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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.
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Introduction to the SAS IT Resource Management 3.8 Migration Process

SAS IT Resource Management 3.8 Software Migration

SAS IT Resource Management 3.8 Data and Metadata Migration
- Migration and Data Model Upgrade Defined
- Options for Migrating to SAS IT Resource Management 3.8
- Post-Migration Options
- Migrating SAS IT Resource Management Reports
- Special Situations That Require a Data Model Upgrade
- How Age Limits Are Handled
- Option 1: Install SAS IT Resource Management 3.8; Do Not Migrate or Upgrade Data and Metadata from Your Previous Installation
- Option 2: Install SAS IT Resource Management 3.8; Migrate All Metadata (and, Optionally, Data) from a Previous Installation of SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 Using the SAS Migration Utility
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SAS IT Resource Management 3.8 Software Migration

This document provides guidelines for migrating the following versions of SAS IT Resource Management to SAS IT Resource Management 3.8 on SAS 9.4.

Table 1.1 Versions of SAS IT Resource Management and SAS Migrated to SAS 9.4M2

<table>
<thead>
<tr>
<th>Version of SAS IT Resource Management</th>
<th>Version of SAS where SAS IT Resource Management is currently installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS IT Resource Management 2.6</td>
<td>SAS 8.2</td>
</tr>
<tr>
<td>SAS IT Resource Management 2.7</td>
<td>9.1.3</td>
</tr>
</tbody>
</table>
SAS IT Resource Management 3.8 is a SAS 9.4 solution. The software components of this solution are installed, migrated, and configured in accordance with the SAS 9.4 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 3.8 software depend on the version of SAS IT Resource Management that you are currently running. These steps are described in the following chapters of this document.

Before you migrate, your current SAS IT Resource Management system should be updated with all applicable hot fixes. You need only apply the latest hot fix for your version of the software because the latest hot fix contains all previous hot fixes.

To locate the hot fix download site for SAS IT Resource Management 3.2 and later, perform the following steps:

2. At the bottom of the page, locate the Support section and click Downloads & Hot Fixes.
3. In the section called Downloads & Hotfixes, click Hot Fixes. The TECHNICAL SUPPORT HOT FIXES page appears.
4. From the left panel, select All Products and Software Releases. The following display appears.

<table>
<thead>
<tr>
<th>Version of SAS IT Resource Management</th>
<th>Version of SAS where SAS IT Resource Management is currently installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS IT Resource Management 3.2</td>
<td>SAS 9.2</td>
</tr>
<tr>
<td>SAS IT Resource Management 3.21</td>
<td>SAS 9.3</td>
</tr>
<tr>
<td>SAS IT Resource Management 3.3</td>
<td>SAS 9.3</td>
</tr>
<tr>
<td>SAS IT Resource Management 3.4</td>
<td>SAS 9.4</td>
</tr>
<tr>
<td>SAS IT Resource Management 3.5</td>
<td>SAS 9.4</td>
</tr>
<tr>
<td>SAS IT Resource Management 3.6</td>
<td>SAS 9.4</td>
</tr>
<tr>
<td>SAS IT Resource Management 3.8</td>
<td>SAS 9.4</td>
</tr>
<tr>
<td>SAS IT Resource Management 3.8</td>
<td>SAS 9.4</td>
</tr>
</tbody>
</table>
5. Select the version of SAS that you are working with. The Hot Fix Quick Links box appears in the left panel.

- For releases of SAS 9.2 and later, follow these instructions:
  - For the SAS 9.2 release, select **SAS 9.2 ➔ All SAS 9.2 Products** from the list in the center pane of the page.
  - For the SAS 9.3 release, select **SAS 9.3 ➔ All SAS 9.3 Products** from the list in the center pane of the page.
• For the SAS 9.4 release, select SAS 9.4 from the list in the center pane of the page. Use the Products Index A–Z to locate the entry for SAS IT Resource Management. Select that entry to access the hot fixes for that release.

• For releases prior to SAS 9.2, follow these instructions:
  • Select the SAS release that you are working with.
  • From the list in the center pane, click Sorted by SAS Product.
  • Under Other Hot Fix Links, select Hot Fixes for Additional SAS Products and Solutions on this page to access the hot fixes for that release.
  • Scroll down to locate the entry for SAS IT Resource Management. Select that entry to access the hot fixes for that release.

Note: There are no hot fixes available for SAS IT Resource Management 3.21.

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### SAS IT Resource Management 3.8 Data and Metadata Migration

**Migration and Data Model Upgrade Defined**

**Migration**

In the context of SAS IT Resource Management 3.8, migration is a task that involves copying data and metadata, when it exists, from SAS IT Resource Management 2.6, 2.7, 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 to SAS IT Resource Management 3.8. Migration involves some internal restructuring of the data and metadata to conform to the requirements of the new software.

**TIP** Migrating from SAS IT Resource Management 3.8 to SAS IT Resource Management 3.8 is useful if you want to move your SAS IT Resource Management system to a different environment. Migrating within families of operating systems (for example, one flavor of UNIX to another) is supported.

**Data Model Upgrade**

The Data Model Upgrade program is part of the SAS IT Resource Management migration process. It copies the physical data in the IT data mart that has been migrated to SAS 9.4 to an IT data mart with a SAS IT Resource Management 3.8 data model.

Reports and the associated reporting metadata are stored in the SAS Content Server on the middle tier. These objects are automatically migrated using the SAS Migration Utility. Therefore, there is no need to promote (or move) the contents of the SAS Content Server on one machine to the SAS Content Server on another machine.

In SAS IT Resource Management 3.3 and earlier, a user could create report galleries that did not specify a domain category. Starting in SAS IT Resource Management 3.4, a domain category is required to access the reports from the SAS Content Server. If you have not specified a domain category, a gallery cannot be accessed from ITRM Report Center. To correct this situation, in ITRM Report Center, perform the following steps:

1. Select the gallery that contains the reports.
2. Click Edit. To create a gallery with the reports that you want to view, specify a domain category.
3. [Optional] Specify additional filters to limit the size of the gallery.
   For more information, see “Reset the Maximum Number of Reports to Be Returned from the Create Gallery Filters” in Chapter 10, “Administrative Tasks,” in the SAS IT Resource Management 3.8: Reporting Guide.

4. Access the reports in the gallery that you edited.
   For more information, see “Migration and Promotion of ITRM Report Center Content” on page 99.

Note: Table names are not changed during migration. Views are migrated in metadata—they are neither created nor deleted during the migration process. The MXG views that were automatically created in previous versions of SAS IT Resource Management are migrated as any other view. However, the MXG views are no longer automatically created by SAS IT Resource Management 3.8 and the migrated physical views do not work correctly in the new environment. Therefore, you should either delete them or upgrade them by using the %RMUPGRDM macro. (For information, see “Introduction to the Data Model Upgrade” on page 79.)

**Options for Migrating to SAS IT Resource Management 3.8**

As your site adopts SAS IT Resource Management 3.8, you have several options to consider. These options affect the data, metadata, and data models that are associated with your current SAS IT Resource Management 2.6, 2.7, 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 system.

Option 1: Install Only

Option 2: Install and Migrate Metadata and, Optionally, Data
Install SAS IT Resource Management 3.8. Migrate all metadata from a previous installation of SAS IT Resource Management using the SAS Migration Utility. You can choose to migrate the data.

You can use the SAS Migration Utility to migrate Gallery Manager report content from SAS IT Resource Management 3.2 or 3.3 to SAS IT Resource Management 3.8. You can also use the SAS Migration Utility to migrate the ITRM Report Center content from SAS IT Resource Management 3.4 or later to 3.8.

Option 3: Install and Migrate a Specific IT Data Mart
Install SAS IT Resource Management 3.8. 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.

SAS IT Resource Management supports the use of the SAS utilities for exporting and importing SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, and 3.8 IT data marts to SAS IT Resource Management 3.8. For information about these utilities, see “Migrating a Single IT Data Mart to SAS IT Resource Management 3.8” on page 27.

You can promote ITRM Report Center content from 3.4 or later to 3.8. For more information, see “Promoting the Content of ITRM Report Center” on page 101.

Option 4: Convert PDBs to IT Marts
Install SAS IT Resource Management 3.8 on your SAS 9.4 system. Then, migrate one or more specific performance databases (PDBs) from an installation of SAS IT
Resource Management 2.6 or 2.7. These PDBs are converted into IT data marts as part of the PDB migration process.

Post-Migration Options

After using any of the migration options, you can use the Data Model Upgrade program to upgrade the data model of any or all migrated IT data marts to the SAS IT Resource Management 3.8 data model.

You can also move your physical data to your new installation of SAS IT Resource Management.

CAUTION:
Use the %RMDMPKG, %RMDMPATH, and %RDMUPKG macros to move your physical data from your previous installation of SAS IT Resource Management to SAS IT Resource Management 3.8. The internal format of the data can change between releases. Therefore, manually moving the data can result in problems with the new release.

Migrating SAS IT Resource Management Reports

This document does not address the conversion of reports from a prior SAS IT Resource Management release to SAS IT Resource Management 3.8. For more information, see Appendix 6, “Report Conversion Guide” in the SAS IT Resource Management 3.8: Reporting Guide. This appendix provides a description of the steps that are performed in order to re-create reports that were generated by using SAS IT Resource Management 2.6 or 2.7 report macros. In addition, see the topic "Migrating SAS Enterprise Guide Projects to Work with SAS IT Resource Management 3.2 and Later" in Chapter 2, "Preparing to Work with the SAS IT Resource Management Client," of the SAS IT Resource Management: Administrator’s Guide.

Note: Reports that are generated using report jobs in SAS IT Resource Management 3.4 and later use the `sasdav/Stylesheets` folder that is located in the SAS Content Server. This folder is available for all report content. However, if your reports were migrated from SAS IT Resource Management 3.3 or earlier, the necessary style sheet is located in the `ITRM/styles` folder of the SAS Content Server. Make sure that the `ITRM/styles` folder is accessible to any ITRM Report Center Group that might access those reports created using ITRM 3.3 or earlier. For information, see “Create a Location in the SAS Content Server” in Chapter 10, “Overview of Administrator Tasks” in the SAS IT Resource Management 3.8: Reporting Guide. (This topic describes the root folders that pertain to ITRM Report Center and how to set permissions for them.)

Note: Reports that were generated in SAS IT Resource Management 3.3 were stored on the SAS Content Server in subfolders under the `sasdav/ITRM` folder. Reports that are generated in SAS IT Resource Management 3.4 or later (by the same report job that was used in SAS IT Resource Management 3.3) store reports in a different location in the SAS Content Server. The reports are stored in the following locations in the SAS Content Server:

- Performance reports: `sasdav/<root-location>/<IT data mart name>/<job name>/<report definition name>`
- Exception reports: `sasdav/<root-location>/<IT data mart name>/<job name>/<Exception transformation name>`

Note: Generating exception reports began with SAS IT Resource Management 3.4.
The report job that is run in SAS IT Resource Management 3.8 cannot automatically purge the SAS IT Resource Management 3.3 reports because those reports are written to a different SAS Content Server folder: `sasdav/ITRM/EGProjectName/ProcessFlowName/ReportDefinitionName`.

Instead, use the Purge reports feature of the Administration workspace of ITRM Report Center to remove the 3.3 reports.

**Special Situations That Require a Data Model Upgrade**

Upgrading a site’s data model is not generally required, although it is recommended. However, the following situations require you to upgrade the data model by running the `%RMUPGRDM` macro. In these cases the SAS IT Resource Management staging code relies on the most recent data model to properly read adapter raw data sources.

- The attributes of the column of a table might have been updated from their state in the PDB or IT data mart of versions of SAS IT Resource Management earlier than 3.8. (For example, the label or the format of the column might have changed.) In that case, even though the columns of the table have the same name as the columns of the IT data mart, an error message is displayed. Perform the data model upgrade before processing any new data.

- After successfully migrating an IT data mart that contains SAR data from a version of SAS IT Resource Management that is earlier than 3.3 to SAS IT Resource Management 3.8, you should perform a data model upgrade. This action ensures that all staged tables are properly staged (that is, using the current external name attributes for the columns). It also ensures that columns with the same name have the same attributes across the tables that are being staged.

For information, see “Introduction to the Data Model Upgrade” on page 79.

**How Age Limits Are Handled**

When IT data marts are migrated, the aggregation tables retain the age limits over the course of migration. The migrated aggregation tables will have the same age limit as they did in the environment from which you have migrated.

However, SAS IT Resource Management might have changed the default age limits for the supplied aggregation templates in the current data model. These are used in the Adapter Setup wizard, the Add Domain Category wizard, and in the Add Aggregation Tables through Template feature. This means that new aggregation tables use the current default age limits in the supplied templates.

If you migrated an IT data mart, and then used the Add Aggregation Tables through Template feature, the new table will have the new age limits. These age limits might not match the age limits for the migrated tables. Similarly, if you add new tables through other SAS IT Resource Management features that use the supplied aggregation templates, such as the Add Domain Category wizard, those new tables will have the new default age limits as well.

If you use the Upgrade Data Model feature, the new IT data mart uses the new data model with the new age limits. These new age limits might not match the age limits for the migrated tables. The physical data is copied from the migrated tables to the new tables during the Upgrade Data Model process. However, the age limits for the new tables remain until they are explicitly changed by the user. The age limit differences, along with other differences between the migrated tables and the new tables, are detailed in the listing output from the `%RMUPGRDM` macro. (For information, see “Post-Migration Options” on page 10.)
These age limits for the aggregation tables of supplied adapters are documented in the SAS IT Resource Management data model. To locate this information, go to the SAS IT Resource Management page and scroll down to the Metrics Documentation section.

**Option 1: Install SAS IT Resource Management 3.8; Do Not Migrate or Upgrade Data and Metadata from Your Previous Installation**

SAS IT Resource Management 3.8 provides 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 3.8 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 3.8 software and establish new IT data marts. Most likely, your site will maintain the earlier version of SAS IT Resource Management for a period of time as a complement to, or running in parallel with, SAS IT Resource Management 3.8. This activity should continue until your operational needs indicate that the legacy system can be retired and the data archived.

*Note:* The availability of processing resources is a key consideration for this option. Additional resources might be needed to run both the old (SAS IT Resource Management 2.6, 2.7, 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8) and new (SAS IT Resource Management 3.8) systems in parallel.

**Option 2: Install SAS IT Resource Management 3.8; Migrate All Metadata (and, Optionally, Data) from a Previous Installation of SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 Using the SAS Migration Utility**

You might want to migrate all SAS 9.2, 9.3, or 9.4 metadata and, optionally, data to SAS IT Resource Management 3.8 on a SAS 9.4 system. If so, migrate your data and metadata using the SAS Migration Utility. Option 2 is most appropriate for sites that have significant investments in these areas:

- data produced by the current IT Resource Management system
- the customizations made for that system
- 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 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 system. It is also the best choice if you have a significant investment in SAS 9.2, 9.3, or 9.4 system metadata other than that for SAS IT Resource Management.

The total size of all metadata for the SAS 9.2, 9.3, or 9.4 system might be extremely large. In that case, 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 Option 3.

*Note:* This migration process uses more overall disk space than an installed system 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 Option 1. (Option 1 does not recommend migration. Instead, it recommends that you install SAS IT Resource Management 3.8 and establish new IT data marts.)
After the migration process is completed, the metadata is available in SAS IT Resource Management 3.8. If you chose to migrate the data, it is also available in SAS IT Resource Management 3.8. However, SAS code that is associated with a User-Written Staging transformation is not included in the migration of the metadata or the data. To enable your user-written staging transformation to execute as you specified, you must move the SAS code that is associated with the User-Written Staging transformation to an appropriate place. Then you must also update the transformation to point to the new location of that SAS code. (In SAS IT Resource Management 3.4 and later, the name of the reporting transformation is changed from Gallery transformation to Performance Report transformation.)

Note: Migrated jobs with Gallery transformations (from SAS IT Resource Management 3.3 or earlier) or Performance Report transformations (in SAS IT Resource Management 3.4 and later) will continue to use the migrated report definitions from the previous version. (The migration process deletes any supplied report definitions from the previous version of the software unless they are used by a migrated job.) User-defined report definitions are not deleted. Exception definitions from SAS IT Resource Management 3.4 and later behave the same way as report definitions.

If you migrated the data from an IT data mart that was created with an earlier version of SAS IT Resource Management (that is, from SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, or 3.7), then you might choose to update that data to the SAS IT Resource Management 3.8 data model. For more information, see “Post-Migration Options” on page 10.

Shared Gallery folders in ITRM Report Center that are migrated become private to the user that created them. If these folders need to be shared, then you must share those items again.

Option 3: Install SAS IT Resource Management 3.8; Migrate Selected Data and Metadata from Your Previous Installation of SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8

If you want to use only specific IT data marts from the previous installation of SAS IT Resource Management in the SAS IT Resource Management 3.8 environment, install and configure IT Resource Management 3.8 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. At any time after the configuration is completed, you can select specific IT data marts to export from the previous SAS IT Resource Management system and deploy them to SAS IT Resource Management 3.8.

This option is most appropriate for sites that want some, but not all, of the IT data marts from their previous SAS IT Resource Management system to be used in the new SAS IT Resource Management 3.8 environment. This option is also useful for sites that have resource constraints. (Migrating one IT data mart at a time uses fewer resources than migrating all of them at the same time.)

To migrate an IT data mart from a SAS IT Resource Management 3.2 or later system to SAS IT Resource Management 3.8, see “Migrating a Single IT Data Mart to SAS IT Resource Management 3.8” on page 27.

After you export a specific IT data mart from the previous version of SAS IT Resource Management and import it to SAS IT Resource Management 3.8, the metadata is available in SAS IT Resource Management 3.8. If you chose to migrate the data, it is also available in SAS IT Resource Management 3.8. If you migrated the data, you can choose whether to update that data to the SAS IT Resource Management 3.8 data model. For more information, see “Post-Migration Options” on page 10.
For information about migrating the Gallery Manager content from SAS IT Resource Management 3.2 or 3.3 or ITRM Report Center content from SAS IT Resource Management 3.4 or later that is on the middle tier, see “Migration and Promotion of ITRM Report Center Content” on page 99.

To move SAS Content Server report content to the target server, use the WebDAVDump and WebDAVRestore utilities. For information about using the WebDAVDump and WebDAVRestore utilities to move SAS Content Server data, see http://support.sas.com/kb/38/667.html.

Note: SAS code that is associated with a User-Written Staging transformation is not included in the migration of the metadata or the data. To enable your user-written staging transformation to execute as you specified, you must move the SAS code that is associated with the User-Written Staging transformation to an appropriate place. Then you must also update the transformation to point to the new location of that SAS code.

Option 4: Migrate Specific Performance Databases from SAS IT Resource Management 2.6 or 2.7

After the installation and configuration of SAS IT Resource Management 3.8 (by using Options 1, 2, or 3), you might want to use one or more specific PDBs from a previous installation of SAS IT Resource Management 2.6 or 2.7. To convert a PDB to an IT data mart, follow the instructions in Chapter 4, “Migrating SAS ITRM 2.6 or 2.7 Performance Databases to SAS ITRM 3.8 IT Data Marts.” For information, see “Introduction to Migrating PDBs” on page 40.

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 the data (if it was migrated) are available in SAS IT Resource Management 3.8. 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 3.8 data model for each specific IT data mart. For more information, see “Post-Migration Options” on page 10.

Post-Migration Options

For Specific IT Data Marts, Perform a Data Model Upgrade to the SAS IT Resource Management 3.8 Data Model

There are more than 4,000 reports that are supplied with and can be created by using SAS IT Resource Management 3.2 and later. These reports are built using the columns and tables of the latest SAS IT Resource Management data model. You might want to use the new supplied reports with data and metadata from your previous installation of SAS IT Resource Management (that is, the 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 version). If so, perform a data model upgrade. In addition, if adapter updates are delivered in a maintenance release, you might want to perform data model upgrades. (If the changes were to the staging template tables only, then you would be more likely to use the maintain tables utility rather than the data model upgrade process. However, if there were changes to aggregation templates, then the data model upgrade tool would be the best option.) In these cases, you must migrate the data and metadata, and then upgrade the data to the new SAS IT Resource Management 3.8 data model.

Upgrading the data model is possible for selected IT data marts whether you choose Options 2, 3, or 4. (If you choose Option 1, then the SAS IT Resource Management 3.8
data model is already available. Therefore, the upgrade is not necessary.) For more information, see “Introduction to the Data Model Upgrade” on page 79.

**CAUTION:**

If you upgrade to the new SAS IT Resource Management 3.8 data model, any reports that were written for that data in previous IT Resource Management releases might not work without significant refactoring. This problem might be caused by a difference in the table and column names.

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 3.8 system, then those processing resources must be considered.

**Move Physical Data with the Migration Macros**

To move your physical data from your previous installation of SAS IT Resource Management to SAS IT Resource Management 3.8, you can use the migration macros: %RMDMPKG, %RMDMPATH, and %RMDMUPKG. For more information, see “Macros That Are Used for the Migration Process” on page 89.

**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 3.8. 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.
Figure 1.2  Flowchart of Paths for Moving to SAS IT Resource Management

Note: Any deployed jobs within the imported data mart on the target system should be deleted and then deployed again. They should not be redeployed.
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Overview of Migrating to SAS IT Resource Management 3.8

About Migration to SAS IT Resource Management 3.8


The process of obtaining, installing, and configuring SAS 9.4 software begins with requesting SAS software from SAS. This request generates a software order email 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 9.4 Planned Deployments Using Electronic Software Delivery.

Locating SAS IT Resource Management Planned Deployment Using Electronic Software Documentation

For z/OS installations, see Installation and Maintenance Instructions–SAS 9.4 Electronic Software Delivery for Planning Installations on z/OS. To locate this documentation, perform the following steps:

2. From the left navigation panel, select Install Center. Then, select the latest entry among the objects labeled “SAS 9.4” such as “SAS 9.4 (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

UNIX Specifics

z/OS Specifics
For z/OS installations, select Documentation for SAS 9.4 Installation on z/OS. Then, scroll downward and select the Installation Instructions for SAS 9.4 Electronic Software Delivery for Planning Installations on z/OS.

Migrating SAS IT Resource Management Metadata

Note: If you are migrating from a previous release, you might have worked with an ITMS repository. IT data marts in that ITMS repository do not have to be moved to
the Foundation repository. By default, new IT data marts are created in the Foundation repository.

To migrate all of the metadata from SAS IT Resource Management (or from your SAS 9.2, 9.3, or 9.4 installation) to SAS IT Resource Management 3.8, run the following programs:

1. Run the SAS Migration Utility on your SAS 9.2, 9.3, or 9.4 system to create a migration package.

   **TIP** Starting in SAS IT Resource Management 3.5, the name of any Admin library must be unique within a specific application server. (Earlier releases of SAS IT Resource Management did not require unique names for Admin libraries.) The SAS Migration Utility automatically renames these libraries to ensure that their names are unique.

2. Install SAS IT Resource Management 3.8 (and SAS 9.4) 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. (Optional) Perform a data model upgrade to the SAS IT Resource Management 3.8 data model. For more information, see “Introduction to the Data Model Upgrade” on page 79.

---

**Moving the Physical Data Associated with SAS IT Resource Management**

For the physical data that is associated with each IT data mart that will be moved from SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 to SAS IT Resource Management 3.8, perform the following steps to migrate the data to the new platform:

1. Run %RMDMPKG on the source SAS 9.2, 9.3, or 9.4 system to create a package of the IT data mart to move to SAS IT Resource Management 3.8.
2. Run %RMDMSPATH on the target SAS 9.4 system, if necessary. This program modifies the paths associated with the items in the IT data mart.
3. Run %RMDMUPKG on the target SAS 9.4 system to unpackage the IT data mart that you moved from SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8.
4. Redeploy all the jobs that were migrated.
5. (Optional) Perform a data model upgrade to the SAS IT Resource Management 3.8 data model. For more information, see “Introduction to the Data Model Upgrade” on page 79.
Migrating Report Definitions

New report definitions are supplied with SAS IT Resource Management 3.8. Migrated Performance Report transformations from SAS IT Resource Management 3.4 or later and Gallery transformations from SAS IT Resource Management 3.2, 3.21, or 3.3 continue to use any migrated report definitions from the prior version of SAS IT Resource Management, including any user-defined report definitions that are not deleted.

If you want to change migrated SAS IT Resource Management Performance Report transformations to use newly available report definitions, you can modify the existing jobs or create new jobs. Alternatively, for IT data marts that were created by using supplied SAS IT Resource Management adapters, you can perform a data model upgrade to SAS IT Resource Management 3.8. The data model upgrade updates the Performance Report transformations and all data and metadata for data marts created SAS IT Resource Management 3.8. For more information, see “Post-Migration Options” on page 10.

Migrating Exception Definitions

New exception definitions are supplied with SAS IT Resource Management 3.8. Exception transformations continue to use any migrated exception definitions from SAS IT Resource Management 3.4, including any user-defined exception definitions. If you want to change the migrated SAS IT Resource Management exception transformations to use newly available exception definitions, you can modify these jobs or create new jobs. Alternatively, you can choose to perform a data model upgrade to SAS IT Resource Management 3.8. For more information, see “Post-Migration Options” on page 10.

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 9.4 Intelligence Platform: Migration Guide, and design your migration. To locate this document, perform the following steps:
  2. Use the Products Index A–Z to select the web page for the SAS Intelligence Platform.
  3. On the SAS Intelligence Platform web page, scroll downward to the Installation, Configuration, and Migration Documentation section where you can find the SAS 9.4 Intelligence Platform: Migration Guide. Also, on this page under Related Installation and Migration Documentation is the documentation for the SAS Migration Utility.

- Perform pre-migration tasks.

- Review information about migrating a single IT data mart. For more information, see “Migrating a Single IT Data Mart to SAS IT Resource Management 3.8” on page 27.
Design Your Migration

For information about the steps to prepare for migration, see the chapter called “Designing Your Migration” in the SAS 9.4 Intelligence Platform: 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 9.4 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 9.4 Intelligence Platform: 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 9.2, SAS 9.3, or SAS 9.4 system, including all servers and desktop clients.

• Perform any required SAS 9.2, SAS 9.3, or SAS 9.4 maintenance that is required to meet minimum baselines.

• 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 3.8 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 9.4 installation, use the QuickStart Guide (for Windows and UNIX installations) or the Installation Instructions for SAS 9.4 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.

• 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 9.4. You might need to share the folder that contains the SAS Migration Utility package. Or mount a copy to the machine where you want to install SAS 9.4.

Note: For information about running the SAS Migration Utility, see the “SAS Migration Utility Reference” appendix of the SAS 9.4 Intelligence Platform: Migration Guide. The topic called “Run the Migration Utility Using a Properties
File” in this appendix also contains information about specifying properties in the SAS Migration Utility. When the SAS Migration Utility package for the middle tier is being created, the user ID and the password for the ITRM database must be available. (The ITRM database was created when the SAS IT Resource Management middle tier was configured.) Add these values to your migration utility properties file: SMU.itrmmidtier.dbms.userid Property and the SMU.itrmmidtier.dbms.password Property. (These properties are available for migrations from SAS IT Resource Management 3.4 or later to 3.8.)

**CAUTION:**

We recommend that you encrypt any passwords used in a migration utility properties file. The migration utility supports the \{sas002\} method through PROC PWENCODE. For more information, see the PWENCODE procedure in the Base SAS Procedures Guide.

**CAUTION:**

To avoid unauthorized access to sensitive information, we recommend that the location where the migration utility writes package information (SMU.Output.Dir) be properly secured with file access permissions, readable by the migration utility and the SAS installer users only.

**Additional Notes about Migration**

The following notes pertain to creating a package of objects to be migrated with the SAS Migration Utility:

- The SAS Deployment Wizard provides SAS IT Resource Management with access to the SAS Application Server. A special context is created by the SAS Deployment Wizard to provide SAS IT Resource Management with exclusive access to the SAS Application Server.

When you are migrating using the SAS Migration Utility, several warnings might be generated in the ErrorWarningReport.html report. These warnings pertain to SAS IT Resource Management metadata objects, such as libraries. This context might generate warnings for SAS library items that are related to SAS IT Resource Management. These are examples of the warnings that might be generated:

- The Data Package "Path" having path "/home/location/Dataset" will not be migrated, as its location on the disk could not be determined.

- The Data Package "NetQoS4" will not be migrated, as its source directory "/vol/data/jobs" does not reside in SAS configuration directory. Any .sas source files in this directory will copied to "newvol/levconfig/datapackage132" in the migration package for future reference.

Warnings that are related to the SAS IT Resource Management objects can be expected because the physical content of SAS library objects typically resides in paths that are outside of the configuration directory. The warnings are meant as a reminder that not all of the locations that are related to SAS IT Resource Management are automatically migrated as part of the SAS Migration Utility package. For more information about what can be migrated, see “What Can be Migrated?” in Chapter 1, “Introduction,” in the SAS 9.4 Intelligence Platform: Migration Guide.

**Note:** SAS IT Resource Management provides migration macros that can migrate physical content such as SAS tables or physical content that is associated with
SAS libraries to the new environment. For more information, see “Macros That Are Used for the Migration Process” on page 89.

Step 2: Run the SAS Deployment Wizard

About the SAS Deployment Wizard

Use the SAS Deployment Wizard to install SAS IT Resource Management 3.8. When prompted, specify that this is a migrated configuration and provide the path to the SAS Migration Utility package. 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 the new release of SAS 9.4. For information about this wizard, see the SAS Deployment Wizard and SAS Deployment Manager 9.4: User's Guide at http://support.sas.com/documentation/installcenter/94/index.html.

Note: In addition, the SAS Deployment Wizard supports the modification of ports during execution of the migrated configuration. For more information, see the instructions for how to remap ports. These instructions are located in step 34 of the topic “Install and Migrate SAS Interactively” in the SAS 9.4 Intelligence Platform: Migration Guide.

Perform the Migration to SAS IT Resource Management 3.8 on SAS 9.4

After you create your SAS Migration Utility package and complete your migration assessment, follow these steps to install and configure SAS 9.4 and SAS IT Resource Management 3.8. 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
   Navigate to the location that contains the setup.sh shell script and type ./setup.sh at the command prompt. 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.


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 9.4 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 9.4 and to migrate the package that contains your SAS 9.2, SAS 9.3, or SAS 9.4 metadata 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 9.2, SAS 9.3, or SAS 9.4 deployment. For more information, see “Changes after SAS 9.2 that Affect the Deployment Plan” topic in the chapter called “Installing SAS 9.4 and Migrating Your SAS Content” in the SAS 9.4 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 3.8 machine must match the accounts that were used for SAS Administrator and SAS Trusted User on the SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 machine from which you are migrating.

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

   The Instructions.html file that is produced after your configuration 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 3.2.

---

**Step 3: Package Data from SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 IT Data Marts for Migration**

**About Packaging the Data from SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 IT Data Marts**

Copy the `%RMDMPKG` macro from the SAS IT Resource Management 3.8 installation location to your SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 system. Execute the macro to package all the physical data in your SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 IT data marts. If necessary, transfer all packaged data to a location that is accessible by your new SAS IT Resource Management 3.8 system.

**Note:** If you want to use the data that you have collected in SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 on your SAS IT Resource Management 3.8 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. However, if the migrated library definitions point to network-accessible paths, you still need to change the paths. You must change the paths so that they do not point directly to the same location as the previous
configuration from which you are migrating. Failure to change the paths result in overwriting the data from the previous release.

**Copy the `%RMDMPKG` Macro**

The `%RMDMPKG` macro resides in the following locations on your SAS IT Resource Management 3.8 server tier:

*Windows Specifics*

`<sasroot>\itmsmvadata\sasmacro`

*UNIX Specifics*

`<sasroot>/sasautos`

*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 3.2 or later server tier so that it can be executed there.

*Note:* The default location of `<sasroot>` might change between releases of SAS Foundation.

**Execute the `%RMDMPKG` Macro**

The `%RMDMPKG` macro packages the physical libraries for a single SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 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 “Introduction to Migration Macros” on page 89.

Each SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 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 (for Windows) of using the `%RMDMPKG` macro to package a SAS IT Resource Management 3.5 IT data mart:

```
%RMDMPKG(
   DATAMART=NTSMFdatamart,
   METAPASS=mypassword,
   METAPORT=8561,
   METASERVERr=my.metadata.server,
   METAUSER=admin,
   PKGDIR=c:\migration\35packages\NTSMFdatamart,
   REPOS=MyFoundation
);
```

The value of the `DOPACKAGES` parameter defaults to `NO` so that it does not have to be specified in the macro invocation. Thus, the preceding invocation of `%RMDMPKG`
produces only a report of what packages would be created if the \texttt{DOPACKAGES} parameter were set to \texttt{YES}. If the value of the \texttt{DOPACKAGES} parameter is set to \texttt{YES}, then the macro packages all the physical SAS libraries that are found in the NTSMFdatamart. The macro writes the transport files to \texttt{c:\migration\35packages\NTSMFdatamart}.

Here is an example of the \texttt{%RMDMPKG} macro for z/OS:

\begin{verbatim}
\%RMDMPKG(
    DATAMART=SMFdatamart,
    DOPACKAGES=YES,
    METAPASS=mypassword,
    METAPORT=8561,
    METASERVER=my.metadata.server,
    METAUSER=admin,
    PKGDIR=MIG.35PKG.SMFDM,
    REPOS=MyFoundation
);
\end{verbatim}

For z/OS, the \texttt{PKGDIR} parameter can specify a PDS, PDSE, or zFS directory.

\textit{Note:} The \texttt{%RMDMPKG} macro supports packaging SAS data sets and catalogs, but not SAS views.

The \texttt{%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 \texttt{PKGDIR} parameter and rerun the macro. This macro does not update any metadata on the SAS Metadata Server.

\section*{Transfer the Packaged Data}

In some situations, the file systems that are used by SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 and SAS IT Resource Management 3.8 target system might not be shared. In that case, you must transfer all package directories and their contents to locations that are accessible by SAS IT Resource Management 3.8 target system.

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 3.8. In that situation, transferring the data is not necessary.

\textit{Note:} If you are using FTP to perform the transfer of the data, ensure that the transfer mode is set to \texttt{BINARY}. In addition, if the target platform is z/OS and you are using traditional file system locations, the target file for the FTP must be pre-allocated with \texttt{RECFM=FB, LRECL=80, BLKSIZE=8000}.

\section*{Step 4: Rename the SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8}
IT Data Mart and SAS Library Pathnames for Migration

When Should Metadata and SAS Library Pathnames Be Renamed?

You might want an IT data mart in the SAS IT Resource Management 3.8 target system to use new locations. For example, you might be moving to a new file system with different drive or pathnames. Similarly, you might be using a shared file system and you do not want to overwrite the existing locations. In those cases, use the %RMDMPATH macro to rename the pathnames in the metadata for the new SAS IT Resource Management 3.8 IT data marts.

Note: This macro changes only the root path for the IT data mart and SAS libraries that are contained in that IT data mart. It does not change other paths such as the path to the raw data.

For more information, see “Introduction to Migration Macros” on page 89.

Examples

Example for Windows Environments; Renaming Pathnames Is Not Required

In this example, the pathname for one of the aggregation libraries in the SAS IT Resource Management IT data mart is `c:\MyDatamart\summary\sum2278`. It resides on a PC named WIN1. The server tier for SAS IT Resource Management 3.8 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` is to be created and populated with physical libraries. Because WIN1 and WIN2 do not share the same file systems, there is no conflict. Thus, there is no need to rename the pathnames due to a conflict. However, you might want to rename the pathnames. For example, if you want the directories on WIN2 to be located on drive D: instead of drive C:, then you would rename the pathnames of those directories.

Example for z/OS Environments; Renaming Pathnames Might Be Required

In this example, the data set name for one of the aggregation libraries in the SAS IT Resource Management IT data mart is ITRM.SUMMARY.SUM3445. It resides on a mainframe named ZOS1. The server tier for the new SAS IT Resource Management 3.8 resides on the same mainframe using the same filesystem. Unpackaging the package directory on this same machine means that an attempt will be made to create a z/OS traditional filesystem file 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 3.5 and SAS IT Resource Management 3.8 are on the same machine and, therefore, share 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 3.8 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 3.8 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,
  DORENAMES=YES,
  METAPASS=mypassword,
  METAPORT=8561,
  METASERVER=my.metadata.server,
  METAUSER=admin,
  NEW_ROOTPATH =SYS2.MY.DATAMART,
  OLD_ROOTPATH=SYS1.MY.DATAMART,
  REPOS=MyFoundation
);
```

This specifies that all SAS libraries that start with `C:\sas9\my35dm` are renamed to start with `C:\sas9\my38dm`. For example, a SAS library with a pathname of `C:\sas9\my35dm\summary\sum2557` would be renamed to `C:\sas9\my38dm\summary\sum2557`. The matching of the value of the `OLD_ROOTPATH` parameter to the pathnames in the SAS IT Resource Management 3.8 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.

Any new libraries that are created in the IT data mart by the Adapter Setup or the Add Domain Category wizard have pathnames that start with the 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 3.8: Administrator’s Guide*.

---

**Step 5: Unpackage the Data from SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 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 3.8 IT data marts. If step 4 was executed to rename the pathnames and data sets, then those new names are used in this step.

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 3.8 IT data mart. PROC CIMPORT is executed to import the libraries from the transport files and write them to the SAS IT Resource Management 3.8 destination libraries. Those libraries are created if they do not currently exist. For information, see “Introduction to Migration Macros” on page 89.

Certain libraries in SAS IT Resource Management 3.8 might have a different internal format than SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 libraries. 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 3.8 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 9.4 web page, scroll downward 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 to unpackage a SAS IT Resource Management 3.5 IT data mart:

```sas
%RMDMUPKG(
    DATAMART=NTSMFdatamart,
    METAPASS=mypassword,
    METAPORT=8561,
    METASERVER=my.metadata.server,
    METAUSER=admin,
    PKGDIR=c:\migration\35packages\NTSMFdatamart,
    REPOS=MyFoundation
);```

The value of the DOPACKAGES parameter defaults to NO so that it does not have to be specified in the macro invocation. 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\35packages\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 to unpackage a SAS IT Resource Management 3.5 IT data mart:

```sas
%RMDMUPKG(
    DOPACKAGES=YES,
    FILEDEVICE=DISK,
    FILEUNIT=CYL,
    FILESPACEPRIMARY=10,
);```
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.

---

**Step 6: [Optional] Upgrade Your Data Model to Conform to the SAS IT Resource Management 3.8 Data Model**

Staged table templates and aggregation tables for all adapters that are supplied by SAS IT Resource Management can be updated. In addition, new performance report and exception definitions are supplied with SAS IT Resource Management 3.8.

If you want to change the supplied SAS IT Resource Management Exception transformations or Performance Report transformations to use newly available exception definitions or report definitions, you can modify these jobs or create new jobs. Migrated Exception transformations continue to use any migrated exception definitions from SAS IT Resource Management 3.5 or later, including any user-defined exception definitions. Similarly, Performance Report transformations continue to use any migrated report definitions from SAS IT Resource Management 3.2 or later, including any user-defined report definitions. Alternatively, you can choose to update that data to the SAS IT Resource Management 3.8 data model. For more information, see “Post-Migration Options” on page 10.
Chapter 3
Migrating a Single IT Data Mart to SAS IT Resource Management 3.8

Migrating a Single IT Data Mart to SAS IT Resource Management 3.8

Overview of Migrating a Single IT Data Mart to SAS IT Resource Management 3.8

Overview of Migrating a Single IT Data Mart to SAS IT Resource Management 3.8

Overview of Migrating a Single IT Data Mart to SAS IT Resource Management 3.8

Preparing to Export and Import an IT Data Mart

Preparing to Export and Import an IT Data Mart

Using the Export and Import Tools to Migrate the Metadata

Using the Export and Import Tools to Migrate the Metadata

Exporting an IT Data Mart

Exporting an IT Data Mart

Importing an IT Data Mart

Importing an IT Data Mart

Associating Computed Columns with Formulas After Importing an IT Data Mart

Associating Computed Columns with Formulas After Importing an IT Data Mart

Moving the Data in the Migrated IT Data Mart to SAS IT Resource Management 3.8

Moving the Data in the Migrated IT Data Mart to SAS IT Resource Management 3.8

Promoting Content from ITRM Report Center 3.4 or Later to SAS IT Resource Management 3.8

Promoting Content from ITRM Report Center 3.4 or Later to SAS IT Resource Management 3.8

Handling Out of Memory Problems in an Export Operation

Handling Out of Memory Problems in an Export Operation

To migrate the metadata of a single IT data mart from SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 to 3.8, use the export and import tools. These tools move the metadata of the IT data mart to the new operating environment. After the metadata has been migrated to the new environment, you can move the data there as well. For information, see “Moving the Data in the Migrated IT Data Mart to SAS IT Resource Management 3.8” on page 35.

Note: SAS IT Resource Management does not support the exporting or importing IT data marts that contain duplicate named items, even if those items are in different folders. If you want to export (and then import) IT data marts that contain duplicate named items, you should first export (and then import) the IT data mart without including its dependent objects. After that, as subsequent steps, you can export (and then import) each separate first-level subfolder including its dependent objects.
Preparing to Export and Import an IT Data Mart

Exporting and Importing After Installing SAS IT Resource Management If the SAS Migration Utility Was Not Used

If you installed SAS IT Resource Management without using the SAS Migration Utility (or without performing an upgrade in place), your new environment will not have the report definitions, exception definitions, or formulas that were used by the IT data marts in the prior release of SAS IT Resource Management. The new environment will have the definitions and formulas that are provided in the new release of the software. Therefore, jobs in an IT data mart that you export from the source environment and import into your new environment will not be able to access the necessary definitions or formulas. To correct this situation, you need to first export those report definitions, exception definitions, and formulas from the source environment and import them into your new environment. The following list describes this process:

• The IT data mart from the source machine can include jobs that contain the Performance Report transformation (or the Gallery transformation). To keep using the same versions of the IT Report Definitions as those on the source machine, you must first export those report definitions from the source machine. Then you can import them to the target machine running the new release. This procedure has to be done only once.

• The IT data mart from the source machine can include jobs that contain the Exception transformation. To keep using the same versions of the IT Exception Definitions as those on the source machine, you must first export those exception definitions from the source machine. Then you can import them to the target machine running the new release. This procedure has to be done only once.

• The IT data mart from the source machine can include jobs that contain staging or Aggregation transformations, and the associated output tables can have computed columns that use formulas. To keep using the same versions of the IT Formulas as those on the source machine, you must first export those formulas from the source machine. Then you can import them to the target machine running the new release. This has to be done only once.

To export definitions and formulas from the source system, perform the following steps:


2. Select the IT Report Definitions or IT Exception Definitions or IT Formulas folder that you want to export to the new environment.

Right-click that object and select Export ⇒ SAS Package to launch the Export to SAS Package wizard.

3. Copy the resulting SAS package (the .spk file) to the target system.


Right-click the SAS IT Resource Management folder that will contain the IT Report Definitions, IT Exception Definitions, or IT Formulas. Select Import ⇒ SAS Package. The Import from SAS Package wizard opens.

5. Enter the location of the SAS package that you copied in Step 3. Click Next.

6. When the object has been imported, the Import Complete page is displayed. Click View Log to see the log file that was created during the import process.
7. Click Finish.

After you have performed the export and import of definitions and formulas, you can export and import the IT data mart. The existing jobs will continue to work as they did in the prior release. However, if you want to use the new versions of supplied definitions and formulas, you can create new jobs or modify your existing jobs and tables to use those objects.

Alternatively, for IT data marts that were created for supplied SAS IT Resource Management adapters, you can perform a data model upgrade to the latest version of SAS IT Resource Management. The data model upgrade results in IT data marts with up-to-date transformations that use the current supplied versions of definitions and formulas. The data model upgrade also updates the data and metadata for IT data marts so that they conform to the latest version of SAS IT Resource Management. For more information, see “Introduction to the Data Model Upgrade” on page 79.

**Exporting and Importing After Migrating If the SAS Migration Utility Was Used**

After migrating with the SAS Migration Utility (or by performing an update in place), the migrated versions of the IT Report Definitions, IT Exception Definitions, and IT Formulas, as well as the new supplied versions, are already available. Therefore, if you export and import an IT data mart to the new environment, the definitions and formulas that are used in any jobs of that IT data mart are available. You do not need to modify any jobs.

*Note:* Only those objects that are used by migrated IT data marts are kept and made available in the new environment.

**Using the Export and Import Tools to Migrate the Metadata of a Single IT Data Mart to SAS IT Resource Management 3.8**

If you are exporting and importing an IT data mart or any subfolders or contents of an IT data mart, perform those functions from the IT Data Marts tab of the SAS IT Resource Management client.

*Note:* If you are exporting and importing any other content that is outside of an IT data mart, perform both of those functions from the Folders tree of the SAS IT Resource Management client. Click Help for information about using these utilities.

**Exporting an IT Data Mart**

To export an IT data mart, use the SAS Export Package wizard. To do so, perform the following steps:

1. In the IT Data Marts tree, navigate to the IT data mart that you want to move and select it.

   *Note:* In the IT Data Marts tree, select only the top level of the IT data mart for export. Do not select an IT data mart and also specific contents of the IT data mart simultaneously for export. Selecting the top level of the IT data mart causes the entire folder hierarchy and all relevant contents to be included in the export package.

2. Right-click the IT data mart and select Export SAS Package.

   The first page of the Export SAS Package Wizard appears.
3. In the **Specify a package to contain the collection of objects that you are exporting** field, you can accept the default location. (The package is called **Package\nn\n.spk**, where \n is a number that is incremented by the value “1” each time the wizard is invoked.)

   Alternatively, click **Browse** to navigate to another location. Select the location that you want to use and click **OK**.

   In addition, if you want to include all the contents of the IT data mart, be sure to check **Include dependent objects when retrieving initial collection of objects**.

4. On the **Select Objects to Export** page, all the contents of the selected IT data mart are selected. You can deselect any items that you do not want to export.

   **Note:** Make sure you have deselected the deployed jobs.

5. The **Summary** page displays the objects that are included in the SAS package. When you are satisfied with your selections, click **Next** to export the IT data mart and its selected objects.

   Click **View Log** to see the log file that was created during the export process.

6. Click **Finish** to return to the **IT Data Marts** tree.

---

**Importing an IT Data Mart**

**Preparing to Import When a Database Is the Raw Data Source**

The exported IT data mart might contain staging jobs whose raw data input is a database. (Adapters such as HP Reporter, MS SCOM, SNMP, or VMware have a raw data source that is a database.) The Import from SAS Package wizard requires you to select a database server definition. This database server is associated with the library that is specified on the staging job as raw data.
If you want to work with a database server definition that does not exist, you must create one. For information about how to create a database server definition, see the “Overview of Common Data Sources” chapter in SAS Intelligence Platform: Data Administration Guide under the Administration Documentation link available at http://support.sas.com/documentation/onlinedoc/intellplatform/index.html. In the topic that discusses your database, review the section called “Register the Database Server.”

The Import wizard might also require you to select a library to which the exported library can map. If the library that points to the input database is located within the IT data mart that is being promoted, you are not required to specify a new library definition. However, if you need to do so, you can create a new library definition with the New Library wizard. To access the New Library wizard from the SAS IT Resource Management client menu bar, select File ➤ New ➤ Library. Respond to the prompts of the wizard as needed.

In addition, For information about how to register a database server, see the “Connecting to Common Data Sources” topic in the SAS 9.4 Intelligence Platform: Data Administration Guide.

**TIP** If you need to specify either a library or a database server, do so before you invoke the Import from SAS Package wizard.

**Notes about Importing an IT Data Mart**

- For best results, make sure that the name of the IT data mart that you are importing is unique within the metadata server. If the metadata server already contains an IT data mart with the same name as the one being imported, the name of the IT data mart is automatically changed to “Copy of <original-name>” or, if that name is already in use, “Copy n of <original-name>”.

- You might be importing the IT data mart to a machine that is running a different version of SAS IT Resource Management from the one where the source data mart resides. Similarly, you might be importing the IT data mart to a different machine from the one where the source IT data mart resides.

**How to Import an IT Data Mart**

To import an IT data mart using the SAS Import Package wizard, perform the following steps:

1. Right-click in the white space of the IT Data Marts tree, and select Import SAS Package. The first page of the Import from SAS Package Wizard appears.
Figure 3.2 First Page of the Import SAS Package Wizard

Note: If you selected an IT data mart, the **Import SAS Package** selection is not available. The **Import SAS Package** selection is available only if an IT data mart was not selected.

2. On this page, you can accept the default location, which is the location of the most recent exported SAS package.

   Alternatively, click **Browse** to navigate to another SAS package. Select the SAS package that you want to use and click **OK**. Make sure that you select only the SAS package that was exported from the **IT Data Marts** tree.

   On this page, you can choose the following options:

   • include the access controls. These access controls govern which users or user groups can access the imported IT data mart.

   • import all objects in the selected SAS package. This option causes objects that exist in the destination IT data mart to be overwritten.

   • import only new objects in the selected SAS package. This option imports only those objects that do not exist in the destination IT data mart.

3. On the second page of the wizard, you can select the objects that you want to import. All items in the SAS package are selected by default. You can deselect those items that you do not want to import.
4. The next page of the Import from SAS Package Wizard displays a note that explains that you might need to create metadata definitions for some of the objects that you want to import. For example, a package might contain a table but does not contain a library for that table. In that case, a library for that table must already exist in metadata before importing the table metadata. (If the table and the library containing the table are both in the package, as they normally would be, you do not need to do anything.)

5. The next page of the wizard prompts you to specify the target application server to which you are importing the IT data mart.

6. The **Directory Paths** page shows the target locations for the folders of the IT data mart that is being imported.
You can accept the default target locations, or you can click the ellipsis (...) to open the Browse dialog box. When you have selected the new target location, click OK.

7. The Summary page displays the choices that you specified. Click Next to import the IT data mart and the objects that you specified.

8. When the IT data mart has been imported, the Import Complete page is displayed. Click View Log to see the log file that was created during the import process.

9. Click Finish to return to the IT Data Marts tree.

10. Use your file system management tools to copy the physical files that are associated with the IT data mart from the source to a location on the target server that is to be referenced from the IT data mart. For more information, see SAS IT Resource Management 3.8: Migration Guide.

11. To move ITRM Report Center objects and reports to the target server, see Appendix 2, “Promoting the Content of ITRM Report Center,” in the SAS IT Resource Management 3.8: Migration Guide.

For information about moving SAS Content Server report content by using the WebDAVDump and WebDAVRestore utilities, see http://support.sas.com kb/38/667.html.

**Associating Computed Columns with Formulas After Importing an IT Data Mart**

If an IT data mart was imported into the current system using the export and import tools, then you might want to associate computed columns with related formulas. The computed columns in staging and aggregation tables in the imported IT data mart will have the correct (migrated) expressions, but they will not be associated with the corresponding formulas on the target system. (This does not apply to IT data marts that were migrated using the SAS Migration Utility or upgrade-in-place.)
This means that although the jobs continue to work as they did in the source system, any future changes to formulas will not result in changes to these computed columns in the imported IT data mart, until the association between formula and computed column is redefined. If you want future changes to the formula to be reflected in each column that uses it, the link to the formula must be re-established. To do so, perform the following steps for each table that contains the computed column:

1. Open the job that contains the table in the Diagram tab of the Job Editor window.
2. Right-click the table that contains the computed column to open the Properties dialog box.
3. Select the Columns tab to open a grid that contains the list of columns and any expressions that are associated with them.
4. Double-click the computed column to display an ellipsis (...). Click the ellipsis to open the Expression Builder window.
5. The IT Formulas tab contains a list of supplied formulas and a list of user-defined formulas. Select the formula that applies to the computed column that you selected and click Insert. Then click OK to close the Expression Builder window and return to the Columns tab of the Properties dialog box.

Note: When all computed columns in the table are corrected, click OK to return to the job in the Diagram tab of the Job Editor window. When all the tables generated in the job have been corrected, save the job.

Moving the Data in the Migrated IT Data Mart to SAS IT Resource Management 3.8

After you have migrated the metadata for your IT data mart from SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 to 3.8, you can move the data to the new IT data mart. To do so, perform the following steps:

1. On your SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 system, use the %RMDMPKG macro to package the data. For information, see “Step 3: Package Data from SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 IT Data Marts for Migration” on page 20.

2. On your SAS IT Resource Management 3.8 system, use the %RMDMPATH macro to rename the pathnames and SAS Library pathnames in the metadata for the new SAS IT Resource Management 3.8 IT data marts. This renaming is done so that existing SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 physical data libraries are not overwritten when the physical data is unpackaged in step 5. For information, see “Step 4: Rename the SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 IT Data Mart and SAS Library Pathnames for Migration” on page 22.

Note: If the file system that is used by SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 source system is not shared with the target SAS IT Resource Management 3.8 system, then this step is not required.

3. On your SAS IT Resource Management 3.8 system, use the %RMDMUPKG macro to unpack the physical data that was created in step 3. The physical data should be unpackaged into the SAS IT Resource Management 3.8 IT data marts. If step 4 was executed to rename the pathnames and data sets, then those new names are used in this step. For information, see “Step 5: Unpackage the Data from SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 Data Marts for Migration” on page 24.
Note: Be sure to set the SMU= option to NO.

4. Delete any deployed jobs that were migrated and then deploy them again. (Do not delete the source jobs.)

5. To upgrade the IT data mart to the SAS IT Resource Management 3.8 data model, run the %RMUPGRDM macro. For information, see “Introduction to the Data Model Upgrade” on page 79.

Promoting Content from ITRM Report Center 3.4 or Later to SAS IT Resource Management 3.8

To promote content from ITRM Report Center 3.4 or later as well as the IT Resource Management reports on the SAS Content Server, see “Promoting the Content of ITRM Report Center” on page 101.

Handling Out of Memory Problems in an Export Operation

If you try to export a large IT data mart, your client machine might run out of memory. If this happens, you can export the IT data mart in two or more parts.

To import all the exported packages, you must invoke the Import SAS Package wizard multiple times. However, you must avoid importing duplicate objects because that results in a corrupted IT data mart and orphaned objects. The first page of the Import SAS Package wizard provides options that enable you to prevent this problem. Perform the following steps:

1. For the first exported package, select the option to Import All objects.

2. For all the other exported packages, select New Objects Only as shown in the following display.
Figure 3.5  Import New Objects Only

Welcome to the Import SAS Package Wizard
This wizard helps you import a collection of objects from a SAS package file.

Enter the location of the input SAS package file:
C:\Users\nmnn\Documents\Package1.spk

Import Options

- Include access controls
  Note that the associated ACTs must already exist in the target environment.

- Select objects to import
  - All Objects
    Objects that already exist in the destination folder location will be overwritten.
  - New Objects Only
    Objects that already exist in the destination folder location will not be imported.
Chapter 4
Migrating SAS IT Resource Management 2.6 and 2.7 PDBs to IT Data Marts

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Introduction to Migrating PDBs

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 2.6 or 2.7 PDB into the SAS IT Resource Management 3.8 software environment. Make sure that you have applied the latest hot fixes to your SAS IT Resource Management 2.6 or 2.7 software. For information about the latest hot fixes that apply to your system, see “SAS IT Resource Management 3.8 Software Migration” on page 1.

Cross-platform PDB migration refers to the following scenarios:

• migrating from SAS 8.2 to SAS 9.2 or later
• migrating from one operating environment platform to another (for example, from Windows to UNIX)

If you want to perform cross-platform PDB migration, utilities for this purpose are available. For more information about migrating between platforms, see “Cross-Platform PDB Migration” on page 47.

Note: SAS IT Resource Management 2.6 runs on SAS 8. The migration of a SAS IT Resource Management 2.6 PDB must be treated as a cross-platform PDB migration regardless of the host operating environments from which, and to which, the PDB migration is being performed.

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 2.6 and 2.7 functionality and the equivalent implementation in SAS IT Resource Management 3.8.

<table>
<thead>
<tr>
<th>2.6 and 2.7 Functionality</th>
<th>3.8 Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Exits</td>
<td>Process exits can be implemented as user-written staging transformations. Users are responsible for adding the appropriate transformations and code.</td>
</tr>
<tr>
<td>Derived Variables</td>
<td>3.8 Implementation</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Computed columns are defined on a staged table.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Formula Variables</th>
<th>3.8 Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computed columns are defined on an aggregation output table.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>%CxPROCES</th>
<th>3.8 Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>%CPREDUCE</th>
<th>3.8 Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>%CPREDUCE is implemented as summarized aggregation output tables of an Aggregation transformation.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHIFT Definition</th>
<th>3.8 Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHIFT definitions are implemented as SHIFT formula definitions and their associated computed columns. As with SAS IT Resource Management 2.6 and 2.7, the SHIFT has the value of the holiday shift if the date is a HOLIDAY.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HOLIDAY Definitions</th>
<th>3.8 Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Here are some additional considerations when comparing the functionality of SAS IT Resource Management 2.6 or 2.7 and SAS IT Resource Management 3.8:

- For migration of SAS IT Resource Management 2.6 or 2.7 collectors that are not supported as SAS IT Resource Management 3.8 adapters (including generic collectors from SAS IT Resource Management 2.6 or 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 2.6 or 2.7 macros. These macros might not be supported in SAS IT Resource Management 3.8, and the code must be updated in order to eliminate their use.

In a few cases, even though a collector that is supported at SAS IT Resource Management 2.6 or 2.7 is supported as an adapter at SAS IT Resource Management 3.8, there might be problems with some specific tables or columns.

- Certain tables that were previously supported might not be supported in SAS IT Resource Management 3.8. If so, the %RMPDB2DM macro will migrate the table. However, when the migrated job is deployed or run from the SAS IT Resource Management client, an error is displayed stating that the staged table is invalid. To correct this problem, remove the table from the migrated staging job.

- The attributes of the table’s columns in the SAS IT Resource Management 3.8 data model might have been updated from their previous state in your PDB. In addition, it is possible that columns with the same name in your migrated tables have different attributes across those tables. For example, the labels and formats of the columns might have different attributes. It is a requirement that the columns’ attributes be the same for them to be staged. If not, an error message is
displayed. To avoid the error, run the Data Model Upgrade macro (%RMUPGRDM) before you start processing new data. For information, see “Introduction to the Data Model Upgrade” on page 79.

---

## Cross-Reference Table of Collectors and Adapters

The following table can help you determine the SAS IT Resource Management 3.8 adapter to choose when upgrading a data mart from a previous release.

**Table 4.1 Cross-Reference Table of Collectors and Adapters**

<table>
<thead>
<tr>
<th>SAS IT Resource Management 2.6 and 2.7 Collectors</th>
<th>SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, and 3.8 Adapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon CloudWatch</td>
<td></td>
</tr>
<tr>
<td>TMON2CIC</td>
<td>ASG TMON2CIC</td>
</tr>
<tr>
<td>TMONDB2</td>
<td>ASG TMONDB2</td>
</tr>
<tr>
<td></td>
<td>ASG TMONDB2 V5</td>
</tr>
<tr>
<td>IMF</td>
<td>BMC Mainview IMS</td>
</tr>
<tr>
<td>Patrol</td>
<td>BMC Perf Mgr</td>
</tr>
<tr>
<td>TMS</td>
<td>CA TMS</td>
</tr>
<tr>
<td></td>
<td>CSV (Comma Separated Values)</td>
</tr>
<tr>
<td>NTSMF</td>
<td>DT Perf Sentry</td>
</tr>
<tr>
<td>TOOLNM=SASDS</td>
<td></td>
</tr>
<tr>
<td>NTSMF</td>
<td>DT Perf Sentry with MXG</td>
</tr>
<tr>
<td>TOOLNM=MXG</td>
<td></td>
</tr>
<tr>
<td>Ganglia</td>
<td></td>
</tr>
<tr>
<td>HP-PCS</td>
<td>HP Perf Agent</td>
</tr>
<tr>
<td></td>
<td>HP Reporter</td>
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<td>EREP</td>
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<td></td>
<td>IBM IMS</td>
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<tr>
<td>SAS IT Resource Management 2.6 and 2.7 Collectors</td>
<td>SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, and 3.8 Adapters</td>
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<td>VMware vCenter</td>
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<tr>
<td>WRBLOG</td>
<td>Web Log</td>
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</tbody>
</table>

Note: The Generic collector is the equivalent of the User-Written staging transformation.

How %RMPDB2DM Supports Data Duplication Parameters

%RMPDB2DM supports the data duplication parameters so that the staging transformation runs successfully.

For adapters that are not based on MXG, %RMPDB2DM sets the data duplication parameters by reading the CPDUPCHK.SOURCE catalog entry. (In SAS IT Resource Management 2.7, this entry contains a %CPDUPCHK invocation. It was created and stored in the ADMIN library.)

For adapters that are based on MXG, the user might have set the data duplication parameters in SAS IT Resource Management 2.7 by constructing an MXG SOURCLIB entry. If so, that MXG SOURCLIB entry can also be used in SAS IT Resource Management 3.8 to control data duplication. That is, if the user constructed or copied that SOURCLIB entry in the copy of MXG that he is using for SAS IT Resource Management 3.8, then that SOURCLIB entry can be used. The staging transformation data duplication parameters are ignored at execution time, if such a SOURCLIB entry is found.
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 2.6 or 2.7 Start of Week setting from the SAS IT Resource Management 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.
   
   Note: If you are used IMACSHFT to set holidays and shifts, see “Handling Holidays” in Appendix 9, “Best Practices and Troubleshooting Tips,” in the SAS IT Resource Management 3.8: Administrator’s Guide. Use those instructions in conjunction with the instructions in this chapter to ensure that the proper holidays and shifts are set up properly.

4. Performs the following tasks for each adapter in the SAS IT Resource Management PDB:
   a. Constructs a staging job with an appropriate staging transformation and staged tables. Staged tables include 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 PDB for this staged table. This job consists of the input staged table, an Aggregation transformation, and the output aggregation tables.
      
      Note: The %RMPDB2DM macro automatically turns on the Purge source table after the successful execution of this transformation option in the Aggregation jobs that it creates.
      
      - Copies the data from the SAS IT Resource Management PDB detail and summary tables to the counterpart aggregation tables in SAS IT Resource Management 3.8.
      
   c. Copies any other necessary constructs that are needed to facilitate the migration of the PDB to the IT data mart. Examples of these constructs are data duplication status information and macros as well as any formats that are required.

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. To limit the 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 2.6 or 2.7 %CPDDUTL utility or the SAS IT Resource Management 2.6 or 2.7 user interface to mark tables as not kept.) The following prerequisites must be satisfied before migrating a PDB:


- SAS IT Resource Management 3.8 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 2.6 and 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 3.8, the same table does not compute statistics dynamically. Instead, the statistics are calculated when the table is written, thus requiring additional permanent 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 3.8 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 APPSERVER 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 2.6 or 2.7 SITELIB that was associated with the PDB must be identified by the user.

• The SAS IT Resource Management 2.6 or 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 2.6 or 2.7 PDB must be accessible on the same host file system that SAS IT Resource Management 3.8 uses for IT data mart storage.

• The JREOPTIONS in the SAS Foundation session used to execute the %RMPDB2DM macro needs to include the following:

  -Djava.awt.headless=false -XX:MaxPermSize=128m -Xmx768m

  The following code is an example of a SAS config file:

  ```
  /* Include the configuration file from the workspace server */
  -config "C:\SAS\Server\Lev1\SASITRM\sasv9.cfg"
  
  /* Supply additional JREOPTIONS or override previously defined ones */
  /* For JREOPTIONS, if a JRE option is specified multiple times, the */
  /* last one is the one that is used.                                */
  -JREOPTIONS=(-Djava.awt.headless=false -XX:MaxPermSize=128m -Xmx768m)
  ```

  Do not modify the existing application server or workspace server configuration files to include these JREOPTIONS, because these options are unique to %RMPDB2DM. Instead, you can specify these options on the SAS command or invocation line, such as:

  ```
  SAS -JREOPTIONS (-Djava.awt.headless=false -XX:MaxPermSize=128m -Xmx768m)
  ```

  An alternative method is to create a new SAS configuration file that includes (by means of the –CONFIG option) a reference to the existing application server configuration file. The new SAS configuration file should also supply the additional JREOPTIONS as listed in the previous line of code. Further details about the SAS configuration files and the CONFIG and JREOPTIONS system options can be found in the SAS 9.4 Companion for your operating system.

• Due to memory concerns, a SAS session or a 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 specification of at least 1024M. Also, ensure that the user ID that migration runs under has a value of 1024M (1342177280 bytes) in the OMVS RACF segment.

• If you are running %RMPDB2DM on z/OS, 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 this location: http://support.sas.com/kb/12/599.html.

  On z/OS, the following additional modification is required to the TKMVSENV configuration file: the libraries /lib and /usr/lib must be added to the existing path information in the TKJNI_OPT_LIBPATH setting. For example, the original TKMVSENV value might be this value:

  ```
  set TKJNI_OPT_LIBPATH=/usr/lpp/java/J7.0/bin/j9vm:/usr/lpp/java/J7.0/bin
  ```
If so, then the revised setting should be this value:

```
set TKJNI_OPT_LIBPATH=/lib:/usr/lib:/usr/lpp/java/J7.0/bin/j9vm:/usr/lpp/java/J7.0/bin
```

This modification ensures the availability of required Java libraries when Java is used by %RMPDB2DM. For more information about TKMVSENV on z/OS, see “SAS Software Files” in SAS® 9.4 Companion for z/OS. (Use the Products Index A-Z to locate this documentation on the http://support.sas.com/documentation/productaz/index.html website.)

- Formats that are used in your SAS IT Resource Management 2.6 or 2.7 system should be moved to the new SAS IT Resource Management 3.8 system and made available to SAS sessions using the FMTSEARCH option. If your data uses MXG formats, then MXG should be configured properly on the SAS IT Resource Management 3.8 system. This should be done before any data is migrated using %RMPDB2DM.

### Cross-Platform PDB Migration

#### About Cross-Platform PDB Migration

PDB migration is performed on the same system where the workspace server for SAS IT Resource Management 3.8 is executed.

The procedure for cross-platform PDB migration applies to the following scenarios:

- The PDB is being migrated from SAS 8.2 (for SAS IT Resource Management 2.6 PDBs) to SAS 9.2 or later.

- The PDB is being migrated from a different platform (or server host) than that used by the SAS IT Resource Management 3.8 software. For example, the PDB might be on a Windows file system, but the IT data mart will 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

The format of SAS libraries differs by operating platform and SAS release. Therefore, a portable format of the PDB and SITELIB SAS libraries must be created on the SAS IT Resource Management 2.6 or 2.7 system. A tool to assist with this task is included as a member in the SAS IT Resource Management 3.8 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 3.8 system into a location where it can be used from the SAS IT Resource Management 2.6 or 2.7 system.

The RMPDBEXP.SAS member resides in the following locations on your SAS IT Resource Management 3.8 server tier:

Windows Specifics
<sasroot>\itmsmvadata\sasmisc

UNIX Specifics
<sasroot>\misc\itmsmvadata

z/OS Specifics
<&prefix>.ITRM.CPMISC

Note: The default location of <sasroot> might change between releases of SAS Foundation.

2. For Windows or UNIX operating environments, 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,
    pdb=<2.6_pdb>|<2.7_pdb>,
    sitelib=<2.6_sitelib>|<2.7_sitelib>);
%rmpdbexp(targetLocation=<directory of export>);
```

Note: If you intend to export PDBs that include tables based on MXG, specify the `MXGSRC=` and `MXGLIB=` parameters.

For z/OS operating environments, 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=<2.6_pdb>|<2.7_pdb>,
    sitelib=<2.6_sitelib>|<2.7_sitelib>);
%rmpdbexp(targetLocation=<high-level-qualifier>);
```

Note: The `TARGETLOCATION` parameter of `%RMPDBEXP` is a writable directory (for UNIX or Windows). For z/OS, the `TARGETLOCATION` parameter only supports a high-level qualifier (&prefix) in the traditional file system, where a set of transport files is written out.

One transport file is created for each library that is needed. The file is named with the libref name and an extension of .cpo. Thus, if the user specifies `targetLocation=/itm/Transports`, the following transport files are created:

- /itm/Transports/admin.cpo
Note: For z/OS, the export files that are created can be allocated in advance if the default space settings are insufficient. The DCB parameter for the files must have the following attributes: REC FM=FB, LRECL=80, and BLK SIZE=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: REC FM=FB, LRECL=80, and BLK SIZE=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 3.8 SASMISC directory. This member is called RMPDBIMP.SAS. The RMPDBIMP.SAS member resides in the following locations on your SAS IT Resource Management 3.8 server tier:

Windows Specifics
<sasroot>\itmsmvadata\sasmisc

UNIX Specifics
<sasroot>\misc\itmsmvadata

z/OS Specifics
<&prefix>.ITRM.CPMISC

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

```sas
options nofmtterr;
%rmmxgini;
/* include from the appropriate location */
%include 'rmpdbimp.sas';
%rmpdbimp\targetLocation=c:\itr\Ready2Migrate, sourceLocation=c:\itr\Transports};
```

The following information applies to the previous example.

- The TARGETLOCATION parameter of %RMPDBIMP is a writable directory (for Windows or UNIX environments) or a &prefix (for traditional z/OS environments) where the respective libraries are to be created.
On z/OS, the **SOURCELOCATION** parameter must specify a high-level qualifier (&prefix) in the traditional file system.

On z/OS, the **TARGETLOCATION** parameter can specify a directory in the hierarchical file system. If you specify a high-level qualifier (&prefix) in the traditional file system for this parameter, the following error is observed:

```
ERROR: targetLocation= must specify a hierarchical location
```

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 3.8 software. This macro should be invoked in a SAS session on the same system where the workspace server for SAS IT Resource Management 3.8 is executed. For best results, execute this macro in batch rather than interactively from SAS IT Resource Management.

**Note:** For information about issues that should be addressed before you run this macro, see “Migration Prerequisites” on page 45.

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**

```sas
%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 2.6 or 2.7 PDB path,
,SITELIB=SAS IT Resource Management 2.6 or 2.7 SITELIB path,
,WORKDIR=directory path for work files,
,<,ADAPTER= _ALL_ | blank-delimited list of adapters>,
,<,APP SERVER=SASITRM | user-specified logical workspace server>,
,<,CLEANUP=Y | N>,
,<,COMPRESSAGG=Y | N>,
,<,COPYDATA=Y | N>
)```
\%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, you might specify a default root path for a traditional z/OS file system. In that case, 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. For information, see the *SAS Intelligence Platform 9.4: System Administration Guide*.

**PDB**=SAS IT Resource Management 2.6 or 2.7 PDB path
specifies the path to the SAS IT Resource Management 2.6 or 2.7 PDB that is to be migrated. A value for this parameter is required.

**SITELIB**=SAS IT Resource Management 2.6 or 2.7 SITELIB path
specifies the path to the SAS IT Resource Management 2.6 or 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 (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 2.6 or 2.7 collectors that are eligible 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.

A list of values for the ADAPTER parameter is available in the SAS IT Resource Management 2.6 and 2.7 Collectors column in the cross-reference table of collectors and adapters in “Upgrading to the New Data Model” on page 81.

Note: This list of possible valid values for this parameter is not exclusive. SAS IT Resource Management 2.6 or 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.

TIP If you specify Cleanup=N, you should also specify an empty WORKDIR location and a new IT data mart that is based on a SAS IT Resource Management 2.6 or 2.7 PDB.

COMPRESSION=Y | N
specifies whether to compress the aggregation tables that are being migrated.
If it is not specified, the default value is \texttt{Y}. The value for this parameter is not case sensitive.

\textbf{COPYDATA=\texttt{Y} | \texttt{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 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 PDB. A value for this parameter is optional. If it is not specified, the default value is \texttt{Y}. The value for this parameter is not case sensitive.

\textbf{DEBUG=\texttt{Y} | \texttt{N}}

If this parameter is set to \texttt{Y}, then additional information is written to the SAS log during execution. This information can assist SAS Technical Support in troubleshooting if the user is encountering problems with \%RMPDB2DM. A value for this parameter is optional. If it is not specified, the default value is \texttt{N}. The value for this parameter is not case sensitive.

\textbf{DEVICE=\texttt{z/OS UNIT=value for allocation}}

specifies the \texttt{UNIT} allocation parameter to use for allocation of IT data mart libraries in a \texttt{z/OS} traditional file system. Valid values for this parameter are dependent on your \texttt{z/OS} system. Typical values might include \texttt{DISK}, \texttt{SYSDA}, or a specific disk unit type. Contact your \texttt{z/OS} systems administrator for what is valid and recommended for your site. For more information, see the \textit{SAS 9.4 Companion for \texttt{z/OS}}.

A value for this parameter is optional. If a value is not specified, then it defaults to the value of the \texttt{FILEDEV} SAS system option. The value for this parameter is not case sensitive.

\textbf{HP\_PCS=\texttt{HPOVREP} | \texttt{HPOVPA}}

This parameter is required if any of the SAS IT Resource Management 2.6 or 2.7 tables to be migrated are for the HP-PCS collector. In SAS IT Resource Management 3.8, this data can be staged by two separate mechanisms:

- Select \texttt{HPOVREP} if you are staging this data from the database for HP OpenView Reporter.
- Select \texttt{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.

\textbf{NUMBEROFVOLS=1}

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

\textbf{PRIMARYCYLS=\texttt{z/OS primary space allocation cylinders}}

specifies the number of primary cylinders to use when allocating IT data mart libraries in a \texttt{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 \texttt{FILESPPRI} SAS system option.

\textbf{SECONDARYCYLS=\texttt{z/OS secondary space allocation cylinders}}

specifies the number of secondary cylinders to use when allocating IT data mart libraries in a \texttt{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 \texttt{FILESPSEC} SAS system option.
SPINDEVICE=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. Valid values for this parameter are dependent on your z/OS system. Typical values might include DISK, SYSDA, or a specific disk unit type. Contact your z/OS systems administrator for what is valid and recommended for your site. For more information, see the SAS 9.4 Companion for z/OS.

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.

SPINPRIMARYCYLS=z/OS primary space allocation cylinders
specifies the number of primary cylinders to use when allocating spin 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 SAS system option used for the Admin library.

SPINSECONDARYCYLS=z/OS secondary space allocation cylinders
specifies the number of secondary cylinders to use when allocating spin 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 SAS system option used for the Admin library.

UPGRADENUMERICLENGTHS=Y | N
specifies whether numeric columns keep their length as specified in the PDB or are upgraded in length to 8 bytes. Numerics that are shorter than 8 bytes can result in statistics with lower precision.

If you specify UPGRADELENGTHS=N, then all numeric columns in the new staged tables have the same lengths as in the original PDB. In addition, all numeric class and computed columns in new aggregation tables have the same lengths as in the original PDB. However, to avoid precision problems, statistics in the new aggregation tables do not inherit lengths from the original PDB.

Note: If you run a data model upgrade on the IT data mart that was created by PDB migration, then the numerics all have lengths of 8 bytes.

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

_RC=macro variable name to hold the return code
specifies the name of a macro variable that holds the value of the return code 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, you might specify a default root path for a traditional z/OS file system. In
that case, 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 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. The IT data mart location is used as a prefix, not a suffix, as in
  
  [ITDataMartRootPath].[Data-Set-Name]

  (A portion of the 44 characters is needed by SAS IT Resource Management in order to completely specify the IT data mart location. Therefore, 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 2.6 or 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 “Cross-Platform PDB Migration” on page 47.

- SAS IT Resource Management 2.6 or 2.7 tables that are created by the %CPAVALI 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 2.6 or 2.7. Do not attempt to migrate these tables to SAS IT Resource Management 3.8.

- You might see one of the following notes in your SAS log:

  Note: Could not load classloader itmsapi. Using default classloader.

  NOTE: Could not initialize, classpath., Classpath variable is not set.

  These notes can be ignored.
%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.

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

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.

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

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 zOS 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 zFS. In addition, the metadata server does not have to be on z/OS.

```plaintext
%RMPDB2DM(
   DEFAULTROOTPATH=SYS2.RMF.DATAMART,
   DEVICE=DISK,
   ITDATAMART=zOS RMF,
   METASERVER=myserver01,
   METAPORT=8561,
);
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 zOS RMF IT data mart. The physical storage for the IT data mart is in the z/OS UNIX System Services hierarchical file system.

```
%RMPDB2DM(
    DEFAULTROOTPATH=/u/itrm/rmf_dm,
    ITDATAMART=zOS RMF,
    METAPASSWORD=mypassword,
    METAPORT=8561,
    METASERVER=myserver01,
    METAUSER=myuserID,
    PDB=SYS2.ITRM.RMF.PDB,
    SITELIB=SYS2.ITRM.SITELIB
    WORKDIR=/tmp/itrm/migrate
);
```

How to Recover If %RMPDB2DM Fails to Run Successfully
If the macro does not complete successfully, perform the following actions:

1. Correct the problem that caused the failure. For example, if the problem was caused by insufficient disk space, determine how much space you need and allocate it accordingly.

2. Using the SAS IT Resource Management client, perform an Erase action against the IT Data Mart that was created by the failed %RMPDB2DM invocation.
   
   Note: This might not fully succeed, because metadata might have been defined for libraries that were never physically created.

3. If step 2 did not remove the IT data mart from view in the client, perform a Delete action against the IT data mart.

4. Verify that any physical libraries that were created as part of the IT data mart have been physical deleted.

5. Clear out the directory pointed to by the WORKDIR= parameter on the invocation of %RMPDB2DM.
   
   Note: This directory should include a subdirectory called api.

6. Re-run %RMPDB2DM.

Note: For more information, see “General Troubleshooting Tips for Migration” on page 107.
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. A random number is appended to the name of the library so that it is unique within the Metadata Repository.

A spin library is created for adapters that handle CICS data. A random number is appended to the name of the library so that it is unique within the Metadata Repository.

Note: That same random number is also appended to the corresponding libref for the Admin and spin libraries.
Formulas

In SAS IT Resource Management 2.6 and 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 3.8, this functionality is now accomplished by means of computed columns. However, SAS IT Resource Management 3.8 does use an object that is called a formula. In SAS IT Resource Management 3.8, 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 3.8, 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 2.6 and 2.7 used a different approach. All levels of a table used the column DATETIME in the class list. In SAS IT Resource Management 2.6 and 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 PDB. This formula also honors the HOLIDAY SHIFT that is used by the PDB.

Note: The SHIFT column created by %RMPDB2DM does not honor IMACSHIFT. If you want the SHIFT column to honor IMACSHIFT, then modify the SHIFT formula so that it honors any pre-existing value in the SHIFT variable of 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.

**Figure 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 2.6 or 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

**Figure 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

**Figure 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 that is being migrated is supported by SAS IT Resource Management 3.8, 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.

**Figure 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 PDB. Staged tables can also include computed column definitions. For information about these definitions, see “Formulas” on page 59.

Additional `name_RATE` columns are defined to the staged tables of SAS IT Resource Management 2.6 or 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 2.6 or 2.7 and 3.8” on page 74.

**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 2.6 and 2.7
- a job to populate the aggregation tables

**Figure 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 2.6 and 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.

**Figure 4.7  Aggregation Job**
Simple Aggregation Tables

Simple aggregation tables are analogous to the SAS IT Resource Management 2.6 or 2.7 DETAIL tables. The following table shows how the functions available in SAS IT Resource Management 2.6 and 2.7 can be accomplished in SAS IT Resource Management 3.8.

Table 4.2  Comparison of DETAIL Level Tables and Simple Aggregation Tables

<table>
<thead>
<tr>
<th>Tasks</th>
<th>SAS IT Resource Management 2.6 and 2.7</th>
<th>SAS IT Resource Management 3.8</th>
</tr>
</thead>
</table>
| 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. | Specify the following settings in the Specify purging and aging criteria page of the Summarized Aggregation:  
  • 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.  
Configuring these specifications causes the existing data in the simple aggregation table to be purged before loading new data when the aggregation transformation is executed. |
| 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 <table-name>_DETAIL (for example, SARDEV_DETAIL). |
How tables are sorted

Columns in the PDB table were sorted as follows:
<MACHINE>
<DATETIME>.

Class columns are sorted in this order: <Alphabetic List of Class Columns> <Aging Column>.

Note: If you want to perform BY-processing on the data in any other order, sort it into a work table. Then perform the task using the work table or a view that accesses that work table.

Summarized Aggregation Tables

Summarized aggregation tables are analogous to the DAY, WEEK, MONTH, and YEAR tables in SAS IT Resource Management 2.6 and 2.7. The following table shows how the functions available in SAS IT Resource Management 2.6 and 2.7 can be accomplished in SAS IT Resource Management 3.8.

Table 4.3 Comparison of DAY, WEEK, MONTH, and YEAR Level Tables and Summarized Aggregation Tables

<table>
<thead>
<tr>
<th>Tasks</th>
<th>SAS IT Resource Management 2.6 and 2.7</th>
<th>SAS IT Resource Management 3.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to deactivate summarization</td>
<td>An age limit of 0 for a summary level table would deactivate summarization for that level.</td>
<td>To deactivate summarization, do not create a summary aggregation table.</td>
</tr>
<tr>
<td>How aging columns are named</td>
<td>The aging column for all summary levels was always named DATETIME.</td>
<td>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, MONTDATE, and YEARDATE. The WEEKDATE column honors the SAS IT Resource Management 2.6 and 2.7 START OF WEEK setting from the PDB.</td>
</tr>
<tr>
<td>How tables are named</td>
<td>The table name was the same at each level of the PDB.</td>
<td>The summarized aggregation table created by migration is named &lt;table-name&gt;_level&gt; (for example, SARDEV_WEEK).</td>
</tr>
</tbody>
</table>
### Tasks

<table>
<thead>
<tr>
<th>How tables are sorted</th>
<th>SAS IT Resource Management 2.6 and 2.7</th>
<th>SAS IT Resource Management 3.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Columns in the PDB table were sorted as follows: <code>&lt;MACHINE&gt;</code> <code>&lt;DATETIME&gt;</code>.</td>
<td>Class columns are sorted in this order: <code>&lt;Alphabetic List of Class Columns&gt;</code> <code>&lt;Aging Column&gt;</code>.</td>
<td></td>
</tr>
<tr>
<td>Note: If you want to perform BY-processing on the data in any other order, sort it into a work table. Then perform the task using the work table or a view that accesses that work table.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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. Similarly, 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 that was run for a migration of a SAS IT Resource Management 2.7 PDB.
### 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:\pdbh\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/S93068
   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 staging transformation pre-code if a machine in your RMF data is not listed in your LSPR table. Otherwise, SAS IT Resource Management halts the staging job and write an error message to the SAS log.

• Update the SAS IT Resource Management properties of staging transformations for supported SAS IT Resource Management 3.8 adapters. In particular, you must specify the path to the raw data. You must also verify the duplicate checking option that applies to your site and implement duplicate-data checking accordingly.

• Supply SAS code for user-written staging transformations.

• Consider upgrading your data model to the current level of SAS IT Resource Management. Performing this upgrade preserves your existing data. It also ensures that your new IT data mart uses the newest data model and can run the latest versions of supplied reports. For more information about this topic, see “Introduction to the Data Model Upgrade” on page 79.

• Review computed columns (migrated formulas) to ensure that they are correct, including the use of formulas in computed columns. In addition, review the expressions that are used in computed columns to identify computed columns that do not use formulas. In general, migrated expressions should be fine. Some of the pitfalls would be any use of the DATETIME variable, or use of formats or informats that might not be included in the format search path.

• 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 2.6 or 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 Staging Transformation Pre-Code to Handle Machines Missing from LSPR Table

If a machine in your RMF data is not listed in your LSPR table, SAS IT Resource Management halts the staging job and writes an error message to the SAS log. If your site does not require this data, you can bypass the error. To do so, for SMF staging, add the following statement to the staging transformation pre-code:

```sas
%LET LSPR_ERROR_ON=N;
```

This code sets all subsequent calculations that are based on the LSPR information to missing values. This causes other computed columns to have missing values. This situation is not statistically incorrect, but it can misrepresent MIPS and MSU usage in aggregations. The SAS log contains notes about this instead of error messages.
For more information, see the topic “Staging Methodology for MIPS and MSU Columns” in Appendix 2, “Data Sources Supported by SAS IT Resource Management Adapters,” in SAS IT Resource Management 3.8: Administrator’s Guide.

**Update SAS IT Resource Management Properties of Staging Transformations**

If the SAS IT Resource Management 2.6 or 2.7 tables that are being migrated are supported by a SAS IT Resource Management 3.8 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.

*Figure 4.8 Properties of a Staging Transformation for a Supported Adapter*

---

**Fill in SAS Code for User-Written Transformations**

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 Options 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.
In addition, review the **Future data** field and update it as needed.

- As shown in the following display, the **Duplicate Checking Options** panel enables the user to specify parameters for the %RMDUPCHK macro to use with the user-written staging code. To access all the duplicate checking parameters, set **Enable duplicate checking** to **Yes**, which displays those parameters.
As shown in the following display, the **User-Written** panel enables the user to specify the file that contains the staging code.
Figure 4.11  User-Written Parameters of a Staging Transformation for a User-Written Adapter

Review Computed Columns

As part of the migration process, computed columns are created to provide similar functionality for the SAS IT Resource Management 2.6 or 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.

Note: For more information about the User-Written staging transformation, see Chapter 13, “User-Written Staging Code” in the SAS IT Resource Management 3.8: Administrator’s Guide.
• using the DATETIME variable
• 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 2.6 or 2.7 and 3.8” on page 74.
• referencing macro variables that are not provided in SAS IT Resource Management 3.8.

Note: For more information, see the “Creating and Using Macro Variables” topic in the SAS 9.4 SQL Procedure User's Guide.

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.

Any user-defined formats that are not yet present on the target system can be moved to that system. You can do so by using one of the following methods:

• Use the same SAS code that originally defined the formats (for example, PROC FORMAT).
• Transport the format catalog using PROC CPORT and PROC CIMPORT.

Output 4.3 Missing Formats Listed in Migration Status Report for an SAS IT Resource Management 2.7 Migration

<table>
<thead>
<tr>
<th>ITRM Migration Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITRM 2.7 Migration started at 9:55:51 Am on Friday, June 17, 2011</td>
</tr>
<tr>
<td>PDB to be migrated: SYS2.ITRM.SMFP.DBD</td>
</tr>
<tr>
<td>Using Metadata itrm.sas.com on port 8561 with userid itrmuser</td>
</tr>
<tr>
<td>The following formats are needed but do not exist: $MGBPT, $MGBTT, $MBTY, ...</td>
</tr>
</tbody>
</table>

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.
Process Exit Considerations

SAS IT Resource Management 2.6 and 2.7 permitted the use of process exits. In SAS IT Resource Management 3.8, 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). In some cases, exit processing cannot be accomplished by means of these mechanisms. In those cases, 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 deploying a job for execution, see the SAS IT Resource Management Help and Chapter 14, “Jobs” in the SAS IT Resource Management 3.8: Administrator’s Guide.

Data Handling Differences between SAS IT Resource Management 2.6 or 2.7 and 3.8

<table>
<thead>
<tr>
<th>Function</th>
<th>SAS IT Resource Management 2.6 or 2.7</th>
<th>SAS IT Resource Management 3.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storing numeric columns</td>
<td>Some numeric values are designated to use less than 8 bytes of storage.</td>
<td>%RMPDB2DM creates all numeric columns according to the setting of the UPDATENUMERICLENGTHS= Y</td>
</tr>
</tbody>
</table>
### Function

<table>
<thead>
<tr>
<th>Function</th>
<th>SAS IT Resource Management 2.6 or 2.7</th>
<th>SAS IT Resource Management 3.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aging incoming data</td>
<td>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.</td>
<td>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.</td>
</tr>
</tbody>
</table>
| Handling normalized values | The use of variable interpretation types influences the behavior of summarization. Specifically, columns with an interpretation type of COUNT, TIME, or TIMETICKS in INTERVAL tables underwent a normalization transformation before summarization. In this normalization process, the incoming value is first turned into a rate by dividing the metric by DURATION. If a weight variable has 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. | The %RMPDB2DM macro 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 2.6 or 2.7. This rate column is then used with weighted statistics (such as weighted mean), specifying DURATION or the indicated SAS IT Resource Management 2.6 or 2.7 weight variable. This provides the same computations that are achieved through the normalization technique used in SAS IT Resource Management 2.6 or 2.7. Consider the case where you had a COUNT column named PGFAULT in an SAS IT Resource Management 2.6 or 2.7 interval table. Then the SAS IT Resource Management 3.8 staged table would include a computed column named PGFAULT_RATE. The source code for the computation would be as follows:

```r
IF DURATION GT 0
THEN PGFAULT_RATE = PGFAULT / DURATION;
ELSE PGFAULT_RATE = .;
```
Function | SAS IT Resource Management 2.6 or 2.7 | SAS IT Resource Management 3.8
--- | --- | ---
Handling pre-set values for SHIFT | It is 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. | 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. If you want to alter the logic for assigning SHIFT, then you can make either of these modifications:
- 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.
For information about how to handle holidays, see “Handling Holidays” in Appendix 9, “Best Practices and Troubleshooting Tips,” in the SAS IT Resource Management 3.8: Administrator’s Guide.

Supporting HP-PCS tables | Support is provided for the following tables for the HP-PCS collector:
- PCSGDK (PCS Global Disk Metrics)
- PCSGLN (PCS Global LAN Metrics)
In SAS IT Resource Management 2.6 and 2.7, these tables were populated by retrieving data from the PCSGLB (Global) table. | Support is not provided for the following tables for the HP-PCS collector with a staging transformation:
- PCSGDK (PCS Global Disk Metrics)
- PCSGLN (PCS Global LAN Metrics)
In SAS IT Resource Management 3.8, use the PCSGLB table instead. The PCSGDK and PCSGLN staged tables and aggregations are migrated. However, the staging transformation does not populate these tables.
### Data Handling Differences between SAS IT Resource Management 2.6 or 2.7 and 3.8

<table>
<thead>
<tr>
<th>Function</th>
<th>SAS IT Resource Management 2.6 or 2.7</th>
<th>SAS IT Resource Management 3.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handling Web Log data with respect to migration</td>
<td>The Web Log adapter works 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.</td>
<td>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 most of the Web Log adapter’s tables that are marked KEPT='Y' in the PDB. The only exception is for the WEBCLI and WEBRES tables.</td>
</tr>
<tr>
<td>Supporting Sum of Weights statistic</td>
<td>The sum of weights is treated as the sum of the weight variable. For example, if X (the analysis variable) is to be weighted by Y, then the sum of weights is 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.</td>
<td>SAS IT Resource Management 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.</td>
</tr>
</tbody>
</table>

**Note:** Both SAS IT Resource Management 2.6 or 2.7 and SAS IT Resource Management 3.8 enable you to request computation of weighted statistics. This request typically involves the computation of the sum of weights.

**Note:** For more information about other migration macros, see “Introduction to Migration Macros” on page 89.
Introduction to the Data Model Upgrade

SAS IT Resource Management data models are designed to be consistent across adapters and to perform efficiently as input to the exception reports and the performance reports that are 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 was migrated to a current release of SAS IT Resource Management to an IT data mart that was created with the Adapter Setup wizard from the current release of the SAS IT Resource Management solution. Upgrading the data model enables you to use your existing data with the new reports that are provided with new SAS IT Resource Management releases.

Note: In most cases, the data model upgrade program should be run against IT data marts from earlier versions of SAS IT Resource Management. However, there might be an instance where an IT data mart from an earlier version of SAS IT Resource Management is migrated to 3.8. If the data model upgrade program was not run after the first migration to SAS IT Resource Management 3.8, then you can run it now.
The program compares the metadata for the tables in a new SAS IT Resource Management 3.8 IT data mart (that was created using the Adapter Setup wizard) with the metadata for the tables in the migrated IT data mart (that was migrated from a SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 IT data mart or a SAS IT Resource Management 2.6 or 2.7 PDB). It then produces a report that shows all the differences 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 you want to copy columns in the migrated IT data mart to your new IT data mart, you can add those columns to the tables. You can also modify the migrated IT data mart to match the new IT data mart data model.

Note: Physical data can be copied from a table in the migrated IT data mart to the new IT data mart if the table names match. In addition, within that table, columns can be copied only if their names match.

In SAS IT Resource Management 3.4, the staged table names and column names of the MXG adapters were changed to their corresponding MXG names. The %RMUPGRDM macro provides special handling for this case:

- For staged table names and the column names within those staged tables, the macro matches by either table (or column) name or external name. Therefore, data from releases of SAS IT Resource Management prior to SAS IT Resource Management 3.4 upgrade successfully, even though the table and column names do not match.
- For aggregated table names, the macro matches the columns by either the input table name or the external name of the input table. The class list must also match.
- For aggregated column names, the macro matches by either the input column name from the staged table or the external name of that input column. The statistic and the weight column names must also match.

Note: The table names and column names of the staged tables appear as you see them in the SAS IT Resource Management client. The external table names and the external column names are not immediately visible and are used internally. The latest SAS IT Resource Management Data Model documentation includes a list of supplied tables and columns names, including their corresponding external name references. SAS IT Resource Management Data Model documentation is located in the Metrics Documentation section on this web page: http://support.sas.com/documentation/ onlinedoc/itsv/index.html.

New tables were created in SAS IT Resource Management 3.1.1 and later that have no equivalent in SAS IT Resource Management 2.6 or 2.7. If you are migrating from those releases and those tables are present in your new IT data mart, the report will show that there is no data to be copied into the new tables. The new tables will be empty after the upgrade.

After you are satisfied with the changes that are indicated on the report, you can run the program again. However, before you rerun the program, make sure you have made a backup copy of your migrated IT data mart. Then you can set the DOREPORT and DOUPGRADE parameters so that the program copies and upgrades the aggregation data from the migrated IT data mart to your new IT data mart. For more information about this, see “Upgrading to the New Data Model” on page 81.

Note: Data for staged tables is not copied because staged tables are always re-populated whenever a staging job is run.
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 2.6, 2.7, 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, or 3.7 data model to the SAS IT Resource Management 3.8 data model.

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 3.8.

• Migrate your SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 IT data mart or SAS IT Resource Management 2.6 or 2.7 PDB to your SAS IT Resource Management 3.8 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 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 to 3.8,” on page 13, “Migrating a Single IT Data Mart to SAS IT Resource Management 3.8” on page 27, and Chapter 4, “Migrating SAS IT Resource Management 2.6 and 2.7 PDBs to IT Data Marts,” on page 39.

TIP Make sure that there is a working backup copy of the new environment.

Upgrading to the New Data Model

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

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 migrated IT data mart. This new IT data mart will contain your upgraded data after this upgrade process has successfully completed.

   When you run the Adapter Setup wizard, make sure that you select the Configuration Level that meets your needs. If you select Minimal or Typical, you will get fewer columns in your new tables. With fewer columns in your new IT data mart, it might be more difficult to find columns from your old IT data mart (or PDB) that will match the columns in your new IT data mart. Therefore, fewer columns will be copied to the new IT data mart.

   TIP This is especially true if you are migrating from SAS IT Resource Management 2.6 or 2.7.

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

   The supplied SAS macro, %RMUPGDM, 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 DOREPORT
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
dit 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 are migrating from SAS IT Resource Management 2.6 or 2.7, simple
aggregation tables (sometimes referred to as DETAIL tables) in your new IT data
mart are not equivalent to the DETAIL level of your SAS IT Resource
Management 2.6 or 2.7 PDB. Simple aggregation tables in SAS IT Resource
Management 3.8 contain far fewer columns by default.

After making changes, rerun the upgrade program with the DOREPORT 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 %RMUPGRDM macro.
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 migrated IT data mart
to the new IT data mart and makes the necessary changes to the columns.

Note: Only aggregation tables are physically copied. Staged tables are not copied.

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

Upgrading the Data Model After Importing
Columns

You can update staged tables by importing new columns from tables of other sources
such as template staged tables or any other tables that are registered in metadata. Once
imported, these staged table columns can be used in SAS IT Resource Management
aggregation, information map, exception, and reporting jobs. When those associated jobs
are run, these imported columns are included in the other tables of SAS IT Resource
Management, such as the aggregation tables, information maps, exception reports, and
performance reports.

When a new release of SAS IT Resource Management is available, you can migrate your
IT data marts and their contents to the new release. The imported columns will be
included in the migration. After the IT data marts for those adapters (that are supplied by
SAS IT Resource Management) are migrated to a new release, the option to run the Data
Model Upgrade program is available. (The Data Model Upgrade program copies the
physical data in the migrated IT data mart to an IT data mart that was created with the
Adapter Setup wizard and that used the new data model.)
When using the Data Model Upgrade program, be aware that for staged and aggregated tables, as well as for information maps that contain imported columns, those imported columns might not have the same names as those that are delivered with the new data model. In that case, you should perform the following steps:

1. Run the Data Model Upgrade program in report only mode with these settings:
   
   - \( \text{DOREPORT} = \text{YES} \)
   
   and

   - \( \text{DOUPGRADE} = \text{NO} \)

2. Review the resulting report to identify all of the column differences between the IT data models.

3. Modify the new IT data mart to accommodate those staged and aggregated columns that were created from the imported columns that you want to appear in the new IT data mart.

   **TIP** Make sure you have a working backup copy of your environment.

4. Run the Data Model Upgrade program with these settings:
   
   - \( \text{DOREPORT} = \text{YES} \)
   
   and

   - \( \text{DOUPGRADE} = \text{Yes} \)

   When the \( \text{DOUPGRADE} \) parameter is set to \text{YES}, the program copies and upgrades the physical data from the migrated IT data mart to your new IT data mart.

These steps preserve your staging and aggregation data. New data that is based on imported columns will now be staged and aggregated in the columns that you defined and upgraded using the Data Model Upgrade program. Likewise, the SAS IT Resource Management supplied columns will begin to be populated with data as jobs are run. Run the associated information map job to generate a new information map from the aggregation tables that contain both columns. In addition, review any exception definitions and performance report definitions that are associated with the site-defined column to determine whether you prefer using the supplied IT Resource Management column.

---

**%RMUPGRDM Macro**

**%RMUPGRDM Syntax**

```
%RMUPGRDM (  
METAPASS=password for metauser  
,METAUSER=user ID for metadata server  
,METASERVER=host-name or IP address for the metadata server  
,METAUSERID=user ID for metadata server access and definition  
,NEW_DATAMART=name of IT data mart with upgraded data model  
,OLD_DATAMART=name of the migrated IT data mart to use  
,UPGRADEFROMVERSION=2.6 | 2.7 | 3.11 | 3.2 | 3.21 | 3.22 | 3.3 | 3.4 | 3.5 | 3.6 | 3.7  
,<DOREPORT=YES | NO>  
,<DOUPGRADE=YES | NO>  
);  
```
%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. Do not enclose the value for this parameter in quotation marks.

**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. Do not enclose the value for this parameter in quotation marks.

**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. Do not enclose the value for this parameter in quotation marks.

*Note:* Do not enter special characters in this field.

**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. Do not enclose the value for this parameter in quotation marks.

**NEW_DATAMART**=*name of IT data mart with upgraded data model*

 specifies the name of the migrated IT data mart that you just created with the Adapter Setup wizard in the previous step. This IT data mart contains the upgraded data after the upgrading process has successfully completed. A value for this parameter is required.

**OLD_DATAMART**=*name of the migrated IT data mart*

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

**UPGRADEFROMVERSION**=2.6 | 2.7 | 3.11 | 3.2 | 3.21 | 3.22 | 3.3 | 3.4 | 3.5 | 3.6 | 3.7

specifies the version of SAS IT Resource Management that the _OLD_DATAMART originated from, before being migrated. 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, not specified, or NO, a report is not produced.

**DOUPGRADE**=*YES | NO*

specifies whether the IT data mart should be updated to 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, not specified, or NO, the IT data mart is not upgraded with the new data model.
%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 3.5 data model. The SAR DataMart IT data mart conforms to the SAS IT Resource Management 3.8 data model.

```
%RMUPGRDM(
    DOREPORT=YES,
    DOUPGRADE=NO,
    METAPASS=mypassword,
    METAPORT=8561,
    METASERVER=host-name,
    METAUSER=myuserID,
    _NEW_DATAMART=SAR DataMart,
    _OLD_DATAMART=Old SAR DataMart
    UPGRADEFROMVERSION=3.5
);```

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 3.5 data model. The IT data mart called SAR DataMart conforms to the SAS IT Resource Management 3.8 data model.

```
%RMUPGRDM(
    DOREPORT=NO,
    DOUPGRADE=YES,
    METAPASS=mypassword,
    METAPORT=8561,
    METASERVER=host-name,
    METAUSER=myuserID,
    _NEW_DATAMART=SAR DataMart,
    _OLD_DATAMART=Old SAR DataMart
    UPGRADEFROMVERSION=3.5
);```

%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. The migrated IT data mart might have specified a different day (for example, Monday) as the beginning of the week. 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.
Upgrading the Data Model After Overriding Input or Output Paths

Overview of Upgrading the Data Model After Overriding Input or Output Paths

If you previously used the override capabilities for processing multiple files, then special provisions might apply if you want to upgrade your IT data mart using %RMUPGRDM. Before you run %RMUPGRDM, you might have to combine the tables from multiple libraries into one set of tables in the defined SAS Library locations of your IT data mart.

(For more information about this topic, see “Processing Multiple Files of Data” in Appendix 10, “Method for Overriding Locations at Execution Time” in the SAS IT Resource Management: Administrator’s Guide.)

What Was Overridden?

Table 5.1  Table of Overridden Objects

<table>
<thead>
<tr>
<th>What was overridden?</th>
<th>Do you want to upgrade the data in the staged tables?</th>
<th>Action necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw data input files</td>
<td>not applicable</td>
<td>None. Proceed to use %RMUPGRDM.</td>
</tr>
<tr>
<td>Staging libraries</td>
<td>Yes</td>
<td>Yes. Combine the tables from all of the alternate staging locations for each library. Write the combined data to the staging library location as it is defined in the IT data mart’s SAS Library object for staging. Then proceed to use %RMUPGRDM. See “Using the %RMCMB Macro to Combine Tables from Multiple Libraries ” on page 87.</td>
</tr>
<tr>
<td>Staging libraries</td>
<td>No</td>
<td>None. Proceed to use %RMUPGRDM.</td>
</tr>
<tr>
<td>Aggregation libraries</td>
<td>not applicable</td>
<td>Yes. Combine the tables from all of the alternate aggregation locations for each library. Write the combined data to the aggregation library location as it is defined in the IT data mart’s SAS Library object for that aggregation job. Then proceed to use %RMUPGRDM. See “Using the %RMCMB Macro to Combine Tables from Multiple Libraries ” on page 87.</td>
</tr>
<tr>
<td>Information map path</td>
<td>not applicable</td>
<td>None</td>
</tr>
</tbody>
</table>
### Upgrading the Data Model After Overriding Input or Output Paths

<table>
<thead>
<tr>
<th>What was overridden?</th>
<th>Do you want to upgrade the data in the staged tables?</th>
<th>Action necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS Content Server path</td>
<td>not applicable</td>
<td>None</td>
</tr>
</tbody>
</table>

**Note:** If you used the information map path override or the SAS content server path override in your previous IT data mart, you should consider whether you want to do the same thing in your new IT data mart. The same capability is present, but you would have to take the same steps as for the previous IT data mart.

### Using the %RMCMB Macro to Combine Tables from Multiple Libraries

You can use the %RMCMB macro to combine the tables from multiple libraries into one set of tables in the defined SAS library location. If you are using %RMDMPKG and %RMDMUPKG to move the physical libraries, you can use %RMCMB to combine the tables, place the combined physical tables into the defined SAS library location. Then you can use %RMDMPKG and %RMDMUPKG.

- For information, see “%RMDMPKG” on page 89.
- For information, see “%RMDMUPKG” on page 93.
- For information, see the %RMCMB macro in Appendix 8, “Macros” in the *SAS IT Resource Management 3.8: Administrator’s Guide*. 

Appendix 1
Migration Macros

Introduction to Migration Macros

The following macros are used in the migration process for SAS IT Resource Management 3.8:

- %RMDMPKG
- %RMDMPATH
- %RMDMUPKG

These three macros can be used when the SAS Migration Utility process is executed. They can also be executed when you migrate a single IT data mart.

Note: For information about how to resolve problems with these macros, see “General Troubleshooting Tips for Migration” on page 107.

%RMDMPKG

%RMDMPKG Overview

%RMDMPKG creates a package of the physical content of the IT data mart that will be moved to SAS IT Resource Management 3.8.

%RMDMPKG Macro Syntax

%RMDMPKG (DATAMART=name of the IT data mart to use, METAPASS=password for the metauers, 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 transport files, <,DISP=OLD>, <,DOPACKAGES=YES | NO | INDEXONLY>, <,DOREPORT=YES | NO>, <,IDXNAME=PKGIDX | alternate filename>, <,REPOS=Foundation | 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 will 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. Do not enclose the value for this parameter in quotation marks.

**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. Do not enclose the value for this parameter in quotation marks.

**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. Do not enclose the value for this parameter in quotation marks.

**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. Do not enclose the value for this parameter in quotation marks.

**PKGDIR=** output directory to contain the transport files
specifies the directory that will contain the transport 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.

*Note:* If you are working with a large IT data mart, the output directory should be a zFS directory instead of a PDS or PDSE.

*Note:* For more information about the METAPASS, METAPORT, METASERVER, and METAUSER parameters, see the SAS 9.4 Intelligence Platform: System Administration Guide.

%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 | INDEXONLY
specifies whether the packages will be created. A value for this parameter is optional. The default value for this parameter is NO so that neither the transport files nor the index file is created. If you specify YES, %RMDMPKG creates an index file that describes the SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8 libraries and the transport files for those libraries. The index file and the transport files can be used later with the %RMDMUPKG macro.

If you specify INDEXONLY, %RMDMPKG does not create transport files for SAS IT Resource Management libraries. Instead, only the index file is created in the specified package directory. The index file is a small SAS data set in transport format that describes the SAS IT Resource Management libraries that will be migrated to SAS IT Resource Management 3.8.
When the `%RMDMUPKG` macro runs later with the `INDEXONLY` option specified, it uses PROC COPY instead of PROC CIMPORT. PROC COPY copies the SAS IT Resource Management libraries (that you are migrating from) to the SAS IT Resource Management 3.8 directories that are specified in the metadata. If `YES` was specified for `%RMDMPKG` and is later specified for `%RMDMUPKG`, then PROC CIMPORT is used to import the transport files that were created by `%RMDMPKG`.

Note: If you specify `INDEXONLY`, the SAS IT Resource Management libraries (that you are migrating from) must be accessible from SAS IT Resource Management 3.8.

**DOREPORT=**`YES | NO` specifies whether to produce a report that lists the SAS libraries that 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 will 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=**`Foundation | 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 `Foundation`.

Note: IT data marts are created in the Foundation repository by default, but they can also be created in other repositories. (The selected repository must be the repository that is the required metadata store for a SAS Metadata Server.)

**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 value of the return code from the execution of this macro. A value for this parameter is optional. This parameter is not case-sensitive.

---

**%RMDMPATH**

**%RMDMPATH Overview**

%RMDMPATH modifies the root paths that are associated with the pathnames for SAS libraries in the IT data mart.

**%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 will be renamed  
  ,<,DEFAULT_ROOTPATH= YES | NO>)  
  ,<,DOREPORT= YES | NO>)  
  ,<,DORENAME= YES | NO>)  
  ,<,REPOS= Foundation | metadata repository>)
```
%RMDMPATH Required Arguments

DATAMART= *name of the IT data mart to use*
specifies the name of the IT data mart that will 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. Do not enclose the value for this parameter in quotation marks.

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. Do not enclose the value for this parameter in quotation marks.

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. Do not enclose the value for this parameter in quotation marks.

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. Do not enclose the value for this parameter in quotation marks.

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 case-sensitive parameter is required.

OLD_ROOTPATH= *old root path that will be renamed*
specifies the old root path value that will 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 case-sensitive parameter is required.

Note: For more information about the METAPASS, METAPORT, METASERVER, and METAUSER parameters, see the SAS 9.4 Intelligence Platform: System Administration Guide.

%RMDMPATH Optional Parameters

DEFAULT_ROOTPATH = *YES | NO*
specifies that the default root path associated with the IT data mart will 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 will be renamed. A value for this parameter is optional. The default value for this parameter is NO.

DOREPORT= *YES | NO*
specifies that a report is produced that details what SAS libraries were renamed. A value for this parameter is optional. The default value for this parameter is YES.

REPOS= *Foundation | 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 Foundation.
Note: IT data marts are created in the Foundation repository by default, but they can also be created in other repositories. (The selected repository must be the repository that is the required metadata store for a SAS Metadata Server.)

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

%RDMUPKG

%RDMUPKG Overview
%RDMUPKG unpackages the physical content of the IT data mart that you moved from SAS IT Resource Management 3.2, 3.21, 3.3, 3.4, 3.5, 3.6, 3.7, or 3.8.

%RDMUPKG Macro Syntax
%RDMUPKG (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=input directory that contains the transport files,<COMPRESSAGG=YES | NO>,<DOPACKAGES=YES | NO | INDEXONLY>,<DOREPORT=YES | NO>,<FILEDEVICE=z/OS type of device>,<FILESACEPRIMARYZ/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>,<LIBREFFILTER=libref>,<REPOS=Foundation | metadata repository>,<_RC=macro variable name to hold return code>,<SMU=YES | NO>);

%RDMUPKG Required Parameters

DATAMART=name of the IT data mart to use
specifies the name of the IT data mart that will 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. Do not enclose the value for this parameter in quotation marks.

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. Do not enclose the value for this parameter in quotation marks.
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. Do not enclose the value for this parameter in quotation marks.

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. Do not enclose the value for this parameter in quotation marks.

PKGDIR=input directory that contains the transport files
specifies the directory that contains the transport files for all of the SAS libraries in the IT data mart. A value for this parameter is required. This directory must exist and contain the transport files before running the %RDMUPKG macro. 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.

Note: If you are working with a large IT data mart, the output directory should be a zFS directory instead of a PDS or PDSE.

Note: For more information about the METAPASS, METAPORT, METASERVER, and METAUSER parameters, see the SAS 9.4 Intelligence Platform: System Administration Guide.

%RDMUPKG Optional Parameters

COMPRESSAGG=YES | NO
specifies whether the migrated aggregation tables will be compressed. A value for this parameter is optional. The default value for this parameter is NO.

DOPACKAGES=YES | NO | INDEXONLY
specifies whether packages were created by the %RDMMPKG macro. A value for this parameter is optional. The default value for this parameter is NO.

If you specify INDEXONLY, %RDMUPKG unpackages the index file and uses the information in that file to access the SAS IT Resource Management libraries directly. The %RDMUPKG macro uses PROC COPY instead of PROC CIMPORT to copy the SAS IT Resource Management libraries (that you are migrating from) to the SAS IT Resource Management 3.8 directories that are specified in the metadata. If YES was specified for %RDMMPKG and is later specified for %RDMUPKG, then PROC CIMPORT is used to import the transport files that were created by %RMDMPKG.

Note: If you specify INDEXONLY, the SAS IT Resource Management libraries (that you are migrating from) must be accessible from SAS IT Resource Management 3.8.

DOREPORT=YES | NO
specifies that a report is produced that details what SAS libraries were unpackaged. 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.
FILESPECEPRIMARV=\textit{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.

FILESPECESECONDARY=\textit{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 FILESPSEC SAS system option.

IDXNAME=PKGIDX | alternate filename
specifies the name of the file that was used as an index of the files that were packaged. A value for this parameter is optional. It must be supplied only if there are naming conflicts. The default name is \texttt{pkgidx.cpt} on Windows, UNIX, and zFS on z/OS. The default name is \texttt{PKGIDX} on traditional z/OS file system.

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

LIBREFFILTER=libef
specifies that only the library that is identified by the specified libref will be copied to the IT data mart in SAS IT Resource Management 3.8. If this argument is not specified, the \%RMDMUPKG macro copies all the libraries in the IT data mart.

\textbf{T I P}
To determine the libref names, view the previous output report of the \%RMDMUPKG macro. You can also determine the libref names by viewing the library metadata in SAS Management Console.

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

\textit{Note:} IT data marts are created in the Foundation repository by default, but they can also be created in other repositories. (The selected repository must be the repository that is the required metadata store for a SAS Metadata Server.)

_RC=\textit{macro variable name to hold return code}
specifies the name of a macro variable that holds the value of the return code 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 was used to migrate the metadata. If the SAS Migration Utility 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 \texttt{YES}.

- If the value is set to \texttt{YES}, error-checking is performed.
- If the value is set to \texttt{NO}, error-checking is not performed.

\textit{Note:} If you are migrating IT data marts individually instead of using the SAS Migration Utility, additional error-checking is not required. Set the value of this parameter to \texttt{NO} to avoid generating error messages.

\%RMDMUPKG Notes
Some changes to the data do not occur until you run the aggregation jobs from the new IT data mart for detail and summarized aggregation tables. For example, any columns that were in the original (or sSource) 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.

For example, any columns (such as Time Period and CompletedDay) or any computed columns that were in the original data (or source) 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.

%RMUPGRDM Macro

%RMUPGRDM Syntax
%RMUPGRDM ( 
METAPASS=\textit{password for metauser} 
,METAPORT=\textit{service or port for the metadata server} 
,METASERVER=\textit{host-name or IP address for the metadata server} 
,METAUSER=\textit{user ID for metadata server access and definition} 
,_NEW_DATAMART=\textit{name of IT data mart with upgraded data model} 
,_OLD_DATAMART=\textit{name of the migrated IT data mart to use} 
,UPGRADEFROMVERSION=2.6 | 2.7 | 3.11 | 3.2 | 3.21 | 3.22 | 3.3 | 3.4 | 3.5 | 3.6 | 3.7 
,<DOREPORT=YES | NO> 
,<DOUPGRADE=YES | NO> 
); 

%RMUPGRDM Required Parameters

\textbf{METAPASS=\textit{password for metauser}}

specifies the password for connecting the user ID to the metadata server. A value for this parameter is required. Do not enclose the value for this parameter in quotation marks.

\textbf{METAPORT=\textit{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. Do not enclose the value for this parameter in quotation marks.

\textbf{METASERVER=\textit{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. Do not enclose the value for this parameter in quotation marks.

\textit{Note:} Do not enter special characters in this field.

\textbf{METAUSER=\textit{user ID for metadata server access and definition}}

specifies the user ID for accessing the metadata server. A value for this parameter is required. Do not enclose the value for this parameter in quotation marks.

\_NEW_DATAMART=\textit{name of IT data mart with upgraded data model}

specifies the name of the migrated IT data mart that you just created with the Adapter Setup wizard in the previous step. This IT data mart contains the upgraded data after the upgrading process has successfully completed. A value for this parameter is required.

\_OLD_DATAMART=\textit{name of the migrated IT data mart}

specifies the name of the migrated IT data mart from which you are upgrading. A value for this parameter is required.
UPGRADEFROMVERSION=2.6|2.7|3.11|3.2|3.21|3.22|3.3|3.4|3.5|3.6|3.7
specifies the version of SAS IT Resource Management that the _OLD_DATAMART
originated from, before being migrated. 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, not specified, or NO, a report is not produced.

DOUPGRADE=YES | NO
specifies whether the IT data mart should be updated to 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, not specified, or
NO, the IT data mart is not upgraded with the new data model.

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 3.5 data model. The SAR DataMart IT data mart conforms to the SAS IT
Resource Management 3.8 data model.

%RMUPGRDM(
   DOREPORT=YES,
   DOUPGRADE=NO,
   METAPASS=mypassword,
   METAPORT=8561,
   METASERVER=host-name,
   METAUSER=myuserID,
   _NEW_DATAMART=SAR DataMart,
   _OLD_DATAMART=Old SAR DataMart
   UPGRADEFROMVERSION=3.5
);

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 3.5 data model. The IT data mart called SAR DataMart
conforms to the SAS IT Resource Management 3.8 data model.

%RMUPGRDM(
   DOREPORT=NO,
   DOUPGRADE=YES,
   METAPASS=mypassword,
   METAPORT=8561,
   METASERVER=host-name,
   METAUSER=myuserID,
   _NEW_DATAMART=SAR DataMart,
   _OLD_DATAMART=Old SAR DataMart
   UPGRADEFROMVERSION=3.5
);
%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 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. The migrated IT data mart might have specified a different day (for example, Monday) as the beginning of the week. 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.
Appendix 2
Migration and Promotion of ITRM Report Center Content

Migrating or Promoting the Content of SAS Gallery Manager or ITRM Report Center

If you are using the SAS Migration Utility to migrate from a SAS 9.4 system to another SAS 9.4 system, all ITRM Report Center content and items are migrated automatically.

When Gallery Manager objects are migrated or promoted from SAS IT Resource Management 3.2 or 3.3 to SAS ITRM Report Center 3.8, the following information applies:

- Public objects that were created in the Gallery Manager web application of SAS IT Resource Management 3.2 or 3.3 are shared with the SASUSERS group of ITRM Report Center 3.8. Users who belong to the IT Resource Management Report Center Administrators group and the owner of the migrated objects have full access to those objects.

- Private objects that were created in the Gallery Manager web application of SAS IT Resource Management 3.2 or 3.3 are fully accessible to users who belong to the IT Resource Management Report Center Administrators group and the owner of the objects.

Any private object that was created by the user with the \texttt{sasadm@saspw} ID (SAS Metadata Server: Unrestricted role) in the Gallery Manager web application of SAS IT Resource Management 3.2 or 3.3 should be edited. The object should be reassigned to an ITRM Report Center user who is a member of the IT Resource Management Report Center Users or the IT Resource Management Report Center Administrators group before migrating that object to SAS IT Resource Management 3.8. Gallery object ownership should be changed because the Metadata Server: Unrestricted role can access only the ITRM Report Center Administration workspace. The Administration workspace does not provide access to gallery objects. Therefore, if the ownership of the gallery object is not changed from \texttt{sasadm@saspw} when the gallery is migrated, then those objects will not be accessible to any ITRM Report Center user. For information about how to reassign ownership of a gallery object, see “Reassign a Folder, Gallery, or Album” in Chapter 3, “The Gallery Workspace,” in the \textit{SAS IT Resource Management 3.8: Report Center Guide}.

(In ITRM Report Center, the user with the \texttt{sasadm@saspw} ID does not have access to any gallery workspace. Users with the Metadata Server: Unrestricted role can access only the ITRM Administration workspace.) If the ownership of the gallery object is not changed from \texttt{sasadm@saspw} when the gallery is migrated, then those objects will not be accessible to anybody in ITRM Report Center, including the user with the \texttt{sasadm@saspw} ID.
If a user of the Gallery Manager web application of SAS IT Resource Management 3.2 or 3.3 does not exist in ITRM Report Center 3.8, then any object owned by that user is not migrated. (ITRM Report Center 3.8 cannot create a home folder for that user.)

Special Consideration for Migrating or Promoting from SAS IT Resource Management 3.2, 3.3, or 3.4

About Migrating or Promoting from SAS IT Resource Management 3.2, 3.3, or 3.4
In SAS IT Resource Management 3.2 and 3.3, report management was provided by the Gallery Manager web application. In SAS IT Resource Management 3.4 and later, enhanced report management is provided by the ITRM Report Center web application. To obtain access to the web application features, users are assigned to a SAS Metadata group. Starting SAS IT Resource Management 3.5, the names of the groups and the names of the roles that controlled access to the web application features were changed to include the term “Report Center”. The following tables show how the group names and role names were changed.

Table A2.1  Table of Group Names per Release

<table>
<thead>
<tr>
<th>SAS IT Resource Management 3.2, 3.3, and 3.4</th>
<th>SAS IT Resource Management 3.5 and Later</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Resource Management Administrators</td>
<td>IT Resource Management Report Center Administrators</td>
</tr>
<tr>
<td>IT Resource Management Users</td>
<td>IT Resource Management Report Center Users</td>
</tr>
</tbody>
</table>

Table A2.2  Table of Role Names per Release

<table>
<thead>
<tr>
<th>SAS IT Resource Management 3.2, 3.3, and 3.4</th>
<th>SAS IT Resource Management 3.5 and Later</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Resource Management Administrators</td>
<td>IT Resource Management: Report Center Administrator</td>
</tr>
<tr>
<td>IT Resource Management Users</td>
<td>IT Resource Management: Report Center User</td>
</tr>
</tbody>
</table>

Assigning Users to New Groups
Before you migrate or promote your system from SAS IT Resource Management 3.2, 3.3, or 3.4 to SAS IT Resource Management 3.8, you need to assign your users to the corresponding new groups, as shown in Table A2.1. To do so, perform the following steps:

1. Open SAS Management Console and log on as an administrator.
2. Under the Plug-ins tab on the left pane of the window, select User Manager.
3. For each user and administrator who needs to access ITRM Report Center, do the following:
a. On the right pane, right-click the user. Click **Properties** to open the Properties dialog box.

b. Under the **Groups and Roles** tab, remove the old groups from right-hand side **Member of:** column. Then add the appropriate new group (with the “Report Center” term) from the **Available Groups and Roles** column. Click **OK**.

**Note:** Anyone who belonged to the IT Resource Management Users or IT Resource Management Administrators groups should now belong to the IT Resource Management Report Center Users or IT Resource Management Report Center Administrators group.

4. After the reassignments are complete, restart the SAS [Config-Lev1] SASServer10_1 - WebAppServe server. To do so, do the following:

   a. Click **Start** on your machine. Select **Services**.

   b. In the details pane, right-click the SAS [Config-Lev1] SASServer10_1 - WebAppServe server. **Tip** You might need to expand the **Name** field to see the complete names of the services.

   c. Click **Restart**.

5. After you migrate or promote your system to SAS IT Resource Management 3.8, all ITRM Report Center objects that were shared with the older-named groups in SAS IT Resource Management 3.4 need to be shared again. These groups must reference the new IT Resource Management Report Center Users or IT Resource Management Report Center Viewers (SASUSERS) group. For more information, see the “Share a Folder” topic in Chapter 3, “The Gallery Workspace,” in the **SAS IT Resource Management 3.8: Report Center Guide**.

**Note:** The preceding steps are not applicable if you are upgrading from SAS IT Resource Management 3.5 to SAS IT Resource Management 3.8 and later.

### Assigning Custom User Groups to New Roles

Before you migrate or upgrade from SAS IT Resource Management 3.4 to SAS IT Resource Management 3.8, assign your custom user groups to corresponding new roles, as shown in Table A2.2 on page 100. To do so, perform the following steps:

1. Open SAS Management Console and log on as an administrator.

2. Under the **Plug-ins** tab on the left pane of the window, select **User Manager**.

3. For each custom user group, do the following:

   a. On the right pane, right-click the custom user group. Click **Properties** to open the Properties dialog box.

   b. Under the **Groups and Roles** tab, remove the old roles from the right-hand side **Member of:** column. Then add the appropriate new role (with the “Report Center” term) from the **Available Groups and Roles** column. Click **OK**.

### Promoting the Content of ITRM Report Center

The ITRM middle-tier promotion tool moves existing gallery objects from one ITRM Report Center machine on SAS 9.4 to another ITRM Report Center machine on SAS 9.4. These are the objects that can be moved:

- gallery
The following promotion techniques apply to reports that are included in albums as static and dynamic links:

- You might have reports that are included in an album by static links. In that case, the promotion tool changes the host, port, and protocol of the source machine to the host, port and protocol of the target machine. (The protocol can be changed to https if required.)

- For reports that are included in an album by dynamic links, the report's ID must exist on the target machine. If it is not present, then the report cannot be accessed.

- watch list
  For reports that are included in the watch list, the report's ID must exist on the target machine. If it is not present, then the report cannot be accessed.

The middle-tier promotion tool (the PromotionClient tool) is invoked from the command prompt on either the source machine or the target machine.

**Middle-Tier Objects That Are Not Promoted**

The following objects on the middle tier are not promoted:

- A gallery, folder, or album is not promoted if a gallery, folder, or album with the same name already exists for the same user under the same parent in the target server.

- A watch list link might not be promoted if it is already present on the target machine. For such cases, a custom exception is logged in the log file. The processing continues. For more information, see “XML That Is Needed for the Promotion Tool” on page 104.

**Promotion Prerequisites**

The following prerequisites must be satisfied before promoting content from ITRM Report Center:

- ITRM Report Center must be launched and running on both the source and target systems.

- The user of the source machine must also exist on the target machine. If not, then the user’s gallery objects on the source machine are not moved to the target machine.

- The SAS IT Resource Management reports from the source system must be moved to the target SAS IT Resource Management system. To move SAS Content Server report content to the target server, use the WebDAVDump and WebDAVRestore utilities. For information about using the WebDAVDump and WebDAVRestore utilities to move SAS Content Server data, see http://support.sas.com/kb/38/667.html.

**How to Run the Middle-Tier Promotion Tool**

To run the promotion tool, perform the following steps:
1. Create an XML file to use as input to the promotion tool. For more information, see “XML That Is Needed for the Promotion Tool” on page 104.

2. On the source or target machine, open a command prompt.

3. Enter the appropriate code at the command prompt.

   Note: For an example of the detailed code that you should enter at the command prompt, see “Example of Middle-Tier Promotion Tool Code”.

   Tip: Blanks in a path might need to be enclosed in double quotation marks.

**Results of the Middle-Tier Promotion Tool**

When run successfully, the promotion tool displays this output on the console:

*Figure A2.1 Console Output of the Middle-Tier Promotion Tool*

The following types of information are available in `ITRM37Promotion.log`:

- The logging setup is completed for ITRM Report Center 3.8 migration.
- The promotion process from the source server to the target server has started.
- Determination of whether the user exists in the source or target system.
- The promotion of objects that belong to the user has started.
- Determination of whether the home gallery folder for the user exists already.
• Gallery folder is found in the source machine.
• Gallery folder is promoted with its new name and ID.
• Promotion from the source server to the target server is completed.

**XML That Is Needed for the Promotion Tool**

```xml
<?xml version="1.0" encoding="UTF-8"?>
<promotion>
  <server type="source">
    <user>SAS-administrator-name</user>
    <password>administrator-password</password>
    <sasserver10.protocol>http or https</sasserver10.protocol>
    <sasserver10.host>SASServer10-host-name</sasserver10.host>
    <sasserver10.port>SASServer10-port</sasserver10.port>
    <sasserver1.protocol>http or https</sasserver1.protocol>
    <sasserver1.host>SASServer1-host-name</sasserver1.host>
    <sasserver1.port>80</sasserver1.port>
    <appName>ITRMReportCenter</appName>
    <logon>SASLogon-manager-application-name</logon>
    <WIPAppName>SASWIPClientAccess</WIPAppName>
  </server>

  <server type="target">
    <user>sasadm@saspw</user>
    <password>my-password</password>
    <sasserver10.protocol>http</sasserver10.protocol>
    <sasserver10.host>SASServer10-host-name</sasserver10.host>
    <sasserver10.port>SASServer10-port</sasserver10.port>
    <sasserver1.protocol>http or https</sasserver1.protocol>
    <sasserver1.host>SASServer1-host-name</sasserver1.host>
    <sasserver1.port>SASServer1-port</sasserver1.port>
    <appName>ITRMReportCenter</appName>
    <logon>SAS-Logon managers-name</logon>
    <WIPAppName>WIP-Application-Name</WIPAppName>
    <log_target>C:\SAS\ITRM\Lev1\Web\Logs\SASServer10_1\ITRM14Promotion.log</log_target>
  </server>
</promotion>
```

The following table provides explanations of the terms that are used in the middle-tier promotion tool code:

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
</table>
| server type| Supply the type of server that you are using. Valid values are **source** or **target**. The value that you specify determines whether the remaining tags are relevant to the source server or the target server.  
*Note:* Values must be enclosed in double quotation marks. |
<p>| user       | Supply the user ID of the SAS Administrative User.                          |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>password</td>
<td>Supply the password for the specified SAS Administrative User.</td>
</tr>
<tr>
<td>sasserver10</td>
<td>Supply the name of the server that is designated as sasserver10.</td>
</tr>
<tr>
<td>sasserver10.protocol</td>
<td>Enter the connection protocol in use by the web application server on which the ITRM Report Center web application is running. This value is either http or https.</td>
</tr>
<tr>
<td>sasserver10.host</td>
<td>Supply the fully qualified host name for the web application server on which the ITRM Report Center web application is running.</td>
</tr>
<tr>
<td>sasserver10.port</td>
<td>Supply the port on which the web application server running the ITRM Report Center web application is listening.</td>
</tr>
<tr>
<td>sasserver1.protocol</td>
<td>Supply the connection protocol in use by the web application server on which the web infrastructure platform is running. This value is either http or https.</td>
</tr>
<tr>
<td>sasserver1.host</td>
<td>Supply the fully qualified host name for the web application server on which the web infrastructure platform is running.</td>
</tr>
<tr>
<td>sasserver1.port</td>
<td>Supply the port on which the web application server running the web infrastructure platform is listening.</td>
</tr>
<tr>
<td>appName</td>
<td>Supply the name of the ITRM Report Center context root that was specified at configuration. This value is typically ITRMReportCenter.</td>
</tr>
<tr>
<td>logon</td>
<td>Supply the name of the SAS Logon Manager context root that was specified at configuration. This value is typically SASLogon.</td>
</tr>
<tr>
<td>WIPAppName</td>
<td>Supply the name of the Web Infrastructure Platform Client Access context root. This value is typically SASWIPClientAccess.</td>
</tr>
<tr>
<td>log_target</td>
<td>Supply the fully qualified filename where the log information that is produced from this action is written.</td>
</tr>
</tbody>
</table>

**Example of Middle-Tier Promotion Tool Code**

The following example shows code that launches the promotion tool. You might need to modify the code for your site. For example, you might need to change the path to the
SASHOME location from `C:\Program Files\SASHome` to the location where you installed your SAS software. In addition, if you are running this code on a UNIX system, then you also need to use forward slashes (`/`) instead of the example backslashes (`\`).

```java
java -Djava.system.classloader=com.sas.app.AppClassLoader
-classpath "C:\Program Files\SASHome\SASVersionedJarRepository\eclipse\plugins\sas.launcher.jar"
-Dsas.app.repository.path="C:\Program Files\SASHome\SASVersionedJarRepository\eclipse"
-Dsas.app.launch.picklist="C:\Program Files\SASHome\SASITResourceManagementMidTier\3.8\picklist"
com.sas.solutions.itms.deploy.webapp.promotion.client.PromotionClient
C:\PromotionTesting\itrm3.8_promotion.xml
```
Appendix 3
Troubleshooting

General Troubleshooting Tips for Migration

How to Turn On Standard Debugging

To diagnose problems with the migration macros, place the following code before the
invocation of the macro:

\%LET DEBUG=1;

This code writes additional information to the SAS log during execution. The
information can help SAS Technical Support troubleshoot the problem. When this code
is used with the \%RMDMPKG and \%RDMUPKG macros, the SAS WORK library is
not cleaned up.

How to Debug a Connection Error

To determine why you are experiencing a connection error, execute the \%RMVINST
macro. This macro verifies that the application server is correctly configured for use by
SAS IT Resource Management.

CAUTION:
Use this macro only under the direction of SAS Technical Support. This macro
produces a large volume of information, the interpretation of which requires
thorough knowledge of SAS IT Resource Management metadata structures.

The output produced by \%RMVINST can be useful for debugging issues related to JAR
files and JREOPTIONS settings.
Troubleshooting the %RMPDB2DM Macro

Verify That Prerequisites for the %RMPDB2DM Macro Are Satisfied

Many issues with the %RMPDB2DM macro can be resolved by ensuring that the configuration of your JRE options is correct. To do so, make sure that the JREOPTIONS that are specified in the SAS session that is used to execute the %RMPDB2DM macro are correct. Review the section on “Migration Prerequisites” with particular attention to the JREOPTIONS item. For more information about this topic, see “Migration Prerequisites” on page 45.

If you are using %RMPDB2DM on a z/OS system, also verify the requirements for TKMVSENV settings for TKJNI_OPT_LIBPATH and TKJNI_OPT_DISPLAY. These are documented in the list of prerequisites for PDB migration. For more information, see “Migration Prerequisites” on page 45.

Formats Not Found Message Is Received

If you are working with MXG data and you receive a warning that formats are not found, make sure that MXG is set up correctly in your configuration. If the problem is with formats that are not part of MXG but are defined at your site, make sure that these formats are made available. To do so, set the FMTSEARCH option appropriately in your SAS configuration.

SAS IT Resource Management uses the following environment variables to locate the MXG SourcLib and Format data sets:

- MXGSRC= Location of the MXG SourcLib library
- MXGFMT= Location of the MXG Format library

On z/OS, these configuration settings are specified in the COMMON member of the `<high-level-qualifier>CONFIG PDS, using the SET SAS system option. To override the physical locations to which these environment variables refer, you must manually add one of the following options to the SITE member of your high-level-qualifier.CONFIG data set:

```
SET=’MXGSRC (<custom> <sourclib>)’
SET=’MXGFMT <formatlib>’
```
In the preceding code fragments, the following definitions apply:

custom
is the path to your MXG custom source library. It is referred to as MXGUSER.SRCLIB.

sourclib
is the path to your MXG source library. It is referred to as MXG.SRCLIB.

formatlib
is the path to your MXG format library. It is referred to as MXG.FMTLIB.

For more information about configuration files, the FMTSEARCH option, or the SET SAS system option, see the operating environment specific information (that is, the companion) for your SAS installation at http://support.sas.com/documentation/onlinedoc/base/index.html.

How to Gather Debugging Information to Help Resolve Problems with the %RMPDB2DM Macro

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

   ```sas
   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:

   ```sas
   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 output to the tracking entry. Attach the file written by PROC CPORT, as shown in the sample code from Step 4.

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. Otherwise, you might have to contact SAS Technical Support for information about transferring the file by means of FTP.
7. Attach the external file from the PROC CPORT invocation. You might need to zip this file in order to upload it. Otherwise, you might have to contact SAS Technical Support for information about transferring the file by means of FTP.

*Note:* If you contact SAS Technical Support for assistance with this macro, attach the debugging files with your correspondence, or notify SAS Technical Support that these files are available.
Appendix 4
Other Resources

If you have questions about or problems with your licensed SAS software, you can explore the multiple resources that are available on the SAS Institute Support website at http://support.sas.com/techsup. This website provides an online mechanism for reporting and tracking problems and questions for SAS Technical Support. These electronic services are available 24 hours a day.

Select Training and Bookstore to access links to the SAS bookstore, training information, and the certification program. In addition, you can access information about SAS Global Academic Program and SAS OnDemand for Academics.

If you want your question or problem handled by phone, ask your site's SAS Installation Representative or on-site SAS support personnel to call the SAS Technical Support Division. Sites in North America can call 919-677-8008 or send a Fax to 919-531-9449. Sites that are outside of North America should check the SAS Technical Support website or their local SAS office.
Recommended Reading

Here is the recommended reading list for this title:

- *What's New in SAS IT Resource Management 3.8*
- *System Requirements—SAS IT Resource Management 3.8*
- *SAS 9.4 Intelligence Platform: Migration Guide*
- *QuickStart Guide: SAS 9.4 Planned Deployments using Electronic Software Delivery*
- *Installation Instructions for SAS 9.4 Electronic Software Delivery for Planning Installations on z/OS*
- *SAS IT Resource Management 3.8: Administrator's Guide*
- *SAS IT Resource Management 3.8: Reporting Guide*
- *SAS IT Resource Management 3.8: Report Center Guide*
- *Guide to Operating SAS IT Resource Management 3.8 without a Middle Tier*
- *SAS IT Resource Management 3.8: Overview*

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