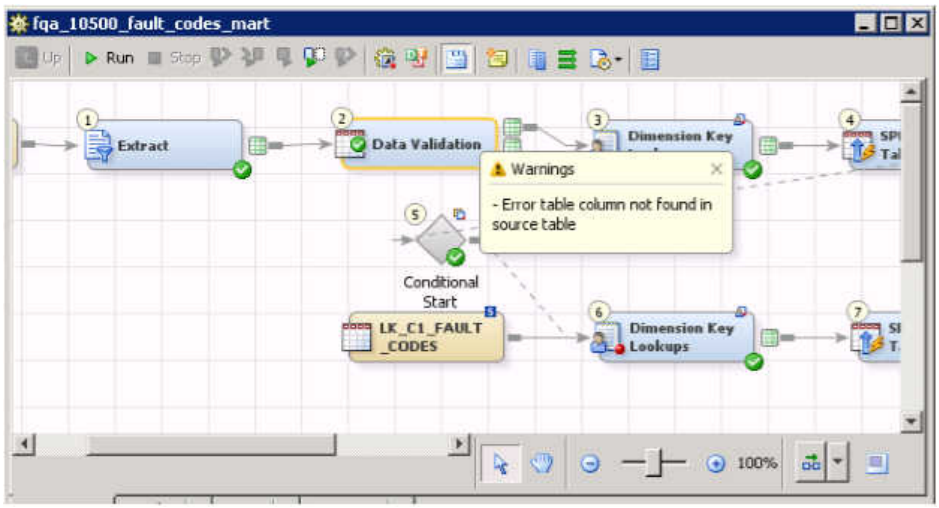


Update all columns to the end.



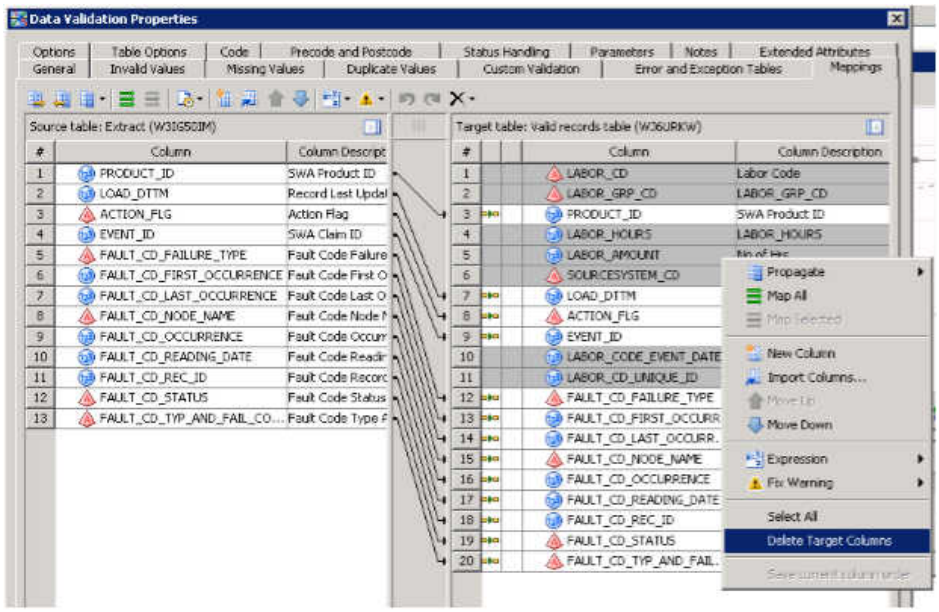
Note: It is a good idea to save the ETL job after completing the modifications in each transformation.

After you modify each transformation, succeeding transformations will show a warning. Each transformation must be edited to remove the obsolete columns.

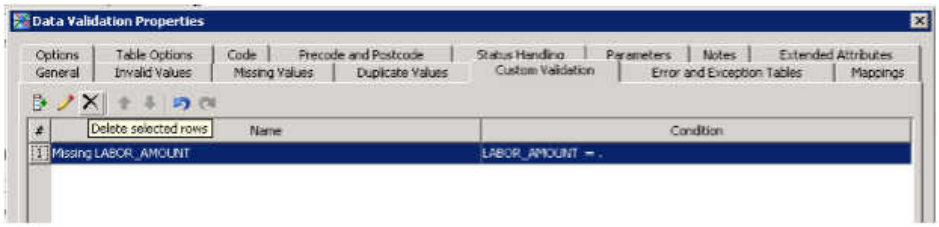


Open the properties window for the **Data Validation** transformation. You need to remove the columns from the copied job from the Target table in the **Mappings** tab. You also need to open the **Invalid Values**, **Missing Values**, **Duplicate Values**, and **Custom Validation** tabs and remove columns from the copied job. In some cases you will want to replace the old column names with column names from the new table.

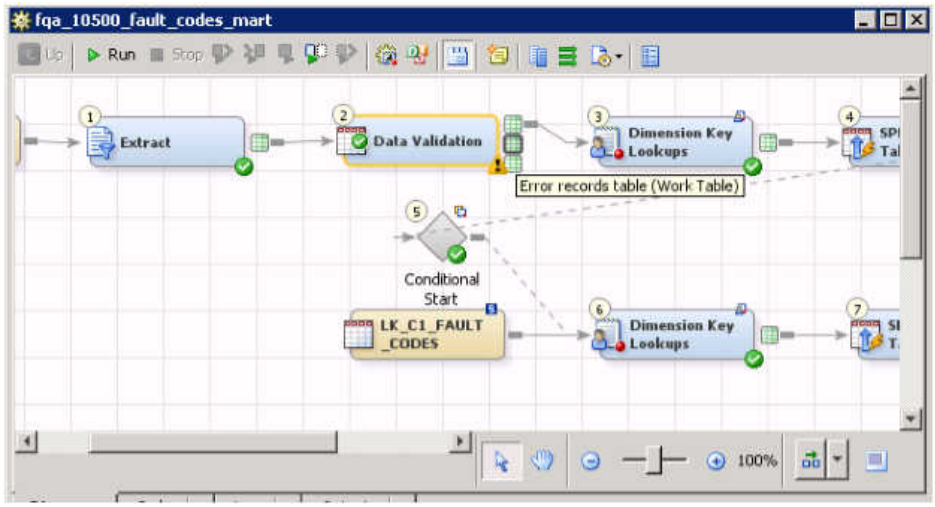
Click the **Error and Exception Tables** tab. Under the **Error Table** section, make sure that **Replace error table** is selected, and click the **Choose Columns** button. Performing the following will eliminate the warning `-Error table column not found in source table` that is displayed on the **Data Validation** transformation. Using the **Double Error** button, move all columns from the **Selected columns** side to the **Available columns** side, and then back again. Click **OK**. Now, under the **Exception Table** section, make sure **Replace exception table** is selected, and click the **Choose Columns** button. Verify the columns that are selected. If required, using the arrows, remove existing columns from the selected list, and, or add new columns to the list. Click **OK**.



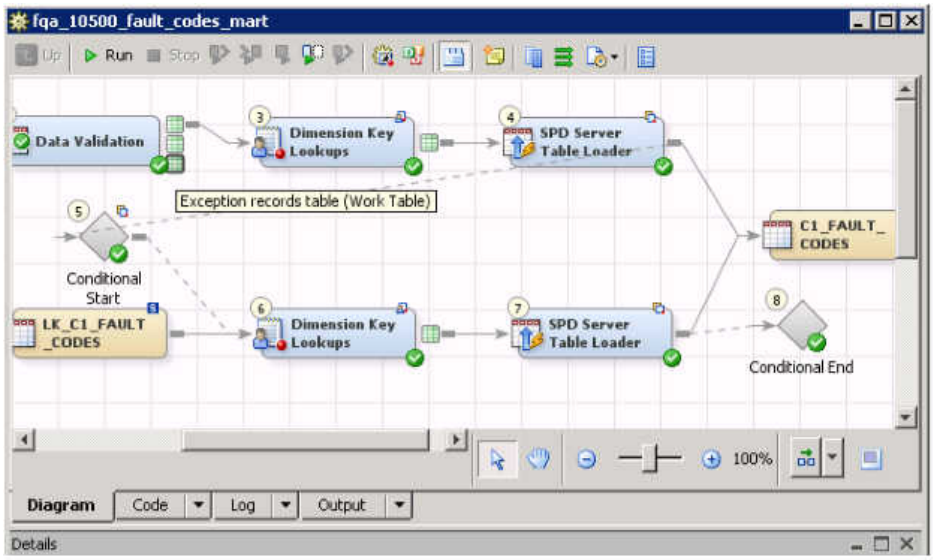
The following illustrates deleting the row in the **Custom Validation** tab for LABOR_AMOUNT, which is not in the new table.



Open the Properties window for the error records table (Work Table) by double-clicking or right-clicking and selecting **Properties**. The error records table is the middle green box on the right-hand side of the **Data Validation** transformation. In the **Physical name** box on the **Physical Storage** tab, change the name of the error records table from LABOR_CODE_MART to C1_FAULT_CODES. Click **OK**.



Next, open the properties for the exception records table (the lower green box on the **Data Validation** transformation).

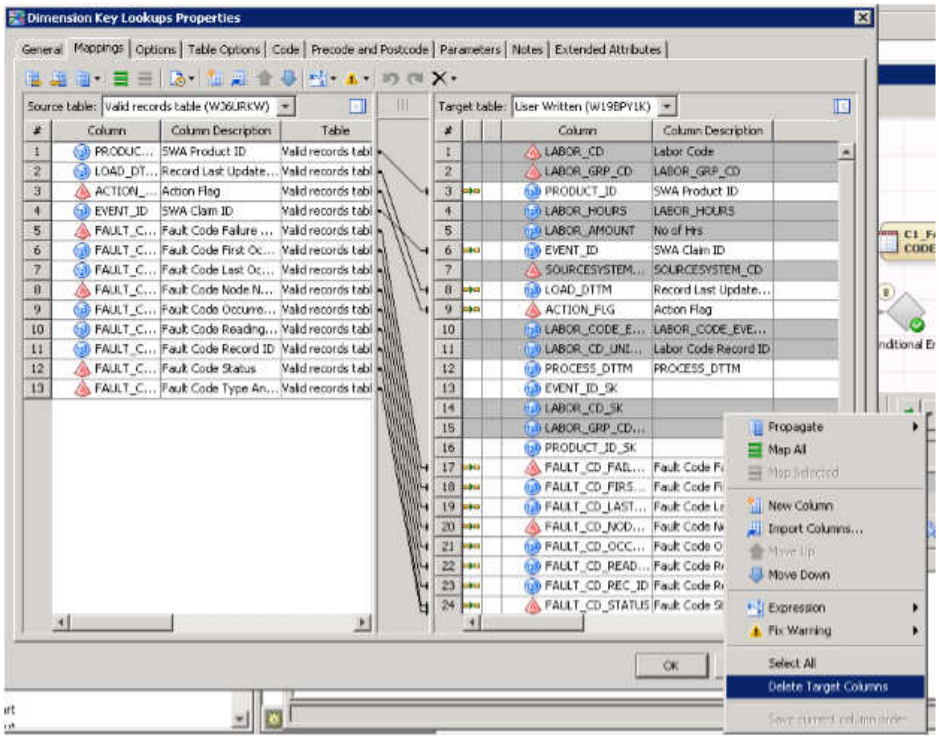


In the **Physical name** box on the **Physical Storage** tab, change the name of the exception records table from EXC_LABOR_CODE_MART to EXC_C1_FAULT_CODES. Click the **Columns** tab. Verify the lengths of columns

X_COLUMN and X_NOTE. If they have lengths less than 500, directly edit the lengths of these two columns to equal 500. Click **OK**.

Open the Properties window for the **Dimension Key Lookups** transformation and delete old columns on the **Mappings** tab. These should be the same columns that were deleted in the **Data Validation** transformation. In addition, delete the numeric _SK columns that correspond to the columns that were deleted.

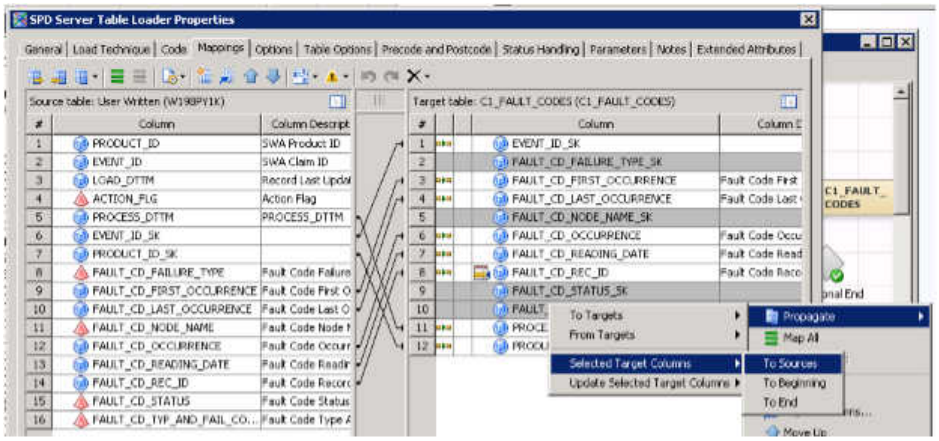
Now click the **Code** tab. On the %WRNA_ETL_LOOKUP macro call, replace the value of the facttable parameter with the name of the mart table being loaded. In this example, replace LABOR_CODE_MART with C1_FAULT_CODES: **`facttable=c1_fault_codes`**. If multi-currency is enabled and currency columns exist in the source data is being loaded for this job, then provide a name for the date column in the data that is to be used in the currency conversion lookup (if the date column exists) on the currencydatevar parameter of the %WRNA_ETL_LOOKUP macro call. Also, specify either DATE or DATETIME on the datevartype parameter to specify whether the date column is of type DATE or type DATETIME. If no date column is available for currency conversions, then the current date is used.



Open the Properties window for the **SPD Server Loader** transformation. On the **Mapping** tab, propagate any _SK columns in the target table back to the source table.

In addition, if applicable, propagate any unmapped currency columns back to the source table. This would apply if multi-currency is enabled. Now click the **Precode and Postcode** tab. On the %WRNA_ETL_FACTDELERR macro call, update the values of parameters facttable, exceptiontable, and lookuperrortable, where facttable is the name of the mart table being loaded, exceptiontable is the name of the exception table, and lookuperrortable is the name of the lookup error table. The parameter values should follow this pattern: **`facttable=<`*`MartTableName`*`>`**, **`exceptiontable=exc_<`*`MartTableName`*`>`**, and **`lookuperrortable=lk_<`*`MartTableName`*`>`**. In this example, the full macro call should be as follows: **`%wrna_etl_factdelerr(facttable=c1_fault_codes,`**

exceptiontable=exc_c1_fault_codes, lookuperrortable=lk_c1_fault_codes). Click **OK** when complete.



Now edit the **Dimension Key Lookups** transformation and the **SPD Server Table Loader** in the lower branch of the process flow. In the **Dimension Key Lookups** transformation, on the **Mappings** tab, propagate all new columns to the end, and update all columns to the end. For all other updates in both transformations, use the same procedure as that for the corresponding transformations in the upper branch of the process flow. Save the job when complete.

There should now be a green check mark on all transformations. You should now be able to run the job to load the target table C1_FAULT_CODES.

Verify Your Configuration of the MFGAPP Tables

The alter data mart job populated the MFGAPP tables DATA_SEL_GRP, DATA_SEL_ATTR, and DATA_SEL_TREE. These tables, which contain your data selection configuration information, were fed by the same named tables in the WRNASTG library, which in turn were fed from the DEW by the wrna_etl_import_DEW.sas macro.

Verify the correct configuration of these tables with the following steps:

1. Log on to the SAS Field Quality Analytics 6.1 application.
2. In the **Data Selection** workspace, create a data selection, filtering on several columns.
3. In the **Analysis** workspace, create an analysis using the data selection just created, selecting columns for the reporting, grouping, and analysis variables.

When this is successful, your configuration and data have been successfully migrated.

Additional Steps to Migrate from SAS Field Quality Analytics 6.1 to SAS Field Quality Analytics 6.x

Pre-migration Steps

Before you perform migration steps to move from a 6.1 development environment to a 6.1 test environment, and then to a 6.1 production environment, the 6.1 test and production environments need to be deployed by using a SAS Migration Utility package that includes users, groups, and platform content.

Migrate from SAS Field Quality Analytics 6.1 to SAS Field Quality Analytics 6.x

The following provides an overview of the steps to migrate from a 6.1 development environment to a 6.1 production environment:

Note: Check that the necessary pre-migration steps have been performed before migrating from a 6.1 development environment to a 6.1 production environment.

- Copy the stage mart from the 6.1 development environment to the 6.1 test environment.
- Export the ETL jobs package from the 6.1 development environment, and import it to the 6.1 test environment.
- Run the alter data mart job and other ETL jobs to move data into the data mart.
- Run the create content package macro on the 6.1 development environment.
- Use the **Administration** workspace on the 6.1 test or production environment to migrate warranty content.
- Use the **Administration** workspace on the 6.1 test or production environment to adjust configuration defaults.

Additional Steps

Be sure to create copies of the following tables in the 6.1 package folder when migrating from a 6.1 installation of SAS Field Quality Analytics to a 6.x installation of SAS Field Quality Analytics:

- ANALYSIS_INSTANCE_PARAM_PKG
- ANALYSIS_INSTANCE_PKG
- CHILD_FILTER_PKG
- CHILD_FILTER_VALUE_PKG
- DATA_SEL_COLUMN_PKG
- DATA_SEL_FILTER_PKG
- DATA_SEL_FILTER_VALUE_PKG
- DATA_SEL_MEMBER_PKG

- DATA_SEL_PKG
- DOMAIN_OBJECT_META_PKG
- PROJECT_ID_PKG
- PROJECT_NODE_PKG
- SUBSET_GROUP_PKG

Partial Promotion

You can use a content macro in SAS Field Quality Analytics 6.1 to import all content, content based on the content type, or content based on the date interval. See "Run Macros to Create the Content Package" on page 72 for more information about using the content macro.

You can use the **Administration** workspace in SAS Field Quality Analytics 6.1 to import all content, content based on the content type, content based on the date interval, or user-selected content. See "Migrating Content in the Administration Workspace" on page 106 for more information about using the **Administration** workspace in SAS Field Quality Analytics 6.1.

Migrating Content in the Administration Workspace

Overview

You can migrate content into SAS Field Quality Analytics by selecting **Content Migration** in the **Administration** workspace, and then importing a package and selecting items to migrate.

Note: To migrate content into SAS Field Quality Analytics, you must have administrator user permissions.

Import a Package

Perform the following steps to import a package into SAS Field Quality Analytics:

1. Click **Content Migration** in the **Administration** workspace.
2. Click **Import Package**.

   The Import Package window appears.
3. Provide the migration package location.
4. Select the type of objects that you want to import.
5. Indicate whether you want to import items for all dates or between a specified range.
6. Specify whether you want to filter the items to import based on who created them.
7. Click **OK**.

Select Items to Migrate

After you have selected a package to import, you can select the items that you want to migrate.

1. Select the item or items that you want to migrate in the **Available Items** list.
2. Click .
3. The item is added to the **Selected Items** list.
4. Click **Migrate**.

Search for an Item to Migrate

After you import a package into SAS Field Quality Analytics, you can search for an available item to migrate.

Type terms that you want to search for in the **Search** text box.

Items that match what you have typed so far are displayed in the available items table. To return to the complete list of available items, clear the text that you have entered in the **Search** text box, or click .

Migration Status

You can check the status of a migration at the following URL:

`http://<server>/SASFieldQualityAnalytics/rest/migration/status`

Note: You must replace <*server*> with the value for your server.

A migration report notification (e-mail) is sent to the user running the migration using the configured e-mail ID. The following table indicates the possible statuses:

Table 8.1 *Migration Status Values*

Status	Description
Ready	Object ready for migration
Running	Object migration in progress
Migrated	Object migrated successfully
Already Migrated	Object already migrated (or object with same name available on target system)

Status	Description
Error	Error in object migration

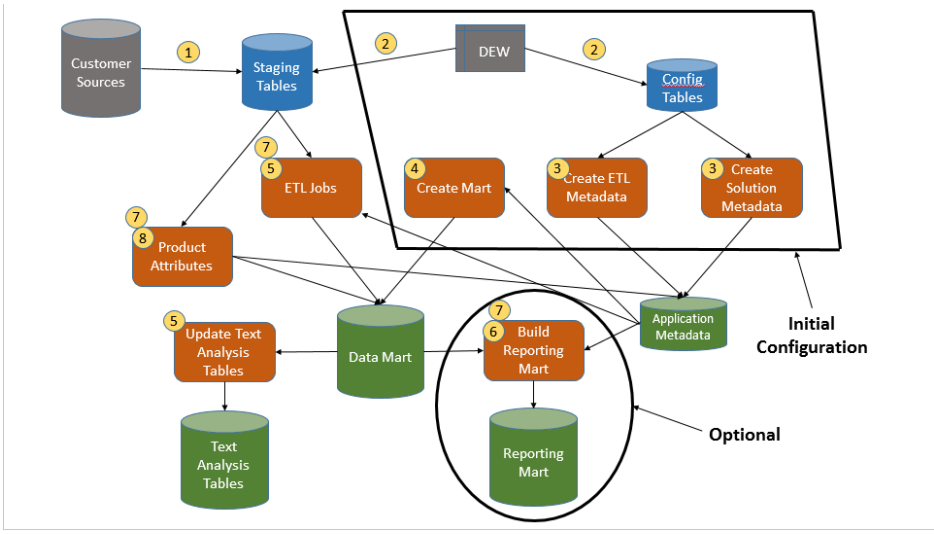
Chapter 9

Extract, Transform, and Load (ETL) Process

Overview of the ETL Process

The extract, transform, and load (ETL) process for SAS Field Quality Analytics includes loading data from the stage tables into the data mart, updating the text analysis tables, and building the reporting mart tables. The reporting mart tables are not required for SAS Field Quality Analytics functionality, and therefore the jobs that build these tables are not included, by default, in the regular ETL build process. The ETL process also includes updating the configuration of stage tables, mart tables, and metadata tables for customer data elements that do not exist in the data model. These configuration jobs are run during the initial SAS Field Quality Analytics implementation and are not part of the regular ETL build process.

The following diagram depicts the different tasks in the ETL process. These do not necessarily correspond to ETL jobs. A job is a logical unit of work that includes one or more tasks. Each task is a specific processing operation such as running a query or executing SAS code.



1. Move customer data from the source systems to the stage tables. No default jobs are available for this step.
2. Import the customer's Data Elements Worksheet (DEW) file into the SAS Field Quality Analytics configuration tables, which re-creates the staging mart tables. This process is explained in Chapter 8, “Migration,” on page 63.
3. Create the ETL metadata (the metadata needed for ETL to run) and the required solution metadata. This process is fed by the stage configuration tables.
4. Create the physical tables in the data mart. The table attributes are stored in the application metadata.
5. Move the data from the stage tables to the mart. The ETL jobs that perform this use the ETL metadata stored in the application metadata tables and can be incremental or full loads. These jobs also update tables required by a Text Mining analysis, and execute analyses that have been scheduled for batch update.
6. Build the large concatenated analytic tables in the reporting mart. This is a full refresh (the tables are re-created).This is also optional, and is not part of the regular ETL build.
7. Updates to these jobs, such as editing parameters, or performing manual activities like propagating columns, might be required when altering the shipped mart.
8. Add extended product attributes to the data mart and application metadata by extracting new attribute columns from the stage extended product attributes table.

Global Variables and Debug Options

SAS macro file wrna_init.sas is called by every SAS process in SAS Field Quality Analytics to initialize global macro variables and SAS system debug options.

To facilitate SAS log debugging when executing the ETL jobs, SAS system debug options (for example, MPRINT SOURCE2) can be set so that they are initialized when wrna_init.sas is called. To set these debug options, add them to the **SAS Log Debug Options** configuration variable in the SAS Field Quality Analytics **Administration** workspace. This variable is listed under the **General Configuration** category. For

information about how to edit configuration variables, see "Alter Warranty Configuration Variables" on page 50.

Before running any SAS Field Quality Analytics macros (such as %WRNA_ETL_IMPORT_DEW) , ETL jobs, or SAS Field Quality Analytics analyses, the assigned values of the global macro variables in wrna_init.sas need to be verified and modified as required. On Windows, this file is located at **<SAS-installation-directory>\wrtyanlmva\ucmacros**. When modifying this macro file, it is highly recommended that a copy of this file is placed in the macro override location, and the modifications are made to the file in that location. On Windows, the macro override location is at ***<SAS-configuration-directory>*\Lev1\SASApp\SASEnvironment\SASFieldQualityAnalytics6.1\SASMacro** . Below is a listing of the variables with their default values:

Table 9.1 *Global Variables*

Global Macro Variable	Default Value	Description
&g_mfgapp	MFGAPP	Pre-assigned application database libref
&g_applib	MFGAPP	Pre-assigned application database libref
&g_wrnaout	WRNAOUT	Pre-assigned analysis output libref
&g_wrnamart	WRNAMART	Pre-assigned data mart libref
&g_sasdata	WRNAMART	Pre-assigned data mart libref
&g_dimlib	WRNAMART.	Pre-assigned data mart libref (with a period)
&g_factlib	WRNAMART.	Pre-assigned data mart libref (with a period)
&g_wrnastg	WRNASTG	Pre-assigned stage mart libref
&g_wrnaetl	WRNAETL	Pre-assigned ETL exceptions libref
&g_userfdl	WRNAFDL	Pre-assigned filtered data libref
&g_wrnarpt	WRNARPT	Pre-assigned reporting mart libref
&g_wrnatxt	WRNATEXT	Pre-assigned text analysis tables libref
&g_wrnalibObjnm	Field Quality: Data Mart	Data mart library object name in metadata
&g_stglibObjnm	Field Quality: Staging Tables	Stage mart library object name in metadata
&g_rptlibObjnm	Field Quality: Reporting Mart	Reporting mart library object name in metadata
&g_etllibObjnm	Field Quality: ETL Exceptions	ETL exceptions library object name in metadata

Global Macro Variable	Default Value	Description
&g_rptTablesOMRPath	`/Products/SAS Field Quality Analytics/ Reporting Mart`	Metadata path in which reporting mart tables are registered. These tables are registered by the jobs that build these tables.
&missingCharVal	Question mark (?)	Value to populate character columns if blank. Not providing a value is valid.
&controlCharReplacement	Underscore (_)	Value to replace non-printable control characters. Provide a one-character value. Control characters are replaced with a blank if no value is specified.
&g_etlJobsPath	`C:\sas\Config \Lev1\SASApp \SASEnvironment\SASCode \Jobs`	Physical path to the SAS program files generated from deployed ETL jobs. This path is required for the ETL build.
&commentkeybuildtype	I	Flags whether the text analysis out and key tables are refreshed with an incremental update or a full rebuild. A value of F (or f) designates a full rebuild. Any other value, including blank, designates an incremental update.
&tminerLanguages	`arabic chinese danish dutch english finnish french german greek hebrew hungarian indonesian italian japanese korean norwegian polish portuguese romanian russian slovak spanish swedish thai turkish vietnamese`	List of text analysis supported languages. Do not modify.
&identifyLanguageFlag	0 (Zero)	A value of 1 indicates that SAS Text Miner code will execute during the ETL process to identify the language in comment columns. Any other value, including blank, indicates that the language identification routine will not execute. This is a time-intensive operation if the SAS session encoding is not UTF-8.
&g_commentDefaultLanguage	English	Language with which to identify a comment's text if variable &identifyLanguageFlag is not equal to 1 or the language is not identified.
&ref_currency_cd	USD	Reference currency code for currency columns. This is required for multi-currency conversions, and must exist in the exchange rates table for those conversions.

Global Macro Variable	Default Value	Description
&converted_currency_cds		Space separated list of conversion currency codes. Leave blank if multi-currency is not required. If not blank, the exchange rates table must be populated with the specified codes.
&g_etl_locale_code	en	Locale code for column labels, table labels, and data selection group labels populated in configuration tables TABLE_CONF, COLUMN_CONF, and DATA_SEL_GRP. The alter data mart job adds and updates the labels for this locale code in SASHELP locale files WRTYANL_DATA_SEL_GRP, WRTYANL_TABLE_META, and WRTYANL_TABLECOLUMN_META.

Data Requirements

SAS Field Quality Analytics requires the following:

- All columns must have unique names. The exception to this are columns that are foreign keyed (for example, PRODUCT_ID, EVENT_ID).
- Child tables are multi-to-one. One-to-one child tables should be put in the parent table. The exceptions to this are EXT_PROD_ATTR_STG and EVENT_COMMENT_STG because of their potential size.
- There can be multiple event tables (EVENT_STG, and so on), but there is only one product table (PRODUCT_STG).

  Note: SAS Field Quality Analytics does not support common child tables across event types (for example, LABOR as a child table present in claims and LABOR as a child table present in call center).
- All column names must be no longer than 29 characters, with the exception that the names for comment columns that are analyzed by a Text Mining analysis must be no longer than 23 characters.
- Column names must meet SAS naming conventions. SAS option VALIDVARNAME=ANY is not supported.
- Both Read and Write access to the **`SASApp`** directory and subdirectories are required for the ETL user that runs the ETL jobs.

Ways That You Can Customize SAS Field Quality Analytics Data

You can customize SAS Field Quality Analytics data in the following ways:

- Add a new numeric or currency column to PRODUCT_STG, EVENT_STG, REPL_PART_STG, or LABOR_CODE_STG.
- Add a new date column to PRODUCT_STG, EVENT_STG, REPL_PART_STG, or LABOR_CODE_STG.
- Add a new character column to PRODUCT_STG, EVENT_STG, REPL_PART_STG, or LABOR_CODE_STG.
- Add a new character code column with related name column to PRODUCT_STG, EVENT_STG, REPL_PART_STG, or LABOR_CODE_STG.
- Add a new numeric column related to CSTMR, SELLING_DEALER or REPAIR_DEALER to PRODUCT_STG or EVENT_STG.
- Add a new character column related to CSTMR, SELLING_DEALER or REPAIR_DEALER to PRODUCT_STG or EVENT_STG.
- Add a new character code column (with a related name column) related to CSTMR, SELLING_DEALER or REPAIR_DEALER to PRODUCT_STG or EVENT_STG.
- Add two or more related columns (meaning they should share a dimension) to PRODUCT_STG, EVENT_STG, REPL_PART_STG, or LABOR_CODE_STG (it does not matter if they are numeric or character).
- Add a new character column to EXT_PROD_ATTR_STG.
- Add a new character code column with a related name column to EXT_PROD_ATTR_STG.
- Add a new comment to EVENT_COMMENT_STG.
- Add a new product child table.
- Add a new event child table (for example, another LABOR_CODE_STG).
- Add a new event table (for example, a second EVENT_STG).
- Add a child on the new event table.
- Add a new dimension table that is referenced by foreign keys in fact tables.
- Change the label of a table.
- Change a label or format on a column. The format must be a Flex supported format. For more information, see "SAS Formats Supported by Flex" on page 285.

Note: Any data change that is not listed is not supported. An example of an unsupported customization would be to delete anything from the shipped mart, or add a new numeric code column with a related name column to the PRODUCT_STG, EVENT_STG, REPL_PART_STG, or LABOR_CODE_STG table. Also, across a hierarchy, duplicate column names are not supported. However, column names can be the same for different hierarchies.

You should use the following process when making any of the previously mentioned data customizations (multiple changes might be made simultaneously):

1. Modify configuration information in the DEW (Data Elements Worksheet), if available.

   Note: This step is optional, as the DEW file is not required.

2. Populate the configuration tables in the stage library. If the DEW is available, this is performed by running the %WRNA_ETL_IMPORT_DEW macro.
3. Modify the stage tables. If the DEW is available, this is performed by running the %WRNA_ETL_IMPORT_DEW macro.

4. Run the configuration update processes and re-create the data mart with empty tables. This is ETL job fqa_00001_alter_data_mart.
5. Repopulate the stage tables. For a migration, this is performed by running the %WRNA_ETL_MIG61 macro.
6. Update table metadata in SAS Data Integration Studio, and make any manual updates to the ETL jobs.
7. Run the ETL process. This will have to be a full load.

Add a New Label for a Given Column in Different Languages

The following is an example of how you can add English and Simplified Chinese labels for a new column, called NEW_COLUMN:

1. Get the English and Chinese labels that you want to use.
2. Get the escaped Unicode characters for the Chinese labels. For example, use an online converter, such as: \u65b0\u5217
3. Manually add two entries to SASHELP.WRTYANL_TABLECOLUMN_META

```
en NEW_COLUMN New Column
zh_CN NEW_COLUMN \u65b0\u5217
```

4. Restart all SAS Field Quality Analytics servers.

ETL Stage Table Information

All fact-type tables (TABLE_TYPE_CD = F or C) contain the LOAD_DTTM column. This column must be populated with the datetime when the record is added to the table. This column is used by the ETL jobs to identify the new data to extract. All fact-type tables also contain the column ACTION_FLG. This is used to flag (ACTION_FLG = D) a record to be deleted that had previously been loaded into the output fact table. If ACTION_FLG is not D, all records are appended or updated, depending on the primary key values for the records.

ETL Utility Jobs

Note: Before running any ETL jobs, make sure that all operating system and metadata group and user permissions are correctly applied for the SAS Field Quality Analytics Data Administrator user who is running the jobs. See Chapter 10, “Users, Groups, and Roles,” on page 153.

ETL utility jobs are run as needed at implementation. They are not included in the regular ETL build process. The following table provides information for the utility jobs for SAS Field Quality Analytics:

Table 9.2 *ETL Utility Jobs*

Job Name	Description
fqa_00001_alter_data_mart	This job can be run as needed at implementation time to add tables or columns to the data mart (WRNAMART). *Note:* After you run this job, you must manually update the table registrations in SAS Data Integration Studio. To do this, right-click the tables (Use the Shift or Ctrl keys to select them all) under the **Data Mart**, **ETL Check**, and **Stage Data** folders, and then select **Update Metadata**. If there are new tables, right-click the corresponding folder and select **Register Tables**. A wizard appears that guides you through registering a new table. There are five configuration tables in the stage library: TABLE_CONF, COLUMN_CONF, DATA_SEL_ATTR, DATA_SEL_TREE, and DATA_SEL_GRP. TABLE_CONF and COLUMN_CONF contain metadata about the tables in the stage library, and the DATA_SEL tables contain metadata about the data selections. These tables must be populated before running this job, and are automatically populated from the customer's DEW (Data Elements Worksheet) file when the %WRNA_ETL_IMPORT_DEW macro is run. When populating these tables, every effort should be made to map a customer's data elements into the pre-defined tables and columns that come installed with SAS Field Quality Analytics 6.1. Information must be provided for all stage table columns, including any new customer tables and columns that cannot be mapped into the predefined data model. Also, information must be provided for the required data mart-only columns that do not exist in the stage tables and for any calculated analysis variable columns. This job reads these configuration tables and re-creates the WRNAMART tables to incorporate any new columns and tables or to incorporate any changes to column attributes (column name, length, data type, and so on). *Note:* • **When this job is run, with the exception of DATE_DIM, all WRNAMART tables are re-created. Any data that previously existed in the tables is permanently deleted.** • **Is is recommended that, before running this job for the first time, the SAS Field Quality Analytics administrator manually delete all physical tables in WRNAMART. This is to clear out any sample data tables that are not used and to force the re-creation of table DATE_DIM so that it is in the current SAS session encoding, which might be different from that of the sample data. This manual step is not needed for any subsequent runs of this job.** The structure of WRNAMART is dimensional in nature. It is structured such that dimension tables are created and populated for each fact table character column, so that each fact table is surrounded by its accompanying dimension tables. The fact table contains numeric key columns that are foreign keys to the dimension tables. After the WRNAMART tables are created, the metadata about each table is updated in the application metadata library (MFGAPP). The following MFGAPP tables are populated with this configuration metadata: • WRNAMART_TABLE_CONF • WRNAMART_COLUMN_CONF • DIMENSION_MAPPING • DIMENSION_CODENAME • TABLE_META • TABLE_ATTRIBUTES • TABLECOLUMN_META • TABLECOLUMN_ATTRIBUTES

Job Name	Description
fqa_00001_alter_data_mart (continued)	The following MFGAPP tables are populated with other configuration metadata extracted from COLUMN_CONF: • FR_FAILURE_RELATIONSHIP • FR_TRIVIAL_RULES • SAS_ANALYSIS_VAR • SAS_TOC_REPORT_VAR • ANALYSIS_GLOBAL_DEFAULTS • ANALYSIS_TEMPLATE_PARAM WRNASTG tables DATA_SEL_ATTR, DATA_SEL_TREE, and DATA_SEL_GRP contain metadata about the data selections that are needed for the **Data Selection** workspace in the SAS Field Quality Analytics application. DATA_SEL_ATTR contains one row for each column that requires a data selection. DATA_SEL_GRP contains one row for each data selection group. The column data selections (attributes) are assigned to groups. DATA_SEL_TREE contains the child and parent relationship between the data selection groups and attributes. The following MFGAPP tables are populated for this data selection metadata: • DATA_SEL_ATTR • DATA_SEL_TREE • DATA_SEL_GRP Table DIMENSION_MAPPING contains information about each dimension that is stored in the data mart. A dimension can be stored in either the MASTER_KEY_DIM table, or a separate unique dimension table, which is identified in DIMENSION_MAPPING. Table DIMENSION_CODENAME contains one row per code-name column pair stored in the dimension tables. After the MFGAPP tables are updated and metadata about each WRNAMART table is updated in SAS Data Integration Studio, any new columns that are added to tables need to be manually propagated through the existing ETL job mappings. If there are any new fact type tables (TABLE_TYPE_CD=F or C), ETL jobs need to be created for each of these new tables. An existing ETL job can be used as reference. The following are the configuration requirements for populating TABLE_CONF and COLUMN_CONF: TABLE_CONF important columns (r = population required) • DATA_SOURCE_ID (r) – Defines a grouping of related product and event tables. Currently only one grouping is allowed. Value of 1. • DATA_TYPE_CD (r) – P for product tables (detail and header). C for claim tables (detail and header). • DATA_TYPE_DETAIL_CD (r) – Required for detail level tables. PO for extended product attributes table (Build Options). ‘CM’ for event comments table. • DATA_TYPE_GRP_CD (r) – E for event tables. P for product tables. • DATA_TYPE_LEVEL_CD (r) – D for detail level tables. H for header level tables. • DM_TABLE_PK_COLUMN_NM (r) – The primary key (natural key) column for the stage table. • DM_TABLE_FK_COLUMN_NM – The column that is the foreign key to the parent fact table. Required for all tables except the products header table. In that case, this must be blank. • LOGICAL_TABLE_NM_LABEL – Specifies the labels for primary fact tables, which are displayed in the application. Required for primary fact tables. • MIGRATION_SOURCE_TABLE_NM – Specifies the name of the source 4.x table for data migration mappings from 4.x.

Job Name	Description
fqa_00001_alter_data_mart (continued)	TABLE_CONF important columns (r = population required) (continued) • TABLE_NM (r) – Stage table name. • TABLE_TYPE_CD (r) – Possible values: F (fact table), C (child fact table), D (dimension table). A value of F identifies a primary fact table, which is available for analysis in SAS Field Quality Analytics 6.1. Each primary fact table must have a unique primary key. A child fact table (value of C) is a child to a primary fact table, sharing the same primary key as a primary fact table. A value of D identifies a dimension table, to which a fact table (value of F) can reference with a foreign key. A child fact table (value of C) should contain no foreign key references to a dimension table. COLUMN_CONF important columns (r = population required) • CODE_COLUMN_NM – For a column identified as a name column (CODE_NAME_FLG=N), this identifies its corresponding code column, which has CODE_NAME_FLG=C. • CODE_NAME_FLG – Value of C or N. This is used to identify code-name column pairs in the data. This is populated for all tables (TABLE_TYPE_CD=F,C,D). A value of C signifies that a column is a code, and a value of N signifies that a column is a name that describes a related code column. In primary fact tables (TABLE_TYPE_CD=F), code-name pairs should be grouped via the RELATED_COLUMN_NM column. • COLUMN_DATA_TYPE_CD (r) – Column data type. Possible values: CHAR, NUM, DATE, DATETIME. • COLUMN_FMT_NM – Format to apply to the column. Must contain the period, and must contain the $ for character formats. Must be a format that is supported by Flex. • COLUMN_LEN_NO (r) – Column length • COLUMN_NM_CD (r) – Column name • COLUMN_NM_LABEL – Column label • CREATE_INDEX_FLG – A value of 1 indicates that a simple index for this column is to be created in the corresponding data mart table. • DATA_SEL_VAR_FLG – Y or N. A value of Y identifies that a column is to be configured for a data selection in the SAS Field Quality Analytics application. • DATE_INTERVAL_CD – Date interval for a date period column. Default values: WEEK, MONTH, QUARTER, SEMIMONTH, WEEK.7, YEAR. This is required for columns such as PRODUCTION_YEAR or PRODUCTION_MONTH. • EST_NUM_DISTINCT_VALUES_NO – Estimated number of unique values for character columns. Recommended for fact table character columns that have less than 1000 unique values. This is used to determine whether MASTER_KEY_DIM (less than 1000) is used to store the values for a column, or whether a separate dimension table (greater than or equal to 1000) is created and used to store the values for a column. This should be populated only for fact table character columns (TABLE_TYPE_CD=F). If blank, and the column has a lookup table, the row count in the lookup table is used in determining the dimension table. If blank, and there is no lookup table, a separate dimension table is used to store the values for a column.

Job Name	Description

fqa_00001_alter_data_mart (continued)	• FOREIGN_KEY_ASSOC_TBL_NM (r) – Required for foreign key columns. Identifies this column as a foreign key to a dimension table (TABLE_TYPE_CD=D), or to a primary fact table (TABLE_TYPE_CD=F). This is populated with the name of the stage table to which this column is a foreign key. Examples:
	  • For a primary key column of a child fact table, such as event comments, this would be populated with the name of its parent primary fact table that contains this column in its primary key. For the default data model, this would be populated with EVENT_STG.
	  • For a column in a primary fact table, such as event labor codes, this would be populated with the name of its associated primary fact table that contains this column in its primary key. For the default data model, this would be populated with EVENT_STG for key column EVENT_ID, and PRODUCT_STG for key column PRODUCT_ID.
	• HIDE_COLUMN_FLG – A value of 1 specifies that a column is not added to the application configuration tables and therefore is hidden from users of SAS Field Quality Analytics.
	• LKUP_TBL_REQ_FLG – Value of Y or N. A value of Y flags that a lookup table exists in stage for the column. If Y, population of the first two of the following lookup associated columns is required:
	  • LKUP_TBL_NM – Name of the lookup table in stage. This table needs to exist.
	  • LKUP_TBL_KEY_COLUMN_NM_CD – Name of the code column in the lookup table.
	  • LKUP_TBL_DESC_COLUMN_NM – Name of the description column in the lookup table. Optional.
	  • LKUP_TBL_WHERE_CLAUSE_STR – WHERE clause to extract the lookup values from the lookup table. Optional.
	• MAPPED_COMPUTED_FLG (r) – Identifies the location for a column: S=staging area only, M=staging and data mart, C=computed column, D=data mart only.
	• MIGRATION_SOURCE_COLUMN_NM – Specifies the name of the source 4.x column for data migration mappings from 4.x. This needs to be populated where the 4.x column name is different from the 6.1 column name.
	• PRIMARY_KEY_FLG (r) – Required for primary key columns. A value of 1 identifies a column as a primary key column.
	• PRIMARY_KEY_ORDER_NO – Identifies the order of the primary key columns for tables containing a multi-column primary key. This is used to correctly create the unique index on the corresponding table in the data mart. A value of 1 identifies the first column in the primary key, value of 2 identifies the second column in the primary key, and so on.
	• RELATED_COLUMN_NM – Populate this only for fact table character columns (TABLE_TYPE_CD=F) to define dimension groupings. This contains the names of the dimension key columns for the grouping of related columns into a dimension. For example, if this has value ACTION_CD for columns ACTION_CD, ACTION_GROUP_CD, ACTION_GRP_NM, ACTION_NM on table Action_code_stg, then this means that these four columns are grouped into a dimension, and ACTION_CD is the primary key column for that dimension. A key with multiple columns is required to be a space-separated list of columns. For example, if ACTION_CD and ACTION_GROUP_CD define the key for this same dimension grouping, then Related_column_nm should be populated with ACTION_CD ACTION_GROUP_CD for all the grouped columns.

Job Name	Description
fqa_00001_alter_data_mart (continued)	• SUBTYPE_TXT – Application usage type. A comma-separated list of usage types that specifies how a column is used by SAS Field Quality Analytics. The following are character usage types: • Geographic – Identifies a reporting variable for the Geographic analysis. • Comment – Identifies a comment variable for the Text Mining analysis. • Failrel – Identifies a reporting variable for the Failure Relationship analysis. • Eianalytic – Identifies a reporting variable for the Early Warning Ad Hoc Analytic analysis. • Eienterprise – For event variables, identifies a reporting variable for the Early Warning Enterprise Analytic analysis. For product variables, identifies a grouping variable for the Early Warning Enterprise Analytic Analysis. • Categorical – Identifies a reporting variable for these analyses: Statistical Drivers, Early Warning Ad Hoc Threshold, Decision Tree, Pareto, Summary Tables, Text Mining. Identifies a grouping variable for these analyses: Pareto, Summary Tables, Trend and Control, Exposure, Reliability, Time of Event, Forecasting. • Detail – Identifies a reporting variable for the Details Table analysis. The following are numeric usage types: • Currency – If multi-currency is enabled, identifies a currency column which requires currency conversion. • Integer – Identifies a data selection variable as an integer. • Decimal — Identifies a data selection variable as a decimal. • Forecasting – Identifies an analysis variable for the Forecasting analysis. • Primarycost – Identifies the primary cost variable for this table for the Failure Relationship analysis. • Analysis – Identifies a general analysis variable for the following analyses: Pareto, Summary Tables, Exposure, Geographic, Early Warning Ad Hoc Threshold, Time of Event, Trend and Control, Trend by Exposure. • Proddate_period – Product date period variable (for example, Year, Month, Quarter, and so on). Identifies a reporting variable for the following analytics: Trend and Control, Trend by Exposure, Early Warning Ad Hoc Threshold, Text Mining Analysis, Pareto, Summary Tables. Identifies a grouping variable for the following analytics: Pareto, Summary Tables, Exposure, Time of Event. • Eventdate_period – Event date period variable (for example, Year, Month, Quarter, and so on). Identifies a reporting variable for the Time of Event analysis and Text Mining analysis. • Proddate – Identifies the product build date variable used for time-in-service calculations. • Shipdate – Identifies the product ship date variable used for the optional ship-to-sale and for optional time-in-service calculations. • Inservicedate – Identifies the product in-service and sale date variable used for time-in-service calculations. • Eventdate – Identifies the event date variable used for time-in-service calculations. • Detail – Identifies a reporting variable for the Details Table analysis. • Eicostvar – Identifies a cost variable for the Early Warning Ad Hoc and Early Warning Enterprise Analytic analyses.

Job Name	Description

fqa_00001_alter_data_mart (continued)	• TABLE_NM (r) – Stage table name.
	• For analysis variables (MAPPED_COMPUTED_FLG=C), which are computed by SAS Field Quality Analytics, populate the following columns:
	  • SOURCE_VAR_COMP_TXT – Comma- or space-delimited list of source numeric columns used to calculate this analysis variable. These are columns that have MAPPED_COMPUTED_FLG=M OR D. This can be blank if no source numeric columns are required in the calculation.
	  • NUMERATOR_TXT – An expression. This can include source numeric columns, other analysis variables, or special numeric variables TOTALCLAIMCOUNT and SAMPLESIZE. This expression derives the numerator portion of the calculation for this analysis variable. Required.
	  • DENOMINATOR_TXT – An expression. This can include source numeric columns, other analysis variables, or special numeric variables TOTALCLAIMCOUNT and SAMPLESIZE. This expression derives the denominator portion of the calculation for this analysis variable. This can be blank.
	  • ANALYSIS_VAR_COMP_TXT – Comma- or space-delimited list of other analysis variables that are to be calculated along with this analysis variable when chosen for analysis.
	Additional COLUMN_CONF Information:
	• When populating stage table COLUMN_CONF, a valid format (supported by Flex) must be specified for numeric columns, especially for date and integer columns. The format for integer columns must not contain the decimal portion for example, 'F12.'). Also, for integer columns, column SUBTYPE_TXT should include the value **`INTEGER`** in its comma-separated list of values.
	• The following month, year, and quarter numeric columns are automatically configured for all date columns identified in COLUMN_CONF. These are all date columns except for YEAR, which is the numeric year:
	  • MONTH
	  • YEAR
	  • WEEK
	  • WEEK7 (Starts on Saturday)
	  • SEMIMONTH
	  • QUARTER
	• One or more of the above automatically derived columns can be included in Column_conf, but need to be flagged with MAPPED_COMPUTED_FLG=C. The names of these columns are derived by replacing the "_DATE" in the column's name with MONTH, YEAR, QUARTER, WEEK, WEEK7, and SEMIMONTH. So, as an example, the following columns are automatically derived for SHIP_DATE:
	  • SHIP_YEAR
	  • SHIP_MONTH
	  • SHIP_WEEK
	  • SHIP_WEEK7
	  • SHIP_SEMIMONTH
	  • SHIP_QUARTER

Job Name	Description

fqa_00001_alter_data_mart (continued)	• If a date period is needed beyond the default values, the following configuration changes are required for each additional date period:
	  • Add the date period column to the DATE_DIM table in the mart. Similar to the existing _DATE columns in this table, this needs to be a date column whose name is in the format <*DatePeriod*>_DATE. For example, if the semiyear (six month) date period is needed, the name of the column should be SEMIYEAR_DATE.
	  • Add an entry for this date period column in MFGAPP table WRNAMART_COLUMN_CONF. Use the entry for another DATE_DIM date column, such as WEEK_DATE, as an example to populate this new entry. For the SEMIYEAR_DATE example, set COLUMN_NM=SEMIYEAR_DATE, COLUMN_NM_LABEL=Semi-Year, TABLE_NM=DATE_DIM, COLUMN_DATA_TYPE_CD=DATE, COLUMN_FMT_NM=MMDDYY10., and DATE_INTERVAL_CD=SEMIYEAR.
	  • Modify SAS macro wrna_etl_datedim.sas, which is the source code that populates DATE_DIM, to add the derivation for the new date period column.
	• Multi-currency is enabled if global variables &ref_currency_cd and &converted_currency_cds are populated in the %WRNA_INIT macro. If multi-currency is enabled, multi-currency columns are generated and configured in the mart for every currency column in COLUMN_CONF. A currency column is identified where column SUBTYPE_TXT contains CURRENCY as one of its delimited list of values. For each identified currency column, each corresponding multi-currency column is generated by appending its currency code (extracted from the list stored in variable &converted_currency_cds) to the identified currency column's name. Similarly, the reference currency columns are generated by appending the reference currency code extracted from variable &ref_currency_cd. For example, for &ref_currency_cd=EUR, &converted_currency_cds=JPY ZAR, and currency column PAYMENT_AMT, the following multi-currency columns are generated in the mart:
	  • PAYMENT_AMT_EUR
	  • PAYMENT_AMT_JPY
	  • PAYMENT_AMT_ZAR
	• Each stage fact table is required to have datetime column LOAD_DTTM. This should be flagged as a stage-only column.
	• Each stage fact table is required to have column ACTION_FLG (Char 1). This should be flagged as a stage-only column.
	• Each event header table (DATA_TYPE_GRP_CD=E, DATA_TYPE_LEVEL_CD=H) should include the following data mart-only columns (MAPPED_COMPUTED_FLG=D):
	  • EVENT_DAYS_INSERVICE
	  • EVENT_DAYS_INSERVICE_BUILD
	  • EVENT_DAYS_INSERVICE_SALE
	  • EVENT_TIS_BIN
	  • EVENT_TIS_BIN_BUILD
	  • EVENT_TIS_BIN_SALE
	  • FAILURE_NO
	  • FIRST_FAILURE_FLG (Char)
	  • EVENT_DAYS_INSERVICE_SHIP
	  • EVENT_TIS_BIN_SHIP

Job Name	Description
fqa_00001_alter_data_mart (continued)	• The product table (DATA_TYPE_GRP_CD=P, DATA_TYPE_LEVEL_CD=H) should include the following data mart only columns (MAPPED_COMPUTED_FLG=D): • PRODUCT_DAYS_INSERVICE • PRODUCT_DAYS_INSERVICE_BUILD • PRODUCT_DAYS_INSERVICE_SHIP • PRODUCT_TIS_BIN_SHIP • PRODUCT_TIS_BIN • PRODUCT_DAYS_INSERVICE_SALE • PRODUCT_TIS_BIN_BUILD • PRODUCT_TIS_BIN_SALE • SALE_LAG_PROFILE_SCALE • SALE_LAG_PROFILE_LOCATION • SALE_LAG_PROFILE_SK • USAGE_PROFILE_CATEGORY (Char) • USAGE_PROFILE_TYPE (Char) • USAGE_PROFILE_SCALE • USAGE_PROFILE_LOCATION • USAGE_PROFILE_SK • SALE_LAG_PROFILE_CATEGORY (Char) • SALE_LAG_PROFILE_TYPE (Char) • The product table should also include the following columns if claim submit lag is enabled. With the exception of CLAIMSUBMITLAG, these are data mart-only columns: • CLAIMSUBMITLAG • ADJ_PRODUCT_DAYS • ADJ_PRODUCT_DAYS_BUILD • ADJ_PRODUCT_DAYS_SALE • ADJ_PRODUCT_DAYS_SHIP • ADJ_PRODUCT_TIS_BIN • ADJ_PRODUCT_TIS_BIN_BUILD • ADJ_PRODUCT_TIS_BIN_SALE • ADJ_PRODUCT_TIS_BIN_SHIP • Each column identified as a comment is required to have a corresponding _LANGUAGE column. For example, for column CSTMR_COMMENT, there needs to be column CSTMR_COMMENT_LANGUAGE. If a comment language is known, the _LANGUAGE column in the data should be populated with the identified language, and this should be in proper case (for example, “English”, not “english” or “ENGLISH”). The following are the supported Text Miner languages: **arabic chinese danish dutch english finnish french german greek hebrew hungarian indonesian italian japanese korean norwegian polish portuguese romanian russian slovak spanish swedish thai turkish vietnamese**

Job Name	Description
fqa_00002_empty_mart_tables	This job, which is intended to be run as needed at implementation time, empties one or more specified tables in WRNAMART, or all tables in WRNAMART. Edit the transformation options in the job to specify the name of one or more tables to empty, or specify _ALL_ to empty all tables. When this job is run, the tables are re-created with all their indexes intact.
fqa_00003_text_create_language_tables	This job is run as needed at implementation time to create the synonym and stop tables in the specified language for SAS Text Miner. The tables are created in the WRNATEXT library. Specify the language in the options for the transformation in the job. For more information, see "Text Analysis ETL Process" on page 124.
fqa_00004_text_populate_language_tables	This job is run as needed at implementation time to populate the text analysis synonym and stop tables with initial values from a template library. The tables must exist in the WRNATEXT library, and are created using job fqa_00003_text_create_language_tables. Source stop and synonym files are available for English, French, and German in SASHELP. For any other languages, the customer can provide, if available, a customized stop list SAS data set and a customized synonym list SAS data set in a library on the server. Otherwise, these data sets are empty initially. The customer is encouraged to populate the stop list as needed. These customized data sets must be named <*language*>STOP and "<*language*>SYNMS", where <*language*> is the specified language. Specify the language and the source template library in the options for the transformation in the job. For more information, see "Text Analysis ETL Process" on page 124.
fqa_00006_alter_configurations	This job can be run at any time to update the data selection configuration user interface metadata in MFGAPP tables DATA_SEL_ATTR, DATA_SEL_TREE, and DATA_SEL_GRP. New data selection attributes (for columns that exist in MFGAPP table TABLECOLUMN_META) can be added, and changes can be made to the existing attributes and groups. The source for these tables are the same-named tables in WRNASTG. These WRNASTG tables can be populated automatically from the DEW by running the macro %WRNA_ETL_BUILD_DATA_SEL_TABLES.

Text Analysis ETL Process

This section contains additional information about the Text Analysis ETL process.

ETL jobs perform the following text analysis tasks:

- Two utility jobs are available, one to create the synonym list and stop list tables for the specified language, and another one to populate the synonym and stop list tables with initial values (if available). The English synonym list table is named TEXTSYN_ENGLISH, and the English stop list table is named TEXTSTOP_ENGLISH. A similar pattern is followed for other languages (for example, for French, the tables are TEXTSYN_FRENCH and TEXTSTOP_FRENCH).
- SAS Text Miner code is run to identify the language of comments in data mart tables if it has not already been identified. Identified languages for comments are then updated in the data mart tables. Any comments that are not identified are set to the default language specified in the %WRNA_INIT macro.
- SAS Text Miner code populates language-specific synonym tables in the WRNATEXT library. The source data for this is the populated comment data (table

EVENT_COMMENT_DIM in the data model). For English, the synonym table is TEXTSYN_ENGLISH.

- The text analysis parsing code creates column- and language-specific out and key tables in the WRNATEXT library. One out table and one key table each are created for each comment column and required language. For English key and out tables, all comments are analyzed, regardless of the language. The following are the English tables: CSTMR_COMMENT key table is TXTK_CSTMR_COMMENT_ENGLISH. CSTMR_COMMENT out table is TXTO_CSTMR_COMMENT_ENGLISH. TECH_COMMENT key table is TXTK_TECH_COMMENT_ENGLISH. TECH_COMMENT out table is TXTO_TECH_COMMENT_ENGLISH.

The table TEXT_TABLE_CONF in MFGAPP contains one row per comment column per identified language. Below is a listing of the columns in TEXT_TABLE_CONF and their descriptions:

- COMMENT_COLUMN_NM — Name of the comment column
- LANGUAGE_CD — Text analysis language
- COMMENT_TABLE_NM — Name of the comment table in the mart
- TEXT_ANALYSIS_KEY_NM — Name of the key table in the WRNATEXT library
- TEXT_ANALYSIS_OUT_NM — Name of the out table in the WRNATEXT library

The SAS Text Miner global variable &tminerlanguages in wrna_init.sas contains the list of all languages that SAS Text Miner supports. The SAS Text Miner global variable &identifyLanguageFlag specifies whether the language identification process is executed to identify comment languages. A value of 1 means yes and a value of 0 (the number 0) means no. The default is 0, since the process will take a long time when the SAS session encoding is not UTF-8. The SAS Text Miner global variable &g_commentDefaultLanguage specifies the language with which to identify a comment's text if &identifyLanguageFlag=0 or if the language is not otherwise identified.

For each comment column that exists in a table, an associated _LANGUAGE column needs to also exist in the same table. For example, if comment column AGENT_COMMENT is included in table EVENT_COMMENT_DIM, then column AGENT_COMMENT_LANGUAGE must also be included in table EVENT_COMMENT_DIM. The name of the comment column needs to be short enough so that the full comment column name is prepended in the _LANGUAGE column name.

WRNATEXT is the library that is specific to Text Analysis. It contains the following English tables after the Text Analysis ETL jobs are executed with the default data model:

- TEXTSYN_ENGLISH
- TEXTSTOP_ENGLISH
- TXTK_CSTMR_COMMENT_ENGLISH
- TXTO_CSTMR_COMMENT_ENGLISH
- TXTK_TECH_COMMENT_ENGLISH
- TXTO_TECH_COMMENT_ENGLISH

Note:

- The ETL job that identifies the languages of text comments for Text Mining analysis performs dramatically better when the SAS session encoding is UTF-8. Please consider this when selecting the encoding for your installation.

- When specifying the language of text comments, the language should be in mixed case instead of in lowercase. For example, when specifying the English language, use “English” instead of “english”.
- The synonym table is populated by spell checking. As Chinese, Japanese, and Korean characters are not spelling based, there is no notion of spelling correction for these languages. Therefore, the synonym table is not populated for Chinese, Japanese, and Korean characters when the synonym ETL job is executed. The user is encouraged to add the synonyms manually for these languages if required.

ETL Load Jobs

Note: Before running any ETL jobs, make sure that all operating system and metadata group and user permissions are correctly applied for the SAS Field Quality Analytics Data Administrator user who is running the jobs. See Chapter 10, “Users, Groups, and Roles,” on page 153.

This section provides information about the load jobs in SAS Data Integration Studio. These jobs load data from the stage tables to the dimensional data mart (fact tables and dimension tables). All fact table jobs have the primary process flow that loads the data from the stage fact table. At a minimum, this process flow includes the following transformations:

Extract — Extracts only new or updated data from the stage table based on the populated value in the LOAD_DTTM column. The WHERE clause criteria (**`load_dttm > &last_process_dttm`**) is specified on the **Where** tab in the **Extract** transformation properties. Referenced variable &last_process_dttm is the datetime that the fact table was last updated. This datetime is extracted from MFGAPP table WRNAMART_TABLE_CONF, column LAST_DATA_UPDATE_DTTM.

Data Validation — Performs defined data validations: invalid values, missing values, duplicate values, and custom. If there is a data validation infraction, the record can be loaded to the error table rather than loaded to the mart. Also, data validation infractions are registered in the exceptions table. The error and exceptions tables for each fact table exist in the "Field Quality: ETL Exceptions" (WRNAETL) library. For the predefined jobs, these WRNAETL tables are replaced with every ETL run. This behavior for each table (error or exceptions) can be changed such that the table is not replaced, but has new rows appended, keeping the previous data. The desired behavior is set by selecting or deselecting the **Replace error table** check box on the **Error and Exception Tables** tab in the data validation properties. The name of the error table is the same as the name of the data mart fact table being loaded by the job (<*FactTable*>), and the name of the exceptions table is EXC_<*FactTable*>. This naming convention is required for every fact table ETL job, and these tables are required to be in the WRNAETL library. The names of these tables, and the library where they exist, need to be set for new custom-defined jobs.

To do this, double-click the error records table icon immediately adjacent to the **Data Validation** transformation in the job (the middle icon in the vertical row of three green table icons). Click the **Physical Storage** tab in the Properties window, and enter the required name in the **Physical name** box. After selecting the **Redirect to a registered library** location, navigate to the **`/Products/SAS Field Quality Analytics/ETL`** check folder, and select the **Field Quality: ETL Exceptions** library. Repeat this step for the exceptions table (the bottom icon in the vertical row of three green table icons). The definitions of the exceptions and error table columns are automatically generated based on the defined data validation properties. Two columns in

the exceptions table, X_COLUMN and X_NOTE, are automatically defined with lengths of 100 and 200, respectively. These lengths have been increased to 500 in the predefined jobs. However, for new jobs, or for exceptions table changes in existing jobs, these lengths need to be set or reset back to 500. To do this, double-click the exception records table icon immediately adjacent to the **Data Validation** transformation in the job (the bottom icon in the vertical row of three green table icons), click the **Columns** tab in the Properties window, and, if necessary, directly change the X_COLUMN and X_NOTE lengths in the table to 500.

Note: This transformation requires a lot of SASWORK space. Make sure that there is adequate disc space for the data validation process.

Dimension Key Lookups — Extracts Dimension Surrogate Key (SK) values for source column values. Extracts, if multi-currency is enabled, exchange rate values for each specified conversion currency code, calculating multi-currency values using the extracted exchange rates, and populates the corresponding reference currency column for each group of multi-currency columns. The conversion currency codes are specified in SAS macro %WRNA_INIT. Extracts, if applicable, usage or sale lag profile dimension columns. Populates column PROCESS_DTTM (datetime the data is processed). Identifies the language of a comment column if %WRNA_INIT global variable &identifyLanguageFlag=1, and the SAS session encoding is UTF-8. If the encoding is not UTF-8, the language identification routine is performed when the postcode of the **SPD Server Table Loader** transformation runs. The output mapping of this transformation should contain all generated SK columns, all generated currency columns (if applicable), all generated usage and sale lag profile columns (if applicable), and the PROCESS_DTTM column. The source code for this transformation is a call to macro %WRNA_ETL_LOOKUP. Click the **Code** tab in the transformation properties to edit the parameter values on this macro call. The following are the macro parameters of note for this transformation:

- **&facttable** — Name of the output fact table in the mart. Do not include the libref. Required.
- **&inds** — Name of the input table or view. The libref is required if this is not in WORK. This table or view must exist. Predefined job value: &_input. Required.
- **&outds** — Name of the output table or view. The libref is required if this is not in WORK. Predefined job value: &_output. Required.
- **&outviewflg** — Flag to specify whether the output is a table or a view. A value of 1 indicates a view. Any other value, including blank, indicates a table. Defaults to 1 if not on the macro call.
- **&currencydatevar** — Name of the exchange rate date column in the source data. This date column is used for exchange rate lookups if multi-currency is enabled and there are currency columns in the source data. If this parameter is blank, which means that a date column does not exist in the data for this purpose, then the current date is used in the exchange rate lookups. If this parameter is not blank and multi-currency is enabled, then this date column must exist.
- **&datevartype** — Designation of &currencydatevar as either a date or datetime column. Possible value of DATE or DATETIME. Defaults to DATE if blank.

SPD Server Table Loader — Loads the output table in the mart. Items of note in the properties for this transformation:

- **Load Technique** tab — The selected load technique must be **Update**.
- **Mappings** tab — There is no mapping for column FIRST_FAILURE_FLG in the event mart job since this column is populated after the data is loaded. Column FAILURE_NO (Failure Sequence Number) in the event mart job has the expression

mapping REPAIR_OPEN_DATE + RAND('uniform'). The failure sequence number is derived from date column REPAIR_OPEN_DATE. If necessary, this expression can be modified to reference a different date column.

- **Precode and Postcode** tab — The postcode contains a call to macro %WRNA_ETL_FACTDELERR, which performs the following: Deletes flagged records from the output fact table (where column ACTION_FLG=d), updates the dimension tables for any column lookup failures, writes-out source data that did not load (due to lookup errors) to the lookup error table in WRNAETL, adds lookup error exception records to the exceptions table in WRNAETL, runs the SAS Text Miner routine to identify the language of the text for any comment column (this is performed here only if the SAS session encoding is not UTF-8), and updates the fact table with the identified language for any comment column. If necessary, the parameter values on macro call %WRNA_ETL_FACTDELERR can be edited.

The following is a list of the macro parameters:

- **&facttable** — Name of the fact table in the mart. Do not include the libref. Required.
- **&exceptiontable** — Name of the exception table to update in WRNAETL. If blank, the exception table will not be updated. The SAS Field Quality Analytics naming standard for this table is EXC_&facttable. Do not include the libref.
- **&lookuperrortable** — Name of the lookup error table to build or rebuild in WRNAETL. The SAS Field Quality Analytics naming standard for this table is LK_&facttable. If blank, table LK_&facttable will be built. This table is registered in SAS Data Integration Studio and is included in the process flow for most jobs. Do not include the libref.

Most of the ETL fact table jobs have a process flow branch that reads from the lookup error table (LK_<*FactTable*>) for that job. This table is populated with records from the input stage table that fail the SK lookup in the **Dimension Key Lookups** transformation and therefore have not been loaded to the mart. If there are SK lookup failures in the primary process flow branch, the final step before that branch completes is to update the dimension tables by loading those values that failed the SK lookup. When the dimension tables have been updated, the LK process flow branch reads the lookup error table, successfully extracts the SKs from the dimension tables, and then loads the records to the mart. If no lookup errors occur in the primary branch, then the LK_ branch does not execute. There are two fact table jobs that do not have the LK_ branch: fqa_10500_event_comment_dim and fqa_10500_ext_prod_attr_dim.

The following table provides information for the load jobs for SAS Field Quality Analytics:

Table 9.3 *ETL Load Jobs*

Job Name	Description
fqa_10010_alter_product_attributes_table	This job adds attribute columns or modifies existing attribute columns on the product attributes table in the mart (EXT_PROD_ATTR_DIM). This is done by reading the physical column properties of the physical attributes table in WRNASTG (EXT_PROD_ATTR_STG) and applying any changes to the mart table. *Note:* Columns cannot be deleted, and column data types cannot be changed (numeric to character or vice versa). The format, length, and label column properties can be changed in the modification of an existing column. Simple indexes are added or removed. Updates are made to the metadata tables STAGE_COLUMN_CONF, WRNAMART_COLUMN_CONF, TABLECOLUMN_META, DIMENSION_CODENAME, and TABLECOLUMN_ATTRIBUTES based on the updated physical table in WRNAMART. Also, updates are made to OMR for the product attributes table in WRNASTG and WRNAMART. Entries are added to DATA_SEL_ATTR and DATA_SEL_TREE if data selection filtering is flagged for new product attributes. This is flagged via macro parameters on the macro call in the job. Report variable and BY variable attributes are added to TABLECOLUMN_ATTRIBUTES as identified by the macro parameters. Double-click the job in SAS Data Integration Studio to open the job, double-click the **User Written** transformation in the job, and then click the **Code** tab in the Properties window. As required, modify the parameter values on the %WRNA_ETL_PRODATTR macro call. The following is macro parameter information: • **&prodattrtable** — Specify the name of the product attributes table in the mart. Do not include the libref. This table must exist physically in the mart and in the metadata tables. Required. • **&attrdataselflg** — A value of 1 indicates that new product attributes are available for data selection filtering. • **&codedescrsource** — Specify a value of L or T if there are code descriptions (names) available for the product attributes. L indicates that the source descriptions exist in a lookup table in stage. T indicates that the description for each attribute exists as a separate column in the source stage product attributes table. A value other than L or T, or a blank value, indicates that there are no descriptions available for the product attributes. • **&descrcolnameappend** — For description columns that exist in the stage product attributes table, this is the character string that was appended to the attribute's column name when each description column was named. Example: For an attribute column with name CODE1 and &descrcolnameappend=_DESC, the name of the corresponding description column in the stage product attributes table is CODE1_DESC. This parameter is required for &codedescrsource=T, and is ignored otherwise. • **&dsreportvar_analysistypes** — Specify a space-separated list of report variable analysis types that are configured for new product attributes, or specify DEFAULT. The following analysis types are configured for a value of DEFAULT: DETAIL, STATDRIVER, EITHRESHOLD, MULTIVARIATE, PARETO, CROSSTAB. If blank, no report variable analysis types are configured. • **&dsbyvar_analysistypes** — Specify a space-separated list of grouping variable analysis types that are configured for new product attributes, or specify DEFAULT. The following analysis types are configured for a value of DEFAULT: PARETO, CROSSTAB, TREND, EXPOSURE, RELIABILITY, TIMEOFCLAIM, FORECASTING. If blank, no grouping variable analysis types are configured.

Job Name	Description
fqa_10020_geographic_coordinates	This job updates the location code coordinates in the MFGAPP GEOGRAPHIC_COORDINATES table from the same-named table in WRNASTG, applying a formula to convert the longitude and latitude coordinates to the required projected format. The MFGAPP table is installed with seeded values, so if the WRNASTG table is empty, no changes are made to the MFGAPP table when this job runs.
fqa_10050_date_dim	This job populates table DATE_DIM, but does not repopulate the table unless the macro parameter &deleteflag in the macro call is flagged. DATE_DIM is loaded with information associated with each SAS date value. By default, the table is populated with one row per day from 1/1/1990 to 12/31/2040. Double-click the job in SAS Data Integration Studio, double-click the **User Written** transformation in the job, and then click the **Code** tab in the Properties window. The job calls macro %WRNA_ETL_DATEDIM, for which the specified parameter values can be modified as necessary. The following is information about each parameter on that macro: • **&weekstart** — Number of the day that starts a week. Possible values: 1,2,3,4,5,6,7. 1=Sunday, 2=Monday, 3=Tuesday, and so on. Defaults to 1 if blank. • **&yearstart** — Number of the month that starts a year. Possible values: 1,2,3,4,5,6,7,8,9,10,11,12. 1=January, 2=February, 3=March, and so on. Defaults to 1 if blank. • **&startdate** — Start date for the entire time span. Must be in the format ddmmmyyyy. Example: 01JAN2012. This is a required parameter. • **&enddate** — End date for the entire time span. Must be in the format ddmmmyyyy. Example: 31DEC2040. This is a required parameter. • **&weekalign** — The alignment within the interval for the week date column. Valid values are B (beginning) or E (end). Defaults to B if blank. • **&monthalign** — The alignment within the interval for the month date column. Valid values are B (beginning) or E (end). Defaults to B if blank. • **&yearalign** — The alignment within the year interval. Valid values are B (beginning) or E (end). Defaults to B if blank. • **&deleteflag** — Specifies whether to replace existing data in DATE_DIM with input data. Valid values are 0 (do not delete the data) or 1 (delete the data). Defaults to 0 if blank. The code will not execute if 0 and the table is populated. • **&libref** — Libref for the DATE_DIM table. Must be a valid pre-allocated libref. Defaults to wrnamart if blank.

Job Name	Description
fqa_10100_dim_tables	This job reads the DIMENSION_MAPPING metadata table in MFGAPP to populate and update all dimension tables in WRNAMART. These tables are the dimension tables that surround the fact tables. These tables include the following in the default data model: CSTMR_DIM, EVENT_DIM, LABOR_CODE_DIM, MASTER_KEY_DIM, MODEL_DIM, PRODUCT_DIM, REPAIR_DEALER_DIM, REPL_PART_DIM, SELLING_DEALER_DIM. The first time this job is run, all dimension tables are loaded. By default, subsequent runs update only the dimension tables fed by lookup tables. This default behavior greatly improves ETL performance, since querying the source fact tables to extract the list of unique values is time intensive. This default behavior can be changed by modifying the parameter values on the macro call in the job transformation code. Double-click the job in SAS Data Integration Studio, double-click the **User Written** transformation in the job, and then click the **Code** tab in the Properties Window. The job calls macro %WRNA_ETL_LOAD_DIM_TABLES. The following is information about each parameter on that macro: • **&p_fullupdateflg** — A value of 1 indicates that all dimension tables are to be updated. If the value is not 1, only the lookup dimension tables are updated. All tables are loaded for the initial load of the dimensions. The value of this parameter is ignored in that case. Defaults to 0. • **&p_dims** — A space-separated list of fact table dimensions (column DIMENSION_NM in table MFGAPP.DIMENSION_MAPPING) to update over and above the lookup dimensions. The user would specify those fact table-fed dimensions for which new data is added with every build, such as the primary key columns. This parameter is ignored if &p_fullupdateflg=1. Any dimension tables that are not on this list but for which there is new data in the stage fact tables are updated when the associated fact tables are loaded.

Job Name	Description
fqa_10300_product_mart	This job loads the PRODUCT_STG fact data into table PRODUCT_MART. Dimension table lookups are performed automatically to generate all the numeric surrogate keys (SK columns) in the output fact table. For any dimension key lookup failures, dimension tables are updated with the values that failed the lookups, associated product data that failed the lookups is loaded to WRNAETL table LK_PRODUCT_MART, and the LK branch executes to load LK_PRODUCT_MART to PRODUCT_MART. In addition to the **Extract**, **Data Validation**, **Dimension Key Lookups**, and **SPD Server Table Loader** transformations, the details of which were discussed previously, this job includes the **Time-in-Service Calculations** transformation and the **Update Historical Profiles** transformation. The following are the details for these transformations: The **Time-in-Service Calculations** transformation calculates the product time-in-service (TIS) and BIN columns, including adjusted product TIS columns if the claim submit lag functionality is enabled. Also, if claim submit lag is enabled, then a claim submit lag column needs to exist and be populated in the product stage table. It also needs to exist in the mappings for this transformation. Before you run this job, the configured names of the base and adjusted product TIS columns and the claim submit lag column need to be correct in the **Warranty Configuration** section of the SAS Field Quality Analytics **Administration** workspace. They also need to exist in the output mappings of this transformation and in the PRODUCT_MART table. Also, claim submit lag needs to be enabled via the **Warranty Configuration** section of the SAS Field Quality Analytics **Administration** workspace. If ship date is populated or provided, the name of the ship date column needs to be configured. Ship date is found under the **General Configuration** group. If ship date is not populated or provided, delete the two product TIS and BIN ship columns in the target table mappings. These two columns are PRODUCT_DAYS_INSERVICE_SHIP and PRODUCT_TIS_BIN_SHIP. If ship date is not configured, as it is in default, and the TIS and BIN ship target column mappings are not deleted, an error will result when running this job. For information about how to configure variables, which include the product TIS and claim submit lag variables, see “Alter Warranty Configuration Variables” on page 50. There are three instances of this transformation. The first two, named **Time-in-Service Calculations**, which occur immediately after the **Dimension Key Lookups** transformation in both branches of the process flow, calculate the TIS and BIN columns on the new incoming data. If the TIS and BIN columns exist in the source product stage table and are populated, then these two transformation instances do not perform the calculations. Existing populated values remain as they are. The third instance of this transformation, named **Time-in-Service Update**, recalculates the TIS and BIN columns on historical records (for an incremental load). To extract the historical PRODUCT_MART records for the **Time-in-Service Update** transformation, a WHERE clause is specified on the **Table Options** tab within the transformation properties: **Table Options tab** ⇨ **Table Options Sub-Tab** ⇨ **Advanced Group item** ⇨ **Where (WHERE) Entry box**. The specified WHERE clause is **`PROCESS_DTTM le &last_process_dttm`**. Column PROCESS_DTTM contains the datetime stamp of each record in the PRODUCT_MART table, and &last_process_dttm is the datetime when PRODUCT_MART was last updated. The following is information about each option on the Properties window for the **Time-in-Service Calculations** transformation:

Job Name	Description

fqa_10300_product_mart (continued)	• **Input Table** — The input table (or view) for the time-in-service calculations. This table must exist, and the specified value must include the libref if the table exists in a permanent library. The default specified value is the macro variable reference &_input, which references the SAS Data Integration Studio input table to the transformation. Required.
	• **Output Table** — The output table (or view) for the time-in-service calculations. The specified value must include the libref if the table exists in a permanent library. The default specified value is the macro variable reference &_output, which references the SAS Data Integration Studio output table to the transformation. Required.
	• **Create output table as view?** — Indicates whether the output is a table or view. Select **Yes** to create an output view, or select **No** to create an output table. The default selected value is **Yes**.
	• **Calculation Type** — Method used for time-in-service calculations. Possible values:
	  • **Fixed Method** — A fixed number is used to calculate the time-in-service bin values. This number is specified on the **Fixed value for BIN calculations** option.
	  • **Interval Method** — The SAS date interval method is used to calculate the time-in-service bin values. The date interval is specified on the **SAS Date Interval** option.
	  • **Custom Method** — Customer-specific code is used to calculate the time-in-service values. The source code for this transformation, SAS macro file wrna_etl_tiscalc.sas, must be modified to add customer-specific time-in-service calculations. Documentation in the macro file explains where to include these calculations in the file.
	  The default selected value is **Interval Method**.
	• **SAS Date Interval** — A SAS date interval, such as MONTH, QTR, SEMIYEAR, and so on. This is the date interval that is used when the Calculation Type=Interval Method. The default value is MONTH. Also defaults to MONTH if blank.
	• **Fixed value for BIN calculations** — A numeric value. This is the numeric value that is used when the Calculation Type=Fixed Method. The default value is 30.4166667, which correlates to 12 equal months in a year. Also defaults to 30.4166667 if blank.
	• **Data Type** — Identifies whether the time-in-service columns for this job are product or event columns. This option is required because this transformation is used by both the product mart ETL job and the event mart ETL job. Available values are Product or Event, with Product being the default value that is required for this job. Also defaults to Product if blank.
	• **Date of Data** — This is the effective date of the data loaded from stage. If manually entering a date, enter the date in the DATE9 format. If (missing values) is selected, then the datetime value from column WRNA_MART_DATA_DTTM in stage table WRNA_DATA_REFRESH is used. If this table is empty, then the current date is used. The default value is (missing values).
	• **Event Date Column** — Not used by this job.
	• **Is this an ETL Load from Stage?** — Indicates whether the input table contains data from stage which is to be loaded into the mart. If Yes, calculations are not done if the time-in-service columns exist in the stage data and are populated. This is to account for environments where the customer calculates the time-in-service columns and provides them in the stage data. If No, time-in-service calculations are always done. The default selected value is Yes for the two instances of the transformation named **Time-in-Service Calculations**. The default value is No for the instance named **Time-in-Service Update**.

Job Name	Description
fqa_10300_product_mart (continued)	The **Update Historical Profiles** is a **User Written** transformation that updates usage profile and sale lag profile columns on historical PRODUCT_MART records (for an incremental update). This update is performed only if usage profiles are enabled and sale lag profiles are enabled. The following are the usage and sale lag profile columns that are updated: • USAGE_PROFILE_CATEGORY • USAGE_PROFILE_LOCATION • USAGE_PROFILE_SCALE • USAGE_PROFILE_TYPE • SALE_LAG_PROFILE_CATEGORY • SALE_LAG_PROFILE_LOCATION • SALE_LAG_PROFILE_SCALE • SALE_LAG_PROFILE_TYPE Historical records are extracted using the WHERE clause **`process_dttm le &last_process_dttm`**, which is included in the **User Written** code (**Code** tab within the transformation Properties). Column PROCESS_DTTM contains the datetime stamp of each record in the PRODUCT_MART table, and &last_process_dttm is the datetime when PRODUCT_MART was last updated.
fqa_10400_event_mart	This job loads the EVENT_STG fact data into table EVENT_MART. Dimension table lookups are performed automatically to generate all the numeric surrogate keys in the output fact table. For any dimension key lookup failures, dimension tables are updated with the values that failed the lookups, associated event data that failed the lookups is loaded to WRNAETL table LK_EVENT_MART, and the LK branch executes to load LK_EVENT_MART to EVENT_MART. In addition to the **Extract**, **Data Validation**, **Dimension Key Lookups**, and **SPD Server Table Loader** transformations, the details of which were discussed previously, this job includes the **Join** transformation, the **Time-in-Service Calculations** transformation, the **Update FIRST_FAILURE_FLG** transformation, and the **Bring in Product Data** transformation. Below are the details for these transformations: The **Join** transformation joins the input event data with its associated PRODUCT_MART data to bring in the key product dates that are needed for the time-in-service calculations. The following are the product dates that are brought-in: • PRODUCTION_DATE • SHIP_DATE • INSERVICE_DATE There are two instances of the **Join** transformation, one in each branch of the process flow (main branch and LK branch). To view and modify (if necessary) the join criteria, double-click the transformation and use the **Navigate** pane to view or modify the join criteria. Click the **Select** icon to view or modify the selected columns, and click the **Join** icon within the **From** folder to view or modify the join criteria (WHERE clause). Clicking the bottom **Where** icon produces the same criteria as the **Join** icon. *Note:* The output for the SQL join is a view by default. To modify this setting, in the **Navigate** pane, select the **Join** table icon within the **Create** folder, and select **Yes** or **No** on the **Create View** option within the job properties pane.

Job Name	Description

fqa_10400_event_mart (continued)	The **Time-in-Service Calculations** transformation calculates the event time-in-service (TIS) and BIN columns. Before running this job, the configured names of the event BIN columns need to be correct in the **Warranty Configuration** section of the SAS Field Quality Analytics **Administration** workspace. They also need to exist in the output mappings of this transformation and in the EVENT_MART table. If ship date is populated or provided, the name of the ship date column needs to be configured. Ship date is found under the **Warranty Configuration** section, **General Configuration** group. If ship date is not populated or provided, delete the two event time-in-service and BIN ship columns in the target table mappings. These two columns are EVENT_DAYS_INSERVICE_SHIP and EVENT_TIS_BIN_SHIP. If ship date is not configured, as it is by default, and the time-in-service and BIN ship target column mappings are not deleted, an error results when running this job. For information about how to configure variables, which include the event BIN variables, see "Alter Warranty Configuration Variables" on page 50.
	
	The event time-in-service columns are not configured in the SAS Field Quality Analytics **Administration** workspace and therefore are hardcoded in the source macro code for this transformation. The default names for these four columns are EVENT_DAYS_INSERVICE, EVENT_DAYS_INSERVICE_BUILD, EVENT_DAYS_INSERVICE_SHIP, and EVENT_DAYS_INSERVICE_SALE. Modify the source macro file wrna_etl_tiscalc.sas to change these columns. The specified event time-in-service columns need to exist in the output mappings of this transformation and in the EVENT_MART table. There are three instances of this transformation. The first two, which occur immediately after the **Dimension Key Lookups** transformation in both branches of the process flow, calculate the time-in-service and BIN columns on the new incoming data. If the time-in-service and BIN columns exist in the source events stage table and are populated, then these two transformation instances do not perform the calculations. Existing populated values remain as they are. The third instance of this transformation, which is the last transformation in the entire process flow, recalculates the time-in-service and BIN columns on historical records (for an incremental load) where corresponding PRODUCT_MART data has changed. The historical EVENT_MART data with its changed Product_mart records are extracted by the **Bring in Product Data** transformation. The following is information about each option on the Properties window for the **Time-in-Service Calculations** transformation:
	
	• **Input Table** — The input table (or view) for the time-in-service calculations. This table must exist, and the specified value must include the libref if the table exists in a permanent library. The default specified value is the macro variable reference &_input, which references the SAS Data Integration Studio input table to the transformation. Required.
	
	• **Output Table** — The output table (or view) for the time-in-service calculations. The specified value must include the libref if the table exists in a permanent library. The default specified value is the macro variable reference &_output, which references the SAS Data Integration Studio output table to the transformation. Required.
	
	• **Create output table as view?** — Indicates whether the output is a table or view. Select **Yes** to create an output view, or select **No** to create an output table. The default selected value is **Yes** for the two transformation instances before EVENT_MART. The default value is **No** for the instance after EVENT_MART.
	
	• **Calculation Type** — Method used for time-in-service and BIN calculations. Possible values:
	
	  • **Fixed Method** — A fixed number is used to calculate the BIN values. This number is specified on the **Fixed value for BIN calculations** option.
	
	  • **Interval Method** — The SAS date interval method is used to calculate the BIN values. The date interval is specified on the **SAS Date Interval** option.
	
	  • **Custom Method** — Customer-specific code is used to calculate the time-in-service and BIN values. The source code for this transformation, SAS macro file wrna_etl_tiscalc.sas, must be modified to add customer-specific time-in-service and BIN calculations. Documentation in the macro file explains where to include these calculations in the file.
	
	The default selected value is **Interval Method**.

Job Name	Description
fqa_10400_event_mart (continued)	• **SAS Date Interval** — A SAS date interval, such as MONTH, QTR, SEMIYEAR, and so on. This is the date interval that is used when the Calculation Type=Interval Method. The default value is MONTH. Also defaults to MONTH if blank. • **Fixed value for BIN calculations** — A numeric value. This is the numeric value that is used when the Calculation Type=Fixed Method. The default value is 30.4166667, which correlates to 12 equal months in a year. Also defaults to 30.4166667 if blank. • **Data Type** — Identifies whether the time-in-service (TIS) columns for this job are product or event columns. This option is required because this transformation is used by both the product mart ETL job and the event mart ETL job. Available values are Product or Event, with Event being the default value that is required for this job. Defaults to Product if blank. • **Date of Data** — Not used by this job. • **Event Date Column** — Name of the event date column in the data. This column is used in the time-in-service (TIS) and BIN calculations. The default value is REPAIR_OPEN_DATE for the two transformation instances before EVENT_MART. The default value is &eventdate_column for the instance after EVENT_MART. Variable &eventdate_column. is initialized in the code for the **Update FIRST_FAILURE_FLG** transformation. Information for this transformation is provided below. Defaults to REPAIR_OPEN_DATE if blank. • **Is this an ETL Load from Stage?** — Indicates whether the input table contains data from stage that is to be loaded into the mart. If the value is **Yes**, calculations are not done if the time-in-service (TIS) and BIN columns exist in the stage data and are populated. This is to account for environments where the customer calculates the time-in-service and BIN columns and provides them in the stage data. If the value is **No**, time-in-service and BIN calculations are always done. The default value is **Yes** for the two transformation instances before EVENT_MART. The default value is **No** for the instance after EVENT_MART. The **Update FIRST_FAILURE_FLG** transformation updates column FIRST_FAILURE_FLG, where the first event for a product is assigned FIRST_FAILURE_FLG=1. FIRST_FAILURE_FLG is blank for the other events. In the **Properties** for the transformation, click the **Code** tab, scroll up to the section noted with `...Parameter values that change from job to job...`. Verify, and modify if necessary, the assignments to variables prodsk_column, eventdate_column, and Martproduct_table. PRODSK_COLUMN is the product SK column, which has a default value of PRODUCT_DIM_SK. EVENTDATE_COLUMN is the primary event date column, which has a default value of REPAIR_OPEN_DATE. MARTPRODUCT_TABLE is the mart product table, which has a default value of PRODUCT_MART. The **Bring in Product Data** transformation brings in product date columns that are needed for the follow-on **Time-in-Service Calculations** transformation, extracting only those historical EVENT_MART rows where the corresponding product data has changed. This transformation is only applicable for an incremental load and will extract no rows for a full refresh. Click the **Mappings** tab, and verify the unmapped product date columns in the target table. These date columns are PRODUCTION_DATE, INSERVICE_DATE, and SHIP_DATE. Modify these column names if different for the site's environment.

Job Name	Description
fqa_10500_event_comment_dim	This job loads the EVENT_COMMENT_STG child fact data into table EVENT_COMMENT_DIM, executing the following transformations in the process flow: • **Extract** • **Data Validation** • **Dimension Key Lookups** • **SPD Server Table Loader** These transformations extract new data from the source stage table, perform predefined data validations, look up numeric SK values from the dimension tables, and load mart table EVENT_COMMENT_DIM. For details about these transformations, see "ETL Load Jobs" on page 126. This job also identifies the language of each comment column if global variable identifyLanguageFlag=1 (initialized in macro file wrna_init.sas). The corresponding _LANGUAGE column for each comment column is populated with the identified language. If the SAS session encoding is UTF-8, the language identification routine is performed directly against the incoming data. If the encoding is not UTF-8, language identification is performed with a time-intensive operation of writing a text file to disk for each comment, and then reading each file to identify the language. For this reason, if language identification is required, it is recommended that SAS Foundation be installed with a session encoding of UTF-8. *Note:* This job has just the primary process flow branch which loads the data into the mart. The lookup error branch is not required.

Job Name	Description

fqa_10500_ext_prod_attr_dim	This job loads the EXT_PROD_ATTR_STG child fact data into table EXT_PROD_ATTR_DIM.
	
	This table contains the product attribute columns for all products in PRODUCT_MART. This table can be a very sparse table, with a small percentage of the attribute columns being populated for a product. If the site has configured a source lookup table for the attributes, this table also contains a column for each attribute's description. This table, with a large amount of attributes and associated descriptions, can become too large to manage. Given that the table is so sparse, the size of the table can be reduced considerably by compressing the table before running this job. To compress, in a stand-alone SAS session with the Wrnamart libref assigned, submit the following DATA step code:
	
	`Data wrnamart.ext_prod_attr_dim (compress=YES index=(PRODUCT_DIM_SK /UNIQUE));`
	`Set wrnamart.ext_prod_attr_dim;`
	`Run;`
	
	PRODUCT_DIM_SK in the preceding DATA statement is the product SK column in the default data model. Change this if the product SK column name is different for an implementation.
	
	This job is different from the other fact table jobs in that it contains one transformation: the **Load Product Attributes User Written** transformation. Open the properties for the transformation, click the **Code** tab, and scroll to the top. In the **Variable Options** section, verify the existing variable values, making any changes as needed. Be sure to set g_enable_lookups=1, and assign values to variables g_cnlkuptable, g_cnlkupfieldnamecol, g_cnlkupcodecol, and g_cnlkupdesccol if a lookup table exists in stage for the product attributes being loaded by this job. The following is information about each of these variable options:
	
	• **&g_stagetable** — Name of the source stage table for the product attributes table. Default value: ext_prod_attr_stg.
	• **&g_marttable** — Name of the product attributes table in the mart. Default value: ext_prod_attr_dim.
	• **&g_product_key** — Name of the product key column in the stage product data. This is not the product SK column in the mart. Default value: product_id.
	• **&g_enable_lookups** — A value of 1 (number 1) enables the loading of descriptions from a lookups table in stage. Default value: 0.
	• **&g_update_lkup_history** — A value of 1 (number 1) enables the update of descriptions for attribute data that was previously loaded. This is applicable only for an incremental load. Default value: 0.
	• **&g_cnlkuptable** — One level name of the lookup table in stage. Do not include the libref. Required if &g_enable_lookups=1.
	• **&g_cnlkupfieldnamecol** — Field name column in the specified lookup table. The lookup table must contain this column. Required if &g_enable_lookups=1.
	• **&g_cnlkupcodecol** — Code column in the lookup table. The lookup table must contain this column. Required if &g_enable_lookups=1.
	• **&g_cnlkupdesccol** — description column in the lookup table. The lookup table must contain this column. Required if &g_enable_lookups=1.
	
	Similar to other fact table jobs, this job extracts new data from the source stage table, and performs predefined data validations and SK lookups. In this case, it checks that the product ID column is not blank and does the SK lookup for that same column. For the description columns, this job also looks up the attribute descriptions from the specified stage lookup table and populates those columns. In addition, for an incremental update, if variable &g_update_lkup_history=1, this job updates the attribute descriptions in the previously loaded data.

Job Name	Description
fqa_10500_labor_code_mart	This job loads the LABOR_CODE_STG fact data into table LABOR_CODE_MART, executing the following transformations in the process flow: • **Extract** • **Data Validation** • **Dimension Key Lookups** • **SPD Server Table Loader** These transformations extract new data from the source stage table, perform predefined data validations, look up numeric SK values from the dimension tables, and load mart table LABOR_CODE_MART. For details about these transformations, see "ETL Load Jobs" on page 126. For SK lookup failures, dimension tables are updated with the values that failed the lookups, the labor code data that failed the lookups is loaded to WRNAETL table LK_LABOR_CODE_MART, and the LK branch is executed to load that data to LABOR_CODE_MART. *Note:* Dimension tables are not updated where the event ID or product ID foreign key columns have lookup errors, and therefore the labor code data with this lookup error is not loaded to the mart.
fqa_10500_repl_part_mart	This job loads the REPL_PART_STG fact data into table REPL_PART_MART, executing the following transformations in the process flow: • **Extract** • **Data Validation** • **Dimension Key Lookups** • **SPD Server Table Loader** These transformations extract new data from the source stage table, perform predefined data validations, look up numeric SK values from the dimension tables, and load mart table REPL_PART_MART. For details about these transformations, see "ETL Load Jobs" on page 126. For SK lookup failures, dimension tables are updated with the values that failed the lookups, the part data that failed the lookups is loaded to WRNAETL table LK_REPL_PART_MART, and the LK branch is executed to load that data to REPL_PART_MART. *Note:* Dimension tables are not updated where the event ID or product ID foreign key columns have lookup errors, and therefore the part data with this lookup error is not loaded to the mart.

ETL Build Jobs

Note: Before running any ETL jobs, make sure that all operating system and metadata group and user permissions are correctly applied for the SAS Field Quality Analytics Data Administrator user who is running the jobs. See Chapter 10, "Users, Groups, and Roles," on page 153.

The following table provides information for the build jobs for SAS Field Quality Analytics:

Table 9.4 ETL Build Jobs

Job Name	Description
fqa_50800_synonym_english	This job populates and updates the Text Analysis English synonyms table (TEXTSYN_ENGLISH) for the comment data populated in EVENT_COMMENT_DIM. The comment columns in the data model are CSTMR_COMMENT and TECH_COMMENT. There are two **Extract** transformations in the job, one for each column. The purpose of these transformations is to extract the English comment data from EVENT_COMMENT_DIM based on the language of the comments as identified in columns CSTMR_COMMENT_LANGUAGE and TECH_COMMENT_LANGUAGE. If the comment column names are different from the default for an implementation, the WHERE clause in this **Extract** transformation must be edited. To modify the WHERE clause, open the properties of the **Extract** transformation, click the **Where** tab, and specify the required WHERE clause text. In this job there also is a **Text Analysis** transformation for each column which executes the parsing code to populate the synonyms table. The options within the properties for each of these transformations should be checked and edited if necessary. To do this, open up the properties for each of the **Text Analysis - Populate Synonyms** transformations, and click the **Options** tab. The following is information about each option: • **Enter the source data library** — This is the libref of the input data to the transformation. Enter the value **`work`** for this job, since the output of the **Extract** transformation is a view in the Work library. • **Enter the Source Table containing the Comment column** — This is the name of the input table or view to this transformation. Enter the value value **`&syslast`** for this job. &syslast is a SAS Data Integration Studio special variable that stores the input table or view name. • **Enter the name of the comment column in the source table** — This is the comment column from which the synonyms are extracted. This correlates to the WHERE clause on the input **Extract** transformation. This is populated with **`cstmr_comment`** for extracted English comments in CSTMR_COMMENT. Similarly, this is populated with **`tech_comment`** for extracted English comments in TECH_COMMENT. • **Select the Text Analysis language** — This is language for which the synonyms are being extracted. The required value for this job is **english**. • **Enter the library for the Text Analysis tables** — This is the libref where the Text Analysis ETL tables are stored. Enter the value **`&g_wrnatxt`**. Variable &g_wrnatxt is initialized in SAS macro file wrna_init.sas with the required libref. The default libref specified in wrna_init.sas is wrnatext. • **Enter the name of the Stop List Data set in the Text Analysis library** — This is the name of English stop list data set. The required value is **`textstop_english`**. • **Enter the name of the Synonym List Data set in the Text Analysis Library** — This is the name of the English synonym list data set. The required value is **`textsyn_english`**.

Job Name	Description
fqa_50850_key_cstmr_comment_en	This job creates, populates, and updates the Text Analysis English key and out tables (TXTO_CSTMR_COMMENT_ENGLISH and TXTK_CSTMR_COMMENT_ENGLISH) for the CSTMR_COMMENT data populated in EVENT_COMMENT_DIM. By default, for an English analysis, all CSTMR_COMMENT data is extracted, regardless of language, which is the reason the **Extract** transformation in the job does not have a WHERE clause specified. A WHERE clause to extract only English comments can be added if required. (See job fqa_50800_synonym_english.) In this job there also is a text analysis transformation (**Text Analysis - Populate Key**), which executes the parsing code to populate the key and out tables. By default, the transformation is set to load incremental updates. Whether the load is full or incremental is globally defined in the %WRNA_INIT macro and can be overridden in the transformation properties options. This option and other options within the transformation properties should be checked and edited if necessary. To do this, open up the properties of the **Text Analysis - Populate Key** transformation, and click the **Options** tab. The following is information about each option: • **Enter the Name of the Source Table in the Data Mart** — This is the comment table in the mart. Do not include the libref. Enter the value **`event_comment_dim`**. • **Enter the Name of the Comment Column in the Source Table** — This is the name of the comment column that is parsed for the output key and out tables. Enter the value **`cstmr_comment`**. • **Select the Text Analysis Language** — This is the language used to parse the comment data. The required value for this job is **english**. • **Select the Build Type** — This identifies the key and out update as a full update or as an incremental update. Possible values are **Site Defined**, **Incremental Update**, and **Full Update**. The default value is **Site Defined**. When **Site Defined** is selected, the value of global variable commentkeybuildtype, which specifies an incremental (I) or full (F) update, is used for the job. Variable commentkeybuildtype is initialized in macro file wrna_init.sas. The default value is I, which indicates an incremental update. *Note:* When this job is first run, a configuration entry for the English key and out tables for CSTMR_COMMENT is created in MFGAPP table TEXT_TABLE_CONF. This entry includes the names of the key and out tables TXTO_CSTMR_COMMENT_ENGLISH and TXTK_CSTMR_COMMENT_ENGLISH.

Job Name	Description
fqa_50850_key_tech_comment_en	This job creates, populates, and updates the Text Analysis English key and out tables (TXTO_TECH_COMMENT_ENGLISH and TXTK_TECH_COMMENT_ENGLISH) for the TECH_COMMENT data populated in EVENT_COMMENT_DIM. By default, for English analysis, all TECH_COMMENT data is extracted, regardless of language, which is the reason the **Extract** transformation in the job does not have a WHERE clause specified. A WHERE clause to extract only English comments can be added if required. (See the information above about editing the **Extract** transformation WHERE clause in job fqa_50800_synonym_english.) In this job there also is a text analysis transformation (**Text Analysis - Populate Key**), which executes the parsing code to populate the key and out tables. By default, the transformation is set to load incremental updates. Whether the load is full or incremental is globally defined in the %WRNA_INIT macro and can be overridden in the transformation properties options. This option and other options within the transformation properties should be checked and edited if necessary. To do this, open up the properties of the **Text Analysis - Populate Key** transformation, and click the **Options** tab. The following is information about each option: • **Enter the Name of the Source Table in the Data Mart** — This is the comment table in the mart. Do not include the libref. Enter the value **`event_comment_dim`**. • **Enter the Name of the Comment Column in the Source Table** — This is the name of the comment column that is parsed for the output key and out tables. Enter the value **`tech_comment`**. • **Select the Text Analysis Language** — This is the language used to parse the comment data. The required value for this job is **english**. • **Select the Build Type** — This identifies the key and out update as a full update or as an incremental update. Possible values are **Site Defined**, **Incremental Update**, and **Full Update**. The default value is **Site Defined**. When **Site Defined** is selected, the value of global variable commentkeybuildtype, which specifies an incremental (I) or full (F) update, is used for the job. Variable commentkeybuildtype is initialized in macro file wrna_init.sas. The default value is I, which indicates an incremental update. *Note:* When this job is first run, a configuration entry for the English key and out tables for TECH_COMMENT is created in MFGAPP table TEXT_TABLE_CONF. This entry includes the names of the key and out tables TXTO_TECH_COMMENT_ENGLISH and TXTK_TECH_COMMENT_ENGLISH.
fqa_50900_prodhier_nway	This job creates, populates, and updates the product NWAY table in the MFGAPP library, which is used by the Early Warning Enterprise Analytic analysis. By default, this NWAY table, named PRODUCT_MART_NWAY, contains a listing of the unique combinations of values for product columns MODEL_CD, PRODUCTION_YEAR, SELLING_DEALER_COUNTRY_CD, and CSTMR_COUNTRY_CD. If job fqa_00001_alter_data_mart will be run to alter the data model, stage table COLUMN_CONF must contain product columns where column SUBTYPE_TXT includes the value EIENTERPRISE. These product columns are configured for the NWAY table after the alter data mart job is run. Then, when job fqa_50900_prodhier_nway is executed, the NWAY table will contain a listing of the unique combinations of values for those configured product EIENTERPRISE columns.

Job Name	Description
fqa_80000_batch_jobs	This job executes batched SAS Field Quality Analytics jobs by sending an event to the middle-tier. These batched jobs are analyses that SAS Field Quality Analytics users have flagged to be updated automatically. In addition, for a regular ETL build, before executing the batch jobs, this job updates the mart datetime (column WRNA_MART_DATA_DTTM) and the ETL refresh datetime (column WRNA_ETL_REFRESH_DTTM) in MFGAPP table WRNA_DATA_REFRESH. The latest ETL update datetime of the fact tables is used to populate the ETL refresh datetime column. If populated, column WRNA_MART_DATA_DTTM in stage table WRNA_DATA_REFRESH is used to populate the mart datetime column. If the stage table is empty, the mart datetime is given the same value as the ETL refresh datetime. Before updating MFGAPP table WRNA_DATA_REFRESH, a check is made to determine whether all the fact tables have been updated. This check is made by extracting the LAST_DATA_UPDATE_DTTM values from MFGAPP table WRNAMART_TABLE_CONF for the fact tables (TABLE_TYPE_CD not equal to D). If one or more fact tables have not been updated, an error is written to the log, and the job exits without updating MFGAPP table WRNA_DATA_REFRESH and executing the batch jobs. This job contains one **User Written** transformation that makes a call to macro %WRNA_ETL_BATCHJOBS. Open the properties of the transformation and click the **Code** tab. The macro call %WRNA_ETL_BATCHJOBS contains the parameter p_updatemartdttm, which flags whether to update the mart and ETL refresh datetime columns before executing the batch jobs. A value of 1 (number 1) updates the datetime columns before executing the batch jobs. A value of 0 (number 0) executes the batch jobs directly without updating MFGAPP table WRNA_DATA_REFRESH (no check is made to determine whether all the fact tables have been updated). This should be set to 1 (the default value) for a regular ETL build.
fqa_95000_event_anly_tbl	This job builds the event reporting table, which contains the event and associated product columns. The event mart table is joined with the event comments table, the product mart table, the product attributes table, and all associated dimension tables. Open the properties of the **Build Analytic Table** transformation in the job, and click the **Options** tab. The following is information about the available options: • **Primary Fact Table** — This is the name of the primary fact table in the mart that is the source for the output reporting table. Do not include the libref. Job value: **`event_mart`**. • **Parent Fact Table** — This is the name of the mart fact table that is the parent to the primary fact table. Do not include the libref. Job value: **`product_mart`**. • **Grandparent Fact Table** — This is the name of the mart fact table that is the parent to the parent fact table. Do not include the libref. Job value: **`None`**. • **Output Table Name** — This is the name of the output table in the reporting mart library. Do not include the libref. The reporting mart libref is referenced by global variable g_wrnarpt, which is initialized in the wrna_init.sas macro file. Job value: **`event_anly_tbl`**. See "Global Variables and Debug Options" on page 110.

Job Name	Description
fqa_95000_labor_code_anly_tbl	This job builds the labor code reporting table, which contains the labor code, event, and product columns. The labor code mart table is joined with the event mart table, the event comments table, the product mart table, the product attributes table, and all associated dimension tables. Open the properties of the **Build Analytic Table** transformation in the job, and click the **Options** tab. The following is information about the available options: • **Primary Fact Table** — This is the name of the primary fact table in the mart that is the source for the output reporting table. Do not include the libref. Job value: **`labor_code_mart`**. • **Parent Fact Table** — This is the name of the mart fact table that is the parent to the primary fact table. Do not include the libref. Job value: **`event_mart`**. • **Grandparent Fact Table** — This is the name of the mart fact table that is the parent to the parent fact table. Do not include the libref. Job value: **`product_mart`**. • **Output Table Name** — This is the name of the output table in the reporting mart library. Do not include the libref. The reporting mart libref is referenced by global variable g_wrnarpt, which is initialized in the wrna_init.sas macro file. Job value: **`labor_code_anly_tbl`**. See "Global Variables and Debug Options" on page 110.
fqa_95000_product_anly_tbl	This job builds the product reporting table, which contains all product columns. The product mart table is joined with the product attributes table and all associated dimension tables. Open the properties of the **Build Analytic Table** transformation in the job, and click the **Options** tab. The following is information about the available options: • **Primary Fact Table** — This is the name of the primary fact table in the mart that is the source for the output reporting table. Do not include the libref. Job value: **`product_mart`**. • **Parent Fact Table** — This is the name of the mart fact table that is the parent to the primary fact table. Do not include the libref. Job value: **`None`**. • **Grandparent Fact Table** — This is the name of the mart fact table that is the parent to the parent fact table. Do not include the libref. Job value: **`None`**. • **Output Table Name** — This is the name of the output table in the reporting mart library. Do not include the libref. The reporting mart libref is referenced by global variable g_wrnarpt, which is initialized in the wrna_init.sas macro file. Job value: **`product_anly_tbl`**. See "Global Variables and Debug Options" on page 110.
fqa_95000_repl_part_anly_tbl	This job builds the parts reporting table, which contains the replacement part, event, and product columns. The replacement part mart table is joined with the event mart table, the event comments table, the product mart table, the product attributes table, and all associated dimension tables. Open the properties of the **Build Analytic Table** transformation in the job, and click the **Options** tab. The following is information about the available options: • **Primary Fact Table** — This is the name of the primary fact table in the mart that is the source for the output reporting table. Do not include the libref. Job value: **`repl_part_mart`**. • **Parent Fact Table** — This is the name of the mart fact table that is the parent to the primary fact table. Do not include the libref. Job value: **`event_mart`**. • **Grandparent Fact Table** — This is the name of the mart fact table that is the parent to the parent fact table. Do not include the libref. Job value: **`product_mart`**. • **Output Table Name** — This is the name of the output table in the reporting mart library. Do not include the libref. The reporting mart libref is referenced by global variable g_wrnarpt, which is initialized in the wrna_init.sas macro file. Job value: **`repl_part_anly_tbl`**. See "Global Variables and Debug Options" on page 110.

Job Name	Description
fqa_99999_execute_build	This job executes the entire SAS Field Quality Analytics ETL build, as defined in the MFGAPP table SAS_JOB_LOADER. First the load jobs are run, and then the build jobs are run. All ETL jobs that are included in the build need to be deployed and included in the SAS_JOB_LOADER table. Click the **Code** tab within the properties for the job. The code contains the following macro call which executes the ETL build: **`%wrna_mpbuild(ETL_Type=, start_lvl_id=0, start_job_id=0)`** The **`ETL_Type`** parameter specifies whether load jobs, build jobs, or both should be run. If you specify **`ETL_Type=L`**, only the load jobs run. If you specify **`ETL_Type=B`**, only the build jobs run. If you do not specify a value, first the load jobs run, and then the build jobs run. It is recommended that, the first time you run a build, you set **`ETL_Type=L`** to validate that the mart tables load correctly before running the build jobs. The **`start_lvl_id`** parameter is the level ID (column LEVEL_ID in table SAS_JOB_LOADER) from which to start the ETL build. A valid value is an integer that exists in SAS_JOB_LOADER for the specified **`ETL_Type`**. **`ETL_Type`** must be populated (L or B) if a nonzero number is specified. All jobs in all levels will run if **`start_lvl_id`** is 0 or blank. **`start_lvl_id`** must be populated with a nonzero number if **`start_job_id`** is populated with a nonzero number. The **`start_job_id`** parameter enables you to start the ETL build from any job within the specified **`start_lvl_id`**. The build will start from the specified **`start_job_id`** and will exclude any jobs with lower-numbered job ID. Example: If start_job_id=3, then job IDs 1 and 2 will be excluded. If there is a dependency (column JOB_DEPENDENCY_NM is populated in SAS_JOB_LOADER) to an excluded job by any job that will execute, then you must start the build from the dependent job. An error will occur if a dependency to an excluded job exists. A valid value is 0, blank, or an integer that exists in SAS_JOB_LOADER for the specified **`start_lvl_id`**. If 0 or blank, all jobs in the specified **`start_lvl_id`** will run. **`ETL_Type`** must be populated (L or B), and **`start_lvl_id`** must be populated with a nonzero number, if a nonzero number is specified. This job can be deployed for scheduling. See "Configuring and Running the ETL Build" on page 145 for information about deploying jobs and for information needed to configure and run the ETL build.

Configuring and Running the ETL Build

MFGAPP table SAS_JOB_LOADER contains the information needed to run the build. In this table, the jobs are listed in the order in which they are submitted for batch processing. This is the sequence that should be used when they are run individually in SAS Data Integration Studio. The sequence in this table follows from the numbers included in the job names, such that the jobs are run in ascending numerical order. Job names that include the same number can be run in parallel. The following provides information about the columns in this table:

- **ETL_TYPE_ID** — Type of job. Numeric integer value of 1 or 2. Load jobs have ETL_TYPE_ID=1, and build jobs have ETL_TYPE_ID=2.
- **ETL_DESC** — ETL type description. Value of ETL Load if ETL_TYPE_ID=1, or value of ETL Build if ETL_TYPE_ID=2.

- **LEVEL_ID** — Nonnegative integer level number for a job, with the value 0 reserved for the %WRNA_INIT initialization macro. If required, one or more level 0 job rows can be added, each referencing a macro. The level 0 job macros are called before executing each job. Lower-number LEVEL_ID jobs are executed before higher-number LEVEL_ID jobs. Jobs can run in parallel that have the same LEVEL_ID value, depending on the number of idle preallocated SAS/CONNECT sessions. However, jobs run in a sequence if job dependency column JOB_DEPENDENCY_NM is populated. If JOB_DEPENDENCY_NM is blank, which is the case by default, a job is submitted as soon as a SAS/CONNECT session becomes available. If there are four preallocated SAS/CONNECT sessions, and there are four jobs in a level, then all four jobs are submitted at the same time. The number of preallocated SAS/CONNECT sessions is governed by the value of configuration property ETL_MAX_PROCESS_COUNT.
- **LEVEL_DESC** — Level ID description.
- **JOB_ID** — Nonnegative integer ID value for a job. This ID value is unique for each job in a level. A value of 1 is the lowest job ID for level 1 or greater, and is the job ID for all jobs that solely occupy those levels. JOB_ID=0 for the two level 0 jobs. If required, one or more level 0 job rows can be added, each referencing a macro. When adding these jobs, since the JOB_ID values must be unique in a level, set JOB_ID to a unique value other than 0. The level 0 job macros are called before executing each job.
- **JOB_NM** — Filename or macro name that is submitted. For LEVEL_ID greater than 0, this is the filename for the job being submitted. For LEVEL_ID=0, this is a macro name (wrna_init).
- **JOB_DESC** — Job description.
- **JOB_DEPENDENCY_NM** — One or more JOB_ID values that must finish executing before the job is submitted. The dependent jobs must exist in the same level as the job being submitted. Multiple referenced JOB_ID values in this column must be delimited with a comma. Example: For JOB_ID=1 that has JOB_DEPENDENCY_NM=3,4, JOB_ID=3 and JOB_ID=4 need to complete before JOB_ID=1 is submitted.
- **LEVEL_ERROR_SKIP_FLG** — Flag that identifies how the ETL process is to proceed after the completion of a level in which a job in that level has an error. A value of y or Y for all jobs in a level indicates that the ETL process will continue submitting jobs in follow-on levels. Any other value, including blank, for any job in a level indicates that the ETL process will exit without submitting jobs in follow-on levels. The default value is N for all levels.
- **SOURCE_STG_TABLES_LIST** — Not used.

Table SAS_JOB_LOADER can be updated to add new jobs or to modify existing jobs. Jobs that are not used do not need to be deleted, as a job will not run if the deployed file does not exist. The following table lists all the jobs with associated information in table SAS_JOB_LOADER:

Table 9.5 *Default Table Values*

LEVEL_ID	ETL_TYPE_ID	JOB_ID	LEVEL_DESC	ETL_DESC	JOB_NM	JOB_DESC	LEVEL_ERROR_SKIP_FLG
0	1	0	Warranty Initialization Code	ETL Load	wrna_init	Warranty Initialization Code	N

LEVEL_ID	ETL_TYPE_ID	JOB_ID	LEVEL_DESC	ETL_DESC	JOB_NM	JOB_DESC	LEVEL_ERROR_SKIP_FLG
1	1	1	Alter Product Attributes Table	ETL Load	fqa_10010_alter_product_attributes_table	Alter Product Attributes Table	N
2	1	1	Geographic Coordinates	ETL Load	fqa_10020_geographic_coordinates	Geographic Coordinates	N
3	1	1	Date Dimension	ETL Load	fqa_10050_date_dim	Date Dimension	N
4	1	1	Dimension Tables	ETL Load	fqa_10100_dim_tables	Dimension Tables	N
5	1	1	Profile Tables	ETL Load	fqa_10200_usage_profiles	Usage Profiles	N
5	1	2	Profile Tables	ETL Load	fqa_10200_sale_lag_profiles	Sale Lag Profiles	N
6	1	1	Products	ETL Load	fqa_10300_product_mart	Products	N
7	1	1	Events	ETL Load	fqa_10400_event_ mart	Events	N
8	1	1	Fact Tables	ETL Load	fqa_10500_event_comment_dim	Event Comments	N
8	1	2	Fact Tables	ETL Load	fqa_10500_ext_prod_attr_dim	Product Attributes	N
8	1	3	Fact Tables	ETL Load	fqa_10500_labor_code_mart	Labour Codes	N
8	1	4	Fact Tables	ETL Load	fqa_10500_repl_part_mart	Replacement Parts	N
0	2	0	Warranty Initialization Code	ETL Build	wrna_init	Warranty Initialization Code	N
1	2	1	Text Analysis Keys	ETL Build	fqa_50850_key_cstmr_comment_en	Customer Comment Keys — English	N

LEVEL_ID	ETL_TYPE_ID	JOB_ID	LEVEL_DESC	ETL_DESC	JOB_NM	JOB_DESC	LEVEL_ERROR_SKIP_FLG
1	2	2	Text Analysis Keys	ETL Build	fqa_50850_key_tech_comment_en	Technician Comment Keys — English	N
2	2	1	Product Hierarchy	ETL Build	fqa_50900_prodhier_nway	Product Hierarchy NWAY	N
3	2	1	Batch Jobs	ETL Build	fqa_80000_batch_jobs	Execute Batch Jobs	N

A job needs to be deployed before it can be executed by the build. When a job is deployed, a SAS program file is generated and saved to the file system for that job. To deploy a job, log on to SAS Data Integration Studio as a user who is a member of the Field Quality Analytics - Data Administrators group. Navigate to **Products** ⇨ **SAS Field Quality Analytics** ⇨ **Jobs** ⇨ **6.1 Jobs**. Select one or more load and build jobs to be deployed, and then right-click and select **Scheduling** ⇨ **Deploy**. A Deployment dialog box appears that identifies details that are needed to deploy the jobs. For the **Batch Jobs** deployment directory, which is selected by default, the jobs are deployed to the path **`<SAS-configuration-directory>/Lev1/SASApp/SASEnvironment/SASCode/Jobs`**.

If a different deployment directory is required, click the associated **New** button, provide a name, navigate to the required directory, and click **OK**. The location option identifies where the deployed jobs are created in metadata. By default, this is the same location as the jobs themselves. If necessary, click the associated **Browse** button to navigate to a different path in which the deployed jobs will be created in metadata, and click **OK**. Then click **OK** to deploy the jobs.

The following three ETL configuration properties need to be modified before running the ETL build:

- ETL_LOG_FOLDER_PATH
- ETL_TO_EMAIL_ADDRESS
- ETL_SENDER_EMAIL_ADDRESS

To modify these and other **ETL Configuration** properties, log on to SAS Field Quality Analytics as an administrator, and select the **System Configuration** menu item in the **Administration** workspace. Select the desired ETL configuration property, and then click  . Modify the property value in the System Configuration window, and click **Save**. The ETL configuration properties are documented in the following table:

Table 9.6 *ETL Configuration Properties*

Property Code	Description
ETL_COMPLETED_COLOR	Background color on the ETL build status report of a job that completes successfully . Default value: LightGreen.

Property Code	Description
ETL_COMPLETED_W_WARNING_COLOR	Background color on the ETL build status report of a job that completes with warnings. Default value: cxFFFF99 (yellow).
ETL_EMAIL_SUBJECT	Subject for the status e-mails sent during the ETL build. Default value: SAS FQA ETL Notification.
ETL_FAIL_COLOR	Background color on the ETL build status report of a job that fails. Default value: LightRed.
ETL_LOG_FOLDER_PATH	Physical path to the ETL SAS logs directory.
ETL_LOG_RETENTION_PERIOD	Number of ETL build log cycles that are kept on disc. Default value: 5.
ETL_MAX_PROCESS_COUNT	Number of SAS/CONNECT sessions available to process ETL jobs. Default value: 4.
ETL_NOTIFICATION_FLAG	Indicates whether a status e-mail is sent for each job in the build. For a value of N, an e-mail is sent only if the job completes with a warning or an error. An e-mail is always sent on the start and completion of the build. Default value: Y.
ETL_REPORT_FLAG	Indicates whether the overall status report is created and sent with the status e-mail on the completion of the ETL build. Default value: Y.
ETL_RUNNING_COLOR	Background color on the ETL build status report of a job for which the status fails to update. This signifies that there was a failure with the job. Default value: White.
ETL_SENDER_EMAIL_ADDRESS	Sender e-mail address for the ETL status e-mails.
ETL_SENDER_NAME	Sender name for the ETL status e-mails. Default value: SAS Field Quality Analytics Solution Administrator.
ETL_TO_EMAIL_ADDRESS	Recipient e-mail address for the ETL status e-mails.

To execute the ETL build, submit job **fqa_99999_execute_build** (located at **`/Products/SAS Field Quality Analytics/Jobs/6.1 Jobs`**) in SAS Data Integration Studio. See "ETL Build Jobs" on page 139 for detailed information about this job.

Data Validations

The following validations are made by the ETL jobs:

1. Primary Key Check (Not NULL and Unique) — Ensures that a primary key exists for each table and that the primary key value is unique and not NULL or not missing. Records that fail this constraint are excluded.
2. Foreign Key Check (Referential Integrity) — Ensures that every foreign key record has an existing parent record. Foreign key records that do not have a corresponding parent record are excluded.
3. Date Value Check — Ensures that certain dates are before or after a particular date. Also ensures that required date variables are not missing and are not in the future. Records that violate any one of the date dependency checks are excluded.
4. Missing Numeric Value Check — Ensures that specified numeric variables do not contain NULL or missing values. This typically applies to all cost variables and non-cost numeric variables used as data selection variables. Numeric variables used only as detail report variables and numeric categorical variables (that are not required keys) can be missing numeric values. Specified numeric variable values that are missing are replaced with a zero (0).
5. Negative Numeric Value Check — Ensures that specified numeric variables do not contain negative values. This typically applies to all cost variables and non-cost numeric variables used as data selection variables. A specified numeric variable value that is negative is replaced with a zero (0).
6. Missing or NULL Character Value Check — Ensures that all character variables do not contain NULL or missing values. By default, NULL and missing character variable values are replaced with a question mark (?).
7. Special Character Value Check — Ensures that all character variables do not contain special characters. Special characters include all ASCII non-printable control characters, which range from hexadecimal 00 to 1F, and include 7F (Delete). By default, each special character value is replaced with an underscore (_).
8. All character variables are left-justified to removing leading blanks.
9. Dimension tables are checked for required unique code descriptions.

These data validations have been incorporated into the ETL jobs as follows:

- fqa_10100_dim_tables job
  - Leading blanks are removed.
  - Control characters — byte(0) to byte(31) and byte(127) — are replaced with the specified character. The replacement character is specified via global macro variable &controlCharReplacement in %WRNA_INIT.
  - Missing values are replaced with the specified characters. The replacement characters are specified via global macro variable &missingCharVal in %WRNA_INIT.
  - Code-description value pairs are checked for uniqueness (data validation item 9). Code-description pairs are identified in MFGAPP table DIMENSION_CODENAME. Duplicate descriptions are made unique by appending the code values to the descriptions within parentheses. Example: For Code="A" and Description="My Description", the description is modified to "My Description (A)" to make it unique from another code that has the same description.
  - Natural key columns with missing values are excluded when populating the dimension tables.
- Fact table jobs

- The **Data Validation** transformation validates data validation items 1, 3, 4, and 5.
- The **Dimension Key Lookups** transformation in the fact table jobs performs data validation items 2, 6, 7, and 8. The lookup code uses the global macro variables &controlCharReplacement and &missingCharVal in %WRNA_INIT.

Chapter 10

Users, Groups, and Roles

Overview of Users, Groups, and Roles

All SAS Field Quality Analytics users must be a direct member of one, and only one, of the following groups:

- **Field Quality Analytics — Users** can log on to the application and use artifacts outside the application (SAS Enterprise Guide, for example)
- **Field Quality Analytics — Data Administrators** has full access to all data and extract, transform and load (ETL) jobs.

Note:

- Direct membership means that the user is a member of that group, and is not a member of a different group that is a member of that group (no chaining of group membership).
- If you want to do both tasks (use the SAS Field Quality Analytics application and run ETL), you must have two users defined in SAS Management Console (not just two user IDs for the same user, but two separate users).

You must refresh the cache after creating a new user.

This chapter discusses permissions for users, groups, and roles in SAS Field Quality Analytics. It is divided into the following sections:

- "Roles, Capabilities, and Groups" on page 154
- "SAS Product Metadata Authorization" on page 155
- "SAS System Metadata Authorization" on page 160
- "Operating System Groups and Users" on page 162

Roles, Capabilities, and Groups

See the following table for an overview of the capabilities by role for SAS Field Quality Analytics:

Table 10.1 *Capabilities by Role*

Information Consumer	Analyst	Administrator
• Access SAS Field Quality Analytics • View reports and results	• Access SAS Field Quality Analytics • View reports and results • Create and edit analyses • Assign alerts	• Access SAS Field Quality Analytics • View reports and results • Create and edit analyses • Assign alerts • Manage SAS Field Quality Analytics application

Note: Each of these roles gives a user access to default actions. Object-level security can be applied by an administrator at a site to either users or groups (but not roles) to further fine-tune the access provided by default roles. To access the SAS Field Quality Analytics application, users should be part of Field Quality Analytics — Users group. To work with the data libraries or ETL, users should be part of the Field Quality Analytics — Data Administrators group. Users should be assigned to one, but not both, of these groups.

Table 10.2 *SAS Metadata Groups*

Field Quality Analytics — Users	Field Quality Analytics — Data Administrators	Field Quality Analytics — SPD Server Users	Field Quality Analytics — Application Metadata Users
No role assigned	No role assigned	No role assigned	No role assigned
		Belongs to the Field Quality Analytics — Users group	Belongs to the Field Quality Analytics — Users group
		Belongs to the Field Quality Analytics — Data Administrators group	Belongs to the Field Quality Analytics — Data Administrators group
		Belongs to the SAS General Servers group	Belongs to the SAS General Servers group

Note:

- The operating system user for the SPD Server and Postgres are assigned to the SPD Server and Application Metadata group accounts. So no actual users using the system are specifically assigned to the SPD Server and Application Metadata groups.
- FQA Business Rule is a stored process. This stored process is accessed by the user through SAS Enterprise Guide. Depending on the input data and on whether

direct SAS Enterprise Guide access is identified, Field Quality Analytics groups are needed for access to the folder or library containing this stored process.

- If users are expected to access the Reporting Mart through SAS Enterprise Guide, SAS Web Report Studio, or Base SAS directly, then group access needs to be applied. If access is only through the SAS Field Quality Analytics application, then no group access other than what is identified is needed.
- Read permission is not granted to the FQA User group.

SAS Product Metadata Authorization

The following table provides information about SAS product metadata authorization for Field Quality Analytics — Users, SAS Administrators, SAS General Servers, and SAS System Services.

Note: The Field Quality Analytics — Data Administrators, Public and SASUSERS are in Table 10.4 on page 159.

Table 10.3 *SAS Product Metadata Authorization*

SAS Metadata *Note:* (All permissions are explicit as libraries are pre-assigned. This protects SAS Data Integration Studio, SAS Enterprise Guide, and Base SAS)	**Field Quality Analytics — Users**	**SAS Administrators**	**SAS General Servers**	**SAS System Services**
/Products/SAS Field Quality Analytics	Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer, Read, Read Metadata	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer
Analysis Mart	Grant: Read Metadata Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Read, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer

SAS Metadata *Note:* (All permissions are explicit as libraries are pre-assigned. This protects SAS Data Integration Studio, SAS Enterprise Guide, and Base SAS)	**Field Quality Analytics — Users**	**SAS Administrators**	**SAS General Servers**	**SAS System Services**
Application Metadata	Grant: Read Metadata, Read, Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer
Data Mart	Grant: Read Metadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Read, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer
Data Selection Output	Grant: Read Metadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer
ETL Check	Deny All	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer
Jobs *Note:* Sub folders inherit from Jobs	Deny All	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer

SAS Metadata *Note:* (All permissions are explicit as libraries are pre-assigned. This protects SAS Data Integration Studio, SAS Enterprise Guide, and Base SAS)	**Field Quality Analytics — Users**	**SAS Administrators**	**SAS General Servers**	**SAS System Services**
Reporting Mart	Grant: Read Metadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer
Results Output	Grant: Read Metadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer
Shared Analyses	Grant: WriteMetadata,WriteMemberMetadata Deny: CheckInMetadata, Read, Write, Create, Delete, Administer, Read Metadata	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer
Stage Data	Deny All	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Deny All	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer
Text Analysis	Grant: Read Metadata Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Read, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer

SAS Metadata *Note:* (All permissions are explicit as libraries are pre-assigned. This protects SAS Data Integration Studio, SAS Enterprise Guide, and Base SAS)	**Field Quality Analytics — Users**	**SAS Administrators**	**SAS General Servers**	**SAS System Services**
Stored Processes	Grant: Read Metadata Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Read, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer
Shared Analyses	Grant: Read Metadata, WriteMetadata, WriteMemberMetadata Deny: CheckInMetadata, Read, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer
Shared Data Selections	Grant: Read Metadata, WriteMetadata, WriteMemberMetadata Deny: CheckInMetadata, Read, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer
Shared Data Selection Templates	Grant: Read Metadata, WriteMetadata, WriteMemberMetadata Deny: CheckInMetadata, Read, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny: Read, Write, Create, Delete	Grant: ReadMetadata, Read Deny: WriteMetadata, WriteMemberMetadata, CheckInMetadata, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata Deny: Read, Write, Create, Delete, Administer

The following table provides information about SAS product metadata authorization for Field Quality Analytics — Data Administrators, Public, and SASUSERS:

Table 10.4 *SAS Product Metadata Authorization*

SAS Metadata *Note:* (All permissions are explicit as libraries are pre-assigned. This protects SAS Data Integration Studio, SAS Enterprise Guide, and Base SAS)	**Field Quality Analytics — Data Administrators**	**Public**	**SASUSERS**
/Products/SAS Field Quality Analytics	Grant All	Deny All	Deny All
Analysis Mart	Grant All	Deny All	Deny All
Application Metadata	Grant All	Deny All	Deny All
Data Mart	Grant All	Deny All	Deny All
Data Selection Output	Grant All	Deny All	Deny All
ETL Check	Grant All	Deny All	Deny All
Jobs *Note:* Sub folders inherit from Jobs	Grant All	Deny All	Deny All
Reporting Mart	Grant All	Deny All	Deny All
Results Output	Grant All	Deny All	Deny All
Shared Analyses	Grant All	Deny All	Deny All
Stage Data	Grant All	Deny All	Deny All
Text Analysis	Grant All	Deny All	Deny All
Stored Processes	Grant All	Deny All	Deny All
Shared Analyses	Grant All	Deny All	Deny All
Shared Data Selections	Grant All	Deny All	Deny All
Shared Data Selection Templates	Grant All	Deny All	Deny All

SAS System Metadata Authorization

The following table provides information about SAS system metadata authorization for Field Quality Analytics — Users, Field Quality Analytics — Data Administrators, and Public:

Table 10.5 *SAS System Metadata Authorization*

SAS Metadata (All permissions are explicit or inherited as noted in the system area)	Field Quality Analytics — Users	Field Quality Analytics — Data Administrators	Public
/System/Applications/SAS Field Quality Analytics	NA	NA	Deny All (Inherited)
/System/Applications/SAS Field Quality Analytics/ Common	NA	NA	Deny All (Inherited)
/System/Applications/SAS Field Quality Analytics/ Common/Generated Transforms	NA	NA	Deny All (Inherited)
/System/Applications/SAS Field Quality Analytics/ Field Quality Analytics 6.1	NA	NA	Deny All (Inherited)
/System/Applications/SAS Field Quality Analytics/ Field Quality Analytics 6.1/ Application SAS Code	NA	NA	Deny All (Inherited)
/System/Applications/SAS Field Quality Analytics/ Field Quality Analytics 6.1/ Data Selections	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata Deny (Inherited): CheckInMetadata, Read, Write, Create, Delete, Administer	Grant: ReadMetadata, WriteMetadata, WriteMemberMetadata Deny (Inherited): CheckInMetadata, Read, Write, Create, Delete, Administer	Deny All (Inherited)
/System/Applications/SAS Field Quality Analytics/ Field Quality Analytics 6.1/ Reporting Projects	NA	NA	Deny All (Inherited)
/System/Applications/SAS Field Quality Analytics/ Field Quality Analytics 6.1/ Stored Process	NA	NA	Deny All (Inherited)

The following table provides information about SAS system metadata authorization for SAS Administrators, SAS System Services, and SASUSERS:

Table 10.6 *SAS System Metadata Authorization*

SAS Metadata **(All permissions are explicit or inherited as noted in the system area)**	**SAS Administrators**	**SAS System Services**	**SASUSERS**
/System/Applications/SAS Field Quality Analytics	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny (Inherited): Read, Write, Create, Delete	Grant (Explicit): ReadMetadata, WriteMetadata, WriteMemberMetadata Deny (Inherited): CheckInMetadata, Read, Write, Create, Delete, Administer	Grant (Inherited): ReadMetadata Deny (Inherited): WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer, Read, Write, Create, Delete
/System/Applications/SAS Field Quality Analytics/ Common	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny (Inherited): Read, Write, Create, Delete	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata Deny (Inherited): CheckInMetadata, Read, Write, Create, Delete, Administer	Grant (Inherited): ReadMetadata Deny (Inherited): WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer, Read, Write, Create, Delete
/System/Applications/SAS Field Quality Analytics/ Common/Generated Transforms	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny (Inherited): Read, Write, Create, Delete	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata Deny (Inherited): CheckInMetadata, Read, Write, Create, Delete, Administer	Grant (Inherited): ReadMetadata Deny (Inherited): WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer, Read, Write, Create, Delete
/System/Applications/SAS Field Quality Analytics/ Field Quality Analytics 6.1	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny (Inherited): Read, Write, Create, Delete	Grant (Explicit): ReadMetadata, WriteMetadata, WriteMemberMetadata Deny (Inherited): CheckInMetadata, Read, Write, Create, Delete, Administer	Grant (Inherited): ReadMetadata Deny (Inherited): WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer, Read, Write, Create, Delete
/System/Applications/SAS Field Quality Analytics/ Field Quality Analytics 6.1/ Application SAS Code	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny (Inherited): Read, Write, Create, Delete	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata Deny (Inherited): CheckInMetadata, Read, Write, Create, Delete, Administer	Grant (Inherited): ReadMetadata Deny (Inherited): WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer, Read, Write, Create, Delete

SAS Metadata (All permissions are explicit or inherited as noted in the system area)	SAS Administrators	SAS System Services	SASUSERS
/System/Applications/SAS Field Quality Analytics/ Field Quality Analytics 6.1/ Data Selections	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny (Inherited): Read, Write, Create, Delete	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata Deny (Inherited): CheckInMetadata, Read, Write, Create, Delete, Administer	Grant (Inherited): ReadMetadata Deny (Inherited): WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer, Read, Write, Create, Delete
/System/Applications/SAS Field Quality Analytics/ Field Quality Analytics 6.1/ Reporting Projects	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny (Inherited): Read, Write, Create, Delete	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata Deny (Inherited): CheckInMetadata, Read, Write, Create, Delete, Administer	Grant (Inherited): ReadMetadata Deny (Inherited): WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer, Read, Write, Create, Delete
/System/Applications/SAS Field Quality Analytics/ Field Quality Analytics 6.1/ Stored Process	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer Deny (Inherited): Read, Write, Create, Delete	Grant (Inherited): ReadMetadata, WriteMetadata, WriteMemberMetadata Deny (Inherited): CheckInMetadata, Read, Write, Create, Delete, Administer	Grant (Inherited): ReadMetadata Deny (Inherited): WriteMetadata, WriteMemberMetadata, CheckInMetadata, Administer, Read, Write, Create, Delete

Operating System Groups and Users

The following table provides information about operating system groups and users:

Table 10.7 *Folder Access by Operating System Group*

Operating System Group	Folder Access
Field Quality Analytics Users (fqa_users)	Assign Read and Execute, List Folder Contents, and Read permissions on **<*SAS-configuration-directory*>\Lev1\AppData\SASFieldQualityAnalytics6.1\WRNATEXT**. Assign full control on the following: • **<*SAS-configuration-directory*>\Lev1\AppData\SASFieldQualityAnalytics6.1\WRNAOUT** • **<*SAS-configuration-directory*>\Lev1\AppData\SASFieldQualityAnalytics6.1\WRNAFDL** Assign Read/Write control on the **<SAS_WORK>** directory. SPD Server: • Open **<*SAS-installation-directory*>\SASScalablePerformanceDataServer\5.1\site\libnames.parm**. • Assign Read and Execute, List Folder Contents, and Read permissions on folders for all directories mentioned in the libnames.parm file. For example (in Windows): **libname=tmp pathname=c:\temp;** **libname=wrnaspds pathname=C:\WRNA_SPDS_DATA\SPDSDATA options="DATAPATH=('C:\WRNA_SPDS_DATA\WRNAMART' 'C:\WRNA_SPDS_DATA\WRNAMART1') INDEXPATH=('C:\WRNA_SPDS_DATA\WRNAMART_IDX')" DYNLOCK=YES;** For the previous example code, assign Read and Execute, List Folder Contents, and Read permissions on the following: • **C:\WRNA_SPDS_DATA\SPDSDATA** • **C:\WRNA_SPDS_DATA\WRNAMART** • **C:\WRNA_SPDS_DATA\WRNAMART1** • **C:\WRNA_SPDS_DATA\WRNAMART_IDX** • **C:\temp**

Operating System Group	Folder Access
Field Quality Analytics Data Administrators (fqa_data_administrators)	Assign full control on **<*SAS-configuration-directory*>\Lev1\AppData\SASFieldQualityAnalytics6.1**. Assign Read/Write control on the **<SAS_WORK>** directory. Assign Read/Write control on **<*SAS-configuration-directory*>\Lev1\SASApp**. *Note:* Write access to SASApp is required while running fqa_80000_batch_jobs as part of the regular ETL build. Assign Read/Write control on **<*SAS-configuration-directory*>\Lev1\SASApp\SASEnvironment\SASCode\Jobs**. *Note:* This is the default Windows path to the deployed jobs. Assign Read/Write control on the following SASHELP Locale files: • wrtyanl_data_sel_grp.sas7bdat • wrtyanl_data_sel_grp.sas7bndx • wrtyanl_tablecolumn_meta.sas7bdat • wrtyanl_tablecolumn_meta.sas7bndx • wrtyanl_table_meta.sas7bdat • wrtyanl_table_meta.sas7bndx The following are the Windows and Linux SASHELP paths for these files: **.../*SAS-installation-directory*/SASFoundation/9.4/sashelp** (Linux) **...*SAS-installation-directory*\SASFoundation\9.4\wrtyanlmva\sashelp** (Windows) SPD Server: • Open **<*SAS-installation-directory*>\SASScalablePerformanceDataServer\5.1\site\libnames.parm**. • Assign full control on folders for all directories mentioned in this file. For example (in Windows): **libname=tmp pathname=c:\temp;** **libname=wrnaspds pathname=C:\WRNA_SPDS_DATA\SPDSDATA options="DATAPATH=('C:\WRNA_SPDS_DATA\WRNAMART' 'C:\WRNA_SPDS_DATA\WRNAMART1') INDEXPATH=('C:\WRNA_SPDS_DATA\WRNAMART_IDX')" DYNLOCK=YES;** For the previous example code, assign full control on the following: • **C:\WRNA_SPDS_DATA\SPDSDATA** • **C:\WRNA_SPDS_DATA\WRNAMART** • **C:\WRNA_SPDS_DATA\WRNAMART1** • **C:\WRNA_SPDS_DATA\WRNAMART_IDX** • **C:\temp**

The following table provides information about operating system users and SAS Management Console users:

Table 10.8 *Operating System to SAS Management Console User Mapping*

Operating System User	Operating System Group	SAS Management Console User	SAS Management Console Group	SAS Management Console Role
fqauser	Field Quality Analytics Users (fqa_users), SAS Server Users	fqauser	Field Quality Analytics — Users	Field Quality Analytics: Information Consumer
fqaanalyst	Field Quality Analytics Users (fqa_users), SAS Server Users	fqaanalyst	Field Quality Analytics — Users	Field Quality Analytics: Analyst
fqaadmin	Field Quality Analytics Users (fqa_users), SAS Server Users	fqaadmin	Field Quality Analytics — Users	Field Quality Analytics: Administrator
fqaetlad	Field Quality Analytics Data Administrators (fqa_data_ administrators), SAS Server Users	fqaetlad	Field Quality Analytics — Data Administrators	

Note:

- For a UNIX environment, make the install user's primary group the primary group of all SAS Field Quality Analytics users.
- The operating system user IDs and SAS Management Console user IDs specified in Table 10.8 on page 165 are only examples. User IDs can be used as required.

Chapter 11

Setting Up Access for the Report Library

Access and Authorization for the Report Library Workspace

The **Report Library** workspace enables you to manage all the reports that summarize your business data and to provide both technical and non-technical users access to that information. You can include reports that you create in other applications such as SAS Visual Analytics or SAS Web Report Studio. In addition to reports, you can provide informative resources, like PDF files and other documents, that your users might find useful.

The reports and files that you work with in the **Report Library** workspace are stored in a metadata folder structure. The following folder is the base folder for the workspace: **`SAS Folders/Products/SAS Quality Analytic Suite/Quality Analytic Reports`**.

The SAS Intelligence Platform provides a metadata-based authorization layer that supplements protections from the host environment and other systems. You can use the metadata authorization layer to manage access to the reports and files that you work with in the **Report Library** workspace. For information about the metadata authorization model and about managing access to metadata, see *SAS Intelligence Platform: Security Administration Guide*.

The following topics in particular are applicable:

- Permissions by Task provides information about permissions for working with folders and reports.
- General-Purpose Permissions describes the general-purpose permissions and their effect on the actions that a user can perform on folders and objects in folders.
- Access to Metadata Folders provides examples of different approaches for setting permissions on folders.

- End Users, Folders, and Permissions addresses the proper use of the WriteMetadata and WriteMemberMetadata permissions.

Roles and Capabilities for the Report Library Workspace

About Roles and Capabilities

The SAS Intelligence Platform uses roles and capabilities to manage access to application features. A role manages the availability of application features such as menu items and the operations that you can perform with those features (for example, create, view, edit, and delete). An application feature that is under role-based management is called a capability. Anyone who is a member of a role has all of the capabilities that are enabled for that role.

Note: You can enable or disable a capability for a role to provide more fine-grained control.

For more information about working with roles and capabilities, see *SAS Management Console: Guide to Users and Permissions*.

Capabilities for Comments

By default, users can create and view comments that are associated with reports or other files. However, if you want to grant users the ability to edit and delete comments, you must add these capabilities.

You can add these capabilities in the following ways:

- by adding the Comments: Administrator role to the appropriate user group.
- by adding the comment-specific capabilities directly to an existing role. This approach enables you to add only those capabilities that your users need.

To add the Comments: Administrator role to a group:

1. On the **Plug-ins** tab in SAS Management Console, select **Environment Management** ⇨ **User Manager**.
2. Right-click the group that you want to update (for example, Field Quality Analytics - Users), and select **Properties**.
3. On the **Groups and Roles** tab, add the Comments: Administrator role to the list of assigned groups and roles.

   Note: By default, both the Edit capability and the Delete capability are enabled for the Comments: Administrator role. When you assign this role to a group, all users in the group can edit and delete comments.

To add specific capabilities to a role:

1. On the **Plug-ins** tab in SAS Management Console, select **Environment Management** ⇨ **User Manager**.
2. Right-click the role that you want to update (for example, Field Quality Analytics: Information Consumer), and select **Properties**.

3. On the **Capabilities** tab, expand **SAS Application Infrastructure** ⇨ **Comments**, and select the capabilities that you want to add to the role (**Edit comments** or **Delete comments**, or both).

Capabilities for SAS Web Report Studio

To create reports in SAS Web Report Studio with data from SAS Field Quality Analytics, you must ensure that your users have the Create Report and Allow Direct Access to Tables capabilities.

You can add these capabilities in the following ways:

- by modifying the Web Report Studio: Report Creation role and then adding the appropriate user group for SAS Field Quality Analytics to the role
- by adding the capabilities directly to an existing role for SAS Field Quality Analytics

To update the Web Report Studio: Report Creation role and add a group to the role:

1. On the **Plug-ins** tab in SAS Management Console, select **Environment Management** ⇨ **User Manager**.
2. Right-click the Web Report Studio: Report Creation role, and then select **Properties**.
3. On the **Capabilities** tab, expand **Web Report Studio 4.4** ⇨ **Report Creation** ⇨ **Basic**, and then select **Allow Direct Access to Tables**.

   Because the Create Reports capability is already enabled for this role, no further changes to the capabilities are needed.
4. On the **Members** tab, add the appropriate SAS Field Quality Analytics groups to the role (for example, Field Quality Analytics - Users).
5. Save your changes.

To add the capabilities directly to a SAS Field Quality Analytics role:

1. On the **Plug-ins** tab in SAS Management Console, select **Environment Management** ⇨ **User Manager**.
2. Right-click the role that you want to update (for example, Field Quality Analytics: Information Consumer), and then select **Properties**.
3. On the **Capabilities** tab, expand **Web Report Studio 4.4** ⇨ **Basic**, and then select **Allow Direct Access to Tables**.
4. Expand **SAS Web Report Studio 4.4** ⇨ **Report Creation**, and then select **Create Report**.
5. Save your changes.

Note: The Create Report capability and the Allow Direct Access to Tables capability are required to use the **Report Library** workspace with SAS Web Report Studio. However, you can also control any of the other capabilities for SAS Web Report Studio in the same way. For more information about the roles and capabilities that are available, see the SAS Web Report Studio chapter in *SAS Intelligence Platform: Web Application Administration Guide*.

Capabilities for SAS Visual Analytics

To create reports in SAS Visual Analytics from the **Report Library** workspace, you must ensure that your users have the appropriate capabilities.

To update the capabilities for SAS Visual Analytics:

1. On the **Plug-ins** tab in SAS Management Console, select **Environment Management** ⇨ **User Manager**.
2. Right-click the role that you want to update (for example, Field Quality Analytics: Information Consumer), and select **Properties**.
3. On the **Capabilities** tab, expand **Visual Analytics 7.1**.

   Select the following capabilities:

   - **View Report and Stored Process**
   - **Create Report**
4. Save your changes.

Note: The Create Report capability and the View Report and Stored Process capability are required to use the **Report Library** workspace with SAS Visual Analytics. However, you can also control any of the other capabilities for SAS Visual Analytics in the same way. For more information about the roles and capabilities that are available, see *SAS Visual Analytics: Administration Guide*.

Chapter 12

Diagnostics

About the Diagnostics Utility

The SAS Field Quality Analytics Diagnostics Utility checks connection pool settings, pings servers, checks that users have been set up correctly, and performs other similar tasks. Diagnostics are deployed at the following path (Diagnostics Root):

`<SAS-config-dir>\Lev1\Applications\SASFieldQualityAnalytics\Diagnostics`

The Diagnostics Root contains subfolders with diagnostics information, including diagnostics components, and the last-run diagnostics report (Diagnostics-Results.pdf). The following table provides an overview of configuration files in the Diagnostics Root:

Table 12.1 *Configuration Files for the Diagnostics Utility*

File	Description
CommonDiagnosticsConfig.xml	Contains information about the connection settings for the container and metadata server for a deployment. Also contains information about the library locations referred to by the Diagnostics Utility.

File	Description
DiagnosticsMasterConfig.xml	Contains information about other diagnostics configuration files. Also contains a listing of components to run diagnostics for by solution and platform, and e-mail settings. The DiagnosticsMasterConfig.xml file helps enable diagnostics if multiple solutions are configured.
FQADiagnosticsConfig.xml	Contains information about SAS Field Quality Analytics diagnostics tests. The FQADiagnosticsConfig.xml file is the primary file used to run diagnostics tests. It contains configuration information about what tests to run, how to run them, what parameters to use while running them, and so on. *Note:* This file is located at ***SAS-config-dir*\Lev1\Applications\SASFieldQualityAnalytics\Diagnostics**
PlatformDiagnosticsConfig.xml	Contains information about platform-level diagnostics tests.

The following sections explain how to run the Diagnostics Utility in stand-alone mode and how to interpret diagnostics results.

Note: You might be prompted to specify a password when using the Diagnostics Utility. Passwords are preserved in encrypted form in FQADiagnosticsConfig.xml.

Prerequisite Checklist

Check that the following have been performed before running diagnostics:

- The JAVA_HOME environment variable should be set to a valid Java installation path.

  Note: The Java path is the folder path where Java is installed (the JDK folder path). An example is **C:\Program Files\Java\jdk1.6.0_24**

- Verify that ANT 1.7 or later is available in the system classpath. If ANT is available in the system path, then make sure that Activation.jar, MailApi.jar, and smtp.jar are also available in the lib folder of the ANT setup.
- Every user that wants access to the Diagnostics Utility should have Full access (in case of UNIX, it is rwx) to ***SAS-config-dir*\Lev1\Applications\SASFieldQualityAnalytics\Diagnostics** and its subdirectories.
- JUnit 4.5 or a later version should be present, and its path should be mentioned in CommonDiagnsoticsConfig.xml.
- An application server user must be created for JBoss and WebLogic. This user's user name and password must be entered in the **<Container>** tag in the CommonDiagnosticsConfig.xml file as follows:

```
<Container serverType="Jboss" serverHost="localhost" adminPort="1099"
```

```
username="admin" password="admin" remoteServicesPort="5091"
wipServicesPort="8080"/>
```

- If you want to perform diagnostics on a LAX machine, you need to perform the following additional steps to add FQA and populate required user names and passwords:

  1. To add FQA into Solutions Diagnostics, add the following lines into DiagnosticsMasterConfig.xml below the **<EmailSettings>** tag.

     ```
     <configuration project-name="FQA" description="Field Quality Analytics"
     config-file-name="FQADiagnosticsConfig.xml"
     config-file-path="C:\SAS\Config\Lev1\Applications\
     SASFieldQualityAnalytics\Diagnostics" verify="true"/>
     ```

  2. Update the host user and internal user credentials in CommonDiagnosticsConfig.xml.
  3. Update the database user credential in FQADiagnosticsConfig.xml.

  The JUnit path (mentioned in the CommonDiagnosticsConfig.xml file) should have a JUnit 4.5 JAR file.

Summary of Diagnostic Tests

The following table provides information about the diagnostic tests that you can choose to run by module. For more information about selecting tests in stand-alone mode, see "Select Tests" on page 178.

Table 12.2 *Diagnostic Tests by Module*

Test	Tab	Module	Description
Availability of Key Tables and Columns	FQA	Database	A relational database management system test that pings the database and checks whether key tables and columns are available.
Database Availability	FQA	Database	A relational database management system test that pings the database and checks tables.
Display Important URL(s)	FQA	FQA Custom Test	Checks domain object listing, batch listing, and audit log listing.
FQA Solution – Datatier File(s)/ Folder(s)	FQA	FileSystem	Checks for the presence of files or folders on the data tier.
FQA Roles, Capabilities and Groups	FQA	Metadata	Checks for the presence of SAS Field Quality Analytics roles, capabilities, and groups within the metadata server.

Test	Tab	Module	Description
Include Mid-tier Log in Detail Result	FQA	FQA Custom Test	Includes the middle-tier log on the diagnostics results.
Include Configuration Table Data File in Detail Result	FQA	FQA Custom Test	Includes the configuration table data file information in the diagnostics results.
Include Domain Object Listing	FQA	FQA Custom Test	Creates a report with domain object listing information in the form of a csv file.
Ping Database	FQA	Database	Checks whether the database server is running and gets basic properties if the database server is running.
Ping Metadata Server	Platform	Metadata	Checks whether the metadata server is reachable.
Ping OLAP Server(s)	FQA, Platform	Metadata	Checks whether the online analytical processing (OLAP) server is reachable.
Ping Stored Process Server(s)	FQA, Platform	Metadata	Checks whether the stored process server is reachable.
Ping Workspace Server(s)	FQA, Platform	Metadata	Checks whether the workspace server and the pooled workspace server is reachable.
SAS Product Expiration	FQA, Platform	Metadata	Checks SAS product expiration information.
Software Components	FQA, Platform	Metadata	Checks whether software components and operating system software components are available in the metadata server.
Software Components' Properties	FQA, Platform	Metadata	Used to print properties of software components. This test also checks whether software components are available and reports an error if a component is not found.

Test	Tab	Module	Description
Verify Analysis Template Parameter Configuration	FQA	FQA Custom Test	Verifies lookup configuration information for the analysis template parameters configuration. *Note:* You can ignore the following warnings if they occur in the diagnostics results: • Lookup flag is blank for parameter code **`WRTYTIMELENGTH`** in analysis type **`EIANALYTIC`** however lookup values available. • Lookup flag is blank for parameter code **`PROJECTEDVALUESMILEAGE`** in analysis type **`RELIABILITY`** however lookup values available. • Lookup flag is blank for parameter code **`PROJECTEDVALUESTIS`** in analysis type **`RELIABILITY`** however lookup values available.
Verify Column Dimension Lookup Attribute Configuration	FQA	FQA Custom Test	Verifies the dimTable, dimColumn, and dimNameColumn values in the Tablecolumn_Attribute table for variables that are marked as reporting or grouping variables.
Verify Comment Variable Datasets	FQA	FQA Custom Test	Verifies comment variables and language lookup configuration. For each entry in the language lookup: • TEXTSTOP_XXX data set should be available in the WRNATEXT library (XXX is language code in language lookup). • TEXTSYN_XXX data set should be available in the WRNATEXT library (XXX is language code in language lookup). For each comment variable XXX and language code YYY: • TXTK_XXX_YYY data set should be available in the WRNATEXT library. • TXTO_XXX_YYY data set should be available in the WRNATEXT library.
Verify Content Server	FQA	Metadata	Verifies that the content server is reachable.

Test	Tab	Module	Description
Verify Data Selection Tree Configuration	FQA	FQA Custom Test	Verifies the data selection attributes table configuration, and the data selection tree configuration. For the data selection attributes table configuration, if the data type is equal to 'selectlist', then the library name, table name, and column name should not be blank. For the data selection tree configuration: • The parent ID should be available in the data selection group table. • The child ID should be available in the data selection attribute table if the type is equal to 'A' or 'RA'. • The child ID should be available in the data selection group table if the type is equal to 'G'. • The child ID should be available as the parent ID column if the type is equal to 'G'.
Verify Email Templates Availability	FQA	FQA Custom Test	Verifies the availability of e-mail templates.
Verify FQA Content Types	FQA	Metadata	Verifies that the FQA content types have been registered in the metadata and have valid associations.
Verify i18n Label Configuration	FQA	FQA Custom Test	Verifies label configuration.
Verify Preassigned Libraries	FQA	FQA Custom Test	Verifies preassigned libraries.
Verify Product Child Table Column Attribute Configuration	FQA	FQA Custom Test	Verifies whether any product child table column is configured as a reporting or a group variable. They should not be configured as a reporting or a group variable.
Verify Required Column Configuration For Analysis	FQA	FQA Custom Test	Verifies whether required columns have been configured for an analysis.
Verify SASHelp Library Datasets	FQA	FQA Custom Test	Verifies localized labels in the SASHELP library.

Test	Tab	Module	Description
Verify SAS License	Platform	Metadata	Checks for a valid SAS license and reports related warnings.
Verify System Configuration Properties	FQA	FQA Custom Test	Verifies or performs the following: • Prints important property values. • Checks the maximum and minimum values for numeric properties. • Verifies property values depending on the property type.
Verify TableMeta Attribute Configuration	FQA	FQA Custom Test	Checks that the component, component type, component group, and primary key table attributes are present. They should be present. Checks that the component, component type, component group, and primary key table attributes are not blank. They should not be blank. Checks that the table name and component attribute values are the same. They should be the same.
Verify Warranty Configuration	FQA	FQA Custom Test	Verifies the warranty type, the warranty subtype, the usage type lookup and related variable configuration, and the maturity criteria value. For warranty type 1 and 4, no usage type configuration is required. For each usage type XXX: • The USAGEXXX variable should be available in the analysis global default table. • The USAGEBINXXX variable should be available in the analysis global default table. • The wrtyusagemaxXXX variable lookup should be available in the analysis param lookup table. • The forewrtyusageXXX variable lookup should be available in the analysis param lookup table. For the maturity criteria value: • The value should be a numeric value for warranty type 1 and 2. • The value should be a string for warranty type 3 and 4.
Verify Users Have Some FQA Role	FQA	Metadata	Checks whether users have a valid FQA role.

Note: Open Diagnostics-Results.pdf for information about the results of each diagnostic test.

Running the Diagnostics Utility in Stand-Alone Mode

About Stand-Alone Mode

Running the Diagnostics Utility in stand-alone mode does not require SAS Field Quality Analytics to be running. It is recommended that you run the Diagnostics Utility in stand-alone mode as soon as configuration is complete.

The Diagnostics Utility can be run in two stand-alone modes:

- launchDiagnostics_UI.bat
- launchDiagnostics_cmd.bat

Both modes can be run with .bat files located at the Diagnostics Root.

Note: You need to register SAS Field Quality Analytics manually by editing DiagnosticsMasterConfig.xml in order to log on and invoke the stand-alone mode in a UNIX environment.

Select Tests

The first stand-alone mode can be launched with the launchDiagnostics_UI.bat file. The launchDiagnostics_UI.bat file opens a window that can be used to select the tests to be carried out and launch the Diagnostics Utility. After beginning the diagnostic, you see a command window that tracks the progress of the diagnostics process. When the diagnostics are complete, a diagnostics report opens.

To run the launchDiagnostics_UI.bat file, perform the following steps:

1. Navigate to the Diagnostics Root.
2. Double-click launchDiagnostics_UI.bat. A window opens where you can select the tests to be carried out and launch the Diagnostics Utility. For more information about the purpose of each diagnostic test, see "Summary of Diagnostic Tests" on page 173.

   General diagnostics information appears on the **Diagnostics** tab.
3. Select the check box for each type of test that you want to include.
4. Click the **Setup** tab for information about credentials settings and registration details.

   Note:

   - You must provide a user name and password in the respective **Credentials Setting** fields on the **Setup** tab if the server is secured. If the server is not secured, you do not need to provide a user name or password.
   - Do not enter a space or any special characters in the **Solution Name** field while adding a solution from the **Setup** tab.
5. The following are examples of information to enter for **Platform Solution Details**:

   - **Solution Name** — Platform

- **Solution Description** — Platform Level Common Diagnostics
- **Config file path** — ***<Diagnostics Root Folder>***
- **Config file name** — PlatformDiagnosticsConfig.xml

Note: Your registration details might differ depending on your setup. For example, you will need to specify the path to your Diagnostics Root folder.

6. The following are examples of information to enter for **FQA Solution Details**:
   - **Solution Name** — FQA
   - **Solution Description** — SAS Field Quality Analytics
   - **Config file path** — **`C:\SAS\Config\Lev1\Applications\SASFieldQualityAnalytics\Diagnostics`**
   - **Config file name** — FQADiagnosticsConfig.xml

   Note: Your registration details might differ depending on your setup.
7. Click the **Platform** tab for a list of platform-level diagnostics tests to select.
8. Select the check box for each test that you want to include.
9. Click the **FQA** tab for a list of diagnostics tests for SAS Field Quality Analytics.
10. Select the check box for each test that you want to include.
11. (Optional) Select **Email Diagnostics Report**, select the report type, and enter a comma-separated list of e-mail addresses in the associated box.
12. Click **Diagnose**.

    After beginning the diagnostic, you see a command window that tracks the progress of the diagnostic. When the diagnostic has completed running, a report is displayed. The diagnostics report lists the findings for each module and element. For more information about interpreting the diagnostics report, see "Viewing the Diagnostic Results" on page 180.

Run Preselected Tests

The second stand-alone mode can be launched with the launchDiagnostics_cmd.bat file. Each time the Diagnostics Utility is run, information about which tests have been selected to run is saved in the FQADiagnosticsConfig.xml file. When the Diagnostics Utility is launched from the launchDiagnostics_cmd.bat file, previously saved selections are used.

Note: If you are running solutions diagnostics from the command prompt in UNIX or Linux, then you need to run launchDiagnostics.sh instead of launchDiagnostics_cmd.bat.

To run the launchDiagnostics_cmd.bat file, perform the following steps:

1. Navigate to the Diagnostics Root.
2. Double-click launchDiagnostics_cmd.bat.

   After beginning the diagnostic, you see a command window that tracks the progress of the diagnostic.

When the diagnostic has completed, a report is not automatically launched. The diagnostics report can be accessed by opening the Diagnostics-Results.pdf file in the **`Results`** folder at the Diagnostics Root.

Viewing the Diagnostic Results

After running a diagnostic, results are grouped and presented in a table format.

Diagnostic tests are divided into the following categories based on the type of test.

- FQA Custom Test
- Database
- FileSystem
- Metadata

Diagnostics can be opened by double-clicking on Diagnostics-Results.pdf in the `Results` folder at the Diagnostics Root.

View Previous Diagnostic Results

After running a diagnostic, perform the following steps to see previous diagnostic results:

1. Click **View History**.

   The SAS Diagnostics History window appears.

2. Click **View PDF** for the diagnostic you want to see.

Print Diagnostic Results

You can print diagnostic results by opening Diagnostics-Results.pdf and selecting **File** ⇨ **Print** from the menu.

Customizing Diagnostic Tests

Each diagnostic test has a default configuration that you can use. The FQADiagnosticsConfig.xml file can be modified to accommodate customizations, such as a change to a logical server name, application name, or a table name. The `ConnectionSettings` section in the FQADiagnosticsConfig.xml file contains entries for the data-tier and middle-tier machines on which SAS Field Quality Analytics is deployed, and the respective connection credentials. The `Diagnosis` sections in the FQADiagnosticsConfig.xml file control all of the available SAS Field Quality Analytics diagnostic tests. Each XML node corresponds to a diagnostic test. The `Connection` section contains details about which elements are to be diagnosed in a particular diagnostic test and, in some cases, how an element is to be diagnosed.

Part 3

Managing Early Warning Alerts

Chapter 13

Overview of Managing Early Warning Alerts

Overview of Managing Early Warning Alerts

The following chapters in this part explain how you can manage early warning alerts in SAS Field Quality Analytics:

- Chapter 14, “Understanding Early Warning Processes,” on page 185
- Chapter 15, “Managing Early Warning Alerts and Graphics,” on page 189
- Chapter 16, “Restore, Reset, or Remove Early Warning Enterprise Alert Groups,” on page 201

For additional information about how to manage information in the SAS Field Quality Analytics application, see “Overview of the Administration Workspace” on page 221.

Chapter 14

Understanding Early Warning Processes

About Early Warning

Overview

Early Warning processes are highly parameter-driven. Therefore, the implementation is site-specific. Your on-site SAS support personnel provide site-specific documentation so that you know how to set up and administer your Early Warning functionality.

The Early Warning functionality within SAS Field Quality Analytics includes these processes:

- threshold watch list process
- automated analytical process
- analytical watch list process

These processes monitor warranty data and identify Early Warning issues by determining when the following have occurred in claims activity:

- upward trends that are statistically significant
- sudden increases that are above a value that you have specified as acceptable

The processes require input from users with an administrator role. For more information about SAS Field Quality Analytics groups and roles, see Chapter 10, “Users, Groups, and Roles,” on page 153.

Threshold Watch List

The threshold watch list process monitors values of a variable (called the *reporting variable*) on a defined subset of data (specified by a data selection) in order to determine whether values of a calculated quantitative value (called the *analysis variable*) surpass a specified threshold value.

Early Warning administrators can use the rich client to define a new data selection, or they can import a data selection that another user has already defined.

A threshold watch list report definition consists of a data selection and a collection of analysis options, such as the reporting variable and a threshold value.

These report definitions are processed in batch whenever a refresh of the data mart is completed. A report is generated (that is, an issue is flagged) from a report definition when the calculated analysis variable exceeds the specified threshold value for at least one value of the reporting variable in the subset of data that is being analyzed. The threshold output displays, in the form of a Pareto chart, the values of the reporting variable for which the analysis variable exceeds the threshold value.

When creating a report definition, the Early Warning administrator can specify which users are to receive e-mail notification whenever any values of the reporting variables are flagged as issues. However, any SAS Field Quality Analytics user who is not specifically denied permission to view the Early Warning watch list reports can access these reports from the **Early Warning** workspace.

Automated Analytical Process and Analytical Watch List Process

The automated analytical process and the analytical watch list process are both used to monitor claims activity on a defined subset of units in order to identify significant upward shifts in claims activity. Instead of using a specified threshold value, these processes use analytical methods to compare current claim activity levels with expected future levels (based on history) and to flag those items for which the actual level is significantly greater than the expected level. The automated analytical process and the analytical watch list process are similar in their use of the same analytic methods. The two processes differ in how the defined subset of units that are being monitored is derived and how parameters that affect the processing (such as the sensitivity of the statistical tests performed) are defined. Additional differences are noted in subsequent sections of this document.

For these processes, the variable and the subset of product information that is to be monitored are defined by individual Early Warning administrators.

For the automated analytical process, the claim variable that is to be monitored is called the *defined entity*, and the rule (or variable hierarchy) that is used to group product units is called the *defined hierarchy*.

The defined hierarchy defines the product information subsets that are to be monitored. The automated process monitors the values of the defined entity by the values of the defined hierarchy. A defined entity, defined hierarchy, and additional processing parameters make up an automated analytical run group. An automated analytical run group is the set of analysis options that are used to create the Early Warning reports.

The Early Warning administrator also selects the variable that is to be monitored (called the *reporting variable*) and additional processing options, such as the sensitivity of hypothesis tests and number of periods to monitor. Additional parameters that affect how the process runs are also defined in the application metadata. The reporting variable is similar to the defined entity in the automated process, but the reporting variable can

include product attributes in addition to claim attributes, whereas the defined entity can be only a claim attribute. Each report definition consists of a data selection, a reporting variable, and other analysis options. The report definition for the analytical watch list process is similar to the run group for the automated analytical process.

For the analytical watch list process, the subset of product information that is to be monitored is defined by a data selection. Early Warning administrators can define a data selection by using the data selection function in the application, or they can import a data selection that another user of the application has already defined.

Report definitions for the analytic watch list process are processed in batch on a scheduled basis whenever a refresh of the data mart is completed. A report is generated (that is, an issue is flagged) from a report definition when the process detects a significant upward shift in claims activity for any value of the reporting variable that is being analyzed.

When creating a report definition for the analytical watch list, the Early Warning administrator can specify users to receive e-mail notification whenever any values of the reporting variables are flagged as issues. However, any SAS Field Quality Analytics user who is not specifically denied permission to view the Early Warning watch list reports can access these reports from the **Early Warning** workspace.

In addition to the analysis options settings, the automated analytical and analytical watch list processes also incorporate business rules that are designed to exclude from monitoring those items that do not have adequate sample sizes and data to support this type of analysis. The business rules are created in the application metadata and are the same for both processes.

Two statistical analysis methods are applied in the analytical watch list and automated analytical processes to identify upward shifts in claims activities:

- production period analysis, a method proposed by Wu and Meeker (2002). The analysis monitors claims activity and the sample size at risk relative to particular production periods for different time-in-service periods (for example, 1 month in service, 2 months in service, and so on). Given a particular production period and in-service period combination, the analysis compares the actual claim rate to the expected claim rate and flags an issue when the actual claim level is significantly greater than the expected level. The expected level of claims activity for a calendar period is based on the population at risk within that calendar period, historic claim rates, seasonality factors (automated analytical process only), and the specified false alarm rate. The output includes a matrix chart that identifies the flagged periods in red.
- claim period analysis, also called the Model A method. The claim period analysis monitors claim counts across calendar periods and flags an issue when the actual claim count that occurs in a calendar period significantly exceeds what is expected to occur for that calendar period. The expected level of claims activity for a calendar period is based on the population at risk within that calendar period, historic claim rates, seasonality factors (analytic automated process only), and the specified false alarm rate. The output from the claim period analysis is a plot of claim count (y-axis) versus calendar periods (x-axis). An issue is flagged if the actual claim count is greater than or equal to the critical value for any of the calendar periods that are being investigated. The chart shows three lines: actual claim count, expected claim count, and calculated critical value.

Data Selections for Early Warning Analysis

An Early Warning Enterprise Analytic analysis always runs on the mart, even if the data selection has stored data. Analyses under a stored data selection are not rerun in batch. If an Early Warning Enterprise Analytic analysis needs to be rerun, the administrator can rerun it using the **`forcedexecute`** command. It is recommended that you always create an Early Warning Enterprise Analytic analysis on a dynamic data selection. For more information about the **`forcedexecute`** command, see "Use Batch Processing with the Forced Execution Option" on page 239.

Additional Reading

Please refer to the site-specific documentation that your on-site SAS support personnel provide for more specific information about the parameter-driven configuration that is required for SAS Field Quality Analytics Early Warning.

Reference

Wu, H. and W. Meeker. 2002. "Early Detection of Reliability Problems Using Information from Warranty Databases." *Technometrics* 79:120–133.

Chapter 15

Managing Early Warning Alerts and Graphics

Overview of Managing Early Warning Alerts and Graphics

This chapter explains how you can manage alerts in the Enterprise Analytic, Ad Hoc Analytic, and Ad Hoc Threshold sections of the **Early Warning** workspace.

Note: The tasks described in this chapter require administrator permissions.

Enterprise Analytic

Create a New Enterprise Analytic Alert Group

Perform the following steps to create a new enterprise analytic alert group:

1. Click  .

   The Select Data Selection window appears.

2. Select a data selection in the table.
3. Click **OK**.

   The Enterprise Analytic window appears.
4. Provide an alert group name.
5. Provide an alert group description.
6. Select a product reporting variable:
   a. Click **Select**.

      The Select Reporting Variables dialog box appears.
   b. Select a reporting variable in the **Available Reporting Variables** list.
   c. Click 

      The reporting variable is added to the **Selected Reporting Variables** list.
   d. Click **OK**.
7. Select an event reporting variable:
   a. Click **Select**.

      The Select Reporting Variables dialog box appears.
   b. Select a reporting variable in the **Available Reporting Variables** list.
   c. Click 

      The reporting variable is added to the **Selected Reporting Variables** list.
   d. Click **OK**.
8. Specify the analyses to perform.
9. If you specified a production period, select a production period alert alpha level.
10. If you specified an event period, select an event period alert alpha level.
11. Specify the monitoring time window length.
12. Select the analysis interval units.
13. Specify whether to reconcile analyses.
14. Specify the event rate estimation time window.
15. Specify the alert gap time window.
16. Specify the event cost parameter.
17. Specify the minimum event records for defined entity.
18. Specify the minimum production unit count.
19. Specify the minimum events per period for event analysis.
20. Specify the minimum production periods for product analysis.
21. Specify the analyses to apply seasonal adjustment.
22. Select the seasonality interval.
23. Specify the seasonal factor estimation time window length.
24. Specify the minimum number of years for seasonal calculation.

25. Select the initial selection.
26. Select the seasonal factor removal.
27. Specify the consistency check.
28. Specify the seasonal factor removal for consistency check.
29. Select the method of notification from the menu.
30. If you selected a method of notification, specify the users that you want to notify.
    a. Click **Select**.

       The Notify Users dialog box appears.

    b. Select an identity in the **Available** list.
    c. Click  .

       The identity is added to the **Selected** list.

    d. Click **OK**.
31. Specify whether you want the alert group to automatically update.
32. If you selected **Between these dates** in the previous step, select a start date and an end date by clicking  .
33. Specify the number of early warning runs to keep on disk.
34. Click **Save**.

Create Defaults for an Enterprise Analytic Alert Group

An administrator can edit many of the early warning defaults for an alert in the **Early Warning** workspace.

Perform the following steps to create defaults for an enterprise analytic alert group:

1. Click  .

   The Enterprise Analytic Defaults window appears.
2. Select a product reporting variable:
    a. Click **Select**.

       The Select Reporting Variables dialog box appears.

    b. Select a reporting variable in the **Available Reporting Variables** list.
    c. Click 

       The reporting variable is added to the **Selected Reporting Variables** list.

    d. Click **OK**.
3. Select an event reporting variable:
    a. Click **Select**.

       The Select Reporting Variables dialog box appears.

    b. Select a reporting variable in the **Available Reporting Variables** list.

c. Click 

The reporting variable is added to the **Selected Reporting Variables** list.

d. Click **OK**.

4. Specify the analyses to perform.
5. If you specified a production period, select a production period alert alpha level.
6. If you specified an event period, select an event period alert alpha level.
7. Specify the monitoring time window length.
8. Select the analysis interval units.
9. Specify whether to reconcile analyses.
10. Specify the event rate estimation time window.
11. Specify the alert gap time window.
12. Specify the event cost parameter.

a. Click **Select**.

The Select Event Cost Parameter dialog box appears.

b. Select a variable in the **Available Variables** list.

c. Click 

The variable is added to the **Selected Variables** list.

Note: You can reorder the relative position of a selected variable by clicking  or  .

d. Click **OK**.

13. Specify the minimum event records for defined entity.
14. Specify the minimum production unit count.
15. Specify the minimum events per period for event analysis.
16. Specify the minimum production periods for product analysis.
17. Specify the analyses to apply seasonal adjustment.

Note: If you deselect **Event Period** or **Production Period**, but keep the value of **Analyses to perform** as `Both production period and event period`, then the deselection of **Event Period** or **Production Period** will not be saved. So if you want to save a selection for **Event Period** or **Production Period**, make sure the value of **Analyses to perform** is consistent with your selection for the analyses to apply seasonal adjustment.

18. Select the seasonality interval.
19. Specify the seasonal factor estimation time window length.
20. Specify the minimum number of years for seasonal calculation.
21. Select the initial selection.
22. Select the seasonal factor removal.
23. Specify the consistency check.
24. Specify the seasonal factor removal for consistency check.

25. Select the method of notification from the menu.
26. If you selected a method of notification, specify the users that you want to notify.
    a. Click **Select**.

       The Notify Users dialog box appears.

    b. Select an identity in the **Available** list.
    c. Click  .

       The identity is added to the **Selected** list.

    d. Click **OK**.
27. Specify whether you want the alert group to automatically update.
28. If you selected **Between these dates** in the previous step, select a start date and an end date by clicking  .
29. Specify the number of early warning runs to keep on disk.
30. Click **Update Defaults Options**.

Modify an Enterprise Analytic Alert Group

Perform the following steps to modify an enterprise analytic alert group:

1. Select an alert group in the table.
2. Click  .

   Fields that define the alert group appear in a window.
3. Modify the fields that you want to change.
4. Click **Save**.

Delete an Enterprise Analytic Alert Group

Perform the following steps to delete an enterprise analytic alert group:

1. Select an alert group in the table.
2. Click  .

   A Confirmation dialog box appears.
3. Click **Delete**.

Copy an Enterprise Analytic Alert Group

Perform the following steps to copy an enterprise analytic alert group:

1. Select an alert group in the table.
2. Click  .

A copy of the enterprise analytic alert group appears in the table.

Replace a Data Selection for the Selected Alert Group

Perform the following steps to replace a data selection for a selected alert group:

1. Select an alert group in the table.
2. Click  .

   The Replace Data Selection window appears.
3. Select a data selection in the list to replace the one that is currently being used.

   Note: You can use the **Search** text box 

   to narrow the list of available data selections. The list of data selections in the table updates to match what you have typed so far. You can also use the drop-down menu to filter the type of data selections that appear in the table.
4. (Optional) Click **View Summary** to view additional information about the selected data selection.

   A View Summary window appears with additional information about the data selection. Click **OK** when you have finished viewing information about the data selection.
5. Click **Save**.

Manage Subscriptions for an Enterprise Analytic Alert Group

Perform the following steps to manage subscriptions for an enterprise analytic alert group:

1. Select an alert group in the table.
2. Click  .

   The Manage Enterprise Analytic Alert Subscriptions dialog box appears.
3. Select an identity in the **Available** list.

   Note: You can use the **Search** text box to help you find an identity.
4. Click  .

   The identity is added to the **Selected** list.

   Note: You can click  or  to reorder the relative position of selected identities.
5. Click **Next**.
6. Modify any fields that you are allowed to change.
7. Click **Finish**.

Ad Hoc Analytic

Create Defaults for an Ad Hoc Analytic Alert Group

Perform the following steps to create defaults for an ad hoc analytic alert group:

1. Click  .

   The Ad Hoc Analytic Defaults window appears.
2. Select a reporting variable:
   a. Click **Select**.

      The Select Reporting Variables dialog box appears.
   b. Select a reporting variable in the **Available** list.
   c. Click 

      The reporting variable is added to the **Selected** list.
   d. Click **OK**.
3. Specify the monitoring time window length.
4. Specify the production period alert alpha level.
5. Specify the warranty time length.
6. Specify the event period alert alpha level.
7. Specify the event cost parameter.
   a. Click **Select**.

      The Select Event Cost Parameter dialog box appears.
   b. Select a variable in the **Available Variables** list.
   c. Click 

      The variable is added to the **Selected Variables** list.

      Note: You can reorder the relative position of a selected variable by clicking  or  .
   d. Click **OK**.
8. Specify the event rate estimation time window.
9. Specify the minimum number of production periods.
10. Select the value to display.
11. Select the method of notification from the menu.
12. If you selected a method of notification, specify the users that you want to notify.
    a. Click **Select**.

       The Notify Users dialog box appears.

b. Select an identity in the **Available** list.

c. Click  .

The identity is added to the **Selected** list.

d. Click **OK**.

13. Specify whether you want the alert group analysis to automatically update.
14. If you selected **Between these dates** in the previous step, select a start date and an end date by clicking  .
15. Click **Update Defaults Options**.

Manage Subscriptions for an Ad Hoc Analytic Alert Group

Perform the following steps to manage subscriptions for an ad hoc analytic alert group:

1. Select an alert group in the table.
2. Click  .

   The Manage Ad Hoc Analytic Alert Subscriptions window appears.
3. Select an identity in the **Available** list.

   Note: You can use the search text box to help you find an identity.
4. Click  .

   The identity is added to the **Selected** list.

   Note: You can click  or  to reorder the relative position of selected users.
5. Click **Next**.
6. Modify any fields that you are allowed to change.
7. Click **Finish**.

Ad Hoc Threshold

Create Defaults for an Ad Hoc Threshold Alert Group

Perform the following steps to create defaults for an ad hoc threshold alert group:

1. Click  .

   The Ad Hoc Threshold Defaults window appears.
2. Select a reporting variable:

   a. Click **Select**.

   The Select Reporting Variables dialog box appears.

b. Select a reporting variable in the **Available** list.

c. Click 

The reporting variable is added to the **Selected** list.

d. Click **OK**.

3. Select an analysis variable:

a. Click **Select**.

The Select Analysis Variables dialog box appears.

b. Select an analysis variable in the **Available** list.

c. Click 

The reporting variable is added to the **Selected** list.

d. Click **OK**.

4. Select the time in service point of view.
5. Select the calculation method.
6. If you selected **Adjusted** or **Extrapolated** as the calculation method, specify whether you want to apply usage profiles.
7. If you specified that you want to apply usage profiles, select the usage type.
8. If you specified that you want to apply usage profiles, select a warranty program usage limitation.
9. Specify a threshold value.
10. Specify whether you want to include pre-delivery claims.
11. Select the claims per unit to include.
12. Specify the maximum exposure.

a. Click **Select**.

The Select Maximum Exposure dialog box appears.

b. Select a variable from the list.

c. Click **OK**.

13. Specify the maturity level.

a. Click **Select**.

The Select Maturity Level dialog box appears.

b. Select a variable from the list.

c. Click **OK**.

14. Select the minimum sample size type from the menu.
15. If you specified a minimum sample size type, specify a minimum sample size.
16. Specify whether you want to use claim submit lag.
17. Select a title from the menu.
18. If you selected **Custom text** as the title, provide the text that you want as the title in the text box.

19. Select a subtitle from the menu.
20. If you selected **Custom text** as the subtitle, provide the text that you want as the subtitle in the text box.
21. Select a footnote from the menu.
22. If you selected **Custom text** as the footnote, provide the text that you want as the footnote in the text box.
23. Specify the number of bars that you want to display.
24. Select the value to display from the menu.
25. Select the method of notification from the menu.
26. Specify the users that you want to notify if you have selected a method of notification.
    a. Click **Select**.

       The Notify Users window appears.

    b. Select a user or group in the **Available** list.
    c. Click  .

       The user or group is added to the **Selected** list.

    d. Click **OK**.
27. Specify whether you want the analysis to automatically update.
28. If you selected **Between these dates** in the previous step, select a start date and an end date by clicking  .
29. Click **Update Defaults Options**.

Manage Subscriptions for an Ad Hoc Threshold Alert Group

Perform the following steps to manage subscriptions for an ad hoc threshold alert group:

1. Select an alert group in the table.
2. Click  .

   The Manage Ad Hoc Threshold Alert Subscriptions window appears.
3. Select an identity in the **Available** list.

   Note: You can use the **Search** text box to help you find an identity.
4. Click  .

   The identity is added to the **Selected** list.

   Note: You can click  or  to reorder the relative position of selected identities.
5. Click **Next**.
6. Modify any fields that you are allowed to change.
7. Click **Finish**.

Note: The **All Alerts** option lists all the available alerts to the user. If a user has selected **My Subscribed Alerts** and creates a new analysis, then the newly added analysis is displayed under the **All Alerts** option. If the user subscribes to this newly added analysis by adding or managing subscriptions, then only the newly created analysis is displayed under the **My Subscribed Alerts** option.

Chapter 16

Restore, Reset, or Remove Early Warning Enterprise Alert Groups

Backing Out and Rerunning EWEA

The Early Warning Enterprise Analytic (EWEA) process always displays a running list of alerts with their status. After each run, the current list of alerts is reconciled with the previous list of reports. However, in the background, SAS Field Quality Analytics saves several snapshots of alert lists, each relative to a previous run of the automated process. In some situations, it might be necessary to back out of one or more runs of EWEA reports. This back-out functionality is useful when circumstances occur that make the run results invalid (for example, when it is found that a significant amount of incorrect data might have been loaded into the SAS Field Quality Analytics data mart, causing the EWEA results to be misleading).

SAS Field Quality Analytics provides an administrative utility that accomplishes the following EWEA tasks:

- completely reset all EWEA run groups
- reset a specific EWEA run group
- restore a specific EWEA run group to a previous run
- delete a specific EWEA run group
- activate or deactivate a specific EWEA run group

When the utility is used to back out of EWEA runs, it is typically followed by a regularly scheduled or ad hoc run of the EWEA process. This utility is executed via the macro file wrna_eireset.sas in a SAS session on the server. This macro file is found in the directory where the SAS Field Quality Analytics macros are located. For Windows, this is the path **`<SAS Root>\wrtyanlmva\ucmacros`**. The Wrnaout and Mfgapp libraries must be allocated in the SAS session that executes this macro.

Please note that wrna_eireset.sas should be executed by a SAS Field Quality Analytics administrator only during a time period when all users are restricted from the system.

The following table provides information about the macro parameters defined for wrna_eireset.sas:

Table 16.1 *Macro Parameters for wrna_eireset.sas*

Macro Parameter	Value
&p_task	**1, 2, 3,** or **4** • Task 1: Reset all alert groups, or reset a specified alert group. • Task 2: Restore an alert group from a previous run. • Task 3: Remove an alert group from SAS Field Quality Analytics. • Task 4: Deactivate or activate an alert group.
&p_alertgroupid	Existing alert group ID. Required if **&p_task=2, 3,** or **4**. This is the alert group that will be reset, removed, activated, or deactivated, depending on **&p_task**.
&p_actdeactflg	Required if **&p_task=4**. Possible Values: **a** or **A** (Activate), **d** or **D** (Deactivate).
&p_updatestartdate	Date string in the DATE9 format (ddmmmyyyy). This is the Auto Update Start Date. Required if **&p_task=4** and **p_actdeactflg=a** or **A**.
&p_updateenddate	Date string in the DATE9 format (ddmmmyyyy). This is the Auto Update End Date. Required if **&p_task=4** and **p_actdeactflg=a** or **A**.

Note: A user should have administrative permissions when using wrna_eireset.sas.

Completely Resetting EWEA

After going live with SAS Field Quality Analytics, it is possible that conditions might arise that warrant a complete reset of the EWEA process. An example of this would be when a decision is made to change the defined hierarchy for products across all run groups. A complete reset of EWEA means that all historical runs from the past would be deleted from the SAS Field Quality Analytics application, including all statuses and notes assigned to those past EWEA alerts. The administrator could manually export the past alert details for reference, but they would no longer be available to the EWEA process once removed.

The administrator should start by making the necessary changes to the EWEA configuration. When this has been done, the next step is to remove old run group information. In order to perform this action, you need to run wrna_eireset.sas. Running wrna_eireset.sas with parameter **&p_task=1** and blank **&p_alertgroupid** resets all alert group IDs and deletes all results data sets for all alert groups. Below is a listing of the data sets:

```
wrnaout.EIENTERPRISE_ALERTS_<analysisid>
wrnaout.EIENTERPRISE_OUTPUT_<analysisid>
wrnaout.EIENTERPRISE_WUMKR_<analysisid>
wrnaout.EIENTERPRISE_WMEXT_<analysisid>
wrnaout.EIENTERPRISE_MAEXT_<analysisid>
```

This action also deletes the following for all available values of N. These are the previous run data sets:

```
wrnaout.EIENT_ALERTS_<analysisid>_N
wrnaout.EIENT_OUTPUT_<analysisid>_N
wrnaout.EIENT_WUMKR_<analysisid>_N
wrnaout.EIENT_WMEXT_<analysisid>_N
wrnaout.EIENT_MAEXT_<analysisid>_N
```

Finally, this action removes alert group records from Mfgapp tables Ei_Enterprise_Meta, Ei_Alert_Assign_Status_Info, and Analysis_Messages.

When the administrator has completed these actions, all of the early warning results are permanently removed. The administrator can then choose to rerun the EWEA process manually to initialize the newly configured run groups or wait for the weekly scheduled batch process to run.

Restoring a Specific EWEA Run Group

The restore functionality enables the administrator to restore a specified alert group to a previous alert group run. You can specify a run backup date from the list of available backup dates. The historical run data sets for each alert group are created at the time immediately before the current results are updated, and the date of this backup is the date that is provided in the list of available dates. The results output data sets for the alert group are replaced with the results data sets from the previous run.

You can restore the specified **&p_alertgroupid** to a previous run with parameter **&p_task=2**. This derives a list of the previous backup dates for **&p_alertgroupid** by using the date that the result data sets were created. After entering one of the available backup dates, the user is prompted to enter a data-as-of date for the restore. An approximate date is prepopulated in the Entry box using the stored Batch Job Run Date. The prepopulated date can be used, or it can be replaced with another date as needed.

Note: Because of the prompting requirements, this task can be run only in a DMS SAS session. An error occurs if you attempt to run this from SAS Data Integration Studio or from SAS Enterprise Guide.

When you restore a specific EWEA run group:

- The results data sets are replaced with the specified run data sets.
- The restored alert group alert count (number of rows in the restored alerts data set) is updated in Mfgapp table Ei_Enterprise_Meta.

- The data-as-of datetime column (DATA_AS_OF_DTTM) in Mfgapp table Domain_Object_Meta is updated with the specified data-as-of value, and the Status column (DOMAIN_OBJ_STATUS_CD) is set to COMPLETED.

Resetting a Specific EWEA Run Group

In some situations, the administrator might need to reset a single EWEA run group. For example, maybe the defined entity needs to be changed only for one run group. A reset of a single run group in EWEA means that all historical runs from the past for only that one run group would be deleted from the SAS Field Quality Analytics application, including any statuses or notes assigned to the EWEA alerts for the run group. See "Completely Resetting EWEA" on page 202 for more information. Similar to completely resetting EWEA, the administrator could choose to manually export the past alert details for reference before resetting the run group.

Running wrna_eireset.sas with **`&p_task=1`** resets the specified **`&p_alertgroupid`**.

When the run is complete, all of the early warning results for the specified run group are permanently removed. It is recommended then that the EWEA administrator allow the next weekly scheduled EWEA batch process to handle the job of generating the first run for the newly configured run group, as well as updating all other previously existing run groups.

Deleting a Specific EWEA Run Group

The administrator can remove a specified alert group entirely from SAS Field Quality Analytics. This entails deleting all result data sets and removing entries from the Mfgapp tables for that alert group.

`&p_task=3` resets the specified **`&p_alertgroupid`** and then deletes entries in the following Mfgapp tables:

- Analysis_Instance_Param
- Analysis_Instance
- Batch_Info
- Batch_Job_Step_Info
- Batch_Job_Info

Activating or Deactivating a Specific EWEA Run Group

The administrator can deactivate or activate a specified alert group. This entails disabling or enabling the Auto Batch Run process for that alert group. When activating, you specify the Auto Batch Start Date and the Auto Batch End Date on parameters **`&p_updatestartdate`** and **`&p_updateenddate`**. With **`&p_task=4`** for **`&p_alertgroupid`**, the parameter **`&p_actdeactflg=D`** updates Mfgapp table

Analysis_Instance_Param by setting **`param_value_txt="Never"`** for parameter **`autoupdate`** and setting to NULL the values for parameters **`autostart`** and **`autoend`**.

With **`&p_task=4`** for **`&p_alertgroupid`**, the parameter **`&p_actdeactflg=A`** updates Mfgapp table Analysis_Instance_Param by setting **`param_value_txt="BetweenTheseDates"`** for parameter **`autoupdate`** and setting the values for parameters **`autostart`** and **`autoend`** to the start and end dates specified on parameters **`&p_updatestartdate`** and **`&p_updateenddate`**.

Part 4

Managing Data Selection Information

Chapter 17

Overview of Managing Data Selection Information

Overview of Managing Data Selection Information

You can manage data selection information from the **Data Selection** workspace in SAS Field Quality Analytics.

Note: You need to log on to SAS Field Quality Analytics as a user with administrative permissions to manage data selection information from the **Data Selection** workspace.

For more information about managing data selection information from the **Data Selection** workspace, see Chapter 18, "Managing Data Selection Templates," on page 211.

For additional information about how to manage information in the SAS Field Quality Analytics application, see "Overview of the Administration Workspace" on page 221.

Chapter 18

Managing Data Selection Templates

About Managing Data Selection Templates

This chapter contains tasks that you can perform to manage data selection templates in the **Data Selection Templates** view of the **Data Selection** workspace.

Note: Managing data selection templates requires administrative permissions.

For more information about data selection templates, see the *SAS Field Quality Analytics 6.1: User's Guide*.

Specify a Default Template

Perform the following steps to specify a default template:

1. Select a data selection template in the table.
2. Click  .

   The Make Default dialog box appears.
3. Click **Yes**.

Note: If a template is shared with you, you will not be able to specify the template as default.

Clear a Default Template

Perform the following steps to clear a default template:

1. Select the data selection template in the table that has been made the default template.
2. Click  .

   The Clear Default dialog box appears.
3. Click **Yes**.

Part 5

Managing Analysis Information

Chapter 19

Overview of Managing Analysis Information

Overview of Managing Analysis Information

You can manage analysis information from the **Analysis** workspace in the SAS Field Quality Analytics application.

Note: You need to log on to the SAS Field Quality Analytics application as a user with administrative permissions to manage analysis information from the **Analysis** workspace.

For more information about managing analysis information from the **Analysis** workspace, see Chapter 20, “Modifying Analysis Information,” on page 217.

For additional information about how to manage information in the SAS Field Quality Analytics application, see “Overview of the Administration Workspace” on page 221.

Chapter 20

Modifying Analysis Information

Overview of Modifying Analysis Information

This chapter contains topics about how you can modify analysis information from the **Analysis** workspace, or tasks that you need to perform to set up an analysis.

Modify Analysis Default Option Values

An administrator can edit many of the analysis defaults for an analysis in the **Analysis** workspace.

Perform the following steps to modify analysis default option values:

1. Click  .

   The New Analysis dialog box appears.

2. Select an analysis from the **Available Analyses** list, and then click .

   The analysis is added to the **Selected Analyses** list.

3. Specify that you want to set analysis default option values.
4. Click **OK**.

   A window with default option values for the analysis appears.

   Note: Due to screen interactions and off-screen settings, all options might not be shown, and you cannot select all values. Due to interactions, some settings might be updated that you do not directly change.

5. Modify any fields that you are allowed to change.

   Note: Changes to check box states will not be preserved.

6. Click **Update Default Options**.

Implement Claim Submit Lag for an Event Forecasting Analysis

If claim submit lag is not configured through the extract, transform, and load process, you need to include claim submit lag as a required variable in the **Data Variables** section of the **Administration** workspace for an event forecasting analysis.

Part 6

The Administration Workspace

Chapter 21

Overview of the Administration Workspace

Overview of the Administration Workspace

The **Administration** workspace enables you to manage administrative tasks in SAS Field Quality Analytics.

Users with administrative rights have access to the **Administration** workspace.

To access the **Administration** workspace, click **Administration** in the main menu. Administrative users can perform the following tasks:

- view, create, and modify administrative messages. See Chapter 22, “Messages,” on page 223 for more information about viewing, creating, and modifying administrative messages in SAS Field Quality Analytics.
- modify data variables. See Chapter 23, “Data Variables,” on page 227 for more information about modifying data variables in SAS Field Quality Analytics.
- view and modify data level security settings. See Chapter 24, “Data Security,” on page 229 for more information about modifying row and column level security in SAS Field Quality Analytics.
- view and modify object security. See Chapter 25, “Object Security,” on page 233 for more information about viewing and modifying object level security in SAS Field Quality Analytics.
- view batch information status. See Chapter 26, “Batch Status,” on page 237 for more information about viewing batch information status in SAS Field Quality Analytics.
- view extract, transform, and load (ETL) status. See Chapter 27, “ETL Status,” on page 243 for more information about viewing ETL status in SAS Field Quality Analytics.
- use the content migration workspace to assist with importing prior work into SAS Field Quality Analytics or perform a partial promotion of your content. See Chapter 8, “Migration,” on page 63 for more information about migrating content into SAS Field Quality Analytics, and “Migrating Content in the Administration Workspace” on page 106 for more information about migrating content using the **Administration** workspace.

  Note: Only the internal administrator (as opposed to the site administrator) can migrate content.

- view and modify warranty configuration information. See Chapter 7, “Installing and Configuring SAS Field Quality Analytics,” on page 27 and “Overview of Warranty Configuration” on page 249 for more information about viewing and modifying warranty configuration information in SAS Field Quality Analytics.

  Note: Only the internal administrator (as opposed to the site administrator) can import or update the warranty configuration.

- view and modify system configuration status. See Chapter 30, “System Configuration,” on page 251 for more information about viewing and modifying system configuration information in SAS Field Quality Analytics.

Chapter 22

Messages

Overview of Messages

You can view or modify messages by selecting **Messages** in the **Administration** workspace.

Note: To view or modify messages, you must have administrator user permissions.

Open a Message

Perform the following steps to open a message in the **Administration** workspace:

1. Click **Messages**.
2. Select a message in the table.
3. Click **Open**.

   Note: Alternatively, double-click the message to open it.

Create a Message

Perform the following steps to create a message in the **Administration** workspace:

1. Click **Messages**.
2. Click  .

   The New Message window appears.
3. Provide the title for the message.
4. Provide text for the message.
5. (Optional) Add a hyperlink:
   a. Click  .

      A new row appears.
   b. Provide the text to display, address, and tooltip information in the respective columns.

   Note: You can reorder the relative position of hyperlinks in the list by selecting a hyperlink, and then clicking  or  .
6. (Optional) Remove a hyperlink:
   a. Select a hyperlink in the table.
   b. Click  .

      A confirmation dialog box appears.
   c. Click **Remove**.
7. Specify whether you want the message to expire on a date.
8. If you specified that you want the message to expire, click  , and then select the date from the menu that appears.
9. Click **Save**.

Edit a Message

Perform the following steps to edit a message in the **Administration** workspace:

1. Click **Messages**.
2. Select a message in the table that you want to modify.
3. Click  .

   A window appears.

4. Modify any fields that you are allowed to change.
5. Click **Save**.

Delete a Message

Perform the following steps to delete a message in the **Administration** workspace:

1. Click **Messages**.
2. Select a message in the table that you want to delete.
3. Click .

   A confirmation dialog box appears.
4. Click **Yes**.

Refresh Messages

Perform the following steps to refresh messages in the **Administration** workspace:

1. Click **Messages**.
2. Click  .

Search for a Message

Perform the following steps to search for a message:

1. Type terms that you want to search for in the **Search** text box.

   Items that match what you have typed so far are displayed in the table. To return to the complete list of available items, clear the text that you have entered in the **Search** text box, or click  .
2. (Optional) Click **Save Search** to save your search terms for a future use.
   a. The Save Search dialog box appears.
   b. Provide a name for the search.
   c. Provide a description for the search.
   d. Click **Save**.

Note: To use a saved search, click  , and then select a search from the list of saved searches. To delete a saved search or adjust the order of saved searches, click  and select **Manage Saved Searches**. The Manage Saved Searches dialog box appears. Select a saved search, and then click  to delete, or use the  and  buttons to reorder the relative position of saved searches.

Sort Rows

For information about how to sort rows, see "Modify Your View of Columns and Rows" on page 281.

Manage Columns

For information about how to manage columns, see "Modify Your View of Columns and Rows" on page 281.

Chapter 23

Data Variables

Overview of Data Variables

You can view or modify data variables by selecting **Data Variables** in the **Administration** workspace.

Note:

- To view or modify administrative data variables, you must have administrator user permissions.
- It is recommended that only internal administrators who set up and configure SAS Field Quality Analytics should modify data variables.

View Data Variables

Perform the following steps to view a data variable in the **Administration** workspace:

1. Click **Data Variables**.
2. Select a table from the **Table Name** menu.
3. Click **Select**.

   A dialog box appears that contains available variables from the selected table.
4. Select a variable from the list.

   Note: You can use the **Search** text box (

) to help you narrow your search of available variables. Items that match what you have typed so far are displayed in the table. To return to the complete list of available items, clear the text that you have entered in the **Search** text box, or click  .

5. Click **OK**.

Modify Variable Values

Perform the following steps to modify variable values in the **Administration** workspace:

1. Click **Data Variables**.
2. Select a table from the **Table Name** menu.
3. Click **Select**.

   A dialog box appears that contains available variables from the selected table.
4. Select a variable from the list.

   Note: You can use the **Search** text box () to help you narrow your search of available variables. Items that match what you have typed so far are displayed in the table. To return to the complete list of available items, clear the text that you have entered in the **Search** text box, or click  .
5. Click **OK**.
6. Select the cell in the **Value** column for each attribute that you want to modify.

   Note: In some cells, you can enter the value. In other cells, you must select a value option from a menu, or click **Select** to open a dialog box that enables you to select from available options. Some attribute values cannot be modified.

   If you want to remove your changes, click **Undo All**.
7. Click **Apply** after you have finished modifying a variable's attribute values.

Note: The field **Include in Data Selection User Interface** does not affect any area of the SAS Field Quality Analytics application.

Chapter 24

Data Security

Overview of Data Security

Row-level security assigns permissions for access to rows in a table. Row-level security can include filters that are associated with users, groups, or roles. Column-level security assigns permissions for access to table columns. You can manage data security, also known as row- and column-level security, in SAS Field Quality Analytics by selecting **Data Security** in the **Administration** workspace.

Note:

- To manage security in SAS Field Quality Analytics, you must have administrator user permissions.
- Column-level security should be applied in the same way to columns with the same name in different tables.
- Analysis output does not render properly if an analysis option is secured after an analysis is created.

Open an Attribute

Perform the following steps to open an attribute:

1. Click **Data Security** in the **Administration** workspace.
2. Select an attribute in the table.

3. Click **Open**.

   Note: Alternatively, you can double-click an attribute to open it.

Modify Data Security for an Attribute

Perform the following steps to modify data security for an attribute:

1. Click **Data Security** in the **Administration** workspace.
2. Select an attribute in the table.
3. Click  .

   The users, groups, and roles that you can apply row- and column-level security to appear in a window.
4. (Optional) Filter the identities that you want to apply security for by using the **Search** box, or select an identity from the **Type** menu.
5. Select an identity in the **Available Identities** list.
6. Click  .

   The identity is added to the **Selected Identities** list.

   Note: You can reorder the relative position of selected identities by selecting  or  .

   To remove a selected identity, select the identity in the **Selected Identities** list, and then click  . The identity is moved to the **Available Identities** list.
7. Click the identity in the **Selected Identities** list, and then specify whether the column should be accessible.
8. (Optional) Add a permission for a selected identity.

   Note: This feature is not available for all attributes.

   a. Select the identity in the **Selected Identities** list.

   b. Click **Add**.

      The Attribute Value Permissions dialog box appears.

   c. Select an operator.

   d. Select or provide the values.

   e. Click **OK**.
9. (Optional) Edit a permission for a selected identity.

   Note: This feature is not available for all attributes.

   a. Select the identity in the **Selected Identities** list.

   b. Select the attribute value permission for the identity that you want to modify.

   c. Click **Edit**.

A dialog box appears.

d. Modify the fields that you are allowed to change.

e. Click **OK**.

10. (Optional) Delete an attribute value permission for a selected identity.

Note: This feature is not available for all attributes.

a. Select the identity in the **Selected Identities** list.

b. Select the attribute value permission that you want to delete.

c. Click **Delete**.

11. Click **Save**.

Refresh Data Security for an Attribute

Perform the following steps to refresh the data security settings for an attribute.

1. Click **Data Security** in the **Administration** workspace
2. Click  .

Search for an Attribute

Perform the following steps to search for an attribute:

1. Type terms that you want to search for in the **Search** text box.

Note: You can search for an attribute or an identity.

Items that match what you have typed so far are displayed in the table. To return to the complete list of available attributes, clear the text that you have entered in the **Search** text box, or click  .

2. (Optional) Click **Save Search** to save your search terms for a future use.

a. The Save Search dialog box appears.

b. Provide a name for the search.

c. Provide a description for the search.

d. Click **Save**.

Note: To use a saved search, click  , and then select a search from the list of saved searches. To delete a saved search or adjust the order of saved searches, click  and select **Manage Saved Searches**. The Manage Saved Searches

dialog box appears. Select a saved search, and then click  to delete, or use the  and  buttons to reorder the relative position of saved searches.

Sort Rows in the Table of Attributes

For information about how to sort rows, see "Modify Your View of Columns and Rows" on page 281.

Manage Columns in the Table of Attributes

For information about how to manage columns, see "Modify Your View of Columns and Rows" on page 281.

Chapter 25

Object Security

Overview of Object Security in the Administration Workspace

You can manage object security in SAS Field Quality Analytics by selecting **Object Security** in the **Administration** workspace. Object security assigns permissions for actions, such as refreshing the cache.

Note: To manage object security in SAS Field Quality Analytics, you must have administrator user permissions.

View Object Security for an Action

Perform the following steps to view object security for an action.

1. Click **Object Security** in the **Administration** workspace.
2. Select an action ID in the table.
3. Click **Open**.

   Note: Alternatively, you can double-click an object to open it.

   Object security for each identity type is displayed.

Modify Object Security

Perform the following steps to modify object security:

1. Click **Object Security** in the **Administration** workspace.
2. Select an action ID in the table.
3. Click  .

   Object security for each identity type is displayed.
4. (Optional) Modify the permission for an identity type.
   a. Select the identity in the table that you want to modify.

      Note: You can use the **Search** text box or **Type** drop-down menu to help you find an identity in the table.

   b. Click the cell in the **Permitted** column, and select the check box to enable permission for the object, or deselect the check box to disable permission for the object.
5. (Optional) Add a user or group.
   a. Click  .

      A new row is added to the table.

   b. Provide the name of the identity.
   c. Click the cell in the **Permitted** column, and select the check box to enable permission for the object, or deselect the check box to disable permission for the object.
6. (Optional) Remove an identity.
   a. Select the identity in the table that you want to remove.
   b. Click  .
7. Click **Save**.

Modify Permissions for an Object by Identity

Perform the following steps to modify permissions for an object by identity:

1. Click **Object Security** in the **Administration** workspace.
2. Click  .

   The Manage Effective Permissions window appears.
3. Select the identity that you want to modify permissions for in the table.

   Note: You can search for an identity with the **Search** text box or filter identities by using the **Type** menu. When you use the **Search** text box, the list of identities is

updated with whatever matches the text you have typed so far. To return to the complete list of available identities, clear the text that you have entered in the **Search** text box, or click .

The effective permissions for the selected identity are displayed in the table.

4. Select the module that you want to modify permissions for.

   Note: You can search for a module with the **Search** text box or filter modules using the **Module** menu. When you use the **Search** text box, the list of modules is updated with whatever matches the text you have typed so far. To return to the complete list of available modules for the selected identity, clear the text that you have entered in the **Search** text box, or click .

   The **Permit** and **Inherit** columns show the module's permission status for the selected identity and indicate whether the module's permission has been inherited based on the identity's membership status.

5. Select the **Permit** or **Inherit** check boxes to enable permission for the object, or deselect the check boxes to disable permission for the object.
6. Click **Apply**.
7. Click **Save**.

Search for an Object

Perform the following steps to search for an object:

1. Type terms that you want to search for in the **Search** text box.

   Items that match what you have typed so far are displayed in the table. To return to the complete list of available objects, clear the text that you have entered in the **Search** text box, or click .

2. (Optional) Click **Save Search** to save your search terms for a future use.
   a. The Save Search dialog box appears.
   b. Provide a name for the search.
   c. Provide a description for the search.
   d. Click **Save**.

   Note: To use a saved search, click , and then select a search from the list of saved searches. To delete a saved search or adjust the order of saved searches, click and select **Manage Saved Searches**. The Manage Saved Searches dialog box appears. Select a saved search, and then click to delete, or use the and buttons to reorder the relative position of saved searches.

Refresh Object Security

Perform the following steps to refresh object security:

1. Click **Object Security** in the **Administration** workspace.
2. Click  .

Sort Rows in the Table of Objects

For information about how to sort rows, see "Modify Your View of Columns and Rows" on page 281.

Manage Columns in the Table of Objects

For information about how to manage columns, see "Modify Your View of Columns and Rows" on page 281.

Chapter 26

Batch Status

Overview of Batch Status

SAS Field Quality Analytics batch processing can be used to perform a bulk refresh (run) of an analysis with the latest information available in the data mart.

A regular batch process is the default mode of batch process that would run after every ETL. A regular batch process can be triggered by specifying the analysis types that need to run in the batch process. A setting to specify all types is also available. Based on the types requested, the batch subsystem navigates through all the analyses of the given types to determine the analyses that need to run in the particular batch cycle. The following parameters are used in the determination logic:

- The analysis is marked for auto-update, and the current date falls within the specified auto-update date range.
- The analysis needs a refresh based on when it was last refreshed, if ever.

A forced execution batch process can be used to force a refresh or rerun of a particular analysis or a set of analyses without considering any of the auto-update settings or last refreshed logic. This is similar to a rerun from the SAS Field Quality Analytics application. The difference is that it is executed in a controlled batch environment. This type of batch run can be performed only by an administrator, and the results are preserved as part of the batch history.

After an ETL refresh completes, a regular batch run for all types of analyses is triggered. A batch run, either regular or forced execution, can also be triggered explicitly by using

a REST URL. In addition, the REST URL can be used to view the available batch history and purge this history. Information about this usage of the REST URL is documented in the following sections.

Batch Access by REST URL

View Batch History

You can view batch history with the following URL:

```
http://{server}/SASFieldQualityAnalytics/rest/batch/list
```

Note:

- {server} should be replaced with the server name.
- You can also view batch history from the **Administration** workspace in the SAS Field Quality Analytics application. See "View Batch Processing Information" on page 239 for more information.

The previous example URL would list all the batch runs that are retained in the system. You can navigate to a particular batch run by using the links that are provided. Using these links again triggers a REST URL to get details about the particular batch run. You can access all the details about the batch run, including which analyses (or data selections) were run as part of this batch run, their respective SAS execution logs, the start and end times, and so on.

Use Regular Batch Processing

Using a regular batch process lets you run analyses by types. Only one regular batch process can run at a time.

You can trigger a regular batch process for all types of analysis with the following URL:

```
http://{server}/SASFieldQualityAnalytics/rest/batch/analysis/types/All/execute
```

Note:

- {server} should be replaced with the server name.
- A regular batch process (with the All option) is triggered after every ETL refresh. So this URL-based triggering can be thought of as a secondary way to trigger a regular batch process (apart from the default automatic post-ETL trigger) and should be used only when needed.

You can trigger a regular batch process for specific types of analyses by using a comma-separated list of types as follows:

```
http://{server}/SASFieldQualityAnalytics/rest/batch/analysis/types/Exposure,
EIEnterprise, Pareto/execute
```

Note: {server} should be replaced with the server name.

The following types can be specified in the batch trigger URL:

```
Detail, Exposure, Forecasting, Geographic, Multivariate, Pareto, Reliability,
Statdriver, Textanalysis, Timeofclaim, Trend, Trendexp, Eienterprise,
Eianalytic, Eithreshold, Failrel, Crosstab
```

Use Batch Processing with the Forced Execution Option

Using a forced batch process lets you run analyses by IDs in forced execution mode. For example, auto-update settings as well as the mart refresh logic criteria are not checked for these types of runs. You can use a comma-separated list of IDs as follows:

```
http://{server}/SASFieldQualityAnalytics/rest/batch/analysis/ids/AEHPV94Z3F,
AEHPXUZBQV/forcedexecute
```

Note: In the previous code example, AEHPV94Z3F and AEHPXUZBQV are hypothetical IDs, and {server} should be replaced with the server name.

Purging Batch History

The number of regular batch history records to preserve and the number of forced batch history records to preserve are configurable. There are two different settings for these two types of batch histories: batch configuration property REGULAR_BATCH_MAX_NUMBER_OF_RECORD_TO_PERSIST indicates the number of historical regular batch records to persist in the application tables, and the batch configuration property FORCED_BATCH_MAX_NUMBER_OF_RECORD_TO_PERSIST indicates the number of historical forced batch records to persist in the application tables. These two properties can be configured via system configuration in the SAS Field Quality Analytics **Administration** workspace. See Chapter 30, "System Configuration," on page 251 for information about editing SAS Field Quality Analytics system configuration properties. Deletion of historical records is automatically triggered at an appropriate time based on the values of these batch configuration properties.

Deletion of a specific batch process can also be triggered manually by using a REST URL. This URL is not accessible through a regular browser, but only through the REST client, since Delete is a destructive action. For example, you could delete batch records by submitting the following URL with **`httpMethod=Delete`** from a valid REST client. There are various default REST clients available, such as Chrome Browser Plugins **Postman** and **Advanced Rest Client**:

```
http://{server}/SASFieldQualityAnalytics/rest/batch/Batch_HQ7UICWF/delete
```

Note: The batch ID (Batch_HQ7UICWF) in the previous example is hypothetical, and {server} should be replaced with the server name.

Batch Processing Access by Administration Workspace

View Batch Processing Information

Perform the following steps to view batch processing information in the SAS Field Quality Analytics application:

1. Select **Batch Status** in the **Administration** workspace.
2. Select a batch ID.
3. Click **Open**.

Note: Alternatively, double-click the batch ID to open it.

4. For all analyses except Enterprise Analytic: Right-click the job and select **View SAS Log** to view the SAS log on the browser, or select **Download SAS Log** to download the log file to disc.
5. For an Enterprise Analytic Analysis: Right-click the job and select **View Job Step Details** to open the job step listing. Right-click a job step and select **View SAS Log** to view the SAS log on the browser, or select **Download SAS Log** to download the log file to disc.

Note: To view batch processing information, you must have administrator user permissions.

Refresh Batch Processing Information

Perform the following steps to refresh batch processing information in the **Administration** workspace:

1. Click **Batch Status**.
2. Click  .

Search for a Batch ID

Perform the following steps to search for a batch ID:

1. Type terms that you want to search for in the **Search** text box.

Items that match what you have typed so far are displayed in the table. To return to the complete list of available items, clear the text that you have entered in the **Search** text box, or click  .

2. (Optional) Click **Save Search** to save your search terms for a future use.
   a. The Save Search dialog box appears.
   b. Provide a name for the search.
   c. (Optional) Provide a description for the search.
   d. Click **Save**.

Note: To use a saved search, click  , and then select a search from the list of saved searches. To delete a saved search or adjust the order of saved searches, click  and select **Manage Saved Searches**. The Manage Saved Searches dialog box appears. Select a saved search, and then click  to delete, or use the  and  buttons to reorder the relative position of saved searches.

Sort Rows

For information about how to sort rows, see "Modify Your View of Columns and Rows" on page 281.

Manage Columns

For information about how to manage columns, see "Modify Your View of Columns and Rows" on page 281.

Chapter 27

ETL Status

Overview of Extract, Transform, and Load (ETL) Status

You can view extract, transform, and load (ETL) status by selecting **ETL Status** in the **Administration** workspace.

Note: To view ETL status, you must have administrator user permissions.

View ETL Status

Perform the following steps to view ETL status:

1. Select **ETL Status** in the **Administration** workspace.
2. Select a cycle number.
3. Click **Open**.

   Note: Alternatively, double-click the cycle number to open it.
4. Right-click a job and select **View ETL Job Log** to view the SAS log on the browser, or select **Download ETL Job Log** to download the log file to disc.

Refresh ETL Status

Perform the following steps to refresh ETL status in the **Administration** workspace:

1. Click **ETL Status**.
2. Click .

Search for an ETL Cycle Number

Perform the following steps to search for an ETL cycle number:

1. Type terms that you want to search for in the **Search** text box.

Items that match what you have typed so far are displayed in the table. To return to the complete list of available items, clear the text that you have entered in the **Search** text box, or click .

2. (Optional) Click **Save Search** to save your search terms for a future use.
   a. The Save Search dialog box appears.
   b. Provide a name for the search.
   c. (Optional) Provide a description for the search.
   d. Click **Save**.

Note: To use a saved search, click , and then select a search from the list of saved searches. To delete a saved search or adjust the order of saved searches, click and select **Manage Saved Searches**. The Manage Saved Searches dialog box appears. Select a saved search, and then click to delete, or use the and buttons to reorder the relative position of saved searches.

Sort Rows

For information about how to sort rows, see "Modify Your View of Columns and Rows" on page 281.

Manage Columns

For information about how to manage columns, see "Modify Your View of Columns and Rows" on page 281.

Chapter 28

Content Migration

Overview of Content Migration

For information about how to use the **Content Migration** menu in the **Administration** workspace, see Chapter 8, “Migration,” on page 63, and “Migrating Content in the Administration Workspace” on page 106.

Chapter 29

Warranty Configuration

Overview of Warranty Configuration

For information about how to use the **Warranty Configuration** menu in the **Administration** workspace, see “Update Configuration” on page 50.

Chapter 30

System Configuration

Overview of System Configuration

You can view or modify system configuration property values by selecting **System Configuration** in the **Administration** workspace.

Note: To view or modify system configuration property values, you must have administrator user permissions.

Edit a System Configuration Property Value

Perform the following steps to edit a system configuration property value in the **Administration** workspace:

1. Click **System Configuration**.
2. Select a system configuration property in the table that you want to modify.
3. Click  .

   A System Configuration dialog box appears.
4. Modify the property value.
5. Click **Save**.

Note: The value of **`EI_ALERTS_TABLE_ROWS_PER_PAGE`** specifies the Early Warning Enterprise and Ad Hoc Analytic rows per page to display for the alerts table. The value of **`EI_MAX_ROWS_PER_PAGE_TO_KEEP_MULTIPLE_CHARTS_ENABLED`** specifies the maximum rows per page that are allowed in order for the multiple charts option to remain enabled. Multiple charts are enabled if the value of

EI_ALERTS_TABLE_ROWS_PER_PAGE is less than the value of **EI_MAX_ROWS_PER_PAGE_TO_KEEP_MULTIPLE_CHARTS_ENABLED**. Multiple charts are disabled otherwise. For example, if the value of **EI_ALERTS_TABLE_ROWS_PER_PAGE** is 20 and the value of **EI_MAX_ROWS_PER_PAGE_TO_KEEP_MULTIPLE_CHARTS_ENABLED** is 30, the alerts table will show 20 rows in a page, and the multiple charts option is enabled. If the value of **EI_ALERTS_TABLE_ROWS_PER_PAGE** is 20 and the value of **EI_MAX_ROWS_PER_PAGE_TO_KEEP_MULTIPLE_CHARTS_ENABLED** is 10, then the alerts table will show 20 rows in a page, and the multiple charts option is disabled.

Refresh System Configuration

Perform the following steps to refresh your view of system configuration property values in the **Administration** workspace:

1. Click **System Configuration**.
2. Click  .

Search for a System Configuration Property

Perform the following steps to search for a system configuration property:

1. Type terms that you want to search for in the **Search** text box.

   Items that match what you have typed so far are displayed in the table. To return to the complete list of items, clear the text that you have entered in the **Search** text box, or click  .

2. (Optional) Click **Save Search** to save your search terms for a future use.
   a. The Save Search dialog box appears.
   b. Provide a name for the search.
   c. Provide a description for the search.
   d. Click **Save**.

   Note: To use a saved search, click  , and then select a search from the list of saved searches. To delete a saved search or adjust the order of saved searches, click  and select **Manage Saved Searches**. The Manage Saved Searches dialog box appears. Select a saved search, and then click  to delete, or use the  and  buttons to reorder the relative position of saved searches.

Part 7

Data and System Administration

Chapter 31

Overview of Data and System Administration

Overview of Data and System Administration

The following chapters in this part contain additional information about data and system administration tasks for SAS Field Quality Analytics:

- Chapter 32, “Finding Scripts, Files, and Other System Components,” on page 257
- Chapter 33, “Starting and Stopping the System,” on page 259
- Chapter 34, “Using Business Rules with SAS Enterprise Guide,” on page 261
- “Increasing Memory” on page 277

Chapter 32

Finding Scripts, Files, and Other System Components

Overview

The physical locations that are described in this chapter are the default locations that are created during the standard installation and configuration processes. The on-site SAS support personnel working at your site are likely to change some or all of these locations when they customize your setup to meet your site's requirements. Your on-site SAS support personnel provide documentation of the locations for your site.

Finding Installation and Configuration Files

This administrator's guide indicates where you can find key resources by referring to the following two standard file system locations where SAS places the software:

- The SAS installation directory (written as <*SAS-installation-directory*>) refers to the directory path where the SAS installation process initially places the software bundle resources before any site-specific configuration.
- The SAS configuration directory (written as <*SAS-configuration-directory*>) refers to the directory path where the SAS configuration process writes the finalized software image.

Different files are written to these locations, depending on the server tier. Also, the on-site SAS support personnel who set up your system might change these locations. Your on-site SAS support personnel provide documentation of the exact paths to these locations for your site.

In general, you can find these locations in the following locations in a Windows environment:

- <*SAS-installation-directory*> defaults to **C:\Program Files*SAS-installation-directory***.
- <*SAS-configuration-directory*> defaults to **C:\SAS\<*ImageName*>**, where <*ImageName*> represents the site-specific name for your software bundle as defined in the SAS plan file that is part of your order.

In general, you can find these locations in the following locations in a UNIX environment:

- <*SAS-installation-directory*> defaults to **/usr/local/*SAS-installation-directory***.
- <*SAS-configuration-directory*> defaults to **/usr/local/<*ImageName*>**, where <*ImageName*> represents the site-specific name for your software bundle as defined in the SAS plan file that is part of your order.

Finding SAS Server Tier Components

Overview

This section contains information about SAS server tier components.

Data Library Directories

By default, the SAS Field Quality Analytics SAS libraries are found in the following subdirectories in the **<*SAS-configuration-directory*>\Lev1\AppData\SASFieldQualityAnalytics6.1** folder in a Windows environment: WRNAETL, WRNAFDL, WRNAOUT, WRNASTG, WRNATEXT.

The on-site SAS support personnel who set up your system might move some of these libraries to site-specific locations. You can view the locations of the data library directories in SAS Management Console under **Data Library Manager ⇨ Libraries**.

Chapter 33

Starting and Stopping the System

Overview

This section explains how to start and stop the entire SAS Field Quality Analytics system (which might consist of multiple machines).

Note: The scripts described in this chapter are the default scripts created by the standard installation and configuration process for the SAS Field Quality Analytics bundle. The on-site SAS support personnel who set up your site's system might have customized the scripts to make the starting and stopping process easier and more streamlined. On-site SAS support personnel provide documentation that describes these site-specific customizations.

Tier Dependencies

The SAS Field Quality Analytics middle tier depends on the resources available from the SAS Field Quality Analytics server tier. Because of this dependency, start up the system as follows:

1. SAS server tier

   The SAS services must be started first, or the middle tier will not run.

2. Middle tier

   The middle tier comes up next to enable clients to run.

Shut down the system as follows:

1. Middle tier

   The middle tier must shut down and release all SAS server tier resources (such as server connections) and terminate the ability of clients to invoke anything else on the SAS server tier.

2. SAS server tier

   The SAS server tier shuts down cleanly without any locked sessions.

Service Dependencies

The SPD Server must be started independently of the other services. In Windows, use **Start Menu ⇨ All Programs ⇨ SAS ⇨ Utilities ⇨ Start SPD 5.1 Service**. In UNIX, use ***<SAS-installation-directory>/SASScalablePerformanceDataServer/5.1/site/rc.spds***.

All other SAS server tier services can be started using the Windows Services (Local) utility or the installed sas.services script in ***<SAS-configuration-directory>*** on UNIX installations. SAS server tier services must be started in the following order:

1. SAS Metadata Server
2. SAS Web Infrastructure Platform data server
3. SAS Field Quality Analytics database server
4. object spawner
5. SAS/CONNECT spawner
6. JMS broker
7. cache locator
8. httpd - WebServer

The following middle-tier services are started next in the following order:

Note: Each server should be allowed to complete its start-up before the next one is started. All middle-tier services can be started using the Windows Services (local) utility or the installed sas.services script in ***<SAS-configuration-directory>*** on UNIX installations.

1. WebAppServer SASServer1_1
2. WebAppServer SASServer8_1
3. WebAppServer SASServer12_1
4. WebAppServer SASServer2_1
5. WebAppServer SASServer7_1
6. WebAppServer SASServer11_1

Chapter 34

Using Business Rules with SAS Enterprise Guide

Overview

You can use SAS Enterprise Guide to calculate warranty metrics outside SAS Field Quality Analytics while retaining the SAS Field Quality Analytics methodology (business rules). The sample code or the prompt framework in SAS Enterprise Guide will take filtered data from SAS Field Quality Analytics and perform a set of calculations that use methodologies and business rules that are part of the SAS Field Quality Analytics application. You can calculate metrics by time in service and one or many categorical variables. To accomplish this, you can use a string of multiple group or class variables from products and claims data sets, along with specific analysis options. The output is a SAS data set. This output can be used by SAS Field Quality Analytics output macros to create graphical reports.

To use SAS Field Quality Analytics business rules with other SAS tools, you must set certain user access permissions.

Note:

- This feature is intended for consultants and advanced users so that they can create custom reports.
- You can also use other SAS tools (such as SAS Add-In for Microsoft Office) to calculate warranty metrics outside SAS Field Quality Analytics while retaining the SAS Field Quality Analytics methodology (business rules). For more information about using SAS Add-In for Microsoft Office, see *SAS Add-In 7.1*

for Microsoft Office: Getting Started in Microsoft Excel, Microsoft Word, and Microsoft PowerPoint.

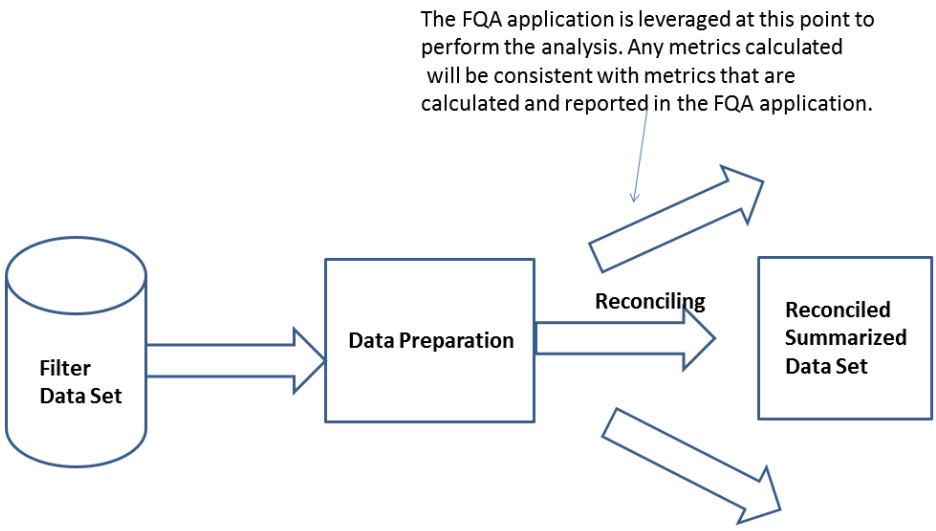
Setting User Access Permissions

To access the SAS Field Quality Analytics data and libraries in SAS Enterprise Guide, you should be member of an appropriate SAS Field Quality Analytics group. See Table 10.8 on page 165 for more information.

Metrics Calculation Process

Metrics are calculated with the following steps:

1. Based on the filtered data set and multiple class variables, input data is indexed separately for claims and products data sets. During indexing, for every combination of distinct values of different class variables, an index value is assigned, and the variable index is used as a group variable.
2. Indexed filtered data sets are created, along with a set of analysis parameters to leverage SAS Field Quality Analytics. The SAS Field Quality Analytics application code base is used to calculate a set of warranty metrics. The set of metrics is provided in a SAS data set after the reconciling is done.
3. Reconciling is done in order to return the class variables to their original form from the indexed form. The final summary output is in the form of a calculation metric with time in service, multiple class variables, and the specified analysis variable. This summary output SAS data set is saved to a permanent location.



Parameter Settings

The following is a list of parameters and accepted values:

Table 34.1 *Parameter Settings*

Parameter	Description	Accepted Values
g_claimslib	Identifies the library location of the input claim subsets to use.	
g_claimsTable	Identifies the name of the claims subset of data to use.	
g_prodslib	Identifies the library location of the input product subsets to use.	
g_prodstable	Identifies the name of the products subset of data to use.	
g_userrptlib	Identifies the library to write the output data set to.	
subtotals	If TRUE, all level summarized tables (subtotals) are created as a part of the output. If FALSE, then only low level summarized output is created.	TRUE or FALSE
analysisID	Output data set name. This is a mandatory parameter.	
reportvar	Corresponds to the SAS Field Quality Analytics reporting variable analysis option.	**For example, PRODUCTION_YEAR**
analysisvar	Corresponds to the SAS Field Quality Analytics analysis variable analysis option.	For example, **CLAIMRATE**
exposureType	Corresponds to the SAS Field Quality Analytics exposure type analysis option.	**TIS**
Binincrement	Corresponds to the SAS Field Quality Analytics bin increment analysis option.	**500**
calcmethod	Corresponds to the SAS Field Quality Analytics calculation method analysis option.	**EXTRAPOLATED** for the extrapolated calculation method, **PROJECTED** for the adjusted calculation method, or **ASIS** for the unadjusted calculation method

Parameter	Description	Accepted Values
tispointofview	Corresponds to the SAS Field Quality Analytics time in service point of view (tispointofview) analysis option.	**frombuild**
usageProfile	Corresponds to the SAS Field Quality Analytics usage profile (usageProfile) analysis option.	**FALSE** to not apply usage profiles or **TRUE** to apply usage profiles
WRTYUSAGEMAXMILEAGE	Corresponds to the SAS Field Quality Analytics warranty usage limitation analysis option.	If **TRUE** was specified for the **usageprofile** parameter, specify a positive integer value that represents the mileage bound of the warranty period (for example, specify 100000 for a warranty bounded at 100,000 miles).
usagetype	Corresponds to the SAS Field Quality Analytics usage type analysis option.	**Hours** or **Mileage**
failures	Identifies which failures to use.	For example (**ALL**, **FIRST_SINGLE**, **FIRST_MULT**)
maxExpVal	Corresponds to the SAS Field Quality Analytics maximum exposure value analysis option.	For example, **5**
maturitylevel	Corresponds to the SAS Field Quality Analytics maturity level analysis option.	For example, **5**
repairBeforeSold	Corresponds to the SAS Field Quality Analytics include pre-delivery claims analysis option.	**FALSE** to exclude pre-delivery claims or **TRUE** to include pre-delivery claims
minsamplesize	Corresponds to the SAS Field Quality Analytics minimum sample size type analysis option.	If **minsamplesizetype** is set to **NONE** or **COUNT**, a numeric value greater than 0. If **minsamplesizetype** is set to **PERCENT**, a numeric value between 0 and 100.
minsamplesizetype	The minimum sample size type.	**NONE**, **COUNT**, or **PERCENT**.
expChartType	Corresponds to the SAS Field Quality Analytics chart type analysis option.	**CUMULATIVE** or **INCREMENTAL**
TISBINSTODISPLAY	Corresponds to the SAS Field Quality Analytics time in service periods to display analysis option.	String of positive integer values separated by a space (for example: 1 3 6 9 12) *Note:* If this field is empty, then it takes all the values.

Parameter	Description	Accepted Values
uniquevalue	Identifies whether a calculated value is needed for each time in service period (**TRUE** or **FALSE**).	If **TRUE** is specified, then each time in service value is displayed. If **FALSE** is specified and the chart type is cumulative, then time in service is not displayed. If chart type is incremental, then regardless of the value of **uniqvalue**, time in service value is displayed.
maxbyvar	Defines the maximum limit for the number of distinct categories of a variable.	

Sample Program

This section includes a sample program. You need to specify the name of the filtered data set that is created by SAS Field Quality Analytics and different analysis options as input values. For a given set of inputs, the sample code gives the summarized data set. The sample program includes a call to wrna_brcalc.sas from the UCMACROS library and the definition of initial parameters.

The following is the sample program:

```
options mprint mlogic symbolgen;
%put NOTE: *** wrna_brsamplecall Begins Execution ***;
   /*user input data location*/
libname brdata "C:\sas\Config\Lev1\AppData\SASWarrantyAnalySrvr\WRNAMART\userfdl";
   /*user output data location*/
libname brdata1 "\\rdcesx03049.race.sas.com\c$\sas\Config\Lev1\AppData\
SASWarrantyAnalySrvr\WRNAOUT\output";
   /*User input library where output data gets stored*/
%include "C:\Program Files\SASHome\SASFoundation\9.4\wrtyanlmva\ucmacros\
wrna_brcalc.sas";
   /*Call to Business Rule stored process for the calculation of metric*/
 %wrna_brcalc(
  g_claimslib=brdata
     /*User input library for Claims filtered data. Mandatory parameter*/
 ,g_claimsTable=_cfs0001_esc_b_001
     /*Identifies the name of the claims subset of data to use.
       Mandatory parameter*/
 ,g_prodslib=brdata
     /*User input library for Products filtered data. Mandatory parameter*/
 ,g_prodstable=_cfs0001_psc_b_001
     /*Identifies the name of the products subset of data to use.
       Mandatory parameter */
 ,g_userrptlib=brdata1
     /*User output library. Mandatory parameter*/
 ,subtotals=FALSE
     /*If True, all level summarized tables (subtotals) are created as
       a part of output. If False, then only low level summarized output
```

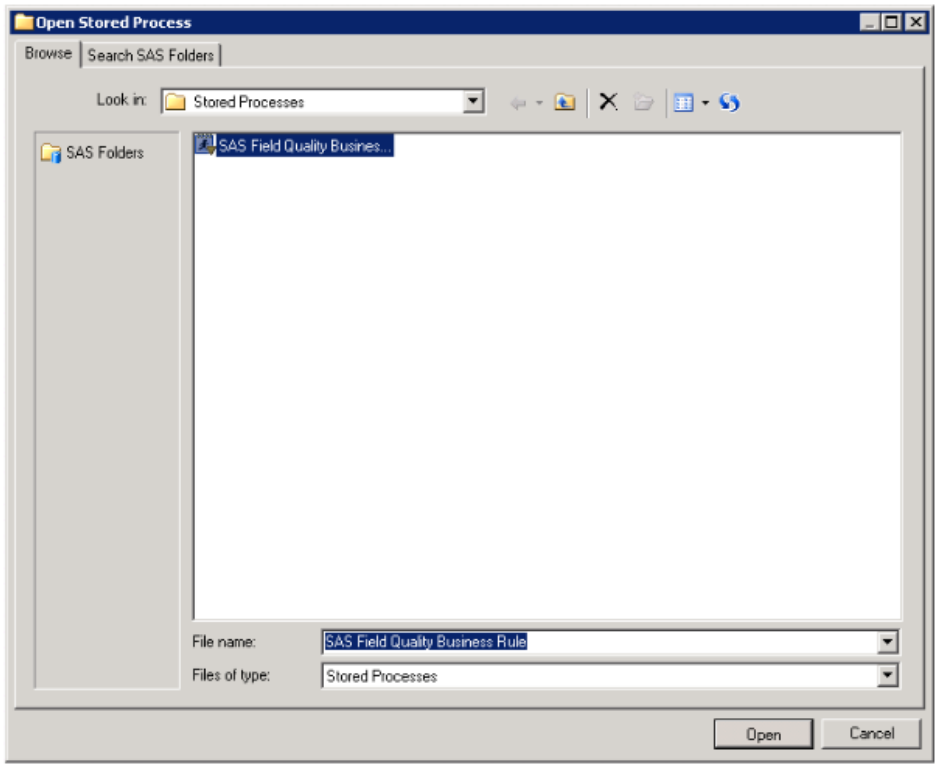
```
      is created*/
,analysisID=DEF123AB
    /*Outputdataset name. Mandatory parameter*/
,reportvar=SELLING_DEALER_COUNTRY_CD EVENT_STATUS_CD
    /*Report Variable*/
,analysisvar=CLAIMCOUNT
    /*Analysis Variable. Mandatory parameter*/
,exposureType=TIS
    /*Exposure Type (Time in service in our case)*/
,binincrement=500
,calcmethod=ASIS
    /*Calculation Method. Mandatory parameter */
,tispointofview=frombuild
,usageProfile=FALSE
    /*Identifies whether or not usage profiles need to be applied.
      Mandatory parameter */
,WRTYUSAGEMAXMILEAGE=
    /* Identifies the warranty program max value for the 2nd dimension
       of warranty.  Would contain value if usageProfile=TRUE, blank otherwise*/
,usagetype=Mileage
    /*Usage Type (Mileage or Hours)*/
,failures=ALL
    /*Claims to include.Mandatory parameter  */
,maxExpVal=
    /*Maximum exposure value */
,maturitylevel=
    /*Maturity value */
,repairBeforeSold=TRUE
    /*Flag indicating if we should include repairs made before sold.
      Mandatory parameter*/
,minsamplesizetype=
    /*Minimum sample size type (count or percent) */
,minsamplesize=
    /*Actual value of minimum sample size*/
,expChartType=CUMULATIVE
    /*Way of calculation. Cumulative or Incremental. Mandatory parameter*/
,TISBINSTODISPLAY=0 1 2
    /*Time in service bins to get used in calculation*/
,uniquevalue= TRUE
    /*Identifies whether or not a calculated value is needed for each time
      in servcie period (TRUE or FALSE. Mandatory parameter) */
 ,maxbyvar=20
    /*This variable defines the maximum limit for the number of distinct
      categories of a BY variable. If the variable specified has categories
      more than this number then that variable will be ignored. You can
      increase this limit for a perticular variable if it is being ignored.*/
)
;
```

Note: Before running this sample code, you must update path and variable values to match your system and goals.

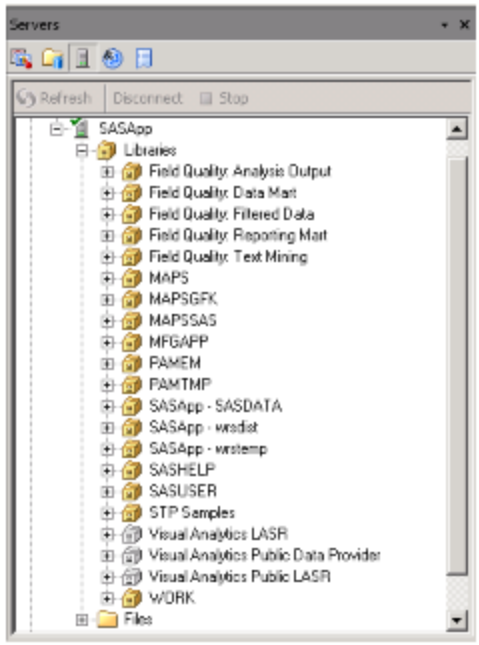
Stored Process and Prompt Framework

Perform the following steps to access the business rule stored process through the prompt framework:

1. Log on to SAS Enterprise Guide as a SAS Field Quality Analytics User who has the credentials described previously.
2. Open the SAS Field Quality Business Rule stored process: Click on **File** ⇨ **Open** ⇨ **Stored Process**. On the **Browse** tab, navigate to and select the **`/SAS Folders/Products/SAS Field Quality Analytics/Stored Processes`** folder. Select and open the **SAS Field Quality Business Rule** stored process.

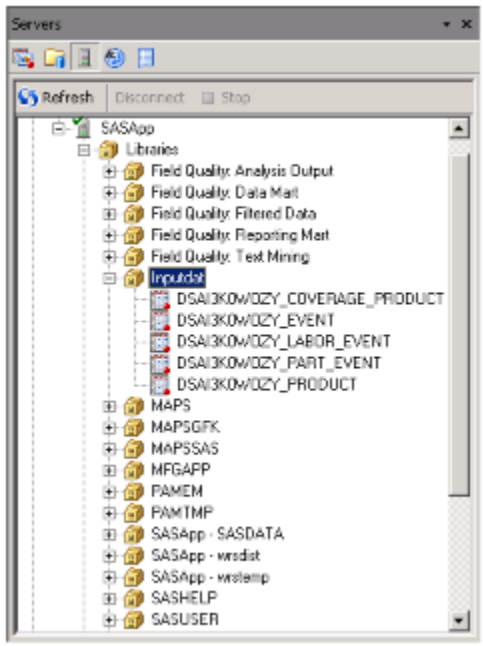


3. View the server list. Click **Servers**, and then expand **SASApp** to see the list of libraries that you can access.



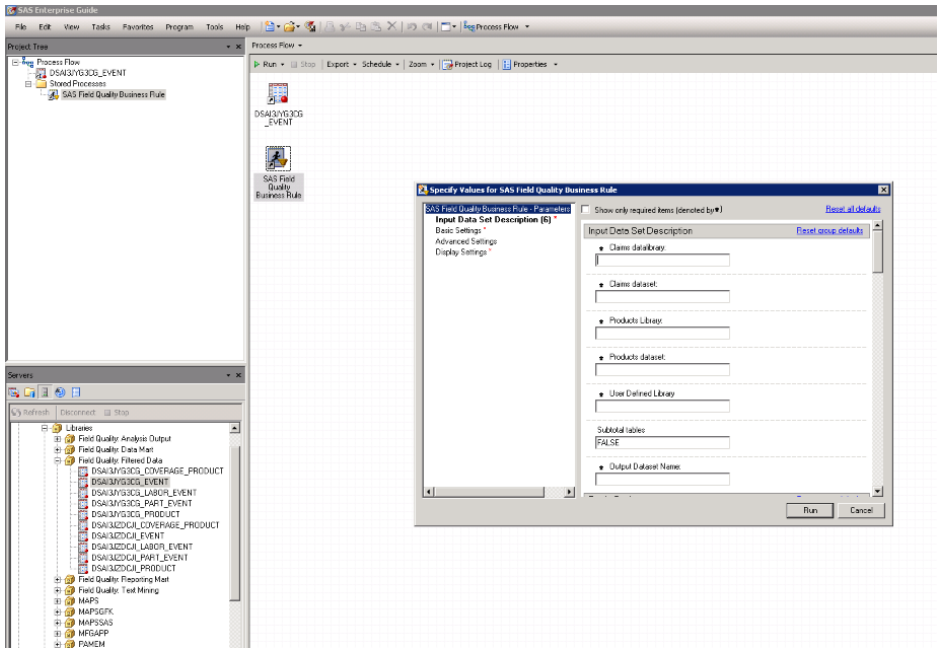
4. Create a filtered data set. For information about how to create a filtered data set, see "Storing Filtered Subsets" on page 284.

5. Put the filtered data set that you created in the previous step in a preassigned library.



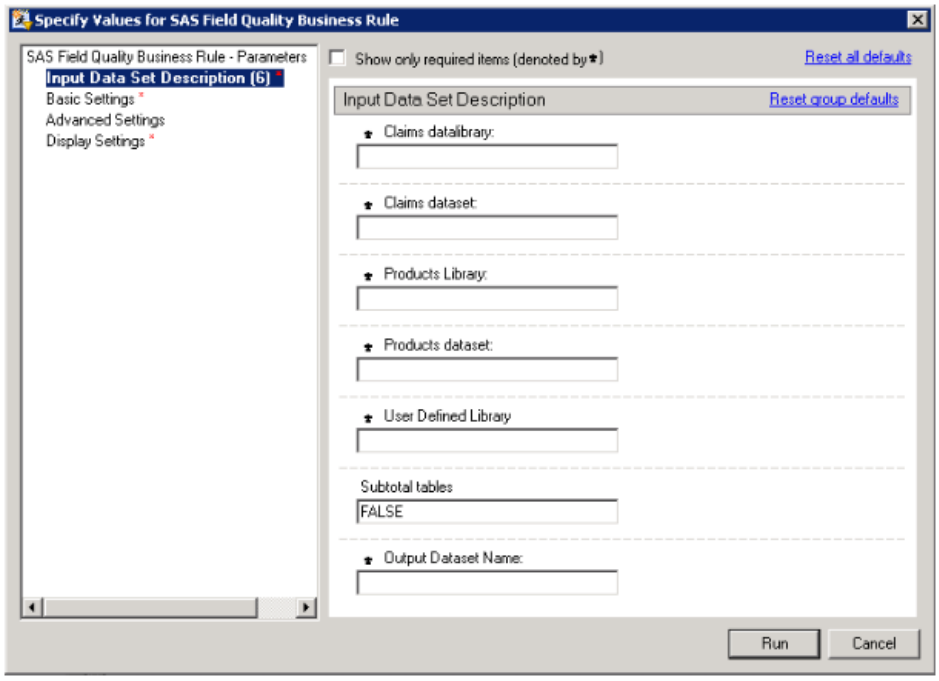
6. Right-click on the stored process in the Process Flow window, and select the option **Run SAS Field Quality Business Rule**. You will be directed to a set of prompts.

   Note: The asterisk before a parameter means that the parameter is mandatory. A parameter without a asterisk is an optional one.

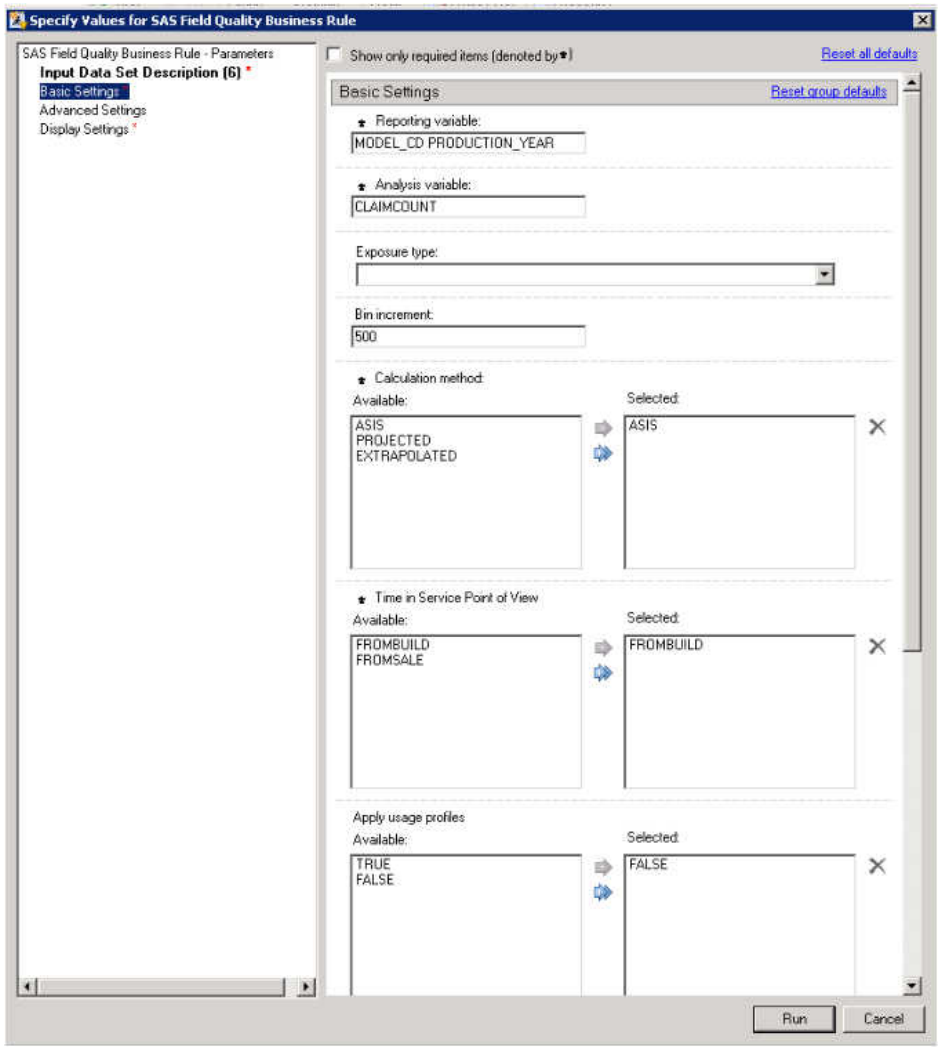


The list of analysis settings are as follows:

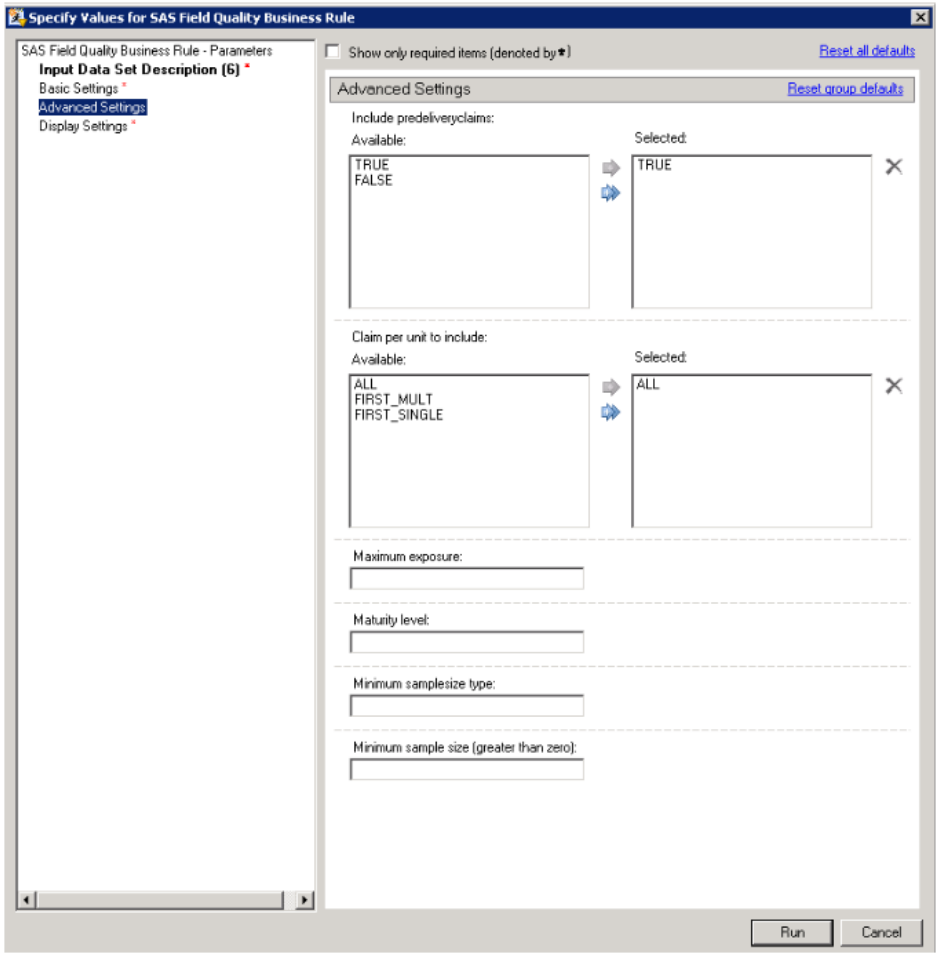
- Input Data Set Description



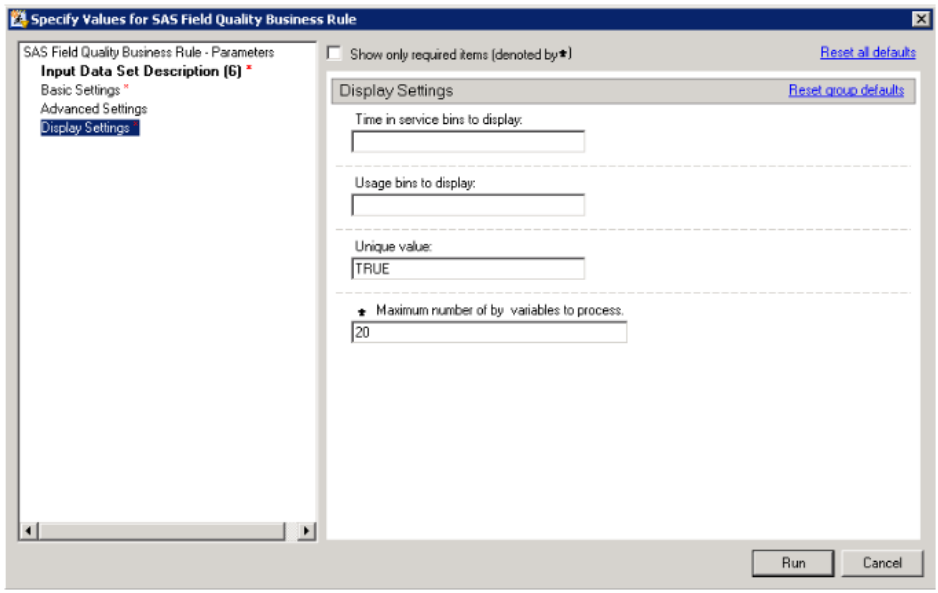
- Basic Settings



- Advanced Settings

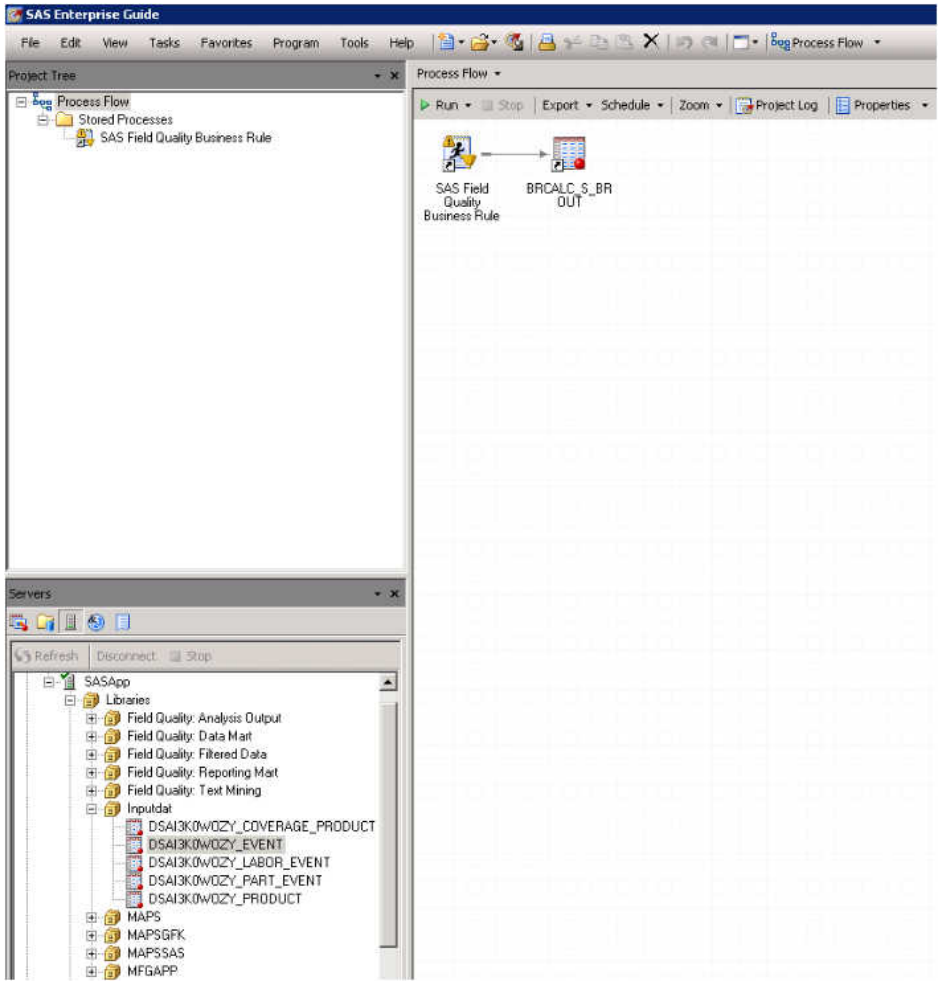


- Display Settings

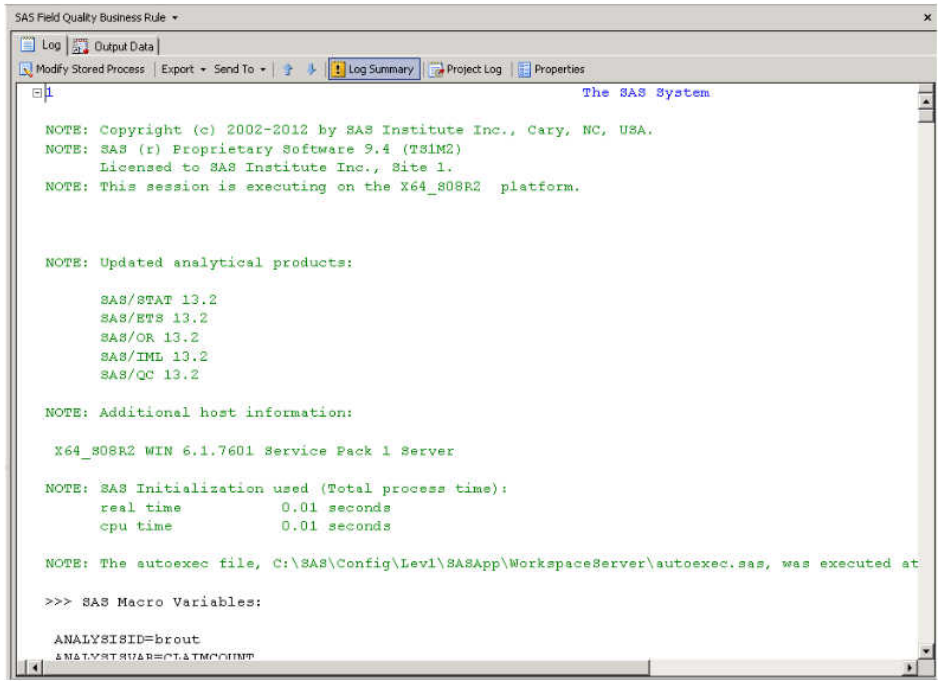


7. Populate the parameters, and then click **Run**.

   You will be able to see the log and output data set on the window. The following illustrates the process flow of the business rule stored process:



The following is an example of the log and the output data:



SAS Field Quality Business Rule

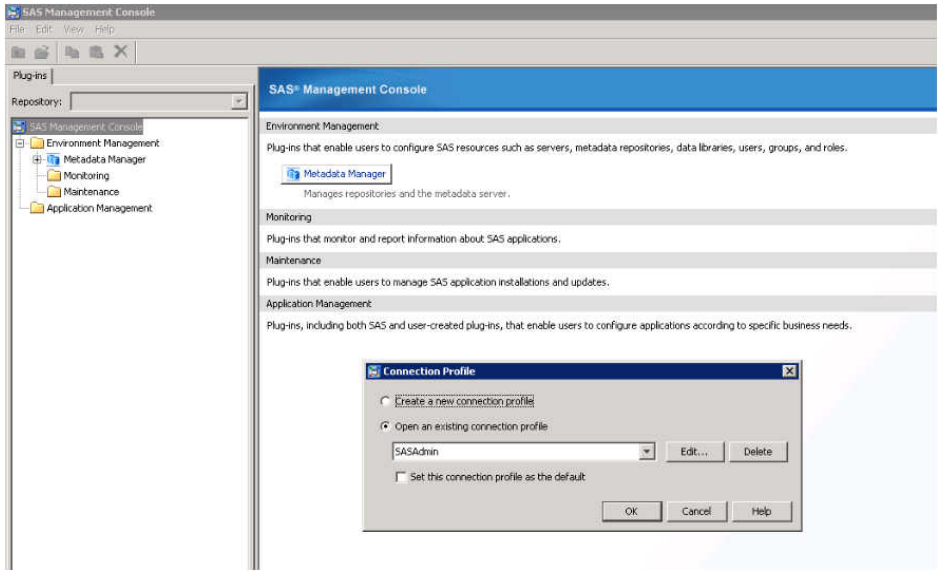
Log | Output Data

Modify Task | Filter and Sort | Query Builder | Data | Describe | Graph | Analyze | Export | Send To

	PRODUCTION_YEAR	SAMPLESIZE	CLAIMCOUNT	CLAIMRATE	FINALMAXEXPTIS	FINALMEANEXPTIS
1	2007	14250	38823	2.7244210526	2369	2240.1140421
2	2008	30129	120920	4.0134090079	2194	1980.4362169
3	2009	24132	65738	2.724100779	1828	1611.6400467
4	2010	25397	28453	1.1203291727	1463	1210.0196517
5	2011	24083	49018	2.0353776523	1098	876.60987949
6	2012	30490	66491	2.1807477862	731	482.51971675
7	2013	46825	26024	0.5557714896	367	135.00742561
8	2014	2894	0	0	2	0.0397222222

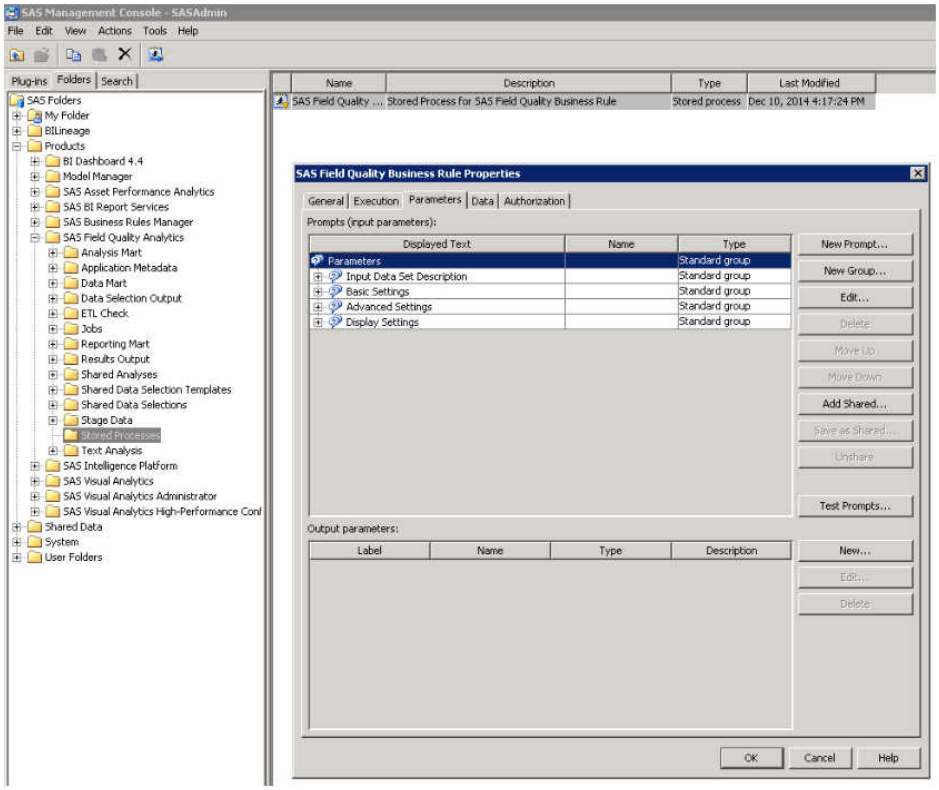
8. Perform the following steps to customize the prompt design if, for example, you want to have one more new calculation method along with the present ones (unadjusted, adjusted, extrapolated) as a part of the calculation methods:

   a. Connect to SAS Management Console.

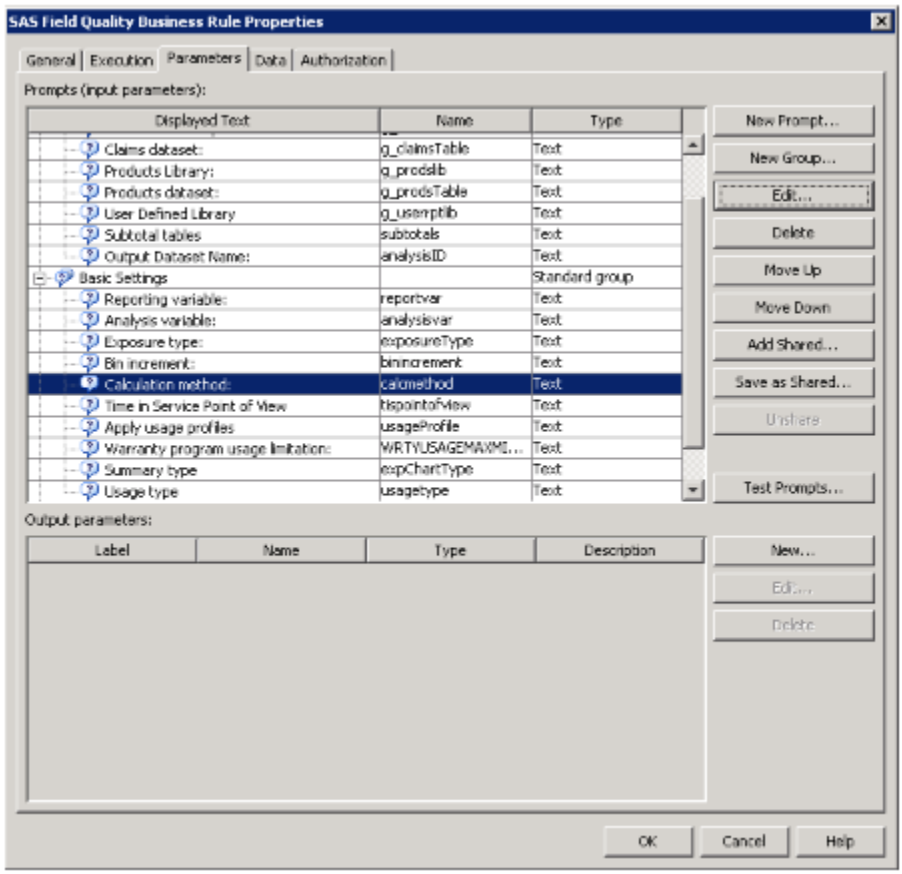


   b. After providing the connection profile, navigate to the stored process location.

   c. Select the **Stored Processes** folder, right-click it, and then select the **Properties** tab.

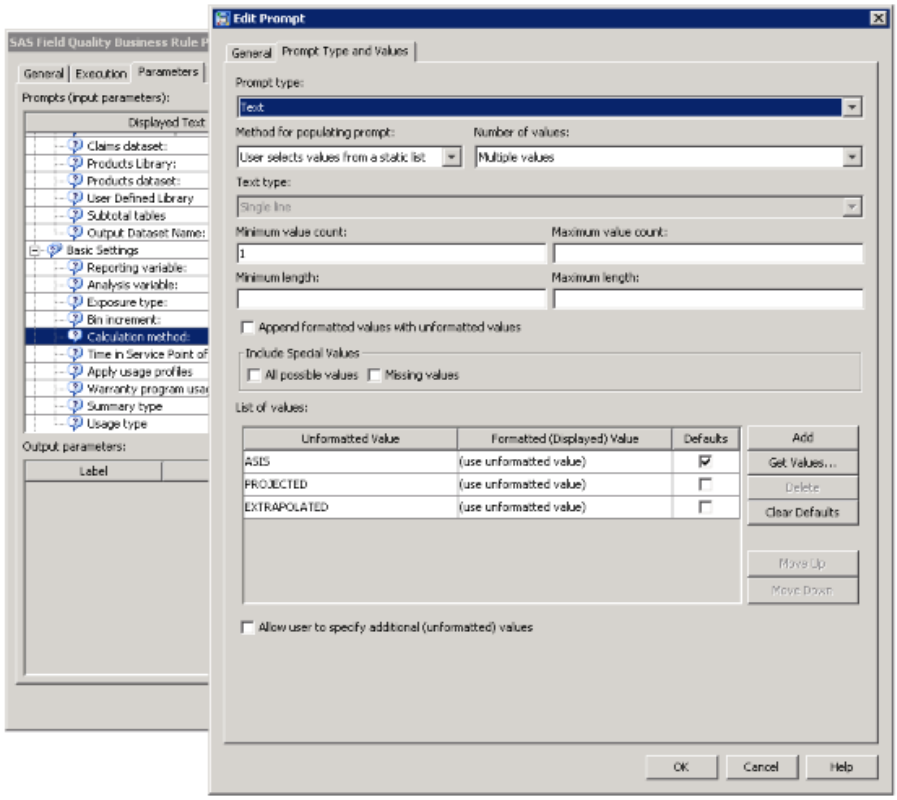


d. Click the **Parameters** tab, navigate to the analysis options group, and click **Calculation method**.



e. Click **Edit**.

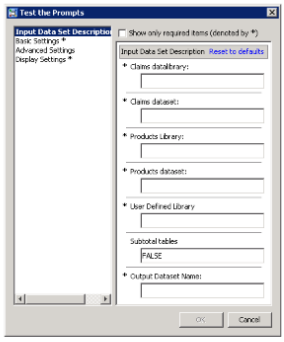
The Edit Prompt dialog box appears.

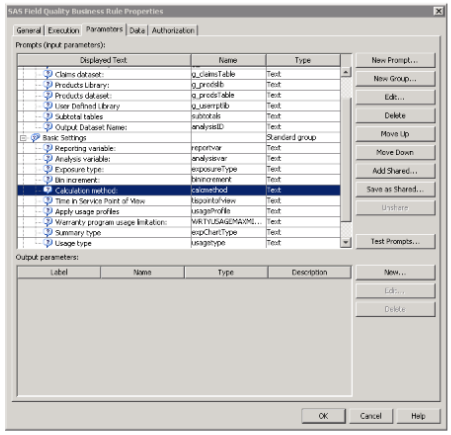


f. Click **Prompt Type and Values**.

g. You can click **Add** to add a new calculation method to the list of values. Add the description for unformatted and formatted values. When you are finished adding a calculation method, click **OK**.

h. Click **Test Prompts** to see the prompt design.





Configuration-Related Changes

Overview

This section contains the steps to follow to incorporate a multiple-type warranty setup for business rules.

Warranty Type 3 and 4

Changes are required due to the incomplete sales data setup. Add the prompt for **`g_tispointofview`** (**`fromsale`** or **`frombuild`**) in the prompt framework. Also, you need to add the macro variable **`g_tispointofview`** in the wrna_BR_samplecall.sas and wrna_BRcalc.sas macros. The instructions for including the new prompt are mentioned in the previous section.

Warranty Type 1 and 4

Ignore the prompts for usage profile, as it is a one-dimensional warranty.

Note: You can remove the **`g_usageprofile`** variable from **`samplecall`** and also disable the prompt **`g_usageprofile`** from the prompt framework.

Additional Information

- When you select the calculation method (analysis options) prompt as **`UNADJUSTED`**, you should select the usage profile (filtering options) as **`NO`**.
- When you select the calculation method (analysis options) prompt as **`EXTRAPOLATED`**, you should select the chart type (output display options) as **`CUMULATIVE`**.
- In trend by exposure, even if you specify a specific value for **`g_tisbinstodisplay`**, you get all the values for **`tisbins`** if you have not specified the reporting variable. To get the observations for a specific **`tisbin`** to appear, you have to specify the reporting variable along with the group variable.

Chapter 35

Increasing Memory

Increasing Memory

If an analysis is taking too long to run or fails to complete, try increasing the available memory to 16 gigabytes (GB) or more for better performance.

To increase the available memory for better performance, perform the following steps in the SAS Field Quality Analytics application:

1. Click **Administration**.

   The Administration workspace appears.

2. Click **Warranty Configuration**.

3. Click  .

   A window appears where you can select configuration options.

4. Click **General Configuration**.

5. Select the **SAS Log Debug Options** variable.

   Note: You might need to scroll down to see it.

6. Add the following value for the **SAS Log Debug Options** variable.

   ```
   SORTSIZE=2M NOTHREADS
   ```

Note:

- In order to save this change, you must first be a member of the SAS Field Quality Analytics Internal Administrator's SAS Management Console group. If you have made the change but cannot save it, first add yourself to this group. Then refresh the cache, log off from SAS Field Quality Analytics, and then log back on to the application. After you navigate back to the **General Configuration** view of the **Warranty Configuration** section in the **Administration** workspace, a **Save** button enables you to save your changes.
- A SAS Field Quality Analytics user should be assigned only to a single SAS Field Quality Analytics group and a single SAS Field Quality Analytics role. Users must be directly assigned. They cannot be a part of a group that is assigned to a SAS Field Quality Analytics group or role.

Part 8

Appendixes

Appendix 1

Common Tasks

About Performing General Tasks

This appendix contains a collection of general tasks that you might want to perform in SAS Field Quality Analytics.

Providing Values of Data Mart Variables

Whenever you enter the value for a data mart variable, you should be aware of the required case to use. The values of data mart variables are case sensitive. For example, if you are specifying security, make sure you are using the right case for values.

Modify Your View of Columns and Rows

You can modify your view of tabular information in many workspaces by changing the order of columns, hiding columns from view, or sorting rows.

You can modify your view of columns in the following ways:

- **Move a column**. Click the column heading and drag it to the column position that you want the column to move to.
- **Move multiple columns**. Click  on the toolbar. The Sort dialog box appears.

  Select a column, and then click  , or select multiple columns and click  .

  Next, you can change the sort order and direction by selecting a column and clicking  or  to reorder the column's relative position to other selected columns.

  Click **OK** when you have finished modifying column order.

  Note: To remove a column from selection, select it and then click  , or select multiple columns and then click  if you want to remove all the selected columns at once.
- **Hide or display a column**. Click  in the toolbar. The Manage Columns dialog box appears. To hide columns by moving them to the **Available columns** box, or to display columns by moving them to the **Displayed columns** box, select a column or columns in a list, and then click  (or  for multiple columns), or click  (or  for multiple columns). You can change the relative column position of displayed columns with the  or  buttons. Click **OK** when you have finished modifying which columns you want to view.

To modify your view of rows by sorting them in ascending or descending order, click the column heading that you want to sort rows by. If columns are sorted in ascending order, click the column heading again to sort in descending order.

Note: You can also sort rows by clicking a cell in the **Sort Direction** column in the Sort dialog box.

Preferences Overview

About User Preferences

You can customize SAS Field Quality Analytics in the following ways:

- "Language Preferences" on page 282
- "Theme Preferences" on page 283
- "Default Workspace Preferences" on page 283

Note: Theme changes do not take effect until you log off and then log back on.

Language Preferences

Perform the following steps to specify the language that you want SAS Field Quality Analytics to display in:

1. Select **File** ⇨ **Preferences** on the main menu.

   The Preferences dialog box appears.
2. Click **Global Preferences**.
3. Select a language from the **User locale** menu.
4. Click **OK**.

Theme Preferences

Perform the following steps to specify the theme that you want SAS Field Quality Analytics to display in:

1. Select **File** ⇨ **Preferences** on the main menu.

   The Preferences dialog box appears.
2. Click **Global Preferences**.
3. Select a theme from the **Theme** menu.
4. Click **OK**.

Default Workspace Preferences

Perform the following steps to specify the default workspace that you want to view when you log on to SAS Field Quality Analytics:

1. Select **File** ⇨ **Preferences** on the main menu.

   The Preferences dialog box appears.
2. Select **Quality Analytic Suite** ⇨ **General**.
3. Select a workspace from the **Open application using this workspace** menu.
4. Click **OK**.

Refresh Your View of Data

In many areas of the **Administration** workspace, you can refresh your view of data in a table by clicking  on the toolbar.

Your view of data in the selected workspace is refreshed.

Refresh the Cache

You can refresh the cache by clicking  in the bottom right corner of the SAS Field Quality Analytics application.

Note: Refreshing the cache should be performed at a time when no analyses or data selections are running.

Reset the Cache to Resolve the Status of Objects that are Hung in an Intermediate State

Sometimes you might want to reset the status of objects in SAS Field Quality Analytics (analysis, data selection, batch runs) that are in an intermediate state (Running, Submitted, Editing, Moving, Copying, and so on), and are left in this state due to an unexpected reason, such as a system or machine crash, outage, or the like. A reset might be required to resolve an intermediate state so that stalled objects can be used in SAS Field Quality Analytics.

Perform the following steps to resolve the status of objects that are stalled in an intermediate state:

1. Restart the machine to ensure that all the running processes are terminated.
2. Start all the services.
3. Perform a cache refresh.

Note: Refreshing the cache should be performed when SAS Field Quality Analytics is not being used actively (either through the application or a batch run).

Storing Filtered Subsets

Perform the following steps to store filtered subsets by using a SAS session or SAS Enterprise Guide:

1. Create your own library where you want to store the filtered subsets.

   ```
   libname mylib "C:\myfdl";
   ```

2. Call the following macro and pass in the data selection ID and the library name:

   ```
   %wrna_getFiltereddata(g_data_ID=SDS0002, g_saveapps=Y, g_datalib=mylib);
   ```

   Note: This code uses hypothetical paths and parameter values. You will need to replace these with the paths and values that are appropriate for your system.

   The filtered subsets created in **`mylib`** can be used in SAS Enterprise Guide, SAS Add-In for Microsoft Office, or SAS Visual Analytics Explorer to do further analysis. The data in the WRNARPT library (Field Quality: Reporting Mart) are the de-normalized data sets of the entire data mart. These data sets can also be used by other applications for further analysis.

Appendix 2

SAS Formats Supported by Flex

The following SAS formats can be used in SAS Field Quality Analytics:

Category	Name	Comments
Numeric	BEST	
Numeric	COMMA	Writes numeric values with a locale-specific thousands separator.
Numeric	COMMAX	Is identical to COMMA.
Numeric	EURO	Always renders the Euro symbol instead of a locale-specific currency symbol.
Numeric	EUROX	Is identical to EURO.
Numeric	F	
Numeric	DOLLAR	Always renders the dollar symbol instead of a locale-specific currency symbol.
Numeric	DOLLARX	Is identical to DOLLAR.
Numeric	NLMNLJPY	Is identical to YEN.
Numeric	NLMNLGBP	Is identical to POUND.
Numeric	NLMNLKRW	Is identical to WON.
Numeric	PERCENT	Writes numeric values with locale-specific percent sign.
Numeric	PERCENTx	Is identical to PERCENT.
Numeric	POUND	Always renders the pound symbol instead of a locale-specific currency symbol.

Category	Name	Comments
Numeric	WON	Always renders the won symbol instead of a locale-specific currency symbol.
Numeric	YEN	Always renders the yen symbol instead of a locale-specific currency symbol.
Numeric	CURRENCY	
Date and Time	DATE	
Date and Time	DATEN	
Date and Time	DAY	
Date and Time	DOWNAME	
Date and Time	JULDAY	Is a locale-insensitive format.
Date and Time	JULIAN	Is a locale-insensitive format.
Date and Time	JULDATE	Is identical to JULIAN.
Date and Time	MMDDYY	Is a locale-insensitive format.
Date and Time	MMDDYYx	Is a locale-insensitive format, identical to MMDDYY.
Date and Time	MONNAME	Is identical to MONTH.
Date and Time	MONTH	Is identical to MONNAME.
Date and Time	MONYY	Is identical to YYMON.
Date and Time	YYMON	Is identical to MONYY.
Date and Time	NLDATE	Is identical to DATE.
Date and Time	NLDATEW	Is identical to WEEKDATE.
Date and Time	DDMMYY	Is a locale-insensitive format.
Date and Time	DDMMYYx	Is a locale-insensitive format, identical to DDMMYY.
Date and Time	YYMMDD	Is a locale-insensitive format.
Date and Time	YYMMDDx	Is a locale-insensitive format, identical to YYMMDD.

Category	Name	Comments
Date and Time	MMYY	Is a locale-insensitive format.
Date and Time	WEEKDATE	
Date and Time	WEEKDATEX	Is identical to WEEKDATE.
Date and Time	WORDDATE	
Date and Time	WORDDATEX	Is identical to WORDDATE.
Date and Time	YEAR	
Date and Time	DATEYW	
Date and Time	YYQC	
Date and Time	DATETIME	Is identical to DATEAMPM.
Date and Time	DATEAMPM	Is identical to DATETIME.
Date and Time	DTDATE	
Date and Time	DTMONYY	
Date and Time	DTWKDATX	
Date and Time	DTYEAR	
Date and Time	DTYYQC	
Date and Time	HHMM	
Date and Time	HOUR	
Date and Time	MMSS	
Date and Time	TIME	Is identical to TOD.
Date and Time	TIMEAMPM	Is identical to TOD.
Date and Time	TOD	
User-Defined Formats	Numeric UDF	

Appendix 3

Encoding Name Aliases

If a name is not given for the Postgres character set in the following table, then it is not currently supported by PostgreSQL. An asterisk denotes that server-side encoding is supported in Postgres. All provided character sets can be encoded client-side.

Table A3.1 *Encoding Name Aliases*

SAS Character Set	Postgres Character Set	Other Names	Other Comments
aarabic			
agreek			
ahebrew			
aiceland			
any	UTF8*		Postgres default character set is UTF8. Use this character set when no character set is specified.
arabic	ISO_8859_6*	ISO 8859-6, ECMA 114	
aroman			
athai			
aturkish			
aukrainian			
big5	BIG5	BIG5, WIN950, Windows950	
cyrillic	ISO_8859_5*	ISO 8859-5, ECMA 113	
dec-cn			
dec-jp			

SAS Character Set	Postgres Character Set	Other Names	Other Comments
dec-tw			
ebcdic037			
ebcdic275			
ebcdic424			
ebcdic425			
ebcdic500			
ebcdic838			
ebcdic870			
ebcdic875			
ebcdic905			
ebcdic924			
ebcdic1025			
ebcdic1026			
ebcdic1047			
ebcdic1097			
ebcdic1112			
ebcdic1122			
ebcdic1130			
ebcdic1137			
ebcdic1140			
ebcdic1141			
ebcdic1142			
ebcdic1143			
ebcdic1144			
ebcdic1145			

SAS Character Set	Postgres Character Set	Other Names	Other Comments
ebcdic1146			
ebcdic1147			
ebcdic1148			
ebcdic1149			
ebcdic1153			
ebcdic1154			
ebcdic1155			
ebcdic1156			
ebcdic1157			
ebcdic1158			
ebcdic1160			
ebcdic1164			
ebcdicany			
euc-cn	EUC_CN*		
euc-jp	EUC_JP*		
euc-kr	EUC_KR*		
euc-tw	EUC_TW*		
fujitsu-cn			
fujitsu-jp			
fujitsu-ko			
fujitsu-tw			
gb18030	GB18030		GB18030 for national standard, GBK for extended national standard.
greek	ISO_8859_7*		
hebrew	ISO_8859_8*		

SAS Character Set	Postgres Character Set	Other Names	Other Comments
hitachi-cn			
hitachi-jp			
hitachi-ko			
hitachi-tw			
hitsas-jp			
hitsas-ko			
hitsas-tw			
hp15-tw			
ibm-1381			
ibm-930			
ibm-933			
ibm-935			
ibm-937			
ibm-939			
ibm-942			
ibm-949			
iso2022cncns			
iso2022cngb			
iso2022jp			
iso2022kr			
latin1	LATIN1*	ISO 8859-1, ECMA 94, ISO88591	
latin2	LATIN2*	ISO 8859-2, ECMA 94, ISO88592	
latin3	LATIN3*	ISO 8859-3, ECMA 94, ISO88593	

SAS Character Set	Postgres Character Set	Other Names	Other Comments
latin4	LATIN4*	ISO 8859-4, ECMA 94, ISO88594	
latin5	LATIN5*	ISO 8859-9, ECMA 128, ISO88599	
latin6	LATIN6*	ISO 8859-10, ECMA 144, ISO885910	Postgres has latin7 listed as Baltic and latin6 as Nordic.
latin8	LATIN8*	ISO 8859-14, ISO885914	
latin9	LATIN9*	ISO 8859-15, ISO885915	
macos-1			
macos-2			
macos-3			
macos-25			
ms-932			
ms-936			
ms-949	UHC	Unified Hangul Code, WIN949, Windows949	Unified Hangul Code
ms-950			
msdos720			
msdos737			
msdos775			
open_ed-037			
open_ed-275			
open_ed-424			
open_ed-425			
open_ed-838			
open_ed-870			
open_ed-875			

SAS Character Set	Postgres Character Set	Other Names	Other Comments
open_ed-905			
open_ed-924			
open_ed-930			
open_ed-933			
open_ed-935			
open_ed-937			
open_ed-939			
open_ed-1025			
open_ed-1026			
open_ed-1047			
open_ed-1097			
open_ed-1112			
open_ed-1122			
open_ed-1130			
open_ed-1140			
open_ed-1141			
open_ed-1142			
open_ed-1143			
open_ed-1144			
open_ed-1145			
open_ed-1146			
open_ed-1147			
open_ed-1148			
open_ed-1149			
open_ed-1153			

SAS Character Set	Postgres Character Set	Other Names	Other Comments
open_ed-1154			
open_ed-1155			
open_ed-1156			
open_ed-1157			
open_ed-1158			
open_ed-1160			
open_ed-1164			
pciscii806			
pcoem437			
pcoem850			
pcoem852			
pcoem857			
pcoem858			
pcoem860			
pcoem862			
pcoem863			
pcoem864			
pcoem865			
pcoem866			
pcoem869			
pcoem874			
pcoem921			
pcoem922			
pcoem1129			
pc1098			

SAS Character Set	Postgres Character Set	Other Names	Other Comments
roman8			
shift-jis	SJIS	Shift JIS, Mskanji, ShiftJIS, Win932, Windows932	
thai			
us-ascii			
utf-8	UTF8*	Win949, Windows949	
utf-16be			
utf-16le			
utf-32be			
utf-32le			
warabic	WIN1256*	Windows CP1256	
wbaltic			
wcyrillic	WIN1251*	Windows CP1251, WIN	
wgreek			
whebrew			
wlatin1	WIN1252*	Windows CP1253	
wlatin2	WIN1250*	Windows CP1250	
wturkish			
wvietnamese	WIN1258*	Windows CP1258, ABC, TCVN, TCVN5712, VSII	

Appendix 4

Data Tables

Descriptions of Stage Tables

The following stage tables are available in SAS Field Quality Analytics:

Table A4.1 *Descriptions of Stage Tables*

Name	Comment	Table
ANALY_PARAM_LOOKUP_VALUE	Not used.	Table A4.2 on page 299
COLUMN_CONF	A configuration table that identifies each table column and its parameters.	Table A4.3 on page 299
DATA_SEL_ATTR	Contains the columns that are available for filtering in the Data Selection Workspace in SAS Field Quality Analytics. *Note:* • You will need to refresh the cache from the **Administration** workspace for any change that is made to DATA_SEL_ATTR, DATA_SEL_TREE and DATA_SEL_GRP. • For multi-currency sites, only localized versions of the Currency columns should be included in the DATA_SEL_ATTR table.	Table A4.4 on page 301

Name	Comment	Table
DATA_SEL_GRP	Contains the groups for the data selection user interface. *Note:* You will need to refresh the cache from the **Administration** workspace for any change that is made to DATA_SEL_ATTR, DATA_SEL_TREE and DATA_SEL_GRP.	Table A4.5 on page 301
DATA_SEL_TREE	Contains the hierarchy of columns and groups for the Data Selection Workspace in SAS Field Quality Analytics. *Note:* You will need to refresh the cache from the **Administration** workspace for any change that is made to DATA_SEL_ATTR, DATA_SEL_TREE and DATA_SEL_GRP.	Table A4.6 on page 301
EVENT_COMMENT_STG	A comment table for events, which includes customer and technician comments in their language or locale.	Table A4.7 on page 302
EVENT_STG	A fact table containing product event information such as claims data.	Table A4.8 on page 302
EXCHANGE_RATES	Contains exchange rates for currency and date range. Population is required only for multi-currency sites.	Table A4.9 on page 304
EXT_PROD_ATTR_STG	Contains extended product attributes.	Table A4.10 on page 304
GEOGRAPHIC_COORDINATES	Contains longitude and latitude coordinates for location codes for graphing.	Table A4.11 on page 305
LABOR_CODE_STG	A labor code fact table.	Table A4.12 on page 305
PRODUCT_STG	A product table with dealer, customer, and model data.	Table A4.13 on page 305
REPL_PART_STG	Contains replacement part facts.	Table A4.14 on page 306
SALE_LAG_PROFILE	Contains sale lag profile for sale date estimation when the sales date is missing.	Table A4.15 on page 307
TABLE_CONF	A configuration table that identifies each table.	Table A4.16 on page 308
USAGE_PROFILE	Contains a usage profile for estimating usage for time and usage warranty.	Table A4.17 on page 309

Name	Comment	Table
WRNA_DATA_REFRESH	Contains the stage refresh date, which is maintained by the extract, transform, and load process.	Table A4.18 on page 309

Details of Stage Tables

This section contains details about each stage table. The tables are in alphabetical order.

Table A4.2 *ANALY_PARAM_LOOKUP_VALUE Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
ACTION_FLG	Null	CHARACTER(1)				
LOAD_DTTM	Not Null	DATE	N	N	N	Y
PARAM_CD	Not Null	VARCHAR(32)	Y	N	N	Y
PARAM_LOOKUP_LABEL	Null	VARCHAR(128)				
PARAM_LOOKUP_VALUE	Null	VARCHAR(32)				

Table A4.3 *COLUMN_CONF Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
ANALYSIS_VAR_COMP_TXT	Null	VARCHAR(500)				
BUS_REQ_FLG	Null	CHARACTER(1)				
CODE_COLUMN_NM	Null	VARCHAR(32)				
CODE_NAME_FLG	Null	CHARACTER(1)				
COLUMN_DATA_TYPE_CD	Null	VARCHAR(32)				
COLUMN_FMT_NM	Null	VARCHAR(64)				
COLUMN_LEN_NO	Null	INTEGER				
COLUMN_NM_CD	Not Null	VARCHAR(32)	Y	N	N	Y
COLUMN_NM_LABEL	Null	VARCHAR(128)				

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
CREATE_INDEX_FLG	Null	CHARACTER(1)				
DATA_SEL_VAR_FLG	Null	CHARACTER(1)				
DATE_INTERVAL_CD	Null	VARCHAR(10)				
DENOMINATOR_TXT	Null	VARCHAR(500)				
EST_NUM_DISTINCT_VALUES_NO	Null	NUMERIC(8)				
FOREIGN_KEY_ASSOC_TBL_NM	Null	VARCHAR(64)				
HIDE_COLUMN_FLG	Null	CHARACTER(1)				
LKUP_TBL_DESC_COLUMN_NM	Null	VARCHAR(32)				
LKUP_TBL_KEY_COLUMN_NM_CD	Null	VARCHAR(32)				
LKUP_TBL_LIB_NM	Null	VARCHAR(32)				
LKUP_TBL_NM	Null	VARCHAR(32)				
LKUP_TBL_REQ_FLG	Null	CHARACTER(1)				
LKUP_TBL_WHERE_CLAUSE_STR	Null	VARCHAR(256)				
MAPPED_COMPUTED_FLG	Null	CHARACTER(1)				
MIGRATION_SOURCE_COLUMN_NM	Null	VARCHAR(32)				
NUMERATOR_TXT	Null	VARCHAR(500)				
PRIMARY_KEY_FLG	Null	CHARACTER(1)				
PRIMARY_KEY_ORDER_NO	Null	NUMERIC(8)				
RELATED_COLUMN_NM	Null	VARCHAR(500)				
SOURCE_VAR_COMP_TXT	Null	VARCHAR(500)				
SUBTYPE_TXT	Null	VARCHAR(500)				
TABLE_NM	Not Null	VARCHAR(32)	Y	N	N	Y
UPDATE_DTTM	Null	DATE				
VALIDATION_RULE_DETAILS_ID	Null	VARCHAR(64)				
VALIDATION_RULE_TXT	Null	VARCHAR(20)				

Table A4.4 *DATA_SEL_ATTR Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
COLUMN_NM	Null	VARCHAR(500)				
DATA_SEL_ATTR_ID	Not Null	VARCHAR(64)	Y	N	N	Y
INPUT_FIELD_LABEL_COL_NM	Null	VARCHAR(32)				
INPUT_FIELD_TBL_NM	Null	VARCHAR(32)				
INPUT_FIELD_TBL_WHERE_TXT	Null	VARCHAR(1000)				
INPUT_FIELD_TYPE_TXT	Null	VARCHAR(20)				
INPUT_FIELD_VALUE_COL_NM	Null	VARCHAR(32)				
INPUT_FLD_TABLE_LIB_NM	Null	VARCHAR(32)				
TABLE_NM	Null	VARCHAR(32)				

Table A4.5 *DATA_SEL_GRP Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
DATA_SEL_GRP_CHILD_TYPE_CD	Null	VARCHAR(3)				
DATA_SEL_GRP_ID	Not Null	VARCHAR(64)	Y	N	N	Y
DATA_SEL_GRP_LABEL	Null	VARCHAR(128)				
MUT_EXC_GRP_FLG	Null	CHARACTER(1)				

Table A4.6 *DATA_SEL_TREE Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
CHILD_ID	Not Null	VARCHAR(64)	Y	N	N	Y
CHILD_LEVEL_NUM	Null	NUMERIC(8)				
CHILD_TYPE_CD	Null	VARCHAR(3)				
COMPONENT_TYPE_CD	Not Null	VARCHAR(10)	Y	N	N	Y

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
DEFAULT_VALUE_TXT	Null	VARCHAR(1000)				
INCLUDE_EXCLUDE_FLG	Null	CHARACTER(1)				
PARENT_ID	Not Null	VARCHAR(64)	Y	N	N	Y
PEER_LEVEL_NUM	Null	NUMERIC(8)				

Table A4.7 *EVENT_COMMENT_STG Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
ACTION_FLG	Null	CHARACTER(1)				
CSTMR_COMMENT	Null	VARCHAR(256)				
CSTMR_COMMENT_LANGUAGE	Null	VARCHAR(10)				
EVENT_ID	Not Null	VARCHAR(50)	Y	N	N	Y
LOAD_DTTM	Not Null	DATE	N	N	N	Y
PRODUCT_ID	Null	VARCHAR(50)				
SOURCESYSTEM_CD	Null	VARCHAR(20)				
TECH_COMMENT	Null	VARCHAR(256)				
TECH_COMMENT_LANGUAGE	Null	VARCHAR(10)				

Table A4.8 *EVENT_STG Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
ACTION_FLG	Null	CHARACTER(1)				
EVENT_ID	Not Null	VARCHAR(50)	Y	N	N	Y
EVENT_PAID_DATE	Null	DATE				
EVENT_STATUS_CD	Null	VARCHAR(20)				
EVENT_STATUS_NM	Null	VARCHAR(40)				

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
EVENT_SUBMIT_DATE	Null	DATE				
EVENT_TYPE_CD	Null	VARCHAR(20)				
EVENT_TYPE_NM	Null	VARCHAR(40)				
LOAD_DTTM	Not Null	DATE	N	N	N	Y
PRIM_LABOR_CD	Null	VARCHAR(20)				
PRIM_LABOR_GRP	Null	VARCHAR(20)				
PRIM_LABOR_GRP_NM	Null	VARCHAR(40)				
PRIM_LABOR_NM	Null	VARCHAR(40)				
PRIM_REPL_PART_CD	Null	VARCHAR(20)				
PRIM_REPL_PART_GRP	Null	VARCHAR(20)				
PRIM_REPL_PART_GRP_NM	Null	VARCHAR(40)				
PRIM_REPL_PART_NM	Null	VARCHAR(40)				
PRODUCT_ID	Not Null	VARCHAR(50)				
REPAIR_COMPLETE_DATE	Null	DATE				
REPAIR_DEALER_CD	Null	VARCHAR(20)				
REPAIR_DEALER_COUNTRY_CD	Null	VARCHAR(20)				
REPAIR_DEALER_COUNTRY_NM	Null	VARCHAR(40)				
REPAIR_DEALER_NM	Null	VARCHAR(40)				
REPAIR_DEALER_STATE_CD	Null	VARCHAR(20)				
REPAIR_DEALER_STATE_NM	Null	VARCHAR(40)				
REPAIR_OPEN_DATE	Null	DATE				
SOURCESYSTEM_CD	Null	VARCHAR(20)				
TOTAL_EVENT_AMT	Null	NUMERIC(8)				
TOTAL_LABOR_AMT	Null	NUMERIC(8)				
TOTAL_LABOR_HRS	Null	NUMERIC(8)				
TOTAL_OTHER_AMT	Null	NUMERIC(8)				
TOTAL_PARTS_AMT	Null	NUMERIC(8)				

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
USAGE	Null	NUMERIC(8)				
USAGE_TYPE_CD	Null	VARCHAR(20)				
USAGE_TYPE_NM	Null	VARCHAR(40)				

Table A4.9 *EXCHANGE_RATES Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
END_DATE	Null	DATE	N	Y	N	N
EXCHANGE_RATE	Null	NUMERIC(15,3)				
FROM_CURRENCY_CD	Not Null	VARCHAR(3)	Y	Y	N	Y
START_DATE	Not Null	DATE	Y	Y	N	Y
TO_CURRENCY_CD	Not Null	VARCHAR(3)	Y	Y	N	Y

Table A4.10 *EXT_PROD_ATTR_STG Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
ACTION_FLG	Null	CHARACTER(1)				
EXTRAS_CD	Null	VARCHAR(20)				
EXTRAS_NM	Null	VARCHAR(40)				
LOAD_DTTM	Not Null	DATE	N	N	N	Y
PRODUCT_ID	Not Null	VARCHAR(50)	Y	N	N	Y
SOURCESYSTEM_CD	Null	VARCHAR(20)				

Table A4.11 *GEOGRAPHIC_COORDINATES Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
LATITUDE_NUM	Null	NUMERIC(8)				
LOCATION_CD	Not Null	VARCHAR(32)	Y	N	N	Y
LONGITUDE_NUM	Null	NUMERIC(8)				

Table A4.12 *LABOR_CODE_STG Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
ACTION_FLG	Null	CHARACTER(1)				
EVENT_ID	Not Null	VARCHAR(50)	N	N	Y	Y
LABOR_AMOUNT	Null	NUMERIC(8)				
LABOR_CD	Not Null	VARCHAR(20)	N	N	Y	Y
LABOR_CD_UNIQUE_ID	Not Null	VARCHAR(50)	Y	N	Y	Y
LABOR_CODE_EVENT_DATE	Null	DATE				
LABOR_GRP_CD	Null	VARCHAR(20)				
LABOR_GRP_NM	Null	VARCHAR(40)				
LABOR_HOURS	Null	NUMERIC(8)				
LABOR_NM	Null	VARCHAR(40)				
LOAD_DTTM	Not Null	DATE	N	N	N	Y
PRODUCT_ID	Null	VARCHAR(50)	N	N	Y	N
SOURCESYSTEM_CD	Null	VARCHAR(20)				

Table A4.13 *PRODUCT_STG Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
ACTION_FLG	Null	CHARACTER(1)				

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
CSTMR_CD	Null	VARCHAR(20)				
CSTMR_COUNTRY_CD	Null	VARCHAR(20)				
CSTMR_COUNTRY_NM	Null	VARCHAR(40)				
CSTMR_NM	Null	VARCHAR(40)				
CSTMR_STATE_CD	Null	VARCHAR(20)				
CSTMR_STATE_NM	Null	VARCHAR(40)				
INSERVICE_DATE	Null	DATE				
LOAD_DTTM	Not Null	DATE	N	N	N	Y
MODEL_CD	Null	VARCHAR(20)				
MODEL_NM	Null	VARCHAR(40)				
PRODUCTION_DATE	Null	DATE				
PRODUCT_ID	Not Null	VARCHAR(50)	Y	N	N	Y
SELLING_DEALER_CD	Null	VARCHAR(20)				
SELLING_DEALER_COUNTRY_CD	Null	VARCHAR(20)				
SELLING_DEALER_COUNTRY_NM	Null	VARCHAR(40)				
SELLING_DEALER_NM	Null	VARCHAR(40)				
SELLING_DEALER_STATE_CD	Null	VARCHAR(20)				
SELLING_DEALER_STATE_NM	Null	VARCHAR(40)				
SHIP_DATE	Null	DATE				
SOURCESYSTEM_CD	Null	VARCHAR(20)				

Table A4.14 *REPL_PART_STG Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
ACTION_FLG	Null	CHARACTER(1)				
EVENT_ID	Not Null	VARCHAR(50)	N	Y	N	Y

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
LOAD_DTTM	Not Null	DATE	N	N	N	Y
PRODUCT_ID	Null	VARCHAR(50)				
REPL_PART_AMT	Null	NUMERIC(8)				
REPL_PART_CD	Not Null	VARCHAR(20)				
REPL_PART_EVENT_DATE	Null	DATE				
REPL_PART_GRP_CD	Null	VARCHAR(20)				
REPL_PART_GRP_NM	Null	VARCHAR(40)				
REPL_PART_NM	Null	VARCHAR(40)				
REPL_PART_QTY	Null	NUMERIC(8)				
REPL_PART_UNIQUE_ID	Not Null	VARCHAR(50)	Y	N	N	Y
SOURCESYSTEM_CD	Null	VARCHAR(20)				

Table A4.15 *SALE_LAG_PROFILE Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
NEW_FLG	Null	CHARACTER(1)				
REMOVE_FLG	Null	CHARACTER(1)				
SALE_LAG_PROFILE_CATEGORY	Null	VARCHAR(20)				
SALE_LAG_PROFILE_LOCATION	Null	NUMERIC(8)				
SALE_LAG_PROFILE_SCALE	Null	NUMERIC(8)				
SALE_LAG_PROFILE_TYPE	Null	VARCHAR(20)				
SL_AVGPERYEAR	Null	NUMERIC(8)				
SL_FREQ_	Null	NUMERIC(8)				
SL_MAX	Null	NUMERIC(8)				
SL_MEAN	Null	NUMERIC(8)				
SL_MEDIAN	Null	NUMERIC(8)				
SL_MIN	Null	NUMERIC(8)				

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
SL_N	Null	NUMERIC(8)				
SL_P1	Null	NUMERIC(8)				
SL_P5	Null	NUMERIC(8)				
SL_P95	Null	NUMERIC(8)				
SL_P99	Null	NUMERIC(8)				
SL_Q1	Null	NUMERIC(8)				
SL_Q3	Null	NUMERIC(8)				
SL_STD	Null	NUMERIC(8)				

Table A4.16 *TABLE_CONF Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
DATA_SOURCE_ID	Null	VARCHAR(64)				
DATA_TYPE_CD	Null	VARCHAR(32)				
DATA_TYPE_DETAIL_CD	Null	VARCHAR(32)				
DATA_TYPE_GRP_CD	Null	VARCHAR(32)				
DATA_TYPE_LEVEL_CD	Null	VARCHAR(32)				
DM_TABLE_FK_COLUMN_NM	Null	VARCHAR(32)				
DM_TABLE_PK_COLUMN_NM	Null	VARCHAR(32)				
ENTITY_RELATSHP_CD	Null	VARCHAR(32)				
HIDE_TABLE_FLG	Null	CHARACTER(1)				
LOGICAL_TABLE_NM_LABEL	Null	VARCHAR(64)				
MIGRATION_SOURCE_TABLE_NM	Null	VARCHAR(32)				
TABLE_NM	Not Null	VARCHAR(32)	Y	N	N	Y
TABLE_TYPE_CD	Null	VARCHAR(32)				
UPDATE_DTTM	Null	DATE				

Table A4.17 *USAGE_PROFILE Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
NEW_FLG	Null	CHARACTER(1)				
REMOVE_FLG	Null	CHARACTER(1)				
UP_AVGPERYEAR	Null	NUMERIC(8)				
UP_FREQ_	Null	NUMERIC(8)				
UP_MAX	Null	NUMERIC(8)				
UP_MEAN	Null	NUMERIC(8)				
UP_MEDIAN	Null	NUMERIC(8)				
UP_MIN	Null	NUMERIC(8)				
UP_N	Null	NUMERIC(8)				
UP_P1	Null	NUMERIC(8)				
UP_P5	Null	NUMERIC(8)				
UP_P95	Null	NUMERIC(8)				
UP_P99	Null	NUMERIC(8)				
UP_Q1	Null	NUMERIC(8)				
UP_Q3	Null	NUMERIC(8)				
UP_STD	Null	NUMERIC(8)				
USAGE_PROFILE_CATEGORY	Null	VARCHAR(20)				
USAGE_PROFILE_LOCATION	Null	NUMERIC(8)				
USAGE_PROFILE_SCALE	Null	NUMERIC(8)				
USAGE_PROFILE_TYPE	Null	VARCHAR(20)				

Table A4.18 *WRNA_DATA_REFRESH Table*

Column	Null Option	Data Type	Part of Primary Key	Index	Foreign Key	Required to be Populated
WRNA_MART_DATA_DTTM	Null	NUMERIC(10)				

Descriptions of Data Mart Tables

The following data mart tables are available in SAS Field Quality Analytics:

Table A4.19 *Descriptions of Data Mart Tables*

Name	Comment	Table
CSTMR_DIM	Contains customer dimension attributes.	Table A4.20 on page 311
DATE_DIM	Contains date dimension attributes.	Table A4.21 on page 311
EVENT_COMMENT_DIM	Contains event comments dimension attributes.	Table A4.22 on page 312
EVENT_DIM	Contains event dimension attributes.	Table A4.23 on page 312
EVENT_MART	Contains event mart facts.	Table A4.24 on page 313
EXT_PROD_ATTR_DIM	Contains extended product attributes and dimension attributes.	Table A4.25 on page 314
LABOR_CODE_DIM	Contains labor code dimension attributes.	Table A4.26 on page 315
LABOR_CODE_MART	Contains labor code mart facts.	Table A4.27 on page 315
LABOR_CODE_UNIQUE_DIM	Contains the unique ID associated with the labor code for an event.	Table A4.28 on page 316
MASTER_KEY_DIM	A master dimension table that contains values that do not require a physical dimension table.	Table A4.29 on page 316
MODEL_DIM	Contains model dimension attributes.	Table A4.30 on page 316
PRODUCT_DIM	Contains product dimension attributes.	Table A4.31 on page 317
PRODUCT_MART	Contains product mart facts.	Table A4.32 on page 317
REPAIR_DEALER_DIM	Contains repair dealer dimension attributes.	Table A4.33 on page 318
REPL_PART_DIM	Contains replacement part dimension attributes.	Table A4.34 on page 319
REPL_PART_MART	Contains replacement part facts.	Table A4.35 on page 319
REPL_PART_UNIQUE_DIM	Contains a unique ID that is associated with the replacement part event.	Table A4.36 on page 320
SELLING_DEALER_DIM	Contains selling dealer dimension attributes.	Table A4.37 on page 320

Details of Data Mart Tables

This section contains details about each data mart table. The tables are in alphabetical order.

Note: Labels are populated based on the language or locale that is specified when SAS Field Quality Analytics is installed and configured.

Table A4.20 *CSTMR_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
CSTMR_CD Label: Customer Code	Null	VARCHAR(20)				
CSTMR_COUNTRY_CD Label: Customer Country	Null	VARCHAR(20)				
CSTMR_COUNTRY_NM	Null	VARCHAR(40)				
CSTMR_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
CSTMR_NM	Null	VARCHAR(40)				
CSTMR_STATE_CD Label: Customer State	Null	VARCHAR(20)				
CSTMR_STATE_NM	Null	VARCHAR(40)				
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				

Table A4.21 *DATE_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
DATE_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
MONTH_DATE	Null	DATE				
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				
QUARTER_DATE	Null	DATE				
SEMIMONTH_DATE	Null	DATE				

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
WEEK_DATE	Null	DATE				
WEEK7_DATE	Null	DATE				
YEAR_NO	Null	NUMERIC(4)				

Table A4.22 *EVENT_COMMENT_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
CSTMR_COMMENT Label: Customer Comment	Null	VARCHAR(256)				
CSTMR_COMMENT_LANGUAGE	Null	VARCHAR(10)				
EVENT_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				
PRODUCT_DIM_SK	Null	NUMERIC(8)				
TECH_COMMENT Label: Technician Comment	Null	VARCHAR(256)				
TECH_COMMENT_LANGUAGE	Null	VARCHAR(10)				

Table A4.23 *EVENT_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
EVENT_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
EVENT_ID Label: Claim Id	Null	VARCHAR(50)				
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				

Table A4.24 *EVENT_MART Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
EVENT_DAYS_INSERVICE	Null	NUMERIC(8)				
EVENT_DAYS_INSERVICE_BUILD	Null	NUMERIC(8)				
EVENT_DAYS_INSERVICE_SALE	Null	NUMERIC(8)				
EVENT_DAYS_INSERVICE_SHIP	Null	NUMERIC(8)				
EVENT_DIM_SK	Not Null	NUMERIC(8)	Y	Y	Y	Y
EVENT_PAID_DATE Label: Claim Paid Date	Null	DATE	N	Y	N	N
EVENT_STATUS_CD_SK	Null	NUMERIC(8)				
EVENT_SUBMIT_DATE Label: Claim Submit Date	Null	DATE	N	Y	N	N
EVENT_TIS_BIN Label: Claim Tis Bin	Null	NUMERIC(8)				
EVENT_TIS_BIN_BUILD	Null	NUMERIC(8)				
EVENT_TIS_BIN_SALE Label: Claim Tis Bin Sale	Null	NUMERIC(8)				
EVENT_TIS_BIN_SHIP Label: Claim TIS Bin Ship	Null	NUMERIC(8)				
EVENT_TYPE_CD_SK	Null	NUMERIC(8)				
FAILURE_NO Label: Failure Number	Null	NUMERIC(8)				
FIRST_FAILURE_FLG Label: First Failure Flag	Null	CHARACTER(1)				
PRIM_LABOR_CD_SK	Null	NUMERIC(8)				
PRIM_LABOR_GRP_SK	Null	NUMERIC(8)				
PRIM_REPL_PART_CD_SK	Null	NUMERIC(8)				
PRIM_REPL_PART_GRP_SK	Null	NUMERIC(8)				
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				
PRODUCT_DIM_SK	Null	NUMERIC(8)	N	Y	Y	Y

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
REPAIR_COMPLETE_DATE	Null	DATE				
REPAIR_DEALER_DIM_SK	Null	NUMERIC(8)			Y	
REPAIR_OPEN_DATE Label: Repair Open Date	Null	DATE	N	Y	N	N
TOTAL_EVENT_AMT Label: Total Claim Amount	Null	NUMERIC(8)				
TOTAL_LABOR_AMT Label: Total Labor Amount	Null	NUMERIC(8)				
TOTAL_LABOR_HRS Label: Total Labor Hours	Null	NUMERIC(8)				
TOTAL_OTHER_AMT Label: Total Other Amount	Null	NUMERIC(8)				
TOTAL_PARTS_AMT Label: Total Parts Amount	Null	NUMERIC(8)				
USAGE Label: Usage	Null	NUMERIC(8)				
USAGE_TYPE_CD_SK	Null	NUMERIC(8)				

Table A4.25 *EXT_PROD_ATTR_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
EXTRAS_CD Label: Extra Code	Null	VARCHAR(20)				
EXTRAS_NM	Null	VARCHAR(40)				
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				
PRODUCT_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y

Table A4.26 *LABOR_CODE_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
LABOR_CD Label: Labor Code	Null	VARCHAR(20)				
LABOR_CD_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
LABOR_GRP_CD Label: Labor Group Code	Null	VARCHAR(20)				
LABOR_GRP_NM	Null	VARCHAR(40)				
LABOR_NM	Null	VARCHAR(40)				
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				

Table A4.27 *LABOR_CODE_MART Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
EVENT_DIM_SK	Null	NUMERIC(8)				
LABOR_AMOUNT Label: Labor Amount	Null	NUMERIC(8)				
LABOR_CD_DIM_SK	Not Null	NUMERIC(8)	N	N	Y	Y
LABOR_CD_UNIQUE_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
LABOR_CODE_EVENT_DATE	Null	DATE				
LABOR_HOURS Label: Labor Hours	Null	NUMERIC(8)				
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				
PRODUCT_DIM_SK	Null	NUMERIC(8)				

Table A4.28 *LABOR_CODE_UNIQUE_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
LABOR_CD_UNIQUE_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
LABOR_CD_UNIQUE_ID	Null	VARCHAR(50)				
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				

Table A4.29 *MASTER_KEY_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
ATTRIB_FIELD_NM	Null	VARCHAR(32)				
ATTRIB_KEY_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
ATTRIB_NM	Null	VARCHAR(100)				
ATTRIB_VALUE	Null	VARCHAR(100)				
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				

Table A4.30 *MODEL_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
MODEL_CD Label: Model Code	Null	VARCHAR(20)				
MODEL_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
MODEL_NM	Null	VARCHAR(40)				
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				

Table A4.31 *PRODUCT_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				
PRODUCT_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
PRODUCT_ID Label: Product Id	Null	VARCHAR(50)				

Table A4.32 *PRODUCT_MART Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
CSTMR_DIM_SK	Null	NUMERIC(8)				
INSERVICE_DATE Label: In Service Date	Null	DATE	N	Y	N	N
MODEL_DIM_SK	Null	NUMERIC(8)	N	Y	Y	N
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				
PRODUCT_DAYS_INSERVICE	Null	NUMERIC(8)				
PRODUCT_DAYS_INSERVICE_BUILD	Null	NUMERIC(8)				
PRODUCT_DAYS_INSERVICE_SALE	Null	NUMERIC(8)				
PRODUCT_DAYS_INSERVICE_SHIP	Null	NUMERIC(8)				
PRODUCT_DIM_SK	Not Null	NUMERIC(8)	Y	Y	Y	Y
PRODUCT_TIS_BIN Label: Product TIS Bin	Null	NUMERIC(8)				
PRODUCT_TIS_BIN_BUILD	Null	NUMERIC(8)				
PRODUCT_TIS_BIN_SALE	Null	NUMERIC(8)				
PRODUCT_TIS_BIN_SHIP	Null	NUMERIC(8)				

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
PRODUCTION_DATE Label: Production Date	Null	DATE				
SALE_LAG_PROFILE_CATEGORY	Null	VARCHAR(20)				
SALE_LAG_PROFILE_LOCATION	Null	NUMERIC(8)				
SALE_LAG_PROFILE_SCALE	Null	NUMERIC(8)				
SALE_LAG_PROFILE_SK	Null	NUMERIC(8)				
SALE_LAG_PROFILE_TYPE	Null	VARCHAR(20)				
SELLING_DEALER_DIM_SK	Null	NUMERIC(8)				
SHIP_DATE Label: Ship Date	Null	DATE	N	Y	N	N
USAGE_PROFILE_CATEGORY	Null	VARCHAR(20)				
USAGE_PROFILE_LOCATION	Null	NUMERIC(8)				
USAGE_PROFILE_SCALE	Null	NUMERIC(8)				
USAGE_PROFILE_SK	Null	NUMERIC(8)				
USAGE_PROFILE_TYPE Label: Usage Profile Type	Null	VARCHAR(20)				

Table A4.33 *REPAIR_DEALER_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				
REPAIR_DEALER_CD Label: Repair Dealer Code	Null	VARCHAR(20)				
REPAIR_DEALER_COUNTRY_CD	Null	VARCHAR(20)				
REPAIR_DEALER_COUNTRY_NM	Null	VARCHAR(40)				
REPAIR_DEALER_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
REPAIR_DEALER_NM	Null	VARCHAR(40)				
REPAIR_DEALER_STATE_CD	Null	VARCHAR(20)				

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
REPAIR_DEALER_STATE_NM	Null	VARCHAR(40)				

Table A4.34 *REPL_PART_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				
REPL_PART_CD Label: Replaced Part Code	Null	VARCHAR(20)				
REPL_PART_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
REPL_PART_GRP_CD Label: Replaced Part Group Code	Null	VARCHAR(20)				
REPL_PART_GRP_NM	Null	VARCHAR(40)				
REPL_PART_NM	Null	VARCHAR(40)				

Table A4.35 *REPL_PART_MART Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
EVENT_DIM_SK	Null	NUMERIC(8)				
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				
PRODUCT_DIM_SK	Null	NUMERIC(8)				
REPL_PART_AMT Label: Replaced Part Amount	Null	NUMERIC(8)				
REPL_PART_DIM_SK	Null	NUMERIC(8)				
REPL_PART_EVENT_DATE	Null	DATE				
REPL_PART_QTY Label: Replaced Part Quantity	Null	NUMERIC(8)				
REPL_PART_UNIQUE_DIM_SK	Not Null	NUMERIC(8)	Y	Y	Y	Y

Table A4.36 *REPL_PART_UNIQUE_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				
REPL_PART_UNIQUE_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
REPL_PART_UNIQUE_ID	Null	VARCHAR(50)				

Table A4.37 *SELLING_DEALER_DIM Table*

Column and Label	Null Option	Data Type	Part of Unique Key	Index	Foreign Key	Required to be Populated
PROCESS_DTTM Label: LOAD_DTTM	Null	DATE				
SELLING_DEALER_CD Label: Selling Dealer Code	Null	VARCHAR(20)				
SELLING_DEALER_COUNTRY_CD	Null	VARCHAR(20)				
SELLING_DEALER_COUNTRY_NM	Null	VARCHAR(40)				
SELLING_DEALER_DIM_SK	Not Null	NUMERIC(8)	Y	Y	N	Y
SELLING_DEALER_NM	Null	VARCHAR(40)				
SELLING_DEALER_STATE_CD	Null	VARCHAR(20)				
SELLING_DEALER_STATE_NM	Null	VARCHAR(40)				

Appendix 5

Working with Technical Support

Overview

SAS Technical Support can be reached in any of the following ways:

Phone: 919-677-8008

E-mail: support@sas.com

Internet: http://support.sas.com

When you contact SAS Technical Support, the Help Desk representative asks for the following information:

- your SAS site number
- the operating system on the machine where the problem occurred
- the version of the SAS software that you are using

The following sections help you collect additional information to assist your SAS Technical Support representative in resolving your problem.

Record the Problem Context

First, create an accurate description of the problem based on information from the SAS Field Quality Analytics user who is experiencing a problem. The following questions are a good starting point:

- What workspace was the user working in?
- What group was the user a member of?
- If applicable, what task was the user attempting when the problem occurred (for example, what analysis was submitted or what report was requested)?

Provide instructions for duplicating the problem scenario in as much detail as possible. For example:

1. Include the steps that caused the problem.
2. Include a description of the data selection, if applicable, and its name.
3. Provide screen shots that illustrate the problem.
4. Provide a description of any recent changes or disruptions in the environment, such as the following:
   - software upgrades
   - database modifications
   - power interruption
   - Internet service interruptions

General System Questions

Here are some specific questions that your SAS Technical Support contact might ask you. Be prepared to answer them as part of a general diagnostic process.

- Is this issue related to a specific user?
- Is the SAS Field Quality Analytics system administrator able to log on to the application?
- Is the error related to the user interface or to batch processes?
- Are the SAS Field Quality Analytics services running in the middle tier?
- Are the SAS Business Intelligence services running in the SAS tier?
- What are the versions of the operating system and SAS Field Quality Analytics?
- What is the error message?
- Can the user reproduce the reported issue?
- Has this error occurred previously?
- Is there any other pertinent information that might be helpful?

Gathering Information from the Log Files

Most of the time, a job log file is available to help diagnose problems. Logs are available by selecting the desired item and then choosing the **View SAS log** or the **Download SAS log** option. The following types of job log files are available in SAS Field Quality Analytics:

- Analysis execution logs are associated with the analysis ID assigned to them.
- Data Selection logs are associated with the data selection ID.

Batch information is available in the **Batch Status** section of the **Administration** Workspace.

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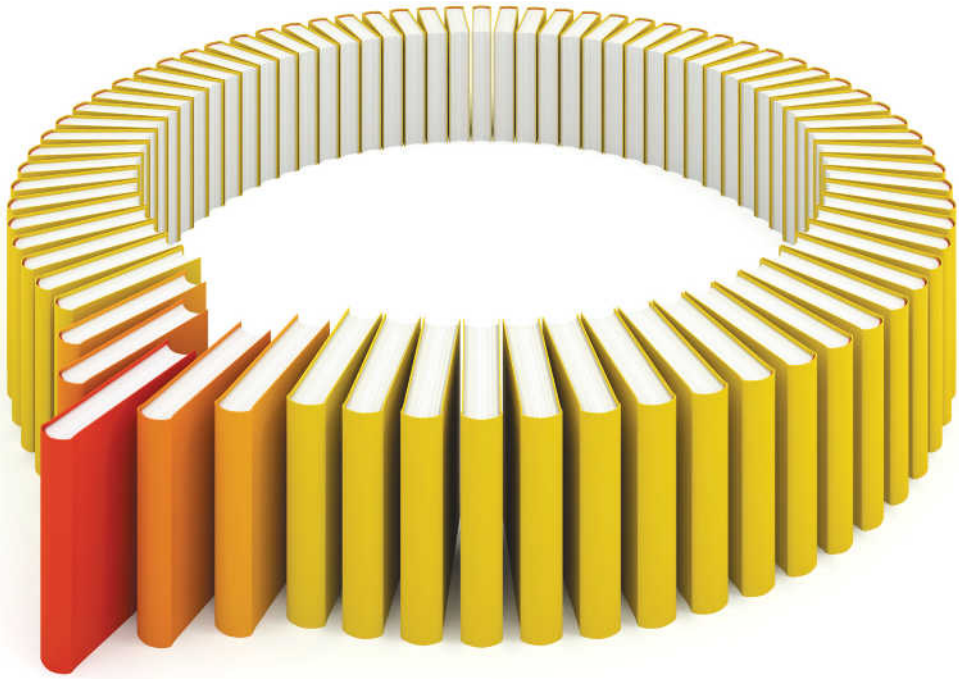

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