

SAS® IT Resource Management 3.2 Migration Documentation

Second Edition



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SAS® IT Resource Management 3.2: Migration Documentation, Second Edition

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About This Book

Audience

Migration tasks are typically performed by the data administrator. Data administrators are responsible for administering the IT data mart and setting up the jobs that stage and aggregate IT performance data to produce analysis and report-ready data.

Recommended Reading

Here is the recommended reading list for this title:

- *QuickStart Guide: SAS 9.2 Planned Deployments using Electronic Software Delivery*
- *SAS 9.2 Electronic Software Delivery for Planning Installations on z/OS*
- *SAS Intelligence Platform: 9.1.3 to 9.2 Migration Guide*
- *What's New in SAS IT Resource Management 3.2*
- *System Requirements*
- *Introduction to SAS IT Resource Management 3.2*
- *SAS IT Resource Management 3.2: Administrator's Guide*
- *SAS IT Resource Management Gallery Manager: User's Guide*
- *SAS IT Resource Management 3.2: Reporting Guide*

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Chapter 1

Introduction to the SAS IT Resource Management 3.2 Migration Process

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SAS IT Resource Management 3.2 Software Migration

This document provides guidelines for migrating from both SAS IT Resource Management 2.7 and SAS IT Resource Management 3.1.1 on SAS 9.1.3 to SAS IT Resource Management 3.2 on SAS 9.2.

SAS IT Resource Management 3.2 is a SAS 9.2 solution. The software components of this solution are installed, migrated, and configured in accordance with the SAS 9.2 platforms. Data that is associated with previous releases of SAS IT Resource Management is migrated using tools delivered by the SAS IT Resource Management solution.

The steps that you must perform to accomplish the migration to SAS IT Resource Management 3.2 software depend on whether you are running SAS IT Resource Management 3.1.1 or SAS IT Resource Management 2.7. These steps are described in the following chapters of this document.

Before you can migrate, your current SAS IT Resource Management system should be updated to one of the following releases with all applicable hot fixes:

- SAS IT Resource Management 2.7 with Hot Fix 27IS07 or later
- SAS IT Resource Management 3.1.1 with Hot Fix 311IS04 or later

SAS IT Resource Management 3.2 Data and Metadata Migration

Migration and Upgrade Defined

Migration

In the context of SAS IT Resource Management, migration is a task that involves copying data and, when it exists, metadata from SAS IT Resource Management 2.7 or 3.1.1 to SAS IT Resource Management 3.2. Migration involves some internal restructuring of the data and metadata to conform to the requirements of the new software.

Upgrade

In the context of SAS IT Resource Management, this task involves changing the structure and names of the tables and columns that define the data in SAS IT Resource Management. This layout of tables and columns is called a data model. The data model for SAS IT Resource Management 3.2 is not the same as the data models for SAS IT Resource Management 2.7 and SAS IT Resource Management 3.1.1.

Options for Migrating to SAS IT Resource Management 3.2

As your site adopts SAS IT Resource Management 3.2, you have options to consider regarding the data, metadata, and data models that are associated with your current SAS IT Resource Management (2.7 or 3.1.1) system.

Migration Option 1

Install SAS IT Resource Management 3.2. Do not migrate data and metadata from a previous installation of SAS IT Resource Management.

Migration Option 2

Install SAS IT Resource Management 3.2. Migrate all metadata (and optionally, data) from a previous installation of SAS IT Resource Management using the SAS Migration Utility.

Migration Option 3

Install SAS IT Resource Management 3.2. Do not migrate data and metadata from a previous installation of SAS IT Resource Management at configuration time. After running configuration for the new system, selectively migrate one or more specific IT data marts from a previous installation of SAS IT Resource Management 3.1.1

PDB Conversion Option: Migrate Specific Performance Databases from SAS IT Resource Management 2.7

After using any of the three previous migration options, you can migrate one or more specific performance databases (PDBs) from a previous installation of SAS IT Resource Management 2.7. These PDBs will be converted into IT data marts as part of the PDB migration process.

Data Model Upgrade Option

After using any of the three previous migration options, and optionally after using the PDB option, you can upgrade one or more specific migrated IT data marts to SAS IT Resource Management 3.2 data models.

The following sections provide information and guidance about each of the three migration options.

Note: This document does not address the conversion of reports from a prior SAS IT Resource Management release to SAS IT Resource Management 3.2. For more information, see the *SAS IT Resource Management 3.2: Reporting Guide*. That document contains an appendix called the “Report Conversion Guide” that provides a description of the steps that are performed in order to recreate reports that were generated using SAS IT Resource Management 2.7 report macros. In addition, see the topic “Migrating SAS Enterprise Guide Projects to Work with SAS IT Resource Management 3.2” in Chapter 2, “Preparing to Work with the SAS IT Resource Management Client” of the *SAS IT Resource Management 3.2: Administrator's Guide*.

Migration Option 1: Install SAS IT Resource Management 3.2; Do Not Migrate or Upgrade Data and Metadata from Your Previous Installation

SAS IT Resource Management 3.2 provides new data models and supplied reports for the adapters that are supported by this release. The use of these data models and reports allows your site to establish a new baseline from which the IT performance management and capacity planning function is performed. If this is what you want to do at your site, choose to install SAS IT Resource Management 3.2 and begin processing IT data with this system. Do not bring forward existing SAS IT Resource Management data and the analysis of that data.

Choosing this option requires you to install the new SAS IT Resource Management 3.2 software and establish new IT data marts. Most likely, your site will maintain the SAS IT Resource Management 2.7 or SAS IT Resource Management 3.1.1 system for a period of time as a complement to, or running in parallel with, SAS IT Resource Management 3.2. This activity should continue until your operational needs indicate that the legacy system can be retired and the data archived.

Note: Processing resources needed to run both the old (SAS IT Resource Management 2.7 or 3.1.1) and new (SAS IT Resource Management 3.2) systems in parallel is a key consideration for this option.

Migration Option 2: Install SAS IT Resource Management 3.2; Migrate All Metadata (and, Optionally, Data) from a Previous Installation of SAS IT Resource Management Using the SAS Migration Utility

If you want to migrate all SAS 9.1.3 system content and configuration to SAS IT Resource Management 3.2 on a SAS 9.2 system, migrate your data and metadata. Migration Option 2 is best suited to sites that have a significant investment in the data produced by the current IT Resource Management system, the customizations made for that system, and the processes that analyze that data.

Choose this option if you want to have access to all IT data marts that were defined in your current SAS IT Resource Management 3.1.1 system. It is also the best choice if you

have a significant investment in SAS 9.1.3 system metadata other than that for SAS IT Resource Management.

If the total size of all metadata for the SAS 9.1.3 system is extremely large, you might encounter (or choose to eliminate the likelihood of) resource constraints such as out-of-memory errors while using this option. If you encounter this problem, you should select Migration Option 3.

Note: The migration process uses more overall disk space because IT data marts must be replicated. If disk space is an issue, you might decide to not migrate and to follow the process described in Migration Option 1. (Migration Option 1 does not recommend migration, but instead recommends that you install SAS IT Resource Management 3.2 and establish new IT data marts.)

After the migration process is completed, the metadata and (optionally) the data are available in SAS IT Resource Management 3.2. If you migrated the data, you can choose whether to update that data to the SAS IT Resource Management 3.2 data model. For more information, see [“Data Model Upgrade Option: Upgrade Specific IT Data Marts to the SAS IT Resource Management 3.2 Data Model”](#).

Migration Option 3: Install SAS IT Resource Management 3.2; Migrate Selected Data and Metadata from Your Previous Installation of SAS IT Resource Management

If you want to use only specific IT data marts from the previous installation of SAS IT Resource Management 3.1.1 in the SAS IT Resource Management 3.2 environment, install and configure IT Resource Management 3.2 without migration. In other words, you perform the installation and configuration without using the SAS Migration Utility and without specifying migration during the configuration process. After the configuration is completed, you can select specific IT data marts to extract from SAS IT Resource Management 3.1.1 and deploy to SAS IT Resource Management 3.2.

Note: For information, see [Migrating a Single IT Data Mart from SAS IT Resource Management 3.1.1 to 3.2 on page 25](#).

Note: Migration of specific IT data marts using this technique does not have to be performed at any specific time.

This option is best suited to sites that want some, but not all, of the IT data marts from their SAS IT Resource Management 3.1.1 system to be used in the new SAS IT Resource Management 3.2 environment. This option is also useful for sites that have resource constraints because migrating one IT data mart at a time uses fewer resources than migrating all of them at the same time.

After you extract a specific IT data mart from SAS IT Resource Management 3.1.1 and deploying it to SAS IT Resource Management 3.2, the metadata and, optionally, the data, are available in SAS IT Resource Management 3.2. If you migrated the data, you can choose whether to update that data to the SAS IT Resource Management 3.2 data model. For more information, see [“Data Model Upgrade Option: Upgrade Specific IT Data Marts to the SAS IT Resource Management 3.2 Data Model”](#).

Using this option will not migrate any metadata outside of the context of SAS IT Resource Management. If you have a significant investment in SAS 9.1.3 system metadata other than metadata that is used for SAS IT Resource Management, you might want to select Migration Option 2.

PDB Conversion Option: Migrate Specific Performance Databases from SAS IT Resource Management 2.7

After the installation and configuration of SAS IT Resource Management 3.2 (by using Migration Options 1, 2, or 3), you might want to use one or more specific PDBs from a previous installation of SAS IT Resource Management 2.7. To convert a PDB to an IT data mart, follow the instructions in Chapter 4, “Migrating SAS ITRM 2.7 Performance Databases to SAS ITRM 3.2 IT Data Marts.” For information, see [“Introduction to Migrating PDBs” on page 33](#).

Migrating specific PDBs using this technique does not have to be performed at a specific time. You can select one or more specific PDBs to migrate now, and also select additional PDBs to migrate at a later date.

After a PDB is migrated, it is in the form of an IT data mart. The metadata, and optionally the data, are available in SAS IT Resource Management 3.2. However, the data model has not been upgraded. You can choose whether to update the data in the IT data mart to the SAS IT Resource Management 3.2 data model for each specific IT data mart. For more information, see [“Data Model Upgrade Option: Upgrade Specific IT Data Marts to the SAS IT Resource Management 3.2 Data Model”](#).

Data Model Upgrade Option: Upgrade Specific IT Data Marts to the SAS IT Resource Management 3.2 Data Model

There are more than 4,000 reports that are supplied in SAS IT Resource Management 3.2. These reports are built using the SAS IT Resource Management 3.2 data model. If you want to use the new supplied reports with data and metadata from your previous installation of SAS IT Resource Management, you must migrate that data and metadata, and then upgrade the data to the new SAS IT Resource Management 3.2 data model.

Upgrading the data model is possible for selected IT data marts whether you choose Migration Options 2 or 3. (If you choose Migration Option 1, then the SAS IT Resource Management 3.2 data model will already be available and so the upgrade is not necessary.) You can also upgrade the data model for selected IT data marts whether the IT data mart was originally migrated from an IT data mart in SAS IT Resource Management 3.1.1 or from a PDB in SAS IT Resource management 2.7.

CAUTION:

If you upgrade to the new SAS IT Resource Management 3.2 data model, any reports that were written for that data in previous IT Resource Management releases might not work without significant refactoring, because the table and column names are different. In addition, some SAS IT Resource Management 3.2 supplied reports might still not function properly for data that is migrated and upgraded from previous IT Resource Management releases. The reason is that the new reports might rely on data that was never present in the previous installation of SAS IT Resource Management.

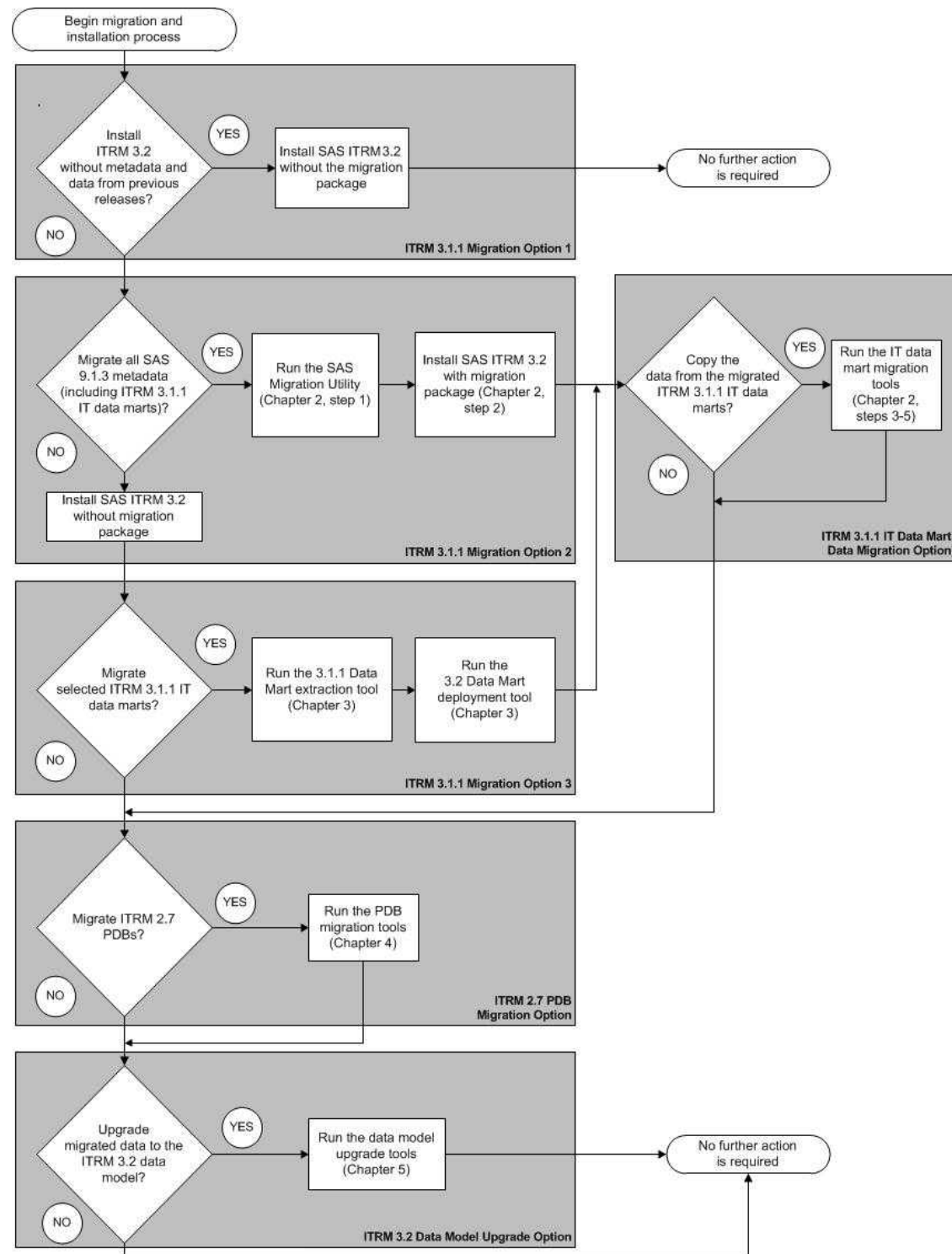
If your site chooses to maintain your former SAS IT Resource Management system or to run that system in parallel with the new SAS IT Resource Management 3.2 system, then those processing resources must be considered.

Summary of Options and the Processes Required for Each

The following flowchart summarizes the options that are available for moving to SAS IT Resource Management 3.2. In addition, this flowchart shows the processes that should

be performed for each option and the chapters in this document that describe how to perform those processes. Use this flowchart and the chapter and step references in it to guide you through your chosen migration option.

Display 1.1 Flowchart of Paths for Moving to SAS IT Resource Management 3.2



Chapter 2

Migrating from SAS IT Resource Management 3.1.1 to 3.2

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Overview of Migrating to SAS IT Resource Management 3.2

To migrate your SAS IT Resource Management software to SAS IT Resource Management 3.2, you must install SAS IT Resource Management 3.2. (The *System Requirements* document for SAS IT Resource Management 3.2 is at <http://support.sas.com/itrm>.)

The process of obtaining, installing, and configuring SAS 9.2 software begins with requesting SAS software from SAS. This request generates a software order e-mail that provides instructions and the tools to download the new SAS IT Resource Management

software from SAS and to install it using the SAS Deployment Wizard. For information about this process for Windows and UNIX installations, see the *QuickStart Guide: SAS 9.2 Planned Deployments using Electronic Software Delivery*. For z/OS installations, see *Installation and Maintenance Instructions—SAS 9.2 Electronic Software Delivery for Planning Installations on z/OS*. To locate this documentation, perform the following steps:

1. Navigate to <http://support.sas.com/documentation/index.html>.
2. From the left navigation panel, select **Install Center**. Then, select the latest entry among the objects labeled “SAS 9.2” such as “SAS 9.2 (TS2Mx).”
3. In the **Quick links** section, select the operating system on which you intend to install the IT Resource Management Server. Locate these documents in the list of documents presented.

Windows Specifics

For Windows installations, select **Documentation for SAS 9.2 Installation on Windows**. Then, scroll down and select **QuickStart Guide to Your SAS 9.2 Planned Deployments using Electronic Software Delivery**. The *QuickStart Guide: SAS 9.2 Planned Deployments using Electronic Software Delivery* is displayed.

UNIX Specifics

For UNIX installations, select **Documentation for SAS 9.2 Installation on UNIX**. Then, scroll down and select **QuickStart Guide to Your SAS 9.2 Planned Deployments using Electronic Software Delivery**. The *QuickStart Guide: SAS 9.2 Planned Deployments using Electronic Software Delivery* is displayed.

z/OS Specifics

For z/OS installations, select **Documentation for SAS 9.2 Installation on z/OS**. Then, scroll down and select the *Installation and Maintenance Instructions—SAS 9.2 Electronic Software Delivery for Planning Installations on z/OS*.

TIP Overall Jobs: The IT Resource Management 3.1.1 grouping of all jobs that are associated with an adapter into an overall job is not a concept that is supported in SAS IT Resource Management 3.2. As such, the migration process will delete any overall jobs that were created by the Adapter Setup Wizard in SAS IT Resource Management 3.1.1. For best results, delete the overall jobs manually in the SAS IT Resource Management 3.1.1 client before the start of the migration process. (Overall jobs were created in SAS IT Resource Management 3.1.1 to serve only as containers of subsidiary jobs. Deleting the overall jobs will not delete the subsidiary jobs contained in them. Do not delete the subsidiary jobs; delete only the overall jobs.)

To migrate all of the metadata from SAS IT Resource Management 3.1.1 (or from your SAS 9.1.3 installation) to SAS IT Resource Management 3.2, run the following programs:

1. Run the SAS Migration Utility on your SAS 9.1.3 system to create a migration package.
2. Install SAS IT Resource Management 3.2 (and SAS 9.2) using the SAS Deployment Wizard. The following options are available for this task:
 - If you want only to install your products (without configuring them), run the SAS Deployment Wizard once, specifying to install your products.

Later, if you want to configure your products, run the SAS Deployment Wizard a second time, specifying to configure your products.

Note: Your SAS IT Resource Management system can be migrated only if the migration option is selected in the configuration process.

- If you want to install your products and configure them at the same time, run the SAS Deployment Wizard once, specifying to install your products and configure them.

Note: Your SAS IT Resource Management system can be migrated only if the migration option is selected in the configuration process.

3. For each IT data mart that is to be moved from SAS IT Resource Management 3.1.1 to SAS IT Resource Management 3.2, perform the following steps to migrate the data to the new platform:
 - a. Run %RMDMPKG on the SAS 9.1.3 system to create a package of the IT data mart to be moved to SAS IT Resource Management 3.2.
 - b. Run %RMDMPATH on the SAS 9.2 system, if necessary. This program modifies the paths associated with the items in the IT data mart.
 - c. Run %RMDMUPKG on the SAS 9.2 system to unpackage the IT data mart that you moved from SAS IT Resource Management 3.1.1.

Step 1: Design Your Migration and Run the SAS Migration Utility

Overview

Before you begin your migration, perform the following preliminary steps to plan your migration:

- Review the *SAS Intelligence Platform: 9.1.3 to 9.2 Migration Guide*, and design your migration. To locate this document, perform the following steps:
 1. Navigate to <http://support.sas.com/documentation/index.html>.
 2. Use the Products Index A–Z to select the Web page for the SAS Migration Utility.
 3. On the SAS Intelligence Platform Web page, scroll down to the Installation, Configuration, and Migration Documentation section where you can find the *SAS Intelligence Platform: 9.1.3 to 9.2 Migration Guide*.
- Perform pre-migration tasks.

CAUTION:

SAS IT Resource Management users: Use the migration approach to install SAS 9.2 and to update their current content. The topic about promotion that is described in *SAS Intelligence Platform: 9.1.3 to 9.2 Migration Guide* does not apply to SAS IT Resource Management data.

Design Your Migration

For information about the steps to prepare for migration, see the chapter called “Designing Your Migration” in the *SAS Intelligence Platform: 9.1.3 to 9.2 Migration Guide*. This chapter describes the following tasks:

- reviewing high-level SAS migration requirements for your SAS topology, middle tier, and operating system.
- assessing your hardware and third-party software.
- taking an inventory of your current SAS deployment. The SAS Migration Utility analyzes the content in your current SAS deployment. It identifies any updates that are needed before the automated migration tools work with your deployment.
- obtaining a SAS 9.2 Deployment Plan file.

Perform Pre-Migration Tasks

For information about the steps to take when preparing for your migration, see the chapter called “Performing Pre-migration Tasks” in the *SAS Intelligence Platform 9.1.3 to 9.2 Migration Guide*. This chapter contains the topics that are mentioned in the following list. They describe the pre-migration tasks that you should perform:

- Back up your SAS 9.1.3 system, including all servers and desktop clients.
- Perform any required SAS 9.1.3 maintenance that is required to meet minimum baselines.

Note: The migration process will delete any overall jobs that were created by the Adapter Setup Wizard in SAS IT Resource Management 3.1.1. For best results, delete the overall jobs manually in the SAS IT Resource Management 3.1.1 client before the start of the migration process.

- Prepare complete pre-installation and migration checklists. These checklists are customized based on the deployment plan that is provided by SAS for your SAS IT Resource Management 3.2 installation. For more information about pre-migration checklists, see the topic about “Completing the Pre-migration Checklists.”
- Install third-party software.
- Create a SAS Software Depot. For information about this task, see the “Creating Software Depots” topic.

When you create a SAS Software Depot for your SAS 9.2 installation, use the QuickStart Guide (for Windows and UNIX installations) or the *SAS 9.2 Electronic Software Delivery for Planning Installations on z/OS* document to help you install your downloaded software. These documents provide an overview of the steps that are required to install your software. The document contains information such as links to documentation for system requirements, migration, pre-installation checklists, and installation. You should review this document to ensure that you have completed all necessary tasks before you begin your installation.

Note: If you plan to create the depot on a UNIX or a z/OS system, make sure that a Windows environment (such as the Common Desktop Environment or X11) is installed. A Windows environment is necessary because the program that you use to create the depot has a graphical user interface.

- Create a migration package by using the SAS Migration Utility. After you create your SAS Migration Utility package, make sure that you can access the package location from the machine where you are installing SAS 9.2. You might need to share the folder that contains the SAS Migration Utility package. Or, you might need to mount or copy the SAS Migration Utility package to the machine where you want to install SAS 9.2.

Note: For information about running the SAS Migration Utility, see the “SAS Migration Utility Reference” appendix of the *SAS Intelligence Platform 9.1.3 to*

9.2 Migration Guide. The “Run the Migration Utility Using a Properties File” topic in this appendix also contains information about specifying properties in the SAS Migration Utility when you are migrating from SAS IT Resource Management 3.1.1.

- Change the ports and host names that are used by SAS products. For more information, see the topic called “Change Ports and Host Names used by SAS Products.” This topic is helpful for users who are installing SAS 9.2 on the same physical machine as their existing SAS 9.1.3 system, particularly z/OS.

Step 2: Run the SAS Deployment Wizard

About the SAS Deployment Wizard

Use the SAS Deployment Wizard to install SAS IT Resource Management 3.2. Specify that this is a migration installation. This action causes the wizard to read the migration package that was created by step 1. The wizard then migrates the metadata content and configuration information so that it can run in SAS 9.2. For information about this wizard, see the *SAS Deployment Wizard: User's Guide* at <http://support.sas.com/documentation/installcenter/92/>.

Perform the Migration to SAS IT Resource Management 3.2 on SAS 9.2

After you create your SAS Migration Utility package and complete your migration assessment, follow these steps to install and configure SAS 9.2 and SAS IT Resource Management 3.2. During this process, you have the option to perform migration.

1. Begin the deployment by locating the SAS Deployment Wizard.

Windows Specifics

Select **setup.exe** from the software depot that you downloaded.

UNIX Specifics

Select **setup.sh**.

z/OS Specifics

Navigate to the root directory of the media that you are working on and type **./setup.rexx** at a command prompt.

These scripts launch the SAS Deployment Wizard, which helps you install and configure SAS 9.2 products. For more information about the SAS Deployment Wizard, see the *SAS Deployment Wizard: User's Guide* at <http://support.sas.com/documentation/installcenter/92/>.

2. In the SAS Deployment Wizard, specify a deployment plan for your installation.

If you have not already done so, contact your SAS representative to obtain a valid SAS 9.2 deployment plan file. A plan file is a necessary component of the SAS Deployment Wizard. This wizard is the tool that you use to install SAS 9.2 and to migrate the package that contains your SAS 9.1.3 data and configuration.

When you contact your SAS representative, it is helpful to have a migration analysis report that represents the current status of your SAS 9.1.3 deployment. For more information, see “SAS 9.2 Changes that Affect the Deployment Plan” topic in the

chapter called “Installing SAS 9.2 and Migrating Your SAS Content” in the *SAS Intelligence Platform: Migration Guide*.

3. Respond to the prompts of the SAS Deployment Wizard until the Migration Information page appears. On this page, select the **Perform Migration** box, and enter the path for the migration package that you created.
4. When prompted, select whether to use the **External User ID** or **SAS internal account**.

This selection determines whether you specify both the user ID and password or just the password for the Unrestricted User and Trusted User IDs. If you choose **External User ID**, make sure that you provide the value for the user ID in a qualified format. For a Windows account, this could be **domain\UserID** or **machine\UserID**. On UNIX, do not use the machine name as part of the user ID.

Note: The external accounts on the SAS IT Resource Management 3.2 machine must match the accounts that were used for SAS Administrator and SAS Trusted User on the SAS IT Resource Management 3.1.1 machine.

5. Complete the installation and configuration process, and then perform any required post-installation steps.

The Instructions.html file that is produced after your installation might have post-installation steps to follow.

Note: When the SAS Deployment Wizard is run specifying the **Perform Migration** option, it deletes any overall jobs that were created by the Adapter Setup Wizard in SAS IT Resource Management 3.1.1.

Step 3: Package SAS IT Resource Management 3.1.1 IT Data Marts for Migration

About Packaging the ITRM 3.1.1 IT Data Marts

Copy the %RMDMPKG macro from the SAS IT Resource Management 3.2 installation location to your SAS IT Resource Management 3.1.1 system. Execute the macro to package all the physical data in your SAS IT Resource Management 3.1.1 IT data marts. If necessary, transfer all packaged data to a location that is accessible by your SAS IT Resource Management 3.2 system.

Note: If you want to use the data that you have collected in SAS IT Resource Management 3.1.1 on your SAS IT Resource Management 3.2 system, then you must execute this step. If you want to migrate only metadata and configuration information without migrating the physical data, then this step is not required.

Copy the %RMDMPKG Macro

The %RMDMPKG macro resides in the following locations on your SAS IT Resource Management 3.2 server tier:

Windows Specifics

`<sasroot>\itmsmvadata\sasmacro`

UNIX Specifics

```
<sasroot>/itmsmvadata/sasmacro
```

z/OS Specifics

```
&prefix.nn.AUTOLIB
```

In the preceding line of code, “&prefix” is your chosen data set prefix and *nn* is the two-byte encoding such as W0, W3, W9, J0, V0, and so on. An example of a z/OS location is **SAS.ITRM.W0.AUTOLIB**.

Copy or transfer this macro to the corresponding macro location on your SAS IT Resource Management 3.1.1 server tier so that it can be executed there.

Note: The directory names and locations for SAS IT Resource Management macros did not change between SAS IT Resource Management 3.1.1 and SAS IT Resource Management 3.2.

Execute the %RMDMPKG Macro

The %RMDMPKG macro packages the physical libraries for a single SAS IT Resource Management 3.1.1 IT data mart. The macro performs this task by scanning the specified IT data mart for SAS libraries and executing PROC CPORT. PROC CPORT creates transport files for each library. The transport files are then written to the specified output package directory. For information, see [“Macros That Are Used for the Migration Process” on page 17](#).

Each SAS IT Resource Management 3.1.1 IT data mart requires a separate invocation of %RMDMPKG that points to a separate output package directory. (The **PKGDIR** parameter specifies the separate output packages.) Do not point to the same output package directory for different IT data marts.

The %RMDMPKG macro can be run in Report mode first, so that only a report of what would be done is produced. (The default mode of execution is to run in Report mode.) Here is an example of the %RMDMPKG macro for Windows:

```
%RMDMPKG (
    DATAMART=NTSMFdatamart,
    METAPASS=mypassword,
    METAPORT=8561,
    METASERVER=my.metadata.server,
    METAUSER=admin,
    PKGDIR=c:\migration\311packages\NTSMFdatamart
);
```

The value of the **DOPACKAGES** parameter defaults to **NO**. Therefore, the preceding invocation of %RMDMPKG produces only a report of what packages would be created if the **DOPACKAGES** parameter were set to **YES**. If the value of the **DOPACKAGES** parameter is set to **YES**, then the macro packages all the physical SAS libraries that are found in the NTSMFdatamart. The macro writes the transport files to **c:\migration\311packages\NTSMFdatamart**.

Here is an example of the %RMDMPKG macro for z/OS:

```
%RMDMPKG (
    DATAMART=SMFdatamart,
    METAPASS=mypassword,
    METAPORT=8561,
    METASERVER=my.metadata.server,
    METAUSER=admin,
```

```

PKGDIR=MIG.311PKG.SMFDM,
DOPACKAGES=YES
);

```

For z/OS, the **PKGDIR** parameter can specify a PDS, PDSE, or zFS directory.

Note: The %RMDMPKG macro supports packaging SAS data sets and catalogs, but not SAS views.

The %RMDMPKG macro can be invoked in SAS interactive or batch mode. However, if the physical data libraries are large or numerous, running in batch mode is more practical. To rerun the macro in the event of an error, clear out the output directory that is specified by the **PKGDIR** parameter and rerun the macro. This macro does not update any metadata on the SAS Metadata Server.

Transfer the Packaged Data

If the file systems that are used by SAS IT Resource Management 3.1.1 and SAS IT Resource Management 3.2 are not shared, you must transfer all package directories and their contents to locations that are accessible by SAS IT Resource Management 3.2. You can do this by means of FTP or a similar tool. If the file systems are shared, then the package directories are accessible by SAS IT Resource Management 3.2. In that situation, transferring the data is not necessary.

Note: If you are using FTP to perform the transfer of the data, ensure that the transfer mode is set to **BINARY**.

Step 4: Rename the SAS ITRM 3.1.1 IT Data Mart Metadata Pathnames and Data Sets for Migration

When Should Metadata Pathnames and Data Sets be Renamed?

If the file systems that are used by SAS IT Resource Management 3.1.1 and SAS IT Resource Management 3.2 are not shared, then this step is not required. You can use the %RMDMPATH macro to rename the pathnames and data sets in the metadata for the new SAS IT Resource Management 3.2 IT data marts. This renaming is done so that existing SAS IT Resource Management 3.1.1 physical data libraries are not overwritten when the physical data is unpackaged in step 5. This step should be performed only if the file systems used by both SAS IT Resource Management 3.1.1 and SAS IT Resource Management 3.2 are shared. If the file systems are shared, then unpackaging the data that was previously packaged by the %RMDMPKG macro might result in errors.

The SAS IT Resource Management 3.1.1 libraries might also be inadvertently overwritten. This situation could occur because the pathnames (or data set names on z/OS) that were in the SAS IT Resource Management 3.1.1 IT data mart metadata were transferred to the SAS IT Resource Management 3.2 IT data marts without modification by the SAS Deployment Wizard. Thus, the pathnames are identical. Because the %RMDMUPKG macro uses the SAS IT Resource Management 3.2 pathnames to unpackage the data, errors might result since those libraries already exist. For information, see [“Macros That Are Used for the Migration Process” on page 17](#).

Examples

Example for Windows Environments

In this example, the pathname for one of the aggregation libraries in the SAS IT Resource Management 3.1.1 IT data mart is **c:\MyDatamart\summary\sum2278**. It resides on a PC named WIN1. Also, the server tier for SAS IT Resource Management 3.2 resides on a PC named WIN2. Unpackaging the package directory on this separate machine means that a new, identically named directory named **c:\MyDatamart\summary\sum2278** will be created and populated with physical libraries. Since WIN1 and WIN2 do not share the same file systems, there is no conflict. Thus, there is no need to rename the pathnames.

Example for z/OS Environments

In this example, the data set name for one of the aggregation libraries in the SAS IT Resource Management 3.1.1 IT data mart is ITRM.SUMMARY.SUM3445. It resides on a mainframe named ZOS1. The server tier for SAS IT Resource Management 3.2 resides on the same mainframe. Unpackaging the package directory on this same machine means that an attempt will be made to create a directory using the same name, ITRM.SUMMARY.SUM3445. This situation results in an error causing the unpackaging job to fail, because a data set by that name already exists. Because SAS IT Resource Management 3.1.1 and SAS IT Resource Management 3.2 are on the same machine, thus sharing the same file systems, renaming the data set names is required.

If you need to rename pathnames or data set names, use the %RMDMPATH macro. This macro scans the SAS IT Resource Management 3.2 metadata and renames a portion of pathname. The renaming is accomplished by using a simple string substitution algorithm.

Note: The pathnames that are being renamed are references in the SAS IT Resource Management 3.2 metadata. No physical data is actually renamed.

Typically, only the starting portion of the pathname is renamed, known as the root path. For example:

```
%RMDMPATH (
    DATAMART=NTSMFdatamart,
    METAPASS=myspassword,
    METAPORT=8561,
    METASERVER=my.metadata.server,
    METAUSER=admin,
    NEW_ROOTPATH =C:\sas9\my32dm,
    OLD_ROOTPATH=C:\sas9\my311dm,
    DORENAMES=YES
);
```

This specifies that all SAS libraries that start with **C:\sas9\my311dm** are renamed to start with **C:\sas9\my32dm**. For example, a SAS library with a pathname of **C:\sas9\my311dm\summary\sum2557** would be renamed to **C:\sas9\my32dm\summary\sum2557**. The matching of the value of the **OLD_ROOTPATH** parameter to the pathnames in the SAS IT Resource Management 3.2 metadata begins in column 1. If there is a match, the old value is replaced with the value specified by the **NEW_ROOTPATH** parameter.

Make sure that you specify the path parameters correctly. Both the **OLD_ROOTPATH** and **NEW_ROOTPATH** parameters are case sensitive, and no validity checking is performed to

ensure that the pathname is technically correct. Run the %RMDMPATH macro in report-only mode initially so that only a report of what would be done is produced. This setting is the default value for the macro. To actually perform the renaming of the pathnames, specify **YES** for the **DORENAMES** parameter.

The following pathnames are renamed:

- pathnames for SAS libraries
- default root path for the IT data mart itself

Other pathnames, such as pathnames for external files, are not renamed.

You can turn off the renaming of the default root path by specifying **NO** for the **DEFAULT_ROOTPATH** parameter. However, this setting is usually not recommended because any new libraries that are created in the IT data mart by the Adapter Setup wizard will have the value of the old default root path. For more information about the default root path in the IT data mart, see Chapter 4, “IT Data Mart” in the *SAS IT Resource Management 3.2: Administrator’s Guide*.

Step 5: Unpackage IT Resource Management

3.1.1 Data Marts for Migration

If you performed step 3, then use the %RMDMUPKG macro to unpackage the physical data that was created in step 3. Unpackage the physical data into the SAS IT Resource Management 3.2 IT data marts. If step 4 was executed to rename the pathnames and data sets, then those new names are used in this step.

Note: If you are migrating a single IT data mart from SAS IT Resource Management 3.1.1 to 3.2, and you are not using the SAS Migration Utility to do so, set the SMU= option to **NO**. This setting indicates that the SAS Migration Utility was not used to migrate the metadata associated with this IT data mart.

The %RMDMUPKG macro unpackages all the transport files in the package directory that were created by the %RMDMPKG macro. It performs this task by reading an index file in the package directory that describes all the libraries that have been packaged. Each library in the index file is then matched with its corresponding library object in the SAS IT Resource Management 3.2 IT data mart. PROC CIMPORT is executed to import the libraries from the transport files and write them to the SAS IT Resource Management 3.2 destination libraries. Those libraries are created if they do not currently exist. For information, see “[Macros That Are Used for the Migration Process](#)” on page 17.

Certain libraries in SAS IT Resource Management 3.2 have a different internal format than SAS IT Resource Management 3.1.1. In order to perform the reformatting, the %RMDMUPKG macro first executes PROC CIMPORT to transfer the libraries into the WORK libref. The macro then performs the reformatting tasks in WORK and uses PROC COPY to write the data sets to the permanent SAS IT Resource Management 3.2 library.

Therefore, in order to run successfully, %RMDMUPKG might require large amounts of WORK space. The maximum amount of WORK space needed is slightly larger than the largest single library to be imported. Refer to your operating system companion documentation for instructions about specifying a larger WORK library. To locate the companion documentation for your operating environment, navigate to <http://support.sas.com/documentation/index.html>. Use the Products Index A–Z to select the Web page for Base SAS. On the Base SAS 9.2 Web page, scroll down to the

section called “Operating Environment Specific Information” where you can find the companion documents.

Like %RMDMPKG, each IT data mart requires a separate invocation of %RMDMUPKG pointing to a separate package directory. The directory is specified by the **PKGDIR** parameter. The %RMDMUPKG macro can be run in report mode first, so that only a report of what would be unpackaged is produced. This setting is the default value for this macro. Here is an example of using the %RMDMUPKG macro for Windows:

```
%RMDMUPKG( DATAMART=NTSMFdatamart,
            METAPASS=myspassword,
            METAPORT=8561,
            METASERVER=my.metadata.server,
            METAUSER=admin,
            PKGDIR=c:\migration\311packages\NTSMFdatamart
            );
```

The value of the **DOPACKAGES** parameter defaults to **NO**. Therefore, this invocation of %RMDMUPKG produces a report of only what would be unpackaged if the value of the **DOPACKAGES** parameter is set to **YES**. If the value of the **DOPACKAGES** parameter is **YES**, then the macro unpackages all the physical SAS libraries that are found in **c:\migration\311packages\NTSMFdatamart**. The macro unpackages these libraries into the corresponding SAS libraries found in the NTSMFdatamart.

Here is an example of using the %RMDMUPKG macro for z/OS:

```
%RMDMUPKG( DATAMART=SMFdatamart,
            METAPASS=myspassword,
            METAPORT=8561,
            METASERVER=my.metadata.server,
            METAUSER=admin,
            DOPACKAGES=YES,
            PKGDIR=MIG.311PKG.SMFDM,
            FILEDEVICE=DISK,
            FILEUNIT=CYL,
            FILESPACEPRIMARY=10,
            FILESPACESECONDARY=20
            );
```

For z/OS, the **PKGDIR** parameter can specify a PDS, PDSE, or zFS directory. You can use the z/OS file allocation parameters to control the creation of the new SAS libraries on the traditional z/OS file system.

The %RMDMUPKG macro can be invoked in SAS interactive or batch mode. However, running in batch mode is recommended if the physical data libraries are large or numerous. This macro does not update any metadata on the SAS Metadata Server.

Macros That Are Used for the Migration Process

Introduction to Migration Macros

The following macros are used in the migration process for SAS IT Resource Management:

- %RMDMPKG
- %RMDMPATH
- %RMDMUPKG

%RMDMPKG

%RMDMPKG Macro Syntax

%RMDMPKG

```
(DATAMART=name of the IT data mart to use
,METAPASS=password for the metauser
,METAPORT=service or port for the metadata server
,METASERVER=host-name or IP address for the metadata server
,METAUSER=user ID for metadata server access and definition
,PKGDIR=output directory to contain the CPORT files
<,DISP=OLD><,DOPACKAGES=YES | NO>
<,DOREPORT=YES | NO>
<,IDXNAME=PKGIDX | alternate filename>
<,REPOS=ITMS | metadata repository>
<,STAGEDLIBS=YES | NO>
<,_RC=macro variable name to hold return code>
);
```

%RMDMPKG Required Arguments

DATAMART=*name of the IT data mart to use*

specifies the name of the IT data mart that is to be used. A value for this parameter is required.

METAPASS=*password for the metauser*

specifies the password for connecting the user ID to the metadata server. A value for this parameter is required.

METAPORT=*service or port for the metadata server*

specifies the TCP/IP service name or port number that the metadata server is listening on. A value for this parameter is required.

METASERVER=*host-name or IP address for the metadata server*

specifies the host name or TCP/IP address of the metadata server. A value for this parameter is required.

METAUSER=*user ID for metadata server access and definition*

specifies the user ID for accessing the metadata server. A value for this parameter is required. The user ID should be configured according to the SAS IT Resource Management configuration and installation instructions. These instructions are available from the SAS Install Center at <http://support.sas.com/documentation/installcenter/index.html>.

PKGDIR=*output directory to contain the CPORT files*

specifies the directory that is to contain the CPORT files for all the SAS libraries in the IT data mart. A value for this parameter is required. This directory must exist before running the %RMDMPKG macro. In addition, the directory must have enough disk space available to accommodate all IT data mart physical data sets in transport format. For Windows, UNIX, and zFS on z/OS, this is a standard directory. For a traditional z/OS file system, this file should be a PDS or PDSE.

%RMDMPKG Optional Parameters**DISP=OLD**

specifies the disposition of input libraries on z/OS only. Warning messages might occur if the disposition is set to **SHR**. A value for this parameter is optional. The default value for this parameter is **OLD**.

DOPACKAGES=YES | NO

specifies that the packages are to be created. A value for this parameter is optional. The default value for this parameter is **NO**.

DOREPORT=YES | NO

specifies that a report is to be produced that lists that SAS libraries were packaged. A value for this parameter is optional. The default value for this parameter is **YES**.

IDXNAME=PKGIDX | *alternate filename*

specifies the name of the file that is to be used as an index of the files that are packaged. A value for this parameter is optional. It is required only if there are naming conflicts. The default name of this file is **pkgidx.cpt** on Windows, UNIX, and zFS on z/OS. The default name is **PKGIDX** on a traditional z/OS file system.

REPOS=ITMS | *metadata repository*

specifies the metadata repository that contains the IT data mart. A value for this parameter is optional. The default value for this parameter is **ITMS**.

STAGEDLIBS=YES | NO

specifies whether staged libraries should be packaged. A value for this parameter is optional. The default value for this parameter is **NO**.

_RC=*macro variable name to hold return code*

specifies the name of a macro variable that holds the return code value from the execution of this macro. A value for this parameter is optional. This parameter is not case sensitive.

%RMDMPATH**%RMDMPATH Macro Syntax****%RMDMPATH(**

```

DATAMART=name of the IT data mart to use
,METAPASS=password for the metauser
,METAPORT=service or port for the metadata server
,METASERVER=host-name or IP address for the metadata server
,METAUSER=user ID for metadata server access and definition
,NEW_ROOTPATH=new root path value
,OLD_ROOTPATH=old root path that is to be renamed
<,DEFAULT_ROOTPATH =YES | NO>
<,DOREPORT=YES | NO>
<,DORENAMES=YES | NO>
<,REPOS=ITMS | metadata repository>
<,_RC=macro variable name to hold return code>
);

```

%RMDMPATH Required Arguments**DATAMART=*name of the IT data mart to use***

specifies the name of the IT data mart that is to be used. A value for this parameter is required.

METAPASS=*password for the metauser*

specifies the password to use for connecting the user ID to the metadata server. A value for this parameter is required.

METAPORT=*service or port for the metadata server*

specifies the TCP/IP service name or port number that the metadata server is listening on. A value for this parameter is required.

METASERVER=*host-name or IP address for the metadata server*

specifies the host name or TCP/IP address of the metadata server. A value for this parameter is required.

METAUSER=*user ID for metadata server access and definition*

specifies the user ID for accessing the metadata server. A value for this parameter is required. The user ID should be configured according to the SAS IT Resource Management configuration and installation instructions. These instructions are available from the SAS Install Center at <http://support.sas.com/documentation/installcenter/index.html>.

NEW_ROOTPATH=*new root path value*

specifies the new root path value that replaces the old root path value in all of the pathnames for SAS libraries. A value for this parameter is required and it is case sensitive.

OLD_ROOTPATH=*old root path that is to be renamed*

specifies the old root path value that is to be renamed. This parameter is matched with the pathnames of all SAS libraries in the IT data mart, starting in column 1 of the pathname. A value for this parameter is required and it is case sensitive.

%RMDMPATH *Optional Parameters***DEFAULT_ROOTPATH** =YES | NO

specifies that the default root path associated with the IT data mart is to be renamed in addition to the pathnames associated with SAS libraries. A value for this parameter is optional. The default value for this parameter is **YES**.

DORENAMES=YES | NO

specifies that the SAS libraries are to be renamed. A value for this parameter is optional. The default value for this parameter is **NO**.

DOREPORT=YES | NO

specifies that a report be produced that details what SAS libraries were renamed. A value for this parameter is optional. The default value for this parameter is **YES**.

REPOS=ITMS | *metadata repository*

specifies the metadata repository that contains the IT data mart. A value for this parameter is optional. The default value for this parameter is **ITMS**.

_RC=*macro variable name to hold return code*

specifies the name of a macro variable that holds the return code value from the execution of this macro. A value for this parameter is optional. This parameter is not case sensitive.

%RMDMUPKG**%RMDMUPKG Macro Syntax**

```

%RMDMUPKG (
  DATAMART=name of the IT data mart to use
  ,METAPASS=password for metauser
  ,METAPORT=service or port for the metadata server
  ,METASERVER=host-name or IP address for the metadata server
  ,METAUSER=user ID for metadata server access and definition
  ,PKGDIR=output directory to contain the CPORT files
  <,>DOPACKAGES=YES | NO>
  <,>DOREPORT=YES | NO>
  <,>FILEDEVICE=z/OS type of device>
  <,>FILESPACEPRIMARY=z/OS primary space allocation>
  <,>FILESPACESECONDARY=z/OS secondary space allocation>
  <,>FILEUNIT=z/OS unit of allocation>
  <,>IDXNAME=PKGIDX | alternate filename>
  <,>LIBNAMEOPTIONS=z/OS LIBNAME options>
  <,>REPOS=ITMS | metadata repository>
  <,>_RC=macro variable name to hold return code>
  <,>SMU=YES | NO>
);

```

%RMDMUPKG Required Parameters**DATAMART**=*name of the IT data mart to use*

specifies the name of the IT data mart that is to be used. A value for this parameter is required.

METAPASS=*password for metauser*

specifies the password for connecting the user ID to the metadata server. A value for this parameter is required.

METAPORT=*service or port for the metadata server*

specifies the TCP/IP service name or port number that the metadata server is listening on. A value for this parameter is required.

METASERVER=*host-name or IP address for the metadata server*

specifies the host name or TCP/IP address of the metadata server. A value for this parameter is required.

METAUSER=*user ID for metadata server access and definition*

specifies the user ID for accessing the metadata server. A value for this parameter is required. The user ID should be configured according to the SAS IT Resource Management configuration and installation instructions. These instructions are available from the SAS Install Center at <http://support.sas.com/documentation/installcenter/index.html>.

PKGDIR=*output directory to contain the CPORT files*

specifies the directory that is to contain the CPORT files for all of the SAS libraries in the IT data mart. A value for this parameter is required. This directory must exist before running the %RMDMUPKG macro. In addition, it must have enough disk space available to accommodate all IT data mart physical data sets in transport format. For Windows, UNIX, and zFS on z/OS, this is a standard directory. For a traditional z/OS file system, this file should be a PDS or PDSE.

%RMDMUPKG Optional Parameters**DOPACKAGES=YES | NO**

specifies that the packages are to be created. A value for this parameter is optional. The default value for this parameter is **NO**.

DOREPORT=YES | NO

specifies that a report be produced that details what SAS libraries were packaged. A value for this parameter is optional. The default value for this parameter is **YES**.

FILEDEVICE=z/OS type of device

specifies the UNIT allocation parameter to use in the allocation of IT data mart libraries in a z/OS traditional file system such as **SYSDA**. A value for this parameter is optional. If it is not specified, it defaults to the value of the **FILEDEV** SAS system option.

FILEUNIT=z/OS unit of allocation

specifies the unit of space allocation to use in the allocation of IT data mart libraries in a z/OS traditional file system such as **CYL**. A value for this parameter is optional. If it is not specified, then it defaults to the value of the **FILEUNIT** SAS system option.

FILESAPCEPRIMARY=z/OS primary space allocation

specifies the primary space allocation to use in the allocation of IT data mart libraries in a z/OS traditional file system. A value for this parameter is optional. If it is not specified, then it defaults to the value of the **FILESPPRI** SAS system option.

FILESAPCESECONDARY=z/OS secondary space allocation

specifies the secondary space allocation to use in the allocation of IT data mart libraries in a z/OS traditional file system. A value for this parameter is optional. If it is not specified, then it defaults to the value of the **FILESPPSEC** SAS system option.

IDXNAME=PKGIDX | alternate filename

specifies the name of the file that is to be used as an index of the files that are packaged. A value for this parameter is optional. It must be supplied only if there are naming conflicts. The default name is **pkgidx.cpt** on Windows, UNIX, and zFS on z/OS. The default name is **PKGIDX** on traditional z/OS file system.

LIBNAMEOPTIONS=z/OS LIBNAME Options

specifies any valid LIBNAME options to use in the allocation of IT data mart libraries in a z/OS traditional file system. A value for this parameter is optional.

REPOS=ITMS | metadata repository

specifies the metadata repository that contains the IT data mart. A value for this parameter is optional.

_RC=macro variable name to hold return code

specifies the name of a macro variable that holds the return code value from the execution of this macro. A value for this parameter is optional. This parameter is not case sensitive.

SMU=YES | NO

specifies whether the SAS Migration Utility (SMU) was used to migrate the data. If the SMU was used, SAS IT Resource Management performs extensive error-checking to ensure that the proper libraries are used to unpack the data. A value for this parameter is optional. The default value for this parameter is **YES**.

- If the value is set to **YES**, error-checking is performed.
- If the value is set to **NO**, error-checking is not performed.

Note: If you are migrating a single IT data mart, additional error-checking is not required. Set the value of this parameter to **NO** to avoid generating error messages.

Chapter 3

Migrating a Single IT Data Mart from SAS IT Resource Management 3.1.1 to 3.2

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Migrating a Single IT Data Mart from SAS IT Resource Management 3.1.1 to 3.2

Overview

In some instances, you might want to migrate only a single IT data mart from SAS IT Resource Management 3.1.1 to SAS IT Resource Management 3.2. The Extract311DataMart and DeployDataMartTo32 tools provide this functionality.

Note: The Extract311DataMart and DeployDataMartTo32 tools are supported only when migrating IT data marts between IT Resource Management systems that are hosted on platforms belonging to the same operating system family. For example, you can migrate only from Windows to Windows, from UNIX to UNIX, or from z/OS to z/OS.

These tools support all objects in an IT data mart except for information maps and formulas.

- To generate information maps on the SAS IT Resource Management 3.2 system, you must run the Information Map jobs on that system.
- The staged and aggregated tables in the IT data mart that you are migrating from SAS IT Resource Management 3.1.1 might use formulas in the calculation of a computed column. If so, the formulas that are invoked are matched to the formulas that are in the **IT Formulas** folder on the SAS IT Resource Management 3.2 system. The formulas on the SAS IT Resource Management 3.2 system are the formulas that will be used in the calculation of computed columns. (The formulas that are on the SAS IT Resource Management 3.1.1 system will not be applied to the computed column calculations.)

Therefore, before migrating your IT data marts, change the formulas on the target SAS IT Resource Management 3.2 system to match the formulas that are used in your SAS IT Resource Management 3.1.1 system. For more information, see Chapter 6, “Formulas” in the *SAS IT Resource Management 3.2: Administrator’s Guide*.

How the Extract311DataMart and DeployDataMartTo32 Tools Work

The Extract311DataMart and DeployDataMartTo32 tools are distributed in a JAR file called Extract311Deploy32.jar. This JAR file is available in hotfix D49001.

1. Move the Extract311Deploy32.jar file to the SAS IT Resource Management 3.1.1 Windows system where your client software is installed. This Windows system will have SAS Management Console 9.1, which is part of the SAS 9.1.3 system. (This system does not need to have SAS Foundation installed on it.)

Note: If you installed SAS Management Console 9.1 in a location other than the default location, you need to set an SMCCLIENT environment variable that points to the non-default location before you run the Extract311ITDataMart.bat script. In a DOS prompt window, issue the **set smcclient =drive:alternate-directory** command. For example:

```
set smcclient=D:\Program Files\SAS\SAS Management Console\9.1
```

2. In a DOS prompt window, make sure that the **..\bin** directory of a Java JDK is in your PATH environment variable. For example:

```
set path=C:\j2sdk1.4.2_09\bin;%PATH%
```

Then use the **jar -xf [janame]** command to unzip the Extract311Deploy32.jar file and place it in a new directory tree. The following example creates a new directory called **Extract**, sets the current working directory to **Extract**, and unzips the JAR file into that directory.

```
mkdir c:\Extract
cd c:\Extract
jar -xf Extract311Deploy32.jar
```

The **jar -xf [janame]** command creates a directory tree that is extracted from the JAR, which is located in the current working directory.

3. Change the current working directory to the **..\Extract311Deploy32\Utilities\metadata** folder of the directory you just extracted. This directory contains a batch file, Extract311DataMart.bat, that you can invoke to extract the metadata of the IT data mart that you want to migrate.
4. Run the Extract311DataMart.bat program.

Note: Before running this Windows batch file, the JAVA_HOME environment variable should be set to the correct Java Virtual Machine (JVM) using the correct version of Java. The supported Java versions for SAS client applications are documented at [Third-Party Software Reference](#). See the section for SAS client applications under the appropriate Service Pack for your SAS 9.1.3 environment.

Specify the following positional parameters for the Extract311DataMart.bat program:

- the name of the IT data mart that you are migrating. This name is also used to identify the migrated IT data mart on the SAS IT Resource Management 3.2 system. If the name of the IT data mart contains spaces, enclose it in double quotation marks.

Note: If an IT data mart with this name already exists on the target SAS IT Resource Management 3.2 system, the migrated IT data mart is renamed in order to avoid duplication.

- the name of the metadata server where the SAS IT Resource Management 3.1.1 system is located.
- the port that is associated with the specified metadata server.
- the user ID that connects you to the specified metadata server.

Note: The user ID should be authorized to create new top-level folders in the ITMS repository. Use an administrative user ID if necessary.

- the password that is associated with the specified user ID.

For example:

```
Extract311DataMart "SampleDataMart"
                    your311server.domain.com
                    8561
                    youruserID
                    yourpassword
```

This extract program produces the metadata about the IT data mart that you want to migrate (in XML form) and writes the extracted files to the directory tree on the SAS IT Resource Management 3.1.1 system.

The messages written by the Extract311DataMart batch file can be captured in the usual Windows method, by redirecting output. For example:

```
Extract311DataMart "SampleDataMart"
                    your311server.domain.com
                    8561
                    youruserID
                    yourpassword
                    > extract.log
```

5. On your SAS IT Resource Management 3.2 system, create a metadata repository named *ITMS*.

To create the repository, perform the following steps:

- a. Invoke SAS Management Console 9.2 and log on using an administrative user account.
- b. On the **Plug-ins** tab, expand **Environment Manager**. In the Metadata Manager section, select **Active Server**.
- c. On the **Actions** menu, select **New Repository**. The New Repository wizard opens.
 - Specify the name of the new repository as **ITMS**.
 - Specify a path. (For example, the path could be **MetadataRepositories \ITMS**).

Note: You can also specify authorization details for the new repository at this time. Alternatively, you can change the authorization details later.

6. Move the entire directory tree that was created in step 2 from your SAS 9.1.3 system to your SAS IT Resource Management 3.2 client machine.

The directory contains a batch file, **DeployDataMartTo32.bat**, that you can invoke to deploy the migrated IT data mart onto your SAS IT Resource Management 3.2 system.

7. On your SAS IT Resource Management 3.2 system, change the current working directory to the `../Utilities/metadata` folder of the directory you just moved.
8. If you installed the SAS IT Resource Management 3.2 client in a location other than the default location, you need to set an `ITRMCLIENTTIER` environment variable to point to the non-default location before you run the `DeployDataMartTo32.bat` script. In the DOS prompt window, issue the `set itrmclienttier =drive: alternate-directory` command. For example:

```
set itrmclienttier=
D:\Program Files\SAS\SASITResourceManagementClient\3.2
```

If you installed the SAS Versioned Jar Repository into a non-default location, you need to set a `VJRPATH` environment variable to point to the non-default location before you run the `DeployDataMartTo32.bat` script. In the DOS prompt window, issue the `vjrpath =drive: alternate-directory` command. For example:

```
set vjrpath =
D:\Program Files\SAS\SASVersionedJarRepository\9.2
```

If you installed the SAS Platform Object Framework into a non-default location, or if you want to use an alternate SAS Java external configuration file, you need to set an `EXTCONFIG` environment variable to point to the non-default location before you run the `DeployDataMartTo32.bat` script. (This environment variable should point to a file location rather than a directory location.) In the DOS prompt window, issue the `set extconfig =drive:alternate-directory filename` command. For example:

```
set extconfig =
D:\Program Files\SAS\SASPlatformObjectFramework\9.2\sas.java.ext.config
```

9. Run the `DeployDataMartTo32.bat` program.

Note: Before running this Windows batch file, the `JAVA_HOME` environment variable should be set to the correct Java Virtual Machine (JVM) using the correct version of Java. The supported Java versions for SAS client applications are documented at [Third-Party Software Reference](#). See the section for Java Runtime Environments under the appropriate maintenance release for your SAS 9.2 environment.

Specify the following positional parameters for the `DeployDataMartTo32.bat` program:

- the name of the metadata server where the SAS IT Resource Management 3.2 system is located
- the port that is associated with the specified metadata server
- your user ID that connects you to the specified metadata server
- the password that is associated with the specified user ID

For example:

```
DeployDataMartTo32 your32server.domain.com
8561
youruserID
yourpassword
```

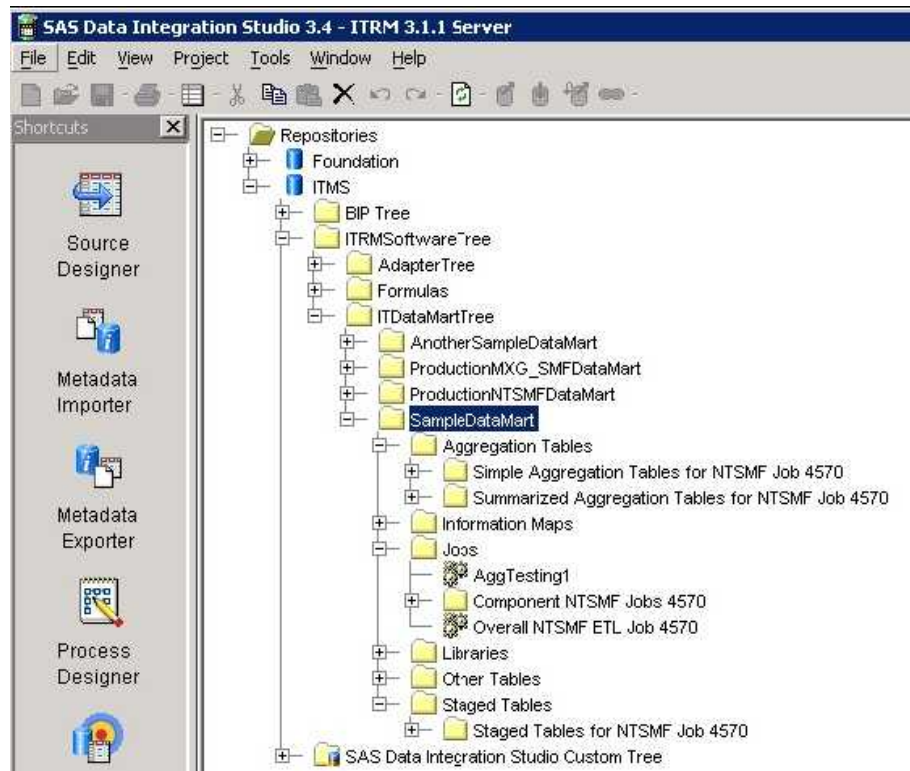
The IT data mart from the SAS IT Resource Management 3.1.1 system is now available on your SAS IT Resource Management 3.2 system.

The messages written by the DeployDataMartTo32 batch file can be captured in the usual Windows method, by redirecting output. For example:

```
DeployDataMartTo32
    your32server.domain.com
    8561
    youruserID
    yourpassword
    > deploy.log
```

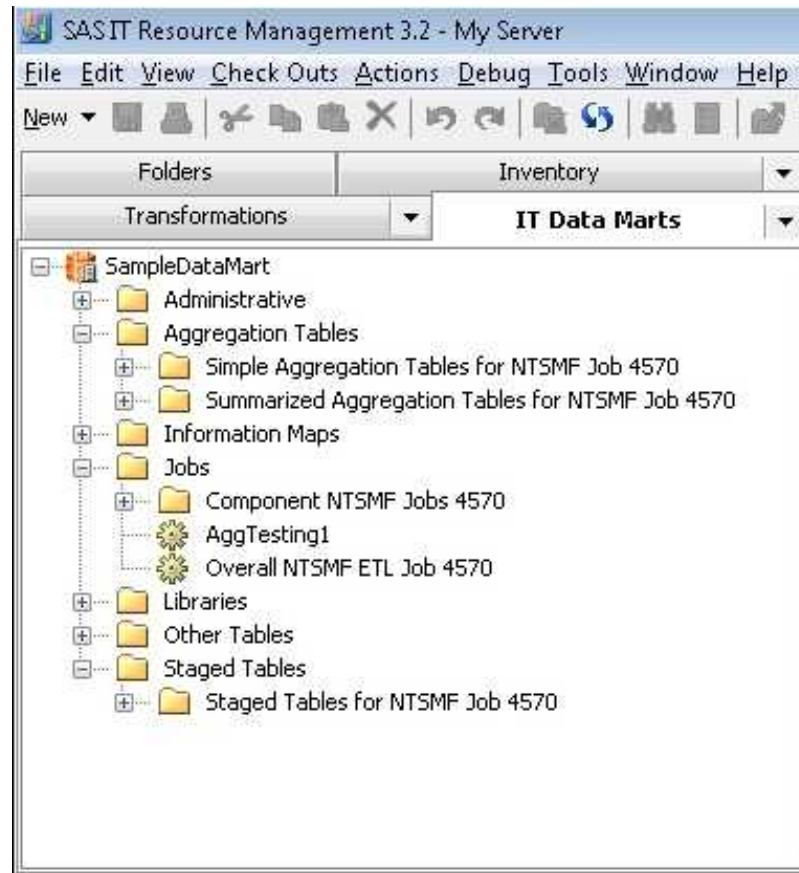
10. To rename the pathnames and data sets in the metadata for the new SAS IT Resource Management 3.2 IT data marts, use the %RMDMPATH macro. Although this step is optional, this renaming is recommended so that existing SAS IT Resource Management 3.1.1 physical data libraries are not overwritten when the physical data is unpackaged on the SAS IT Resource Management 3.2 system. For information, see [“Step 4: Rename the SAS ITRM 3.1.1 IT Data Mart Metadata Pathnames and Data Sets for Migration”](#) on page 14.
11. The Extract311DataMart and DeployDataMartTo32 tools migrate only the metadata that is associated with an IT data mart. To migrate the data from the SAS IT Resource Management 3.1.1 IT data mart to the SAS IT Resource Management 3.2 IT data mart, use the package (%RMDMPKG) and unpackage (%RMDMUPKG) macros. For information, see [“Step 3: Package SAS IT Resource Management 3.1.1 IT Data Marts for Migration”](#) on page 12 and [“Step 5: Unpackage IT Resource Management 3.1.1 Data Marts for Migration”](#) on page 16.

Note: In the specification of the %RMDMUPKG macro, make sure that the SMU= parameter is set to **NO**. This setting indicates that the SAS Migration Utility was not used to migrate the metadata associated with this IT data.
12. The same folder structure of the original IT data mart is carried over to the SAS IT Resource Management 3.2 system. The following display shows the folder structure of an IT data mart on a SAS IT Resource Management 3.1.1 system.

Display 3.1 Structure of a SAS IT Resource Management 3.1.1 IT Data Mart

The following display shows the folder structure of a SAS IT Resource Management 3.2 IT data mart, after the Extract311DataMart and DeployDataMartTo32 tools have been successfully run.

Display 3.2 Structure of a Deployed SAS IT Resource Management 3.2 IT Data Mart



To upgrade the IT data mart to the SAS IT Resource Management 3.2 data model, run the %RMUPGRDM macro. For information, see [Chapter 5, “Data Model Upgrade,”](#) on page 65.

Chapter 4

Migrating SAS ITRM 2.7 Performance Databases to SAS ITRM 3.2 IT Data Marts

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Introduction to Migrating PDBs

In SAS IT Resource Management 3.2, the IT data mart is the logical collection of the jobs, data, information maps, tables, and other elements that support the extracting,

transforming, and loading (ETL) of IT data. The IT data mart is conceptually similar to, but architecturally quite different from, the performance database (PDB) that was supported in SAS IT Resource Management 2.6 and 2.7.

This chapter describes how to use the tools and methodologies that are necessary to migrate data from a SAS IT Resource Management 2.7 PDB into the SAS IT Resource Management 3.2 software. The only supported migration path for SAS IT Resource Management PDBs is from SAS IT Resource Management 2.7 with Hot Fix 27IS06 or later to SAS IT Resource Management 3.2. If you are running earlier versions of SAS IT Resource Management, you must first migrate your PDBs to SAS IT Resource Management 2.7 before migrating to SAS IT Resource Management 3.2.

If you want to perform cross-platform PDB migration, utilities for this purpose are available. For more information about migrating between platforms, see [“Migrating to a Different Platform” on page 37](#).

The migration of a PDB results in an IT data mart that includes the following information, organized in folders:

- definitions of staging and aggregation jobs
- staging and aggregation tables (Data from the PDB is used to populate the aggregation tables.)
- SAS libraries, for storing staging and aggregation tables
- formulas for the following data:
 - SHIFT
 - Holiday
 - aging definitions
 - other useful computed columns

The following table shows some SAS IT Resource Management 2.7 functionality and the equivalent implementation in SAS IT Resource Management 3.2.

2.7 Functionality	3.2 Implementation
Process Exits	Process exits can be implemented as user-written staging transformations. Users are responsible for adding the appropriate transformations and code.
Derived Variables	Computed columns are defined on a staged table.
Formula Variables	Computed columns are defined on an aggregation output table.
%CxPROCES	The staging phase of %CxPROCES is implemented as a separate staging or user-written staging transformation. The resulting DETAIL table from %CxPROCES is now a simple aggregation output table of an Aggregation transformation.
%CPREDUCE	%CPREDUCE is implemented as summarized aggregation output tables of an Aggregation transformation.

2.7 Functionality	3.2 Implementation
SHIFT Definition	SHIFT definitions are implemented as SHIFT formula definitions and their associated computed columns. As with SAS IT Resource Management 2.7, the SHIFT has the value of the holiday shift if the date is a HOLIDAY.
HOLIDAY Definitions	HOLIDAY formula definition and associated computed columns. This formula is set to a value of Y or N depending on whether the data is for a holiday.

Note: Here are some additional considerations when comparing the functionality of SAS IT Resource Management 2.7 and SAS IT Resource Management 3.2:

- For migration of SAS IT Resource Management 2.7 collectors that are not supported as SAS IT Resource Management 3.2 adapters (including user-written, generic collectors from SAS IT Resource Management 2.7), user-written transformations are created to stage the data. Users provide the SAS code for user-written transformations.
- Evaluate any site-developed code that you intend to migrate in order to determine whether this code includes the use of SAS IT Resource Management 2.7 macros. These macros might not be supported in SAS IT Resource Management 3.2, and the code must be updated in order to eliminate their use.

Actions Performed by the PDB Migration Macro

The PDB migration macro performs the following steps:

1. Validates the parameters that are used by the macro.
2. Constructs a new IT data mart according to the supplied parameters. A new IT data mart is created each time the macro is executed.
3. Constructs formulas in a subfolder of the newly created IT data mart to support the following objects:
 - the SHIFT definition used by the PDB.
 - the HOLIDAY definitions used by the **PDB/SITELIB**.
 - the DAY, WEEK, MONTH, and YEAR datetime mapping formulas that are needed for computed columns in the staged table and are ultimately used to support aging. The WEEK computation respects the SAS IT Resource Management 2.7 Start of Week setting from the SAS IT Resource Management 2.7 PDB options.
 - the DATE, HOUR, and TIME formulas used to populate staged table columns that might be used in the class list of summarized aggregation tables.
4. Performs the following tasks for each adapter that is present in the SAS IT Resource Management 2.7 PDB:
 - a. Constructs a staging job with an appropriate staging transformation and staged tables. The staged table includes computed columns for DAYDATE, WEEKDATE, MONTHDATE, YEARDATE, SHIFT, HOLIDAY, DATE, TIME, and HOUR.

- b. Performs the following tasks for each staged table:
 - Constructs a job to perform the aggregations that are currently implemented in the SAS IT Resource Management 2.7 PDB for this staged table. This job consists of the input staged table, an Aggregation transformation, and the output aggregation tables.
 - Copies the data from the SAS IT Resource Management 2.7 PDB detail and summary tables to the counterpart aggregation tables in SAS IT Resource Management 3.2.
 - c. Copies any other necessary constructs such as data duplication status information and any formats that are needed to facilitate the migration of the PDB to the IT data mart.
5. Generates a report (on the standard SAS output area) that provides information about the actions that were taken.

Migration Prerequisites

Tip: For best results, make sure you are migrating only what is useful at your site. In order to limit that amount of data that is migrated, mark any tables that you do not want to be migrated as not kept before you run the migration utility. (Use either the SAS IT Resource Management 2.7 %CPDDUTL utility or the SAS IT Resource Management 2.7 user interface to mark tables as not kept.) The following prerequisites must be satisfied before migrating a PDB:

- The existing SAS IT Resource Management 2.7 installation is running with the SAS IT Resource Management Hot Fix 27IS06 or later. For information about the latest SAS IT Resource Management hot fix, see <http://ftp.sas.com/techsup/download/hotfix/itrm27.html>.
- SAS IT Resource Management 3.2 software must be installed, configured, and operational.
- Sufficient disk space for the resulting IT data mart must exist.

As point of reference, a PDB of about 510 megabytes was migrated and the resulting IT data mart was 1.92 gigabytes. Approximately four times the space allocation of the existing PDB libraries was needed to contain the migrated PDB in the IT data mart.

This amount of space was required because, unlike the PDB, the IT data mart does not use views. In SAS IT Resource Management 2.7, several statistics in a table were computed dynamically in the PDB's views. These views required temporary utility file space, which was released when the processing of the table was finished. In SAS IT Resource Management 3.2, the same table does not compute statistics dynamically. Instead, the statistics are calculated when the table is read, thus requiring additional temporary space. By not using views, SAS IT Resource Management has an improved overall efficiency. However, the efficiency in processing requires additional space.

For this same PDB migration, 65 megabytes of space was required for external files, and 3 gigabytes of SASWORK space was required. This space is needed only to run %RMPDB2DM, and is released upon completion.

For z/OS, disk space can be in the traditional z/OS file system or in a hierarchical directory. (HFS or zFS are the recommended hierarchical directories.)

Note: All items in the WORKDIR and SASWORK directories are deleted only after the PDB migration is finished.

- A valid user ID and password are required for connecting to the SAS IT Resource Management 3.2 Metadata Server. The user ID needs authority to define objects in the Foundation repository.
- A valid user ID and password are required for running the SAS macro to perform the migration. This user ID needs authority to create files and create the physical storage for the IT data mart.
- A workspace server must be defined for the host system where the migration executes. If the workspace server is named something other than **SASITRM**, then the name must be specified in the **APPSEVER** parameter of the %RMPDB2DM macro.
- The TCP/IP service (port) that the SAS Metadata Server is listening on must be known in order to specify it to the %RMPDB2DM macro.
- The SAS IT Resource Management 2.7 SITELIB that was associated with the PDB must be identified by the user.
- The SAS IT Resource Management 2.7 PDB should not be accessed by any programs while migration is in progress.
- No outstanding reduction checkpoints or other issues with the PDB should exist. The SAS IT Resource Management 2.7 PDB must be accessible on the same host file system that SAS IT Resource Management 3.2 will use for IT data mart storage.
- The JREOPTIONS in the SAS configuration file used to execute the %RMPDB2DM macro needs to include the following:
`-Djava.awt.headless=false -XX:MaxPermSize=128m -Xmx768m`
- Due to memory concerns, a SAS session or batch job should perform only a single PDB migration at a time.
- If you are running %RMPDB2DM on z/OS, you need to ensure that the batch job has a region of at least 1024M. Also, ensure that the user ID that migration will run under has a value of 1024M (1342177280 bytes) in the OMVS RACF segment.
- If you are running %RMPDB2DM on z/OS, you also need to ensure that the TKMVSENV data set includes a statement to set the TKJNI_OPT_DISPLAY environment variable to an X Windows Server. This setting is needed due to the internal use of certain Java graphics code. However nothing is ever displayed. For more information, see the SAS Note at: <http://support.sas.com/kb/12599>.

Migrating to a Different Platform

About Migrating to a Different Platform

PDB migration is performed on the same system where the workspace server for SAS IT Resource Management 3.2 is executed.

The existing SAS IT Resource Management 2.7 PDB might be on a different platform than what is used by the SAS IT Resource Management 3.2 software. For example, the PDB might be on a Windows file system, but the IT data mart is going to reside on a UNIX file system. A more subtle example is if the PDB is on a Windows file system using a 32-bit Windows operating system, and the IT data mart is on a Windows file system using a 64-bit Windows operating system.

In any of these cases of different platforms, the PDB must first be moved to the new platform, and then PDB migration can be performed. The process to do this has three basic steps:

1. Export the PDB and SITELIB SAS libraries into a transferable format.
2. Transfer the exported libraries to the target system.
3. Import the PDB and SITELIB libraries from the export package into new SAS libraries on the target system.

Each step of this process is explained in the following topics.

Export the PDB and SITELIB SAS Libraries

Because the format of SAS libraries differs by platform and SAS release, a portable format of the PDB and SITELIB SAS libraries must be created on the SAS IT Resource Management 2.7 system. A tool to assist with this task is included as a member in the SAS IT Resource Management 3.2 SASMISC directory. This member is called RMPDBEXP.SAS. To export the libraries, perform the following steps:

1. Transfer the RMPDBEXP.SAS member from the SAS IT Resource Management 3.2 system into a location where it can be used from the SAS IT Resource Management 2.7 system.

The RMPDBEXP.SAS member resides in the following locations on your SAS IT Resource Management 3.2 server tier:

Windows Specifics

<sasroot>\itmsmvadata\sasmisc

UNIX Specifics

<sasroot>/misc/itmsmvadata

z/OS Specifics

<high-level-qualifier>.ITRM.CPMISC

Note: The directory names and locations for SAS IT Resource Management macros did not change between SAS IT Resource Management 3.1.1 and SAS IT Resource Management 3.2.

2. Run a SAS session with the following code:

```
options nofmterr;
/* include from the appropriate location */
%include 'rmpdbexp.sas';
/* activate the PDB and SITELIB in readonly mode */
%cpstart(mode=batch,
  access=readonly,
  mxglib=MXG-format-library,
  mxgsrc=('mxg-userid-sourclib' 'mxg-mxg-sourclib'),
  pdb=<2.7_pdb>,
  sitelib=<2.7_sitelib>);
%rmpdbexp(targetLocation=<high-level-qualifier or directory of export>);
```

Note: The **TARGETLOCATION** parameter of %RMPDBEXP is a writable directory (for UNIX or Windows). For z/OS, the **TARGETLOCATION** parameter is a high-level qualifier in the traditional file system, where a set of transport files is written out. One transport file is created for each needed library. The file is named with the

library libref name and an extension of .cpo. Thus, if the user specifies **targetLocation=/itrm/Transports**, the following transport files are created:

- /itrm/Transports/ADMIN.cpo
- /itrm/Transports/COLLECT.cpo
- /itrm/Transports/DAY.cpo
- /itrm/Transports/DETAIL.cpo
- /itrm/Transports/DICTLIB.cpo
- /itrm/Transports/MONTH.cpo
- /itrm/Transports/SITELIB.cpo
- /itrm/Transports/WEEK.cpo
- /itrm/Transports/YEAR.cpo

For z/OS, the created export files can be allocated in advance if the default space settings are insufficient. The **DCB** parameter for the files must have the following attributes: **RECFM=FB**, **LRECL=80**, and **BLKSIZE=8000**.

Transfer the Exported Libraries

After the libraries have been exported, the .cpo files need to be moved to the target platform. This can be accomplished by doing a binary FTP transfer or similar copy operation. If the target platform is z/OS, these transport files must reside in the traditional z/OS file system. In addition, these files must have the following DCB attributes: **RECFM=FB**, **LRECL=80**, and **BLKSIZE=8000**.

Import the PDB and SITELIB SAS Libraries

When the .cpo files are on the target platform, they need to be unloaded into SAS libraries on the target platform. A tool to assist with this is included as a member in the SAS IT Resource Management 3.2 SASMISC directory. This member is called RMPDBIMP.SAS. The RMPDBIMP.SAS member resides in the following locations on your SAS IT Resource Management 3.2 server tier:

Windows Specifics

<sasroot>\itmsmvadata\sasmisc

UNIX Specifics

<sasroot>/misc/itmsmvadata

z/OS Specifics

<high-level-qualifier>.ITRM.CPMISC

To perform this operation, invoke the RMPDBIMP.SAS macro as shown in the following example:

```
options nofmterr;
%rmxgini;
/* include from the appropriate location */
%include 'rmpdbimp.sas';
%rmpdbimp(targetLocation=c:\itrm\Ready2Migrate, sourceLocation=c:\itrm\Transports);
```

The following information applies to the previous example.

- The **TARGETLOCATION** parameter of %RMPDBIMP is a writable directory or z/OS high-level qualifier where the respective libraries will be created.
- On z/OS, the **SOURCELOCATION** parameter must specify a high-level qualifier in the traditional file system.
- On z/OS, the **TARGETLOCATION** parameter can specify a high-level qualifier in the traditional file system or a directory in the hierarchical file system.
- If the directory specified by the **TARGETLOCATION** parameter does not exist, it is created.
- Upon successful execution of RMPDBIMP.SAS, the directory specified by the **TARGETLOCATION** parameter is the value to specify as the **PDB** parameter on the %RMPDB2DM macro.
- Upon successful execution of RMPDBIMP.SAS, the SITELIB directory beneath the location specified by the **TARGETLOCATION** parameter is the value to specify as the **SITELIB** parameter to the %RMPDB2DM macro.

The %RMPDB2DM Macro

Using the %RMPDB2DM Macro

PDB migration is performed by invoking the %RMPDB2DM SAS macro that is part of the SAS IT Resource Management 3.2 software. This macro should be invoked in a SAS session on the same system where the workspace server for SAS IT Resource Management 3.2 is executed. For best results, execute this macro in batch rather than interactively from SAS IT Resource Management.

The macro %RMPDB2DM creates a new IT data mart according to the parameters that are provided. It then migrates tables, definitions, and data for the adapters that are requested. When processing is complete, a status report is generated to the standard SAS output area.

%RMPDB2DM Syntax

```

%RMPDB2DM(
  DEFAULTROOTPATH=root directory for the data mart
  ,ITDATAMART=name of the data mart to create
  ,METAPASSWORD=password for metauser
  ,METAPORT=service or port for the metadata server
  ,METASERVER=host-name or IP address for the metadata server
  ,METAUSER=user ID for metadata server access and definition
  ,PDB=SAS IT Resource Management 2.7 PDB path
  ,SITELIB=SAS IT Resource Management 2.7 SITELIB path
  ,WORKDIR=directory path for work files
  <,ADAPTER=_ALL_ | blank-delimited list of adapters>
  <,APPSERVER=SASITRM | user-specified logical workspace server>
  <,CLEANUP=Y | N>
  <,COMPRESSAGG=Y | N>
  <,COPYDATA=Y | N>
  <,HP_PCS=HPOVREP | HPOVPA>
  <,SECONDARYCYLS=z/OS secondary space allocation cylinders>
  <,_RC=macro variable name to hold the return code>
);

```

%RMPDB2DM Required Parameters**DEFAULTROOTPATH=***root directory for the data mart*

specifies the default root path to the IT data mart. This parameter is used as the root path for the libraries and data created and contained in the IT data mart. A value for this parameter is required.

The syntax of the default root path determines the syntax that is used as the default for any other paths that are specified. For example, if you specify a default root path for a traditional z/OS file system, then the default paths to all the libraries in this IT data mart would be in the traditional z/OS file system.

ITDATAMART=*name of the data mart to create*

specifies the name of the IT data mart. A value for this parameter is required. The name of the IT data mart must be unique to avoid potential difficulty when using other SAS tools. The name can contain a maximum of 60 characters.

Note: The name of an IT data mart cannot contain any of the following characters:

* ? " ' | \ / [] \$ & > < () { } : ; , ~ % ^ @ # ! In addition, this field cannot contain a newline or tab character.

METAPASSWORD=*password for metauser*

specifies the password for connecting the user ID to the metadata server. A value for this parameter is required.

METAPORT=*service or port for the metadata server*

specifies the TCP/IP service name or port number that the metadata server is listening on. A value for this parameter is required.

METASERVER=*host-name or IP address for the metadata server*

specifies the host-name or TCP/IP address of the metadata server. A value for this parameter is required. The metadata server does not need to be on the same host platform as the application server.

METAUSER=*user ID for metadata server access and definition*

specifies the user ID for accessing the metadata server. A value for this parameter is required. The user ID should be configured according to the SAS IT Resource Management configuration and installation instructions. These instructions are available from the SAS Install Center at <http://support.sas.com/documentation/installcenter/index.html>.

PDB=*SAS IT Resource Management 2.7 PDB path*

specifies the path to the SAS IT Resource Management 2.7 PDB that is to be migrated. A value for this parameter is required.

SITELIB=*SAS IT Resource Management 2.7 SITELIB path*

specifies the path to the SAS IT Resource Management 2.7 SITELIB that has been associated with the PDB to be migrated. A value for this parameter is required.

WORKDIR=*directory path for work files*

specifies a directory where %RMPDB2DM can write temporary external files. If this directory does not exist, it is created. For z/OS, this parameter needs to be a UNIX System Services directory path (HFS or zFS file system). A value for this parameter is required.

%RMPDB2DM Optional Parameters**ADAPTER=***_ALL_ | blank-delimited list of adapters*

specifies the list of SAS IT Resource Management 2.7 collectors to migrate from the PDB that is specified by the PDB parameter. A value for this parameter is optional. If this parameter is not specified, then all collectors are migrated. This action is the same as specifying the special keyword value **_ALL_** for this parameter.

For the list of collectors, separate each collector by white space. For example, to migrate tables for the NTSMF and PATROL collectors, specify **Adapter=NTSMF PATROL**. The values for this parameter are not case sensitive.

Here is a list of the valid values for the adapters that SAS IT Resource Management 2.7 supports:

- AS400
- DCOLLECT
- EREP
- GENERIC
- HP-PCS
- IMF
- IMS
- NTSMF
- NTSFMXG
- PATROL
- SAPR3
- SAR
- SMF
- TMON2CIC
- TMONDB2

- TMS
- TPF
- VMMON
- WEBLOG

Note: This list of possible valid values for this parameter is not exclusive. SAS IT Resource Management 2.7 users can manually modify adapter names for in-house, generic collectors, and these values might be valid for the **Adapter** parameter. If you specify a value that is not in the preceding list, then verify that the value that you specify is correct. The %RMPDB2DM macro does not generate an error or warning message for invalid values.

APPSERVER=SASITRM | *user-specified logical workspace server*

specifies the logical workspace server to use when registering data libraries that are created as part of the IT data mart. A value for this parameter is optional. The default value is **SASITRM**.

CLEANUP=Y | **N**

The %RMPDB2DM macro generates numerous intermediate items to complete its work. All of these intermediate items are cleaned up when the macro terminates, regardless of success or failure. Specifically, the macro performs the following tasks:

- creates text files in the directory that is specified by the **WORKDIR** parameter
- creates SAS data sets and catalogs in the WORK library
- creates macro variables
- sets certain system options

This parameter enables you to skip the cleanup phase. If you have problems with the %RMPDB2DM() macro, then SAS Technical Support might request that you specify **Cleanup=N** in order to investigate the problem. A value for this parameter is optional. If it is not specified, the default value is **Y**. The value for this parameter is not case sensitive. You might choose to start with a fresh IT data mart based on a SAS IT Resource Management 2.7 PDB. A value for this parameter is optional.

COMPRESSAGG=Y | **N**

specifies whether to compress the aggregation tables that are being migrated.

If it is not specified, the default value is **Y**. The value for this parameter is not case sensitive.

COPYDATA=Y | **N**

The %RMPDB2DM macro essentially performs two types of work:

- defining the metadata for the libraries, tables, folders, jobs, and formulas
- copying data to the new IT data mart from the existing SAS IT Resource Management 2.7 PDB

This parameter enables you to choose not to perform the data copy operation. You might choose to start with a fresh IT data mart based on a SAS IT Resource Management 2.7 PDB. A value for this parameter is optional. If it is not specified, the default value is **Y**. The value for this parameter is not case sensitive.

DEVICE=z/OS UNIT=value for allocation

specifies the **UNIT** allocation parameter to use for allocation of IT data mart libraries in a z/OS traditional file system. A value for this parameter is optional. If a value is not specified, then it defaults to the value of the **FILEDEV** SAS system option. The value for this parameter is not case sensitive.

HP_PCS=HPOVREP | HPOVPA

This parameter is required if any of the SAS IT Resource Management 2.7 tables to be migrated are for the HP-PCS collector. In SAS IT Resource Management 3.2, this data can be staged by two separate mechanisms:

- Select **HPOVREP** if you are staging this data from the database for HP OpenView Reporter.
- Select **HPOVPA** if you are staging this data from the text file from HP OpenView Performance Agent.

This parameter has no default value, and the valid values are not case sensitive.

NUMBEROFVOLS=1

specifies the number of volumes that SAS libraries can span when using the z/OS traditional file system. A value for this parameter is optional. If a value is not specified, then it defaults to 1.

PRIMARYCYLS=z/OS *primary space allocation cylinders*

specifies the number of primary cylinders to use when allocating IT data mart libraries in a z/OS traditional file system. A value for this parameter is optional. If a value is not specified, then it defaults to the value of the **FILESPPRI** SAS system option.

SECONDARYCYLS=z/OS *secondary space allocation cylinders*

specifies the number of secondary cylinders to use when allocating IT data mart libraries in a z/OS traditional file system. A value for this parameter is optional. If a value is not specified, then it defaults to the value of the **FILESPSEC** SAS system option.

RC=*macro variable name to hold the return code*

specifies the name of a macro variable that holds the return code value from the execution of this macro. The value for this optional parameter is not case sensitive.

%RMPDB2DM Notes

Here are some notes about %RMPDB2DM to consider when using the macro:

- Each time %RMPDB2DM is executed, a new IT data mart is created. (PDB Migration fails if you attempt to create an IT Data Mart with the same name as an existing IT Data Mart.)
- A PDB can be migrated multiple times because each migration results in a new IT data mart.
- If the directory that is specified by the WORKDIR parameter already exists, then make sure that it is empty before executing %RMPDB2DM.
- The syntax of a path is validated according to its operating environment. For example, if you specify a default root path for a traditional z/OS file system, then the paths to the administrative and spin libraries, as well as the staged data, simple data, and summarized data locations also default to the traditional z/OS file system.

For Windows operating environments that run SAS IT Resource Management, the following characters * ? " | < > / \ are not allowed. In addition, the newline and tab characters are not allowed.

For UNIX operating environments and zFS and HFS file systems on z/OS operating environments that run SAS IT Resource Management, the following characters & * @ \ / | [] ^ { } \$! > < () % ? ' " ; are not allowed. In addition, the space, newline, tab, and open quotation character are not allowed.

For traditional z/OS file system operating environments that run SAS IT Resource Management, the following rules apply:

- The length of the data set name can be a maximum of 44 characters. (A portion of the 44 characters is needed by SAS IT Resource Management in order to completely specify the associated locations. In this case, the maximum length of the data set name is 35 characters.)
- The data set name consists of segments that are separated by a period. The length of each segment can be a maximum of eight characters.
- z/OS restricts the following characters in a segment name:
 - Numerals (0–9), the pound character, and the hyphen character are not allowed as the first character of a segment name.
 - The first character of each name must be either an alphabetic character (Aa–Zz) or a dollar sign (\$).
 - The remaining seven characters of a segment name can include alphabetic characters (Aa–Zz), numeric characters (0–9), dollar signs (\$), pound characters (#), and hyphens (-).
- Individual tables can be omitted from migration by marking them as not kept in SAS IT Resource Management 2.7.
- %RMPDB2DM is not intended for migrating across different host platforms. For example, migrating a PDB on Windows to an IT data mart on UNIX is not supported. For more information about migrating between platforms, see [“Migrating to a Different Platform” on page 37](#).
- SAS IT Resource Management 2.7 tables that are created by the %CPAVAIL macro are migrated as if they were generic collector tables. Staging code is not provided for these tables. For best results when performing migration, mark these tables as not kept in SAS IT Resource Management 2.7. Do not attempt to migrate these tables to SAS IT Resource Management 3.2.

%RMPDB2DM Examples

Example 1: Migrate All Tables for All Collectors in a UNIX Environment

In this UNIX example, the `/u/itrm/prod-pdb` PDB is migrated to the Production Metrics IT data mart.

```
%RMPDB2DM (
    PDB=/u/itrm/prod-pdb,
    WORKDIR=/tmp/itrm/migrate,
    METASERVER=myserver01,
    METAPORT=8561,
    METAUSER=myuserID,
    METAPASSWORD=mypassword,
    ITDATAMART=Production Metrics,
    DEFAULTROOTPATH=/u/itrm/prod-itdm,
    SITELIB=/u/itrm/sitelib
);
```

Example 2: Migrate Specified Collectors in a Windows Environment

In the following Windows example, the PDB called `c:\my-pdb` is migrated to the Server Metrics IT data mart. Only the data for the PATROL and NTSMF collectors is migrated in this example.

```
%RMPDB2DM (
    PDB=c:\my-pdb,
    WORKDIR=c:\temp\migrate,
    METASERVER=myserver01,
    METAPORT=8561,
    METAUSER=myuserID,
    METAPASSWORD=mypassword,
    ITDATAMART=Server Metrics,
    DEFAULTROOTPATH=c:\my-itdm,
    SITELIB=c:\sitelib,
    ADAPTER=Patrol NTSMF
);
```

Example 3: Migration Using the z/OS Traditional File System

In this z/OS example, the SYS2.ITRM.RMF.PDB PDB is migrated to the z/OS RMF IT data mart. The physical storage for the IT data mart is in the traditional z/OS file system. Space and Unit allocation values are provided.

Note: The *WORKDIR* parameter must be in a z/OS UNIX file system such as HFS or zFS. In addition, the metadata server does not have to be on z/OS.

```
%RMPDB2DM (
    PDB=SYS2.ITRM.RMF.PDB,
    WORKDIR=/tmp/itrm/migrate,
    METASERVER=myserver01,
    METAPORT=8561,
    METAUSER=myuserID,
    METAPASSWORD=myuser_password,
    ITDATAMART=%str(zOS RMF),
    DEFAULTROOTPATH=SYS2.RMF.DATAMART,
    SITELIB=SYS2.ITRM.SITELIB,
    DEVICE=DISK,
    PRIMARYCYLS=50,
    SECONDARYCYLS=20
);
```

Example 4: Migration Using the z/OS UNIX File System

In this z/OS example, the SYS2.ITRM.RMF.PDB PDB is migrated to the z/OS RMF IT data mart. The physical storage for the IT data mart is in the z/OS UNIX System Services hierarchical file system.

```
%RMPDB2DM (
    PDB=SYS2.ITRM.RMF.PDB,
    WORKDIR=/tmp/itrm/migrate,
    METASERVER=myserver01,
    METAPORT=8561,
    METAUSER=myuserID,
    METAPASSWORD=mypassword,
    ITDATAMART=%str(z/OS RMF),
```

```

DEFAULTROOTPATH=/u/itrm/rmf_dm,
SITE LIB=SYS2.ITRM.SITE LIB
);

```

What Is Produced by the %RMPDB2DM Macro

Overview

Executing the %RMPDB2DM macro produces the following three categories of items:

- metadata
- physical storage
- status report

These items are explained in more detail in the following sections.

Metadata Objects Produced by %RMPDB2DM

About the Metadata Objects Produced by %RMPDB2DM

Every table, column, computation, and data transformation, as well as the organizational structure of these items, is described by metadata in the SAS Metadata Server. The %RMPDB2DM macro defines all the metadata to support the migrated PDB in its new form as an IT data mart.

Specific metadata items that are created include the following objects:

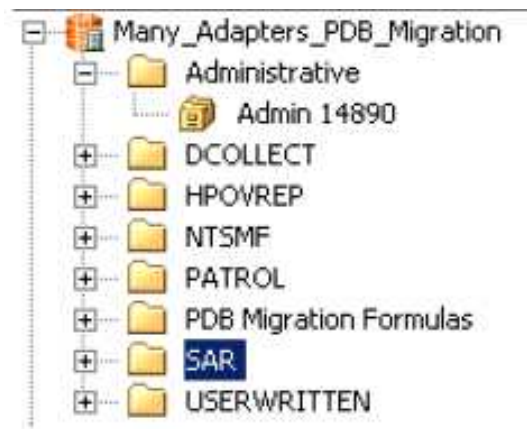
- the IT data mart.
- formulas used by the various staging tables for all of the adapters in the IT data mart.
- subfolders for each adapter. Within each folder, the following objects are created:
 - folders for Aggregation and Staging
 - SAS libraries
 - staged tables
 - simple aggregation tables
 - summarized aggregation tables
 - jobs

Each of these items is described in more detail in the following sections.

IT Data Mart

Each invocation of %RMPDB2DM creates a new IT data mart. The IT data mart is a logical metadata container of related SAS IT Resource Management tables, jobs, and other objects.

The **Administrative** folder is created with a library for administrative purposes.

Display 4.1 An IT Data Mart Created by %RMPDB2DM

Formulas

In SAS IT Resource Management 2.7, the term formula was used to describe a column in a table that was calculated by means of a user-written expression. In IT Resource Management 3.2, this functionality is now accomplished by means of computed columns. However, SAS IT Resource Management 3.2 does use an object that is called a formula. In SAS IT Resource Management 3.2, a formula is a reusable expression that is associated with one or more computed columns in order to allow a single definition to be shared and replicated.

In SAS IT Resource Management 3.2, Aggregation transformations perform no transformation of the aging and datetime stamp variables. Therefore, the values that are needed for summarization must be computed as columns that are part of the table that is input to the Aggregation transformation.

SAS IT Resource Management 2.7 used a different approach. All levels of a table used the column DATETIME in the class list. In SAS IT Resource Management 2.7, the DATETIME that was read into DETAIL was transformed in some way to be the DATETIME at the other levels.

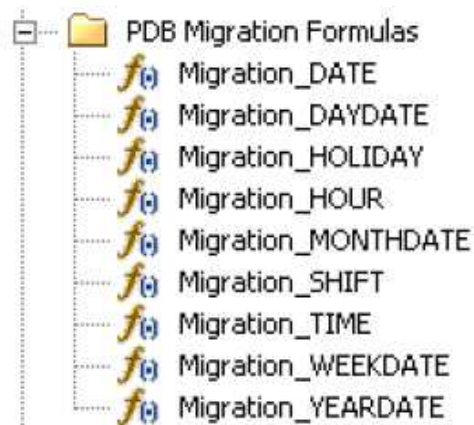
Migration does this computation by means of formulas that are used on the staged tables. These formulas are used to create the following staged columns: DAYDATE, WEEKDATE, MONTHDATE, and YEARDATE. The source code that is used to define the WEEKDATE formula respects the setting of the START OF WEEK parameter that was used in the PDB.

In addition to the formulas that are used for aging, the staged column SHIFT is created by a formula that %RMPDB2DM creates. It is based on the SHIFT definition that is used with the SAS IT Resource Management 2.7 PDB. This formula also honors the HOLIDAY SHIFT that is used by the PDB.

In addition, a new staged column is created named HOLIDAY. This column has values of **Y** or **N**, depending on whether the date of the observation is for a holiday. This formula is based on the active list of holidays that are read from the SITELIB that is used during migration.

Finally, the staged columns for DATE, HOUR, and TIME are created, using the respective formulas that manipulate the DATETIME column.

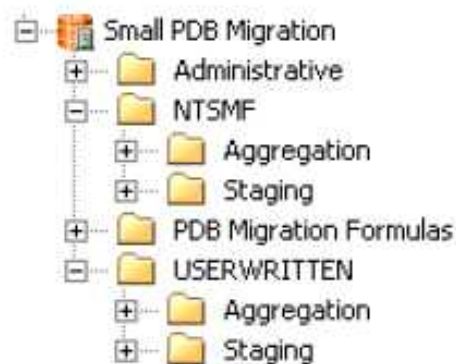
All formulas created for migration of a PDB are stored in the **PDB Migration Formulas** folder of the IT data mart that was created by running the %RMPDB2DM macro.

Display 4.2 Formulas and Folder Created by %RMPDB2DM

Objects in the IT Data Mart That Are Created for Each Adapter

In each IT data mart, the following sets of objects are created for each migrated SAS IT Resource Management 2.7 collector:

- staged tables
- simple aggregation tables
- summarized aggregation tables
- the libraries for these tables
- jobs that load these tables
- **Aggregation** and **Staging** folders to provide organization of these objects

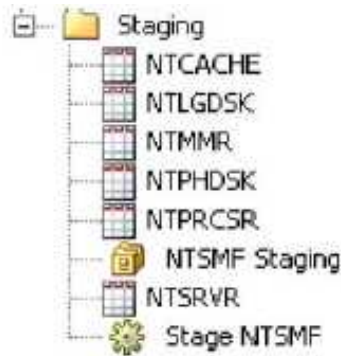
Display 4.3 Folders Created for Each Adapter

Contents of the Staging Folder

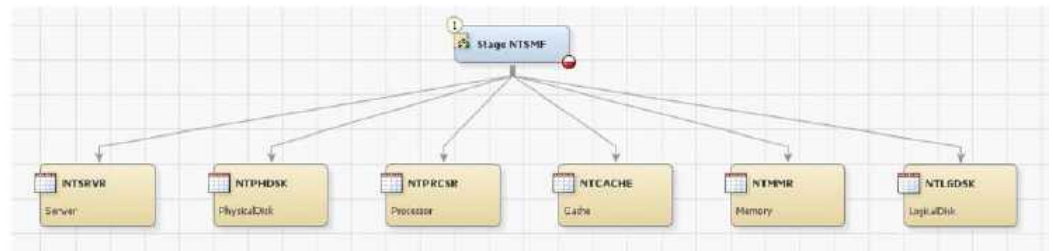
All objects that are related to staging data for a given adapter are in the Staging folder for that adapter. This includes the following objects:

- a SAS library to hold the data for all staged tables for this staging transformation instance
- the staged tables needed for this adapter, as determined by the PDB

- a job to stage the data for this adapter

Display 4.4 Staging Folder Contents

Staged tables are populated by user-written staging code or staging transformations that SAS IT Resource Management supplies. These tables hold the metrics that are presented by the data source adapter. If the adapter being migrated is supported by SAS IT Resource Management 3.2, then the staging job for the adapter has a staging transformation for the specific adapter as the starting point of the job. Otherwise, the first element of the job is a user-written staging transformation. In either case, the outputs of the first transformation of the staging job are the staged tables for the adapter.

Display 4.5 Staging Job

The %RMPDB2DM macro determines the columns that are needed for each staging table by determining the columns that are in existence in the SAS IT Resource Management 2.7 PDB. Staged tables can also include computed column definitions. For information about these definitions, see [“Formulas” on page 48](#).

Additional *name_RATE* columns are defined to the staged tables of SAS IT Resource Management 2.7 tables of type INTERVAL, for columns that had a variable interpretation type of COUNT, TIME, or TIMETICKS. For more information, see [“Data Handling Differences between SAS IT Resource Management 2.7 and 3.2” on page 61](#).

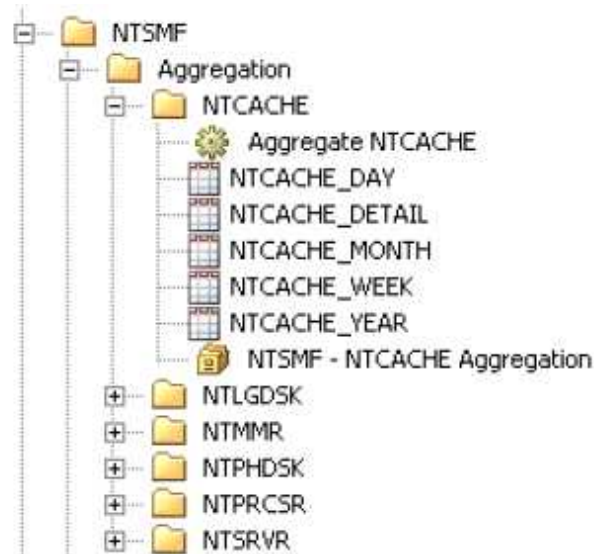
Contents of the Aggregation Folder

All objects that are related to the aggregation of data for a given adapter are in the **Aggregation** folder for that adapter. For each staged table in the **Staging** folder, there is a corresponding subfolder in the **Aggregation** folder. The following objects are in the subfolder for each staged table:

- a SAS library to hold the data for all aggregation tables that are produced from the staged table

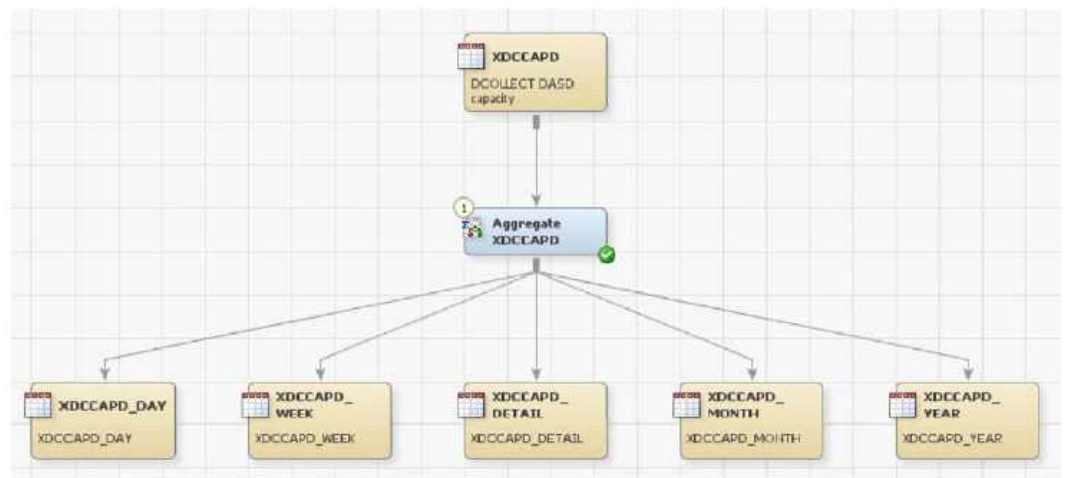
- aggregation tables that corresponding to the DETAIL, DAY, WEEK, MONTH, and YEAR tables in SAS IT Resource Management 2.7
- a job to populate the aggregation tables

Display 4.6 Aggregation Folder Contents



An aggregation job is created for each table that is staged by the staging job. The aggregation job starts with the staged table as the input to an Aggregation transformation. This transformation functions similarly to the SAS IT Resource Management 2.7 %CxPROCES and %CPREDUCE macros. As shown in the following display, the outputs of the Aggregation transformation are the simple and summarized aggregation tables.

Display 4.7 Aggregation Job



Simple Aggregation Tables

Simple aggregation tables are analogous to the SAS IT Resource Management 2.7 DETAIL tables. The following table shows how the functions available in SAS IT Resource Management 2.7 can be accomplished in SAS IT Resource Management 3.2.

Table 4.1 Comparison of DETAIL Level Tables and Simple Aggregation Tables

Tasks	SAS IT Resource Management 2.7	SAS IT Resource Management 3.2
How to purge existing data from a table before loading new data into that table	An age limit of 0 for the DETAIL level was a special setting that caused %CPREDUCE to purge the DETAIL table after it was summarized.	<p>Specify the following settings in the Specify purging and aging criteria page of the Summarized Aggregation :</p> <ul style="list-style-type: none"> • Ensure that the check box for Purge output table before loading new data is selected. • Ensure that the check box for Perform aging for output table is not selected. <p>Configuring these specifications causes the existing data in the simple aggregation How to load table to be purged before loading new data when the aggregation transformation is executed.</p>
How to load data that is older than the specified age limit	Data could be loaded into the DETAIL level even if it should be aged out based on the age limit settings. The purpose of this capability was to allow post-processing (such as user-written chargeback routines) to read the DETAIL data.	Select the option Allow incoming data even if it precedes the age limit to enable this same functionality for simple aggregation tables that have been migrated.
How tables are named	The table name was the same at each level of the PDB.	The simple aggregation table that is created by migration is named <code><table-name>_DETAIL</code> (for example, SARDEV_DETAIL).

Summarized Aggregation Tables

Summarized aggregation tables are analogous to the DAY, WEEK, MONTH, and YEAR tables in SAS IT Resource Management 2.7. The following table shows how the functions available in SAS IT Resource Management 2.7 can be accomplished in SAS IT Resource Management 3.2.

Table 4.2 Comparison of DAY, WEEK, MONTH, and YEAR Level Tables and Summarized Aggregation Tables

Tasks	SAS IT Resource Management 2.7	SAS IT Resource Management 3.2
How to deactivate summarization	An age limit of 0 for a summary level table would deactivate summarization for that level.	To deactivate summarization, do not create a summary aggregation table.
How aging columns are named	The aging column for all summary levels was always named DATETIME.	A separate aging column (that is named appropriate to the summarization) is used to support the aging. These aging columns are created as computed columns in the staged tables. The names of these columns are DAYDATE, WEEKDATE, MONTHDATE, and YEARDATE. The WEEKDATE column honors the SAS IT Resource Management 2.7 START OF WEEK setting from the PDB.
How tables are named	The table name was the same at each level of the PDB.	The summarized aggregation table created by migration is named <code><table-name>_<level></code> (for example, SARDEV_WEEK).

Physical Storage

About Physical Storage

%RMPDB2DM creates metadata, and it also creates the physical SAS libraries and tables that are needed to store the data. These libraries are allocated in accordance with the parameters that are specified to the macro. In addition, the simple and summarized aggregation tables are created and the data is loaded into these tables from the PDB.

The storage location that is specified must be accessible to the SAS session where the macro is executed. This location can be on a network drive or other device.

One SAS library is created for each staging or Aggregation transformation. Thus, all staged tables for a given adapter are stored in a single SAS library, and all of the aggregation tables for a given staged table are stored in another single SAS library.

Special Considerations for z/OS Physical Storage

For z/OS systems, the IT data mart can be created in the traditional z/OS file system or in the UNIX file system that is managed by UNIX Systems Services (zFS or HFS). One advantage of using a UNIX file system is that you do not need to specify additional allocation information.

Status Report

When the execution of %RMPDB2DM is finished, a status report is written to the standard SAS output area. The following two figures show an example of this report.

Output 4.1 Status Report Produced by %RMPDB2DM (First Part)

```
ITRM Migration Report  5:36 Wednesday, March 24, 2010
ITRM 2.7 Migration started at 3:37:05 PM on Wednesday, March 24, 2010
PDB to be migrated: X:\pdbc\pdb-basic

Using metadata server my_server on port 8561 with userid my_userid

Tables for the following adapters will be Migrated: NTSMF USERWRITTEN

Creating IT data mart: Small PDB Migration
  in metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts
  at physical location: c:\datamarts\Small PDB Migration
IT data mart created successfully

Creating SAS library: Migration Spin with libref: SPIN
  in metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts
  at physical location: c:\datamarts\Small PDB Migration\spin
SAS library created successfully

Creating metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts
Creating migration formulas:
  Migration_DAYDATE formula created
  Migration_MONTHDATE formula created
  Migration_YEARDATE formula created
  Migration_WEEKDATE formula created
  Migration_TIME formula created
  Migration_HOUR formula created
  Migration_DATE formula created
  Migration_HOLIDAY formula created
  Migration_SHIFT formula created

***** Creating metadata *****

Constructing metadata for adapter: NTSMF
  Creating metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts/Small PDB
  Migration/NTSMF
  Creating metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts/Small PDB
  Migration/NTSMF/Aggregation
  Creating metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts/Small PDB
  Migration/NTSMF/Staging

  Creating SAS library: NTSMF Staging with libref: S93068
  in metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts/Small PDB
  Migration/NTSMF/Staging
  at physical location: c:\datamarts\Small PDB Migration\NTSMF\S93068
  SAS library created successfully

  Created staging job Stage NTSMF for adapter NTSMF
```

Output 4.2 Status Report Produced by %RMPDB2DM (Second Part)

```

Created Aggregation Job Aggregate NTPHDSK for table NTPHDSK

Creating SAS library: NTSMF - NTPHDSK Aggregation with libref: A93068
  in metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts/Small PDB
Migration/NTSMF/Aggregation
  at physical location: c:\datamarts\Small PDB Migration\NTSMF\A93068
SAS library created successfully

Creating metadata for staged table: NTPHDSK
  in metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts/Small PDB
Migration/NTSMF/Staging

      <the above is repeated for each adapter and staged table encountered in the PDB>

Creating metadata for aggregation table: NTPHDSK_DETAIL
  in metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts/Small PDB
Migration/NTSMF/Aggregation

Creating metadata for aggregation table: NTPHDSK_DAY
  in metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts/Small PDB
Migration/NTSMF/Aggregation

Creating metadata for aggregation table: NTPHDSK_WEEK
  in metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts/Small PDB
Migration/NTSMF/Aggregation

Creating metadata for aggregation table: NTPHDSK_MONTH
  in metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts/Small PDB
Migration/NTSMF/Aggregation

Creating metadata for aggregation table: NTPHDSK_YEAR
  in metadata folder: /Shared Data/SAS IT Resource Management/IT Data Marts/Small PDB
Migration/NTSMF/Aggregation

      <the above is repeated for each set of aggregation tables that will be created>

***** Begin Migration Data Copy *****

Processing adapter: NTSMF

Processing table: NTPHDSK
  Copying DETAIL data for table NTPHDSK
  Copying DAY data for table NTPHDSK
  Copying WEEK data for table NTPHDSK
  Copying MONTH data for table NTPHDSK
  Copying YEAR data for table NTPHDSK

      <the above is repeated for each table of data being copied>

ITRM 2.7 PDB migration completed at 3:38:31 PM on Wednesday, March 24, 2010 with return code
0

```

Subsequent Tasks

Overview of Subsequent Tasks

After %RMPDB2DM has migrated a PDB, you need to perform the following tasks in order to continue loading the IT data mart with incoming data:

- Update the ITRM properties of staging transformations for supported SAS IT Resource Management 3.2 adapters. In particular, you must specify the path to the raw data.
- Supply SAS code for user-written staging transformations.
- Review computed columns (migrated formulas) to ensure that they are correct, including the use of formulas in computed columns.
- Review the Migration Status Report to determine whether any formats are missing.
- Update the pre-code for the SAPR3 staging transformation.
- If you used process exits in SAS IT Resource Management 2.7, then enhance the job flow to provide necessary functionality.
- Deploy and schedule jobs for execution.

The preceding tasks are explained in more detail in the following sections.

Update ITRM Properties of Staging Transformations

If the SAS IT Resource Management 2.7 tables that are being migrated are supported by a SAS IT Resource Management 3.2 adapter, then the staging job that is created for each supported adapter includes a staging transformation. Open the Properties dialog box for the transformation and click the **Staging Parameters** tab. On this tab, specify the adapter-specific attributes such as data duplication checking options and the location of the raw data. These options vary, depending on the specific adapter.

Display 4.8 Properties of a Staging Transformation for a Supported Adapter

The screenshot shows the 'Stage NTSMF Properties' dialog box with the 'Staging Parameters' tab selected. The dialog has several tabs: General, Staging Parameters, Options, Code, Precode and Postcode, Parameters, Notes, and Extended Attributes. The 'Staging parameters' section contains four labeled fields:

- * Raw data input file or directory: (empty text box)
- * Delimiter in raw data: (text box containing 'Comma')
- * Duplicate checking: (text box containing 'Discard')
- * Future data: (text box containing 'Discard')

Fill in SAS Code for User-Written Transformations

Some SAS IT Resource Management 2.7 collectors, such as SiteScope, do not have a corresponding SAS IT Resource Management 3.2 adapter. In this situation, do not attempt to migrate the unsupported data source to SAS IT Resource Management 3.2. For best results, continue to run the unsupported collector in SAS IT Resource Management 2.7 until a version of SAS IT Resource Management is available that supports that data source. Future releases of SAS IT Resource Management might include support for legacy SAS IT Resource Management 2.7 collectors.

If migration is performed for unsupported data sources, a single staging job (and set of folders) is created for them.

Note: If you have multiple generic collectors in your PDB, then only a single staging job is created for all of the generic collectors. You can split this staging job into separate jobs because not all the staging tables are from the same generic collector or the same staging code.

The staging job for the unsupported data sources contains a User-Written staging transformation. Right-click this transformation in the process flow diagram and select **Properties**. Three types of properties need to be specified: Staging parameters, Duplicate Checking parameters, and User-Written parameters.

As shown in the following display, the **Staging** panel of the **Staging Parameters** tab enables the user to update the **Raw data input file or directory** field, if it is used by the staging code.

Display 4.9 Staging Parameters Tab of a Staging Transformation for a User-Written Adapter

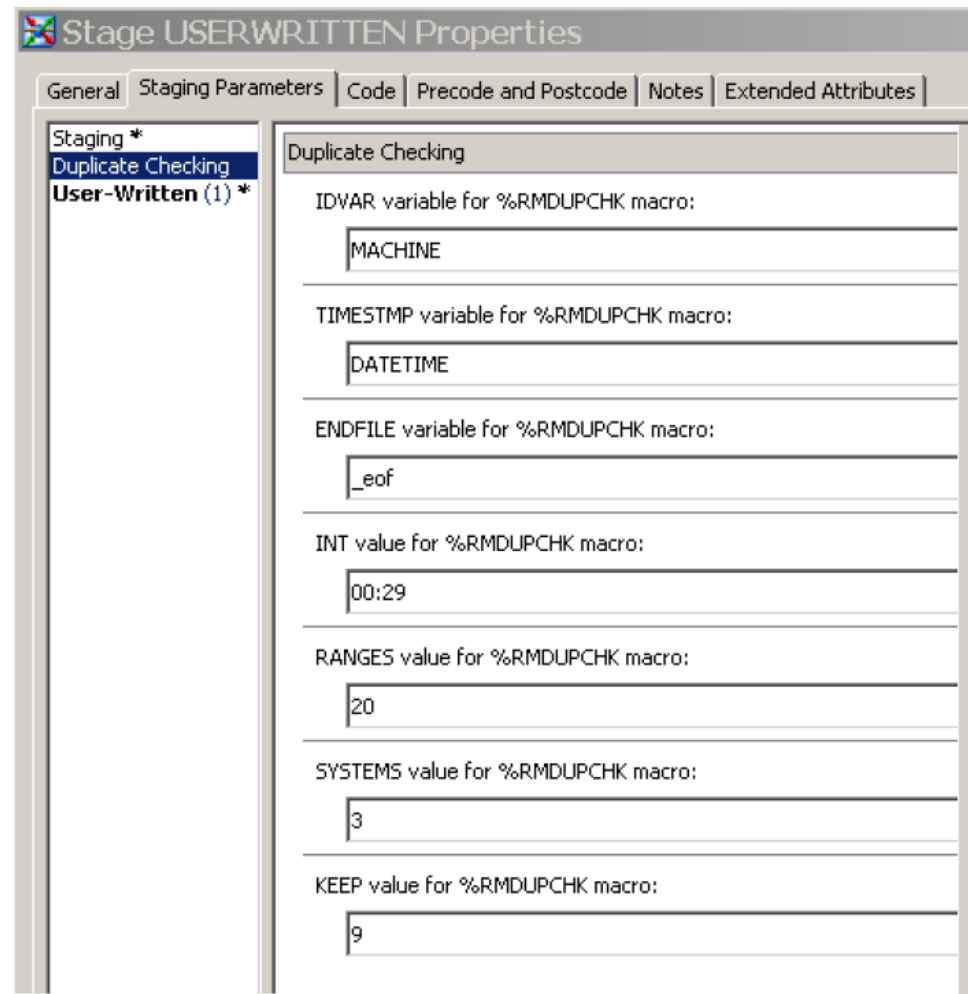
The screenshot shows a window titled "Stage USERWRITTEN Properties". It has several tabs: "General", "Staging Parameters", "Code", "Precode and Postcode", "Notes", and "Extended Attributes". The "Staging Parameters" tab is selected. On the left, there is a list of items: "Staging *", "Duplicate Checking", and "User-Written (1) *". The "Staging" item is selected. The main area of the dialog shows the "Staging" section with the following fields:

- "Raw data input file or directory:" followed by a text input field.
- "* Duplicate checking:" followed by a text input field containing the word "Discard".
- "* Future data:" followed by a text input field containing the word "Discard".

In addition, review the **Duplicate checking** and **Future data** fields and update them as needed.

As shown in the following display, the **Duplicate Checking** panel enables the user to specify parameters for the %RMDUPCHK macro to use with the user-written staging code.

Display 4.10 Duplicate Checking Parameters of a Staging Transformation for a User-Written Adapter



Duplicate Checking	
IDVAR variable for %RMDUPCHK macro:	MACHINE
Timestmp variable for %RMDUPCHK macro:	DATETIME
ENDFILE variable for %RMDUPCHK macro:	_eof
INT value for %RMDUPCHK macro:	00:29
RANGES value for %RMDUPCHK macro:	20
SYSTEMS value for %RMDUPCHK macro:	3
KEEP value for %RMDUPCHK macro:	9

As shown in the following display, the **User-Written** panel enables the user to specify the file that contains the staging code.

Display 4.11 User-Written Parameters of a Staging Transformation for a User-Written Adapter

Stage USERWRITTEN Properties

General | **Staging Parameters** | Code | Precode and Postcode | Notes | Extended Attributes

Staging *
Duplicate Checking
User-Written (1) *

User-Written

- * User-written code:
Select the file that contains the user-written SAS code.
- * Generate a macro variable with input table name:

☒ Yes
- * Generate macro variables with target table names:

☒ Yes
- * Generate a macro with target table options:

☒ Yes
- * Generate Tabinfo and Varinfo tables:
 Temporary SAS tables containing information about target tables and variables
☒ No
- * Generate a macro to create target table ATTRIB statements:

☒ Yes
- * Generate a macro to create computed columns:

☒ Yes
- * Generate a macro to create column lists:

☒ Yes
- * Generate a macro to assign columns to missing:

☒ Yes

For more information about the user-written staging transformation, see Chapter 11, “User-Written Staging Code” in the *SAS IT Resource Management 3.2: Administrator’s Guide*.

Review Computed Columns

As part of the migration process, computed columns are created to provide similar functionality for the SAS IT Resource Management 2.7 derived variables and formulas. Derived variables result in computed columns in the staging tables. Formula variables result in computed columns in the appropriate simple and summarized aggregations.

Review the source code for each computed column to ensure that the column functions correctly in this new context. Here are some examples of problems that can occur with the migrated source code:

- using formats or informats that cannot be located.
- referencing other statistics where the referenced statistics were of interpretation type COUNT, TIME, or TIMETICKS. These statistics might now be weighted-rate statistics. Therefore, a different variable name should be used. For more information, see [“Data Handling Differences between SAS IT Resource Management 2.7 and 3.2” on page 61](#).
- referencing macro variables that are not provided in SAS IT Resource Management 3.2.

Review the Migration Status Report to Discover Missing Formats

The migration process verifies that any associated SAS formats can be located. A list of missing formats is displayed as part of the migration status report, as well as in the SAS log. Missing formats do not cause migration or the generated jobs to fail. However, missing formats might yield unexpected results in reporting. In addition, any formats that are used by computed column or formula code need to be in the format search path. Migration does not verify source code for computed columns.

Output 4.3 Missing Formats Listed in Migration Status Report

```

ITRM Migration Report

ITRM 2.7 Migration started at 9:55:51 AM on Friday, June 17, 2011
PDB to be migrated: SYS2.ITRM.SMF.PDB

Using Metadata itrm.sas.com on port 8561 with userid itmuser

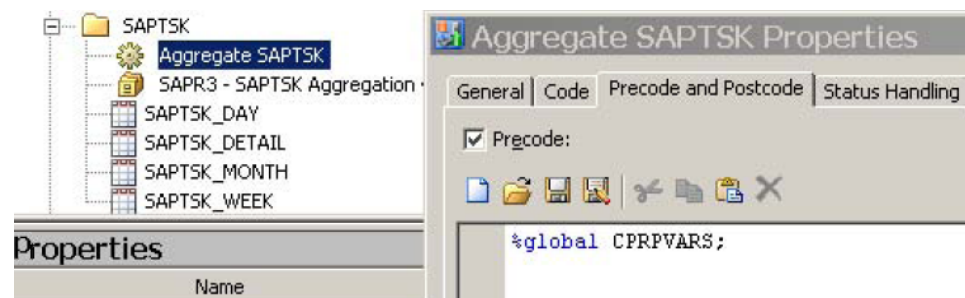
The following formats are needed but do not exist: $MGDBPT, $MGDBTT, MGDBTY,
...

```

SAPR3 Considerations

The SAPTSK and SAPMTS aggregation jobs for the SAPR3 adapter used a macro variable called CPRPVARS. To compensate for this macro variable not being present, add a %GLOBAL statement as part of the pre-code for the SAPTSK and SAPMTS aggregation jobs. The following display shows the %GLOBAL statement added to the **Precode and Postcode** tab of the SAPTSK Properties dialog box.

Display 4.12 Specifying PreCode for a SAPTSK Job



Process Exit Considerations

SAS IT Resource Management 2.7 permitted the use of process exits. In SAS IT Resource Management 3.2, the architecture has changed so that process exits are no longer supported. In some cases, the same functionality is possible by means of attributes for the transformations, tables, or columns (including computed columns). For exit processing that cannot be accomplished by means of these mechanisms, alter the process flow diagram to include your own transformations to accomplish the same work as the process exits.

Deploy and Schedule Jobs for Execution

After all job customization is complete, you can deploy the job to the server and schedule it for execution. Although the jobs that are generated by %RMPDB2DM can be run interactively from the SAS IT Resource Management client, it is more efficient to run them in batch mode. For more information about generating, deploying, and scheduling jobs for execution, see the SAS IT Resource Management Help and Chapter 12, “Jobs” in the *SAS IT Resource Management 3.2: Administrator's Guide*.

Data Handling Differences between SAS IT Resource Management 2.7 and 3.2

Table 4.3 Table of Data Handling Differences

Function	SAS IT Resource Management 2.7	SAS IT Resource Management 3.2
Storing numeric columns <i>Note:</i> Numeric values in SAS are stored in floating point, using a maximum of 8 bytes.	In SAS IT Resource Management 2.7, some numeric values were designated to use less than 8 bytes of storage.	%RMPDB2DM unilaterally creates all numeric columns with a length of 8 bytes.
Aging incoming data	In SAS IT Resource Management 2.7, all incoming data is permitted in the DETAIL level, regardless of age limit. Subsequent %CxPROCES invocations aged this data out. This action permitted the backloading of data among other uses.	As %RMPDB2DM copies data from the PDB into the IT data mart, the age limit for the DETAIL label is applied against the data. Thus, it is possible that there are fewer observations in the target detail table than were in the source detail table.

Function	SAS IT Resource Management 2.7	SAS IT Resource Management 3.2
Handling normalized values	<p>In SAS IT Resource Management 2.7, the use of variable interpretation types influenced the behavior of summarization. Specifically, columns with an interpretation type of COUNT, TIME, or TIMETICKS in INTERVAL tables underwent a normalization transformation before summarization.</p> <p>In this normalization process, the incoming value was first turned into a rate by dividing the metric by DURATION. If a weight variable had been specified, then the metric would instead be divided by the weight variable. The resulting value is the value that was used in computations by %CPREDUCE.</p>	<p>%RMPDB2DM creates a corresponding rate column in the staged table for each COUNT, TIME, and TIMETICKS type column migrated for an interval table. This is done to provide results that are consistent with the existing data that migrated from SAS IT Resource Management 2.7. This rate column is then used with weighted statistics (such as weighted mean), specifying DURATION or the indicated SAS IT Resource Management 2.7 weight variable, to provide the same computations that are achieved through the SAS IT Resource Management 2.7 normalization technique.</p> <p>For example, if you had a COUNT column named PGFAULT in an SAS IT Resource Management 2.7 interval table, then the SAS IT Resource Management 3.2 staged table would include a computed column named PGFAULT_RATE. The source code for the computation would be as follows:</p> <pre> IF DURATION GT 0 THEN PGFAULT_RATE = PGFAULT/DURATION; ELSE PGFAULT_RATE = . ; </pre>

Function	SAS IT Resource Management 2.7	SAS IT Resource Management 3.2
Handling pre-set values for SHIFT	In SAS IT Resource Management 2.7, it was possible to set the value for SHIFT in the underlying data (for example, through MXG customization), and not use the SAS IT Resource Management SHIFT definitions.	<p>In SAS IT Resource Management 3.2, this capability is no longer supported. SHIFT is a computed column in the tables that are produced by staging transformations. This computed column uses a MIGRATION_SHIFT formula that is created by %RMPDB2DM.</p> <p>If you want to alter the logic for assigning SHIFT, then you can make either of these modifications:</p> <ul style="list-style-type: none"> • Change the source code for the MIGRATION_SHIFT formula. This change affects the computation of SHIFT in all staged tables in the IT data mart. You need to locate the MIGRATION_SHIFT formula in the PDB Migration Formulas folder of the IT data mart for this invocation of %RMPDB2DM. • Change the source code for the SHIFT computed column in the desired staged tables. This change affects only this particular SHIFT column.
Supporting HP-PCS tables	<p>SAS IT Resource Management 2.7 supported the following tables for the HP-PCS collector:</p> <ul style="list-style-type: none"> • PCSGDK (PCS Global Disk Metrics) • PCSGLN (PCS Global LAN Metrics) <p>In SAS IT Resource Management 2.7, these tables were populated by retrieving data from the PCSGLB (Global) table.</p>	<p>SAS IT Resource Management 3.2 does not support the following tables for the HP-PCS collector with a staging transformation:</p> <ul style="list-style-type: none"> • PCSGDK (PCS Global Disk Metrics) • PCSGLN (PCS Global LAN Metrics) <p>In SAS IT Resource Management 3.2, use the PCSGLB table instead. The PCSGDK and PCSGLN staged tables and aggregations are migrated. However, the staging transformation does not populate these tables.</p>

Function	SAS IT Resource Management 2.7	SAS IT Resource Management 3.2
Handling Web Log data with respect to migration	The Web Log adapter in SAS IT Resource Management 2.7 worked by presummarizing data to an hourly granularity into the WEBRES or WEBCLI table. It then used the DETAIL parameter of %CPREDUCE() to populate the required tables.	In SAS IT Resource Management 3.2, the WEBLOG staging transformation does not support the WEBRES or WEBCLI tables. Instead, the staging transformation directly populates the required staged tables. Thus, for PDB migration, the staged and aggregation tables are created for all Web Log tables that are marked KEPT='Y' in the PDB, with the exception of WEBCLI and WEBRES.
Supporting Sum of Weights statistic <i>Note:</i> Both SAS IT Resource Management 2.7 and SAS IT Resource Management 3.2 enable you to request computation of weighted statistics. This request typically involves the computation of the sum of weights.	SAS IT Resource Management 2.7 treated the sum of weights the same as the sum of the weight variable. For example, if X (the analysis variable) was to be weighted by Y, then the sum of weights was simply the sum statistic requested on Y. In cases where the analysis has no missing values, this treatment is entirely correct. However, if the analysis variable has a missing value, then this treatment can lead to erroneous results.	SAS IT Resource Management 3.2 correctly maintains the sum of weights for an analysis variable as a separate statistic. This statistic is the sum of the weight variable where the analysis variable is not missing. Thus, it is the sum of Y with respect to X not missing.

Chapter 5

Data Model Upgrade

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Introduction to the Data Model Upgrade

SAS IT Resource Management 3.2 data models are designed to be consistent across adapters and to perform efficiently as input to the reports supplied by the solution.

The Data Model Upgrade program is part of the SAS IT Resource Management migration. It copies the physical data in the IT data mart that has been migrated to SAS 9.2 to an IT data mart with a SAS IT Resource Management 3.2 data model. At the same time, for those adapters that are supported by the solution, it upgrades the physical data to the SAS IT Resource Management 3.2 data model. Upgrading the data model enables you to use your existing data with the new reports that are provided with SAS IT Resource Management 3.2.

The program compares the metadata for the tables in your new SAS IT Resource Management 3.2 IT data mart (that was created using the Adapter Setup wizard) with the metadata for the tables in the old SAS IT Resource Management 3.1.1 IT data mart or SAS IT Resource Management 2.7 PDB. It then produces a report that shows all the changes between the two IT data marts. Based on the information in the report, you can modify the new IT data mart as needed. For example, if there are columns in your old IT data mart that you want to be copied to your new IT data mart, you can add those columns to the tables. After you are satisfied with the changes that are indicated on the report, you can run the program again. This time, you can set the **DOREPORT** and **DOUPGRADE** parameters so that the program copies and upgrades the aggregation data from your old IT data mart to your new IT data mart.

Overview of the Upgrade Process

About the Upgrade Process

The following instructions guide you through the process of upgrading an IT data mart from the SAS IT Resource Management 3.1.1 or SAS IT Resource Management 2.7 data model to the SAS IT Resource Management 3.2 data model. This process can be used for those SAS IT Resource Management adapters that were also supported as SAS IT Resource Management 2.7 collectors or SAS IT Resource Management 3.1.1 adapters.

Requirements for Upgrading Your Data Model

Before you upgrade your data model, you must perform the following tasks.

- Install and configure SAS IT Resource Management 3.2.
- Migrate your SAS IT Resource Management 3.1.1 IT data mart or SAS IT Resource Management 2.7 PDB to your SAS IT Resource Management 3.2 installation. This migration should include both the physical data as well as the metadata. For information about these tasks, see [Chapter 2, “Migrating from SAS IT Resource Management 3.1.1 to 3.2,” on page 7](#), [“Migrating a Single IT Data Mart from SAS IT Resource Management 3.1.1 to 3.2” on page 25](#), and [Chapter 4, “Migrating SAS ITRM 2.7 Performance Databases to SAS ITRM 3.2 IT Data Marts,” on page 33](#).

Upgrading to the New Data Model

To upgrade to the new data model, perform the following steps:

1. Make a new IT data mart. Use the Adapter Setup wizard to create a new IT data mart for the same adapter, or set of adapters, that were located in your old IT data mart. This new IT data mart will contain your upgraded data after this upgrading process has successfully completed.

The following table can help you determine which ITRM 3.2 adapter to choose when upgrading a data mart from a previous release.

Table 5.1 Cross-Reference Table of Collectors and Adapters

ITRM 2.7 Collectors	ITRM 3.1.1 Adapters	ITRM 3.2 Adapters
TMON2CIC	TMON2CIC	ASG TMON2CIC
TMONDB2	TMONDB2	ASG TMONDB2
IMF	IMF	BMC Mainview
Patrol	PATROL	BMC Perf Mgr
TMS	TMS	CA TMS

ITRM 2.7 Collectors	ITRM 3.1.1 Adapters	ITRM 3.2 Adapters
NTSMF TOOLNM=SASDS	NTSMF	DT Perf Sentry
NTSMF TOOLNM=MXG	NTSMF-MXG	DT Perf Sentry with MXG
HP-PCS	HP-OVPA	HP Perf Agent
	HP-OVREP	HP Reporter
DCOLLECT	DCOLLECT	IBM DCOLLECT
EREP	EREP	IBM EREP
SMF	SMF	IBM SMF
TPF	TPF	IBM TPF
VMMON	VMMON	IBM VMMON
		MS SCOM
SAPR3 (TOOLNM=SASADAPT)	SAPR3	SAP ERP
SAR	SAR	SAR
		SNMP
		VMware vCenter
WRBLOG		Web Log

2. Generate a comparison report of the two IT data marts.

The supplied SAS macro, %RMUPGRDM, can be run from an interactive session of SAS, or by creating a SAS program and running it in batch mode. This macro is used both to create the comparison report and to perform the IT data mart upgrade. To generate the comparison report without performing an update, set the **DOPREPORT** parameter to **YES** and the **DOUPGRADE** parameter to **NO**.

Based on the comparison report, you might determine that you would lose some data that you want to keep. In that case, you can use SAS IT Resource Management to edit the new IT data mart. You can add columns, edit existing columns, and delete unwanted columns. You can also create new tables, modify existing tables, and delete unwanted tables.

Note: If you change or delete any columns or tables, some of the supplied reports might not work.

After making changes, rerun the upgrade program with the **DOPREPORT** parameter set to **YES**. You can use the report to see how your changes could affect the upgrade.

Once you determine that all the data will be carried forward to your satisfaction, continue to the next step.

3. Upgrade the IT data mart.

In order to upgrade the IT data mart, you need to use the same macro that you used to create the comparison report: %RMUPGRDM. You should change two parameters in order to upgrade the data. Change the value of the **DOREPORT** parameter to **NO** and the value of the **DOUPGRADE** parameter to **YES**.

The Upgrade program copies the physical data tables from the old IT data mart to the new IT data mart and makes the necessary changes to the columns.

This program does not delete your old data. The data is still available in the old IT data mart's location. Once you are confident that the upgrade was successful, you can delete the data manually or by using the **Erase Data Mart** action in SAS IT Resource Management.

%RMUPGRDM Macro

%RMUPGRDM Syntax

```
%RMUPGRDM (
  METAPASS=password for metauser
  ,METAPORT=service or port for the metadata server
  ,METASERVER=host-name or IP address for the metadata server
  ,METAUSER=user ID for metadata server access and definition
  ,_NEW_DATAMART=name of IT data mart with upgraded data model
  ,_OLD_DATAMART=name of IT data mart being upgraded
  <,DOREPORT=YES | NO>
  <,DOUPGRADE=YES | NO>
  <,UPGRADEFROMVERSION=2 | 3>
);
```

%RMUPGRDM Required Parameters

METAPASS=*password for metauser*

specifies the password for connecting the user ID to the metadata server. A value for this parameter is required.

METAPORT=*service or port for the metadata server*

specifies the TCP/IP service name or port number that the metadata server is listening on. A value for this parameter is required. This value is usually 8561.

METASERVER=*host-name or IP address for the metadata server*

specifies the host-name or TCP/IP address of your metadata server. A value for this parameter is required.

METAUSER=*user ID for metadata server access and definition*

specifies the user ID for accessing the metadata server. A value for this parameter is required.

_NEW_DATAMART=*name of the IT data mart to use*

specifies the name of the migrated IT data mart that you just created with the Adapter Setup wizard in the previous step. A value for this parameter is required.

_OLD_DATAMART=name of the IT data mart to use

specifies the name of the IT data mart from which you are upgrading. A value for this parameter is required.

%RMUPGRDM Optional Parameters**DOREPORT=YES | NO**

specifies whether a report should be produced that details the changes that would be made by upgrading to the new data model. A value for this parameter is optional. If this value is **YES**, a report is produced. The default value is **NO**. If this value of the parameter is blank or **NO**, a report is not produced.

DOUPGRADE=YES | NO

specifies whether the IT data mart should be updated with the new data model. A value for this parameter is optional. If this value is **YES**, the IT data mart is upgraded with the new data model. The default value is **NO**. If this value is blank or **NO**, the IT data mart is not upgraded with the new data model.

UPGRADEFROMVERSION=2 | 3

specifies the version of SAS IT Resource Management that the **_OLD_DATAMART** originated from. If the **_OLD_DATAMART** ran on SAS IT Resource Management 2.7, set the value of this parameter to **2**. If the **_OLD_DATAMART** ran on SAS IT Resource Management 3.1 or 3.1.1, set the value of this parameter to **3**. A value for this parameter is optional. If left blank, the value of this parameter defaults to **3**.

%RMUPGRDM Examples**Example 1: Create a Comparison Report**

The following example creates a comparison report that summarizes the differences between an IT data mart called Old SAR DataMart and the SAR DataMart IT data mart. The IT data mart called Old SAR DataMart conforms to the SAS IT Resource Management 3.1.1 data model. The SAR DataMart IT data mart conforms to the SAS IT Resource Management 3.2 data model.

```
%RMUPGRDM (
    METAPASS=mypassword,
    METAPORT=8561,
    METASERVER=host-name,
    METAUSER=myuserID,
    _NEW_DATAMART=SAR DataMart,
    _OLD_DATAMART=Old SAR DataMart,
    DOREPORT=YES,
    DOUPGRADE=NO) ;
```

Example 2: Upgrade an IT Data Mart to the New Data Model

The following example copies and upgrades the data in an IT data mart called Old SAR DataMart to the IT data mart called SAR DataMart. The IT data mart called Old SAR DataMart conforms to the 3.1.1 data model. The IT data mart called SAR DataMart conforms to the SAS IT Resource Management 3.2 data model.

```
%RMUPGRDM (
    METAPASS=mypassword,
```

```
METAPORT=8561,  
METASERVER=host-name,  
METAUSER=myuserID,  
_NEW_DATAMART=SAR DataMart,  
_OLD_DATAMART=Old SAR DataMart,  
DOREPORT=NO,  
DOUPGRADE=YES);
```

%RMUPGRDM Notes

Some changes to the data do not occur until you run the aggregation jobs from the new IT data mart for these tables. For example, any columns that were not in the original data are not populated until the first time the aggregation job is run. Therefore, the supplied reports might not work correctly until you run the aggregation jobs.

By default, the WEEKDATE formula used in the IT data mart that is created by the Adapter Setup wizard sets the beginning of the week as Sunday. Your old IT data mart might have specified that the beginning of the week should be a different day (for example, Monday). If so, update the WEEKDATE formula that the new IT data mart uses before you upgrade the IT data mart to the new data model.

Chapter 6

Other Resources

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If You Need Help

For more information about migration, check with your on-site SAS support personnel or with SAS Technical Support.

Contact SAS Technical Support at <http://support.sas.com/techsup/contact/index.html>.

If you are having a problem with PDB migration, then follow these directions and include the specified information when you open a tracking entry:

1. Specify CLEANUP=N on the %RMPDB2DM macro.
2. Create an empty SAS library to back up the contents of the work directory just before ending the SAS session.

To create a SAS library, on the menu bar of SAS IT Resource Management, select **New** ⇒ **Library**. The New Library Wizard opens and prompts you to specify the type of library, name, location, server, and other library options for the library that you want to create. For more information, click **Help** for that page of the wizard.

3. Immediately preceding the invocation of %RMPDB2DM, include the following SAS statements:

```
OPTIONS MPRINT;
LIBNAME SNAPDIR 'location of snapshot library';
PROC OPTIONS OPTION=JREOPTIONS;
RUN;
PROC JAVAINFO ALL;
RUN;
```

4. Immediately following the invocation of %RMPDB2DM, include the following SAS statements:

```
OPTIONS NOMPRINT OBS=MAX;
%PUT _ALL_;
PROC COPY IN=WORK OUT=SNAPDIR;
RUN;
```

```
PROC CPORT LIB=SNAPDIR FILE='some external file';  
RUN;
```

5. Attach the SAS log and the contents of the standard SAS output area to the tracking entry.
6. Attach the contents of the path that is specified by the **WORKDIR** parameter. You might need to zip this file in order to upload it, or you might have to contact technical support for information about transferring the file via FTP.
7. Attach the external file from the PROC CPORT invocation. You might need to zip this file in order to upload it, or you might have to contact technical support for information about transferring the file via FTP.