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Getting Your Cube from Here to There:
Migration and Promotion of OLAP Cubes in SAS® 9.2

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ABSTRACT

In SAS® 9.2 there are several ways to move your OLAP cube metadata from one SAS environment to another. This paper will explain your choices and help you develop a strategy for cube migration and promotion by evaluating the benefits of each technology.
This paper will include information, examples, and evaluation of these methods:
- The SAS® 9.2 Migration Utility.
- The Export Cubes and Import Cubes batch tools available for SAS® 9.1.3 and the second maintenance release of SAS 9.2, respectively.
- The Export SAS Package and Import SAS Package wizards that support including the cube in a SAS package.
- Exporting PROC OLAP long form to run on the target environment.

Understanding your choices will help you plan and succeed in migrating and promoting your cube metadata and data from one metadata environment to another.

INTRODUCTION

With the recent release of SAS® 9.2, the number of choices you have for moving metadata from one environment to another has increased significantly.   Becoming familiar with each option will help you plan your strategy for moving your cubes from one system to another.

In SAS® 9.1.3 there are two methods to use to move your cube metadata from one SAS 9.1.3 environment to another SAS 9.1.3 environment. The two methods are:

1.   Export Cube and Import Cube wizards in OLAP Cube Studio 9.1.

2.   Export PROC OLAP code and run this code on your target system to create your cube.

When moving your cubes from SAS 9.1.3 to SAS 9.2 the number of choices increases from two to three. The following three strategies are available:

1.   SAS Migration Utility.

2.   Export Cubes and Import Cubes batch tools.

3.   Export PROC OLAP code and run this code on your target system to create your cube.

If you need to move your cubes from one SAS 9.2 environment to another SAS 9.2 environment, the followingoptions are supported:

1.   Export SAS Package and Import SAS Package wizards.

2.   Export PROC OLAP code and run this code on your target system to create your cube.

This paper describes the advantages and restrictions of each of these choices and helps you navigate the options you have when moving your cubes. .

Thefollowing charts summarize the available choices based on the source and target SAS$^®$ environments. The first chart categorizes your choices based on your SAS version. The second chart shows you which SAS client software supports each utility.

Method to use to move OLAP cubes from one SAS environment to another	Export Cube and Import Cube wizards in OLAP Cube Studio 9.1	Export SAS Package and Import SAS Package wizards	SAS Migration Utility	Export Cubes and Import Cubes batch tools	Export PROC OLAP code
From SAS 9.1.3 to 9.1.3	√	X	X	X	√
From SAS 9.1.3 to 9.2	X	X	√	X	√
From SAS 9.1.3 to 9.2 second maintenance	X	X	√	√	√
From SAS 9.2 to 9.2	X	√		X	√

Table 1. Available Utilities to Move OLAP Cubes from one Environment to Another Based on SAS Software Version

Which client contains the cube utility	Export Cube and Import Cube wizards	Export SAS Package and Import SAS Package wizards	SAS Migration Utility	Export Cubes batch tool	Import Cubes batch tool	Export PROC OLAP code
SAS OLAP Cube Studio 9.1	√	X	X	X	X	√
SAS Data Integration Studio 9.1	√	√ (cubes not supported)	X	X	X	√
Integrated with SAS Deployment Wizard 9.2	X	X	√	X	X	X
Batch command line script	X	X	√	√	X	X
SAS OLAP Cube Studio 4.2 SAS Management Console 9.2 SAS Data Integration Studio 4.2	X	√	X	X	X	√

Table 2. Availability of Migration and Promotion Tools Based on SAS Client

PROMOTION VERSUS MIGRATION

You can move your cubes using **promotion** or **migration** technology. Understanding the differences between these strategies is important. When upgrading your OLAP Server installation and OLAP cubes from SAS® 9.1.3 to SAS® 9.2. you can do one of the following:

- Promote -- install SAS 9.2 and upgrade **portions** of your current SAS content.

- Migrate -- install SAS 9.2 and upgrade **all** your current SAS content and your SAS environment configuration.

- Use a combination of migration and promotion.

Promotion is the movement of *selected content* from a source system to an already configured target system. Promotion is also sometimes called "partial promotion." Promotion can be performed repeatedly.

Migration is a process in which your SAS content and configuration from an earlier SAS release is upgraded to run in a later SAS release. All your SAS 9.1.3 content and configuration is migrated to SAS 9.2 at the same time. Migration is performed *one time only* to upgrade your system to a new release.

Migration and promotion are not mutually exclusive. You might choose to migrate to a 9.2 deployment and run it in parallel with 9.1.3 and periodically refresh the 9.2 content through partial promotion. This enables you to continue to use SAS 9.1.3 in production while you validate your migrated SAS content and become familiar with the new features of SAS 9.2.

This chart classifies the migration and promotion choices you have in SAS 9.1.3 and SAS 9.2.

Moving cube metadata	Migration	Promotion
From SAS® 9.1.3 to 9.1.3	X	Export Cube and Import Cube wizards in OLAP Cube Studio 9.1 Export PROC OLAP code
From SAS® 9.1.3 to SAS® 9.2 M1 (first maintenance)	SAS Migration Utility	Export PROC OLAP code
From SAS® 9.1.3 to SAS® 9.2 M2 (second maintenance)	SAS Migration Utility	Export Cubes and Import Cubes batch tools Export PROC OLAP code
From SAS® 9.2 to 9.2	X	Export SAS Package and Import SAS Package wizards Export PROC OLAP code

Table 3. Tools to Use for Migration and Promotion

EXAMPLE CUBE

For the examples in this paper the ORION STAR cube will be used for illustration. The following diagram shows the dimensional data model for this cube.
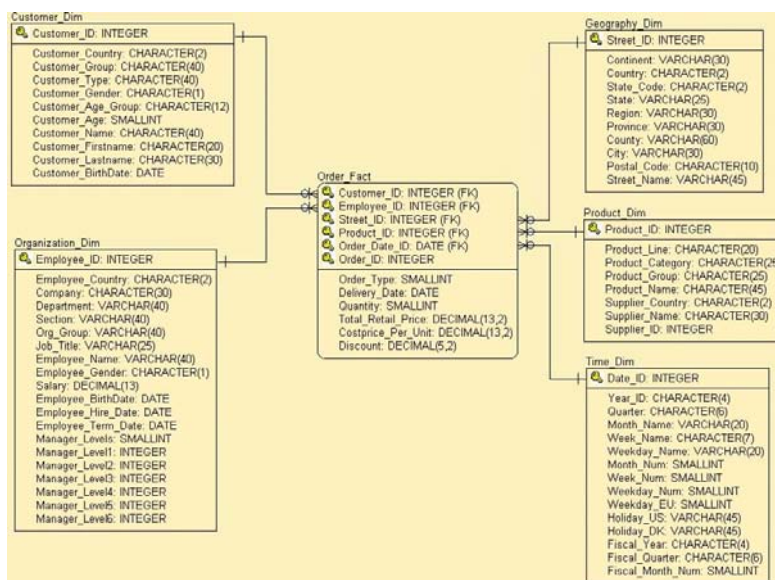

Figure 4. Orion Star Cube Dimensional Data Model

Regardless of the method you use to migrate or deploy your cubes, an understanding of your cubes' dependencies and associations is required.

These are the possible dependencies for a cube:

- Detail table.

- Aggregation tables.

- Summary table.

- Fact table and Dimension tables.

- Drill-Through tables.

- OLAP schema.

- Metadata identities including Users and Groups.

- For each table dependency, the table's library and the library's SAS Application Server.

The fact and dimension tables used by the Orion Star cube are Order_Fact, Customer_Dim, Geography_Dim, Product_Dim, Time_Dim, and Organization_Dim. These tables are in the ORION SAS library. The ORION STAR cube also depends on the SALES OLAP schema.

Before migrating or promoting Orion Cube it is important to understand that it has dependencies on the SALES OLAP Schema, all of its tables, and the tables' columns. In addition, the tables themselves are dependent on their SAS library, and the library can be associated to a SAS application server. When a cube is promoted from one environment to another, these dependent objects must either exist in your target environment prior to the addition of the cube so that the cube can find, re-connect to, and use these objects, or the tables must be in the same package as the cube so that they are transported together.

In SAS 9.1.3, you can use OLAP Cube Studio 9.1 and select a cube and choose the action "save PROC OLAP code". This will allow you to save a file that contains the PROC OLAP statements to create your cube. You can reference this code to review which tables are used.

USER PRIVILEGE AND PERMISSION CONSIDERATIONS

It is recommended that the user identity performing the promotion have full SAS metadata administration of all metadata objects in the server. This is because other users might have restrictions on parts of the cube that could result in a partial cube being exported and imported. It is also important that the identities, groups, and permissions for the imported data be set to correspond to the target environment security settings.

MOVING CUBES FROM SAS 9.1.3 TO 9.1.3

In SAS 9.1.3 there were two ways to create cube metadata in a new environment: the Export Cube and Import Cube wizards and the OLAP procedure.

EXPORT CUBE AND IMPORT CUBE WIZARDS

The SAS OLAP Cube Studio Export Cube and Import Cube wizards enable you to copy cube metadata from a source repository to a target repository, and if needed, to another server.

The Export Cube function extracts a cube's metadata from the source repository and saves it in an XML file that is specified by the user. All information about a cube, including its dimensions, hierarchies, levels, measures, notes, properties, calculated measures, aggregations, and security settings, will be extracted.

The Import Cube wizard then enables you to save the cube metadata to another metadata repository on another metadata server. The following metadata connection points must exist on the target system:

- The OLAP schema for the cube.

- All of the tables (input, dimension, drill-through, and aggregation) and columns that are associated with the cube. The table in the target repository must have the same Library name as the table that is located where the cube was exported from.

- Any UniqueKey, ForeignKey, and KeyAssociation objects required by star schemas.

- The identities, groups, and permissions for the security settings.

When you import your cube, all the physical directories that are part of your cube's definition, such as the cube's path, can be modified to reflect your target system.

All the access control entries (ACLs) that you defined on your cube in its source environment are exported to the XML file along with the cube metadata. So when you import, these ACLs will be associated to the users and groups in your target system.

CREATE CUBE METADATA BY EXPORTING AND RUNNING PROC OLAP CODE

The OLAP procedure is used to create, update, and delete cubes. It provides statements that enable you to add dimensions, levels, hierarchies, measures and aggregations to a cube as it is being created. These statements, when combined with the PROC OLAP statement and METASVR statement, are often referred to as the long form of PROC OLAP. The long form of PROC OLAP can be used to create a metadata definition for a cube in the SAS metadata. When submitted, the long form of the procedure first creates the metadata definition of the cube in the SAS metadata and then creates the physical files for the cube.

In your source environment you can use SAS OLAP Cube Studio to create the long for of PROC OLAP for each of your cubes. This is done by selecting a cube and then selecting the 'Save PROC OLAP code' action.

 NOTE: It is important to note that when you use this method to create your cubes on your target system, the access control entries that defined your security for the cube in your source environment *are not maintained*. So use this method only if you are prepared to redefine your cube's security.

CUBES NOT SUPPORED IN EXPORT SAS PACKAGE AND IMPORT SAS PACKAGE WIZARDS

In SAS 9.1.3, cubes are *not* supported by the Export SAS Package and Import SAS Package wizards in SAS Management Console. Only the following types of objects can be exported: data explorations, deployed jobs, documents, external files, folders, generated transformations, information maps, jobs, jobs flows, libraries, mining results, notes, reports, stored processes, and tables. (In SAS 9.2, a larger number of object types can be imported and exported.)

NEW CONCEPTS IN SAS 9.2

In order to understand what happens during migration or promotion to SAS 9.2 you need to be familiar with some new concepts in the SAS BI Platform in 9.2.

SAS FOLDERS

One of the new features in SAS 9.2 is the support for the SAS Folders tree in metadata. Folders give you the ability to organize your BI objects according to your business and system requirements. All BI metadata objects, including cubes, must now be stored in a SAS folder. During migration or promotion from SAS 9.1.3 to SAS 9.2 your cubes will be placed into a folder by default. The default folder name is the name of the OLAP schema of the cube and will be under the \Shared Data top-level folder. For example, the Orion Cube will be in the `\Shared Data\SALES –` `OLAP Schema` folder. (If your cube was already in a folder in the Custom Tree view of SAS Data Integration Studio 9.1 then your cube will remain in this folder.)

When you use SAS OLAP Cube Studio 4.2 you can navigate to your metadata objects by using the Folders view, which displays the SAS Folders tree, or by using the Inventory view, which displays objects grouped by their type.
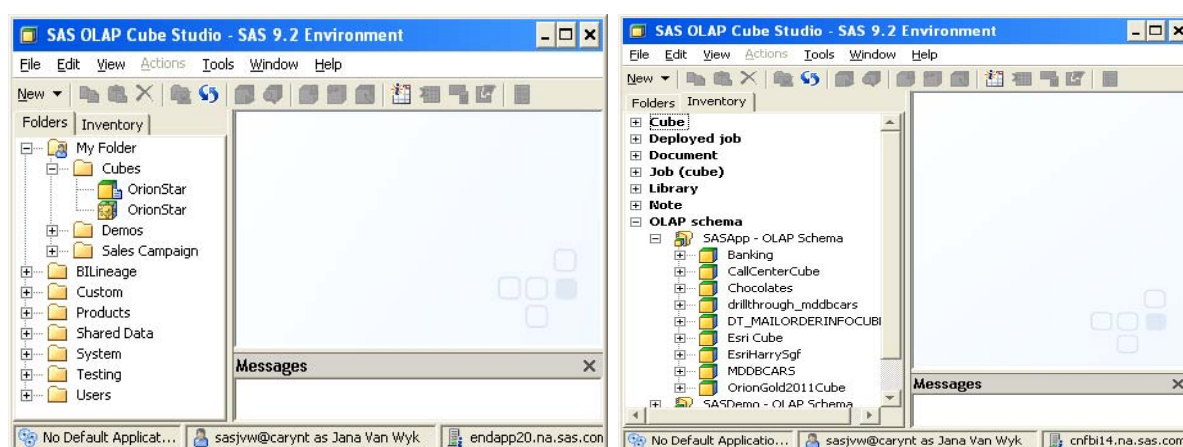

Figure 5: The Folders View and the Inventory View in SAS OLAP Cube Studio 4.2

CUBE JOBS

Another new concept in SAS 9.2 is the Cube Job metadata object associated to a Cube object. When you create a cube definition in SAS OLAP Cube Studio, a cube job is automatically created for that cube. A job is a collection of SAS tasks that create output. After creation, the cube job and the cube have the same name. It is recommended that cubes and their jobs be stored in the same SAS folder.

THE ESSENTIAL STEPS: PLAN, IMPLEMENT, AND VALIDATE

Even though there are three specific, technical methods to implement your migration or promotion, these steps are common to each process.

STEP 1: PLAN

As part of your planning, research your choices by using this paper and the information in the references section and pick a strategy.   Also, research your cubes' dependencies on other metadata objects.

FINDING YOUR OLAP CUBE DEPENDENCIES

Ideally, you have documentation for your cube's dependencies that was created when the cube was designed. However, if you need to research the tables used by your cube you can use the following techniques.

In SAS 9.2, there are five methods you can use to find your cube's dependencies. First, as in SAS 9.1.3, OLAP Cube Studio 4.2 or SAS® Data Integration Studio can be used to export PROC OLAP code by using the "`Export Code…`" command and selecting the "`Long form:`" option. Secondly, you can use the "`Properties`" command to view the cube properties, including the tables used by the cube. Third, using SAS® Management Console, OLAP Cube

Studio, or SAS Data Integration Studio, you can bring up the Export SAS Package wizard after selecting a cube. Next, navigate to the Select Object to Export window, select the cube, and select the Dependencies tab. This will display all the objects that this cube depends on.
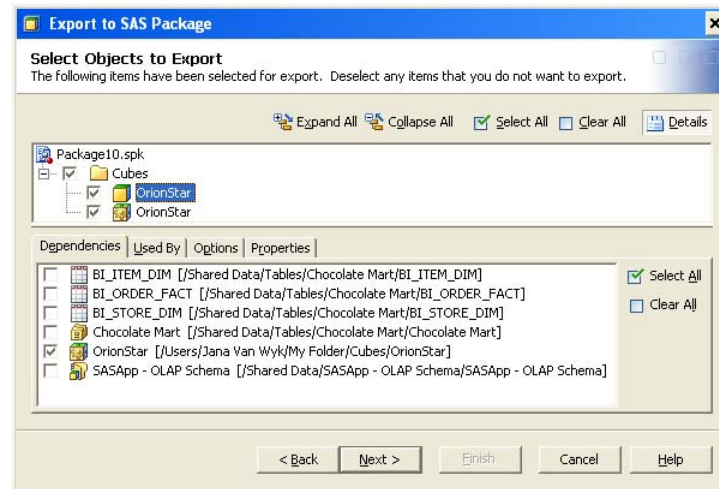

Figure 6. Export SAS Package Wizard

A fourth method to find the tables that your cube depends on is to select the cube in SAS OLAP Cube Studio and select the "`Edit Cube Structure`" action to bring up the Cube Designer wizard. If you navigate to the Input Table, Dimension Tables, and Drill Through Table windows you can select the table specified and display the properties for that table.
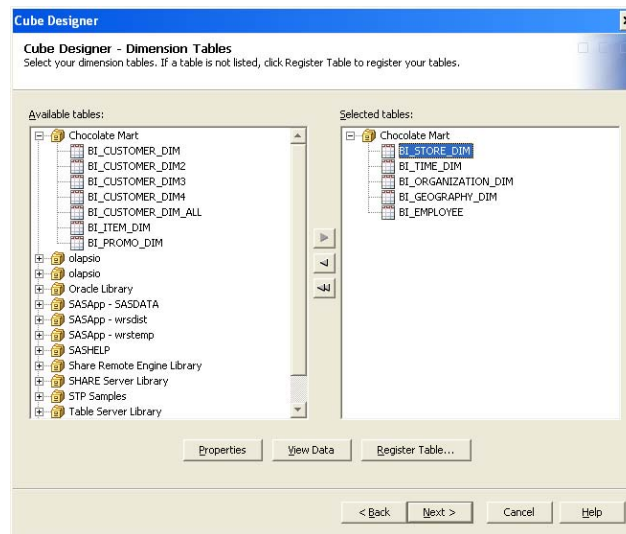

Figure 7. Cube Designer and Dimension Tables

And, finally, in SAS OLAP Cube Studio and SAS Data Integration Studio you can execute an "`Impact Analysis`" on a cube and examine the Reverse Impact Analysis graph to display the tables used by your cube.
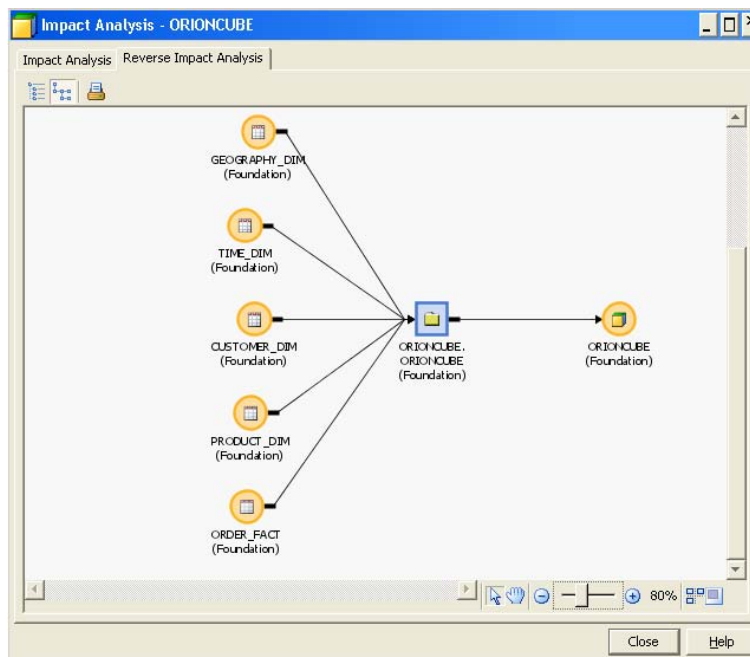
Figure 8. Impact Analysis on Orion Star

STEP 2: IMPLEMENT

After your planning is complete, the next step is to implement your chosen plan. You will need to prepare the physical directories on the target system where you will store your cube's physical data. If you are doing promotion, move or create your cube's dependencies on the target system first (or plan to include these dependencies in the same package as the cubes). Execute one of the three methods to move your cubes' metadata. (More details about these methods are in the next section.) Rebuild the cube's physical data or move the physical data from your source environment to your target machine.

MOVING OR BUILDING YOUR CUBE PHYSICAL DATA AT SAS 9.2

After moving your cube definition to SAS 9.2, you must build the cube's physical data. To build your cube data you have three options:

1. Use SAS OLAP Cube Studio 4.2 to build your cubes interactively by selecting the "`Build Physical Cube`" command
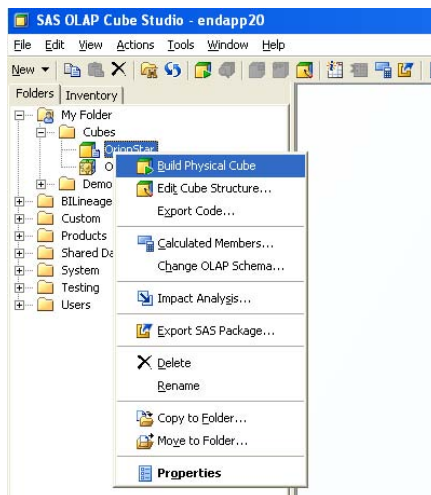

Figure 9: SAS OLAP Cube Studio – Build Physical Cube

8

2. Use SAS OLAP Cube Studio 4.2 to schedule your cube build job using the new scheduling feature found under the "`Scheduling`" command. You can deploy the cube job for scheduling and then use the Scheduling Manager in SAS Management Console Studio to create and schedule your Job Flow object.
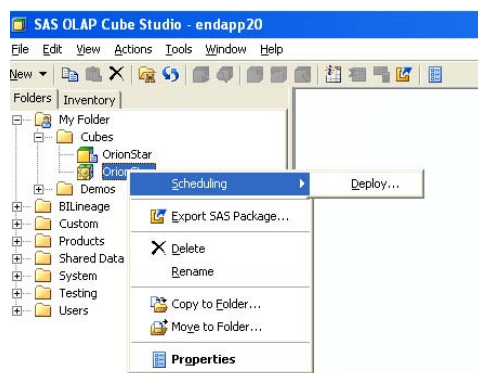

Figure 10: SAS OLAP Cube Studio - Scheduling

3. If you used the SAS Migration Utility and the SAS Deployment Wizard the SAS code needed to build your cubes is written to files in this directory:
`SASConfigurationDirectory\Levn\SASMain\OLAPServer\OLAP`. You can run these SAS files to recreate your cubes without having to specify a new SAS 9.2 path for your cubes.

4. You can also use SAS OLAP Cube Studio to export the long form of the OLAP procedure for each of your new cubes. You can then run this SAS code to create the physical data for your cube at SAS 9.2.

STEP 3: VALIDATE

Validate that your target environment is functioning with the new cubes by following this process:

- In SAS Management Console, ensure that all SAS OLAP Servers and OLAP schemas are available.

- In the Server Manager, validate the connections to the SAS OLAP Servers.

- Use the Cube Viewer in SAS OLAP Cube Studio to validate your cubes.

MOVING CUBES FROM SAS 9.1.3 TO 9.2

To implement the migration or promotion of your cubes from SAS 9.1.3 to SAS 9.2 the following strategies are available:

1. SAS Migration Utility.

2. Export Cubes and Import Cubes batch tools.

3. Export PROC OLAP code and run this code on your target system to create your cube.

SAS® 9.2 MIGRATION UTILITY

Migration of the SAS® 9.1.3 platform environment to SAS® 9.2 requires careful and deliberate planning. The SAS Migration Utility and SAS Deployment Wizard utilities cooperate and collaborate to analyze the existing SAS 9.1.3 enterprise business intelligence (BI) deployment, collect, validate and aggregate the customer SAS data and configuration, and redeploy SAS 9.1.3 content into the SAS 9.2 deployment.
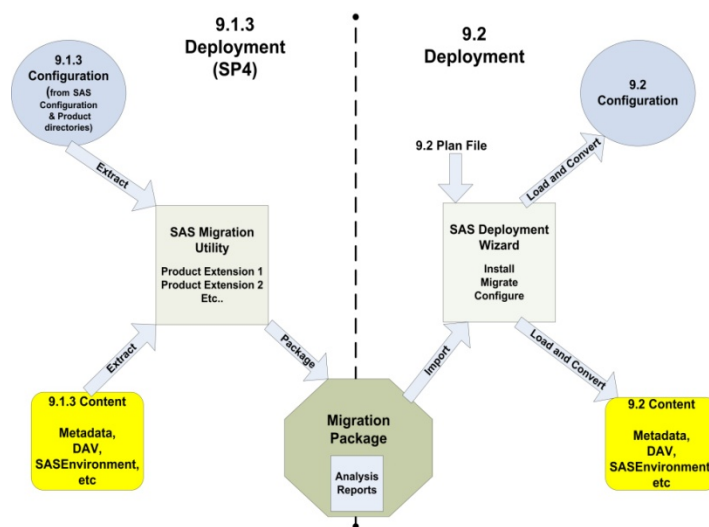
Figure 11. SAS Migration Utility

The SAS Migration Utility will create the migration package and an analysis report document to highlight any potential migration issues. The migration analysis report will identify the cubes that will need to be rebuilt at SAS 9.2. This migration package, created with the smu.sh script, will be imported during the installation phase using the SAS Deployment Wizard.

Using the SAS Migration Utility and SAS Deployment Wizard to migrate your cube metadata from 9.1.3 to SAS 9.2 manages the movement of your cubes' dependencies for you so that your cubes' associations to these objects are maintained. In the design phase of your migration, the migration analysis report will identify the SAS 9.1.3 cubes that will need to be rebuilt in order to run in SAS 9.2.

The SAS Migration Utility and SAS Deployment Wizard will **not** migrate the physical data for your tables. For details about how to migrate your table data, see SAS Intelligence Platform: 9.1.3 to 9.2 Migration Guide "Server Tier Post-migration Tasks". After the successful completion your full system migration of metadata and table data, you must build the SAS 9.2 version of your cubes' physical data.

 As part of the SAS Deployment Wizard migration of OLAP content to SAS 9.2, SAS code files are created that you can run to create your cubes in the new environment. The deployment wizard writes these files to the *SAS-configuration-directory*\`Levn`\`SASMain\OLAPServer\OLAP` directory. You can run these SAS files to recreate your cubes without having to specify a new SAS 9.2 path for your cube repository.

USING THE EXPORT CUBES AND IMPORT CUBES BATCH TOOLS TO MOVE YOUR OLAP CUBES FROM 9.1.3 TO 9.2

Starting with the second SAS 9.2 maintenance release, partial promotion of OLAP cube metadata is supported. To use this partial promotion feature you must have SAS 9.2, second maintenance release, and, in addition, you will need the SAS OLAP Cube Studio 9.1.3 Export Cubes batch utility to export all OLAP cubes. The tool is available with hot fix #36716 for SAS 9.1.3, service pack 4.

USING EXPORT CUBES BATCH TOOL IN SAS 9.1.3

The Export Cubes batch tool is a command-line tool that enables you to export SAS 9.1.3 OLAP cube metadata. This tool exports the metadata for your cubes into individual XML files that are stored in a designated directory. The Export Cubes batch tool exports all cubes on the metadata server. It is available for use on Windows and is executed from a DOS command line.

When exporting cubes, you designate the output directory that you want to store the XML files to and whether you want to generate a log file of the export process. You can also designate whether security should be exported with the cube metadata or not. When you export cube metadata, the name of the XML file is generated from a combination of the name of the cube's OLAP schema (if there is one) and the name of the cube. If the OLAP schema or cube name contains characters that are not allowed for a filename on that particular operating system, then those characters are changed according to the native Java interface for that operating system.

When you export your cube metadata, the output directory is populated with an XML file for each extracted cube. All cubes in the Foundation and Custom repositories are exported. However, cubes in Project repositories are not exported and are ignored. A log file of the export execution is created in the output directory.

When you export your cube metadata you can specify these options:

• Connection information to your server.

• The output directory for the .xml files.

• Whether you want security metadata extracted along with the cube metadata.

The following is an example of using the Export Cubes command:

```
ExportCubes –user "x2345\xxx" –password "Passwordxxx" –host "X2345.xy.abc.com"
–port 8561 –extractSecurity –outputDirectory c:\myextractedcubes
```

USING IMPORT CUBES BATCH TOOL IN SAS 9.2

In SAS 9.2 M2, the Import Cubes batch tool can be used to selectively import the exported SAS 9.1.3 cubes.

The Import Cubes batch tool is a command-line tool that enables you to import SAS 9.1.3 OLAP cube metadata files that have been exported using the Export Cubes batch tool on your SAS 9.1.3 SP4 environment. The metadata for a cube is exported as an XML file. With the Import Cubes batch tool you can specify the location of multiple exported SAS 9.1.3 XML files and import them to your SAS 9.2 OLAP environment. The SAS 9.1.3 SP4 cube metadata is imported and added to the SAS 9.2 Metadata Server. In addition, you can specify that a log file of the import execution be created. After the metadata files are imported, you can then rebuild your SAS 9.1.3 SP4 cubes on your SAS 9.2 system. You can use SAS OLAP Cube Studio to build the physical data for the cubes.

The Import Cubes batch tool is included with the standard SAS OLAP installation and is available for use on Windows. When you execute the Import Cubes command from the DOS command line, all the cube XML extract files in the specified directory are imported. The cubes are imported into the repository from which they were exported. If that repository does not exist on the target metadata server, then the cubes are imported into the Foundation repository and this is noted in the log.

If needed, you can substitute file paths during the import of your cube metadata. To substitute file paths during the import, each XML file where you want to substitute file paths must be edited. To change file paths for a cube, you must edit the Substitutions section of the XML file. Specifically, you must change the string following the tag "DefaultValue=" to the directory path that you want. Do this for each XML file that you want to change, and then run the Import Cubes batch tool. The following example shows the Substitutions section of an XML file.

```
<Substitutions>
<Property Id="A5G2Y32Q.AI000EOC" TLObjN="1" Name="INDEXPATH"
defaultValue="c:\indexAggregationA"/>
<Property Id="A5G2Y32Q.AI000EOD" TLObjN="1" Name="DATAPATH"
DefaultValue="c:\partitionsAggregationA"/>
<Directory Id="A5G2Y32Q.B00000RU" TLObjN="1" Name="c:\v9cubes"
DirectoryName="c:\v9cubes"/>
<Property Id="A5G2Y32Q.AI000EO9" TLObjN="1" Name="WORKPATH"
DefaultValue="c:\v9cubes"/>
</Substitutions>
```

For each cube, the connection points that the Import Cubes batch tool expects to find must exist in the target repository. If a table, column, or OLAP schema connection cannot be found in the target metadata server, the import of the cube fails and an error message is written to the Import Cubes log file. For the OLAP schema connection of a cube, if the OLAP schema does not exist on the target metadata server, then the cube is imported and not associated with any OLAP schema.

In SAS 9.1.3, specifying a metadata folder for your cube was optional and only available in SAS Data Integration Studio client. If your cube was not associated to a folder in SAS 9.1.3, then it will be imported and associated to a folder in \Shared Data where the folder is the name of the OLAP schema. For example, the cube Orion Cube would be placed in the `\Shared Data\SALES – OLAP Schema` folder.

When you execute the Import Cubes tool you can specify options for the following:

- Connection information for your server.

- The directory where the log file will be created.

- The directory that contains the XML files with your 9.1.3 cube metadata.

The following is an example of using the ExportCubes command:

```
ImportCubes  -user "xxxx" -password "Passwordxxx" -server "X7891.xy.abc.com"
-port 8561  -input c:\myextractedcubes
```

MOVING CUBES FROM SAS 9.2 TO ANOTHER SAS 9.2 ENVIRONMENT

If you need to move your cubes from one SAS 9.2 environment to another SAS 9.2 environment, the following methods are supported:

1. Export SAS Package and Import SAS Package wizards.

2. Export PROC OLAP code and run this code on your target system to create your cube.

USING THE EXPORT SAS PACKAGE AND IMPORT SAS PACKAGE WIZARDS TO MOVE YOUR OLAP CUBES FROM SAS 9.2 TO ANOTHER SAS 9.2 ENVIRONMENT
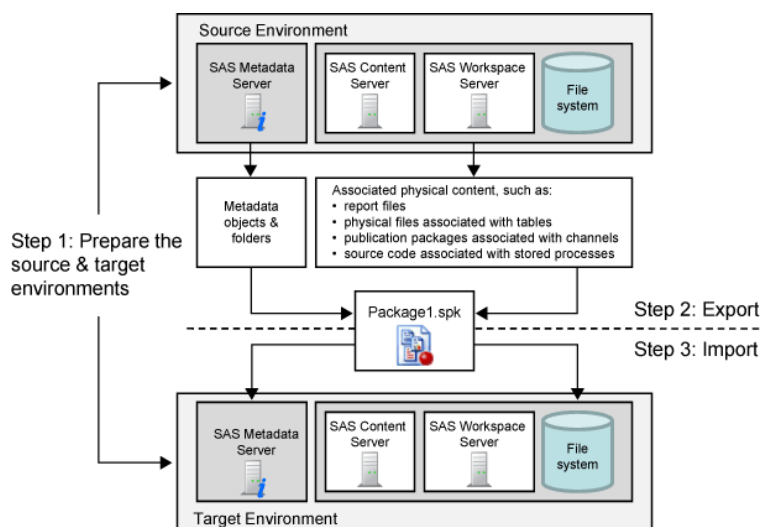

Figure 12. Export and Import SAS Package Wizard

OLAP cube metadata is fully integrated with the Export SAS Package and Import SAS Package facility in SAS 9.2. This is a very powerful and flexible way to selectively export and then import a wide variety of metadata in SAS 9.2. To move a cube you can use the Export SAS Package to create the package file of your exported objects. On your target system, you import these objects using the Import SAS Package wizard. After the import is complete you can either move your physical cube data using standard operating system functions, or you can rebuild the cube data.

In the following figure, two cubes and their tables are being exported together. Note that a cube object and its job object must be exported together or the export will fail.
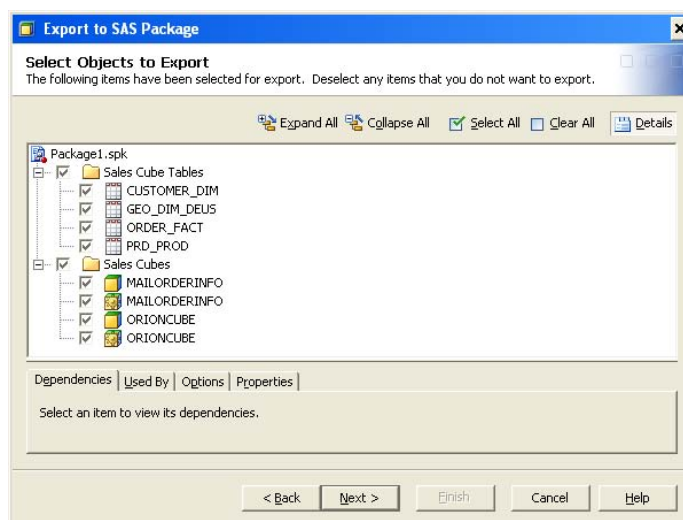
Figure 13. Export SAS Package Wizard

Then on the target system, the Import SAS Package wizard can be used with the exported package to import the tables and cubes. The cube and its job must be imported together.
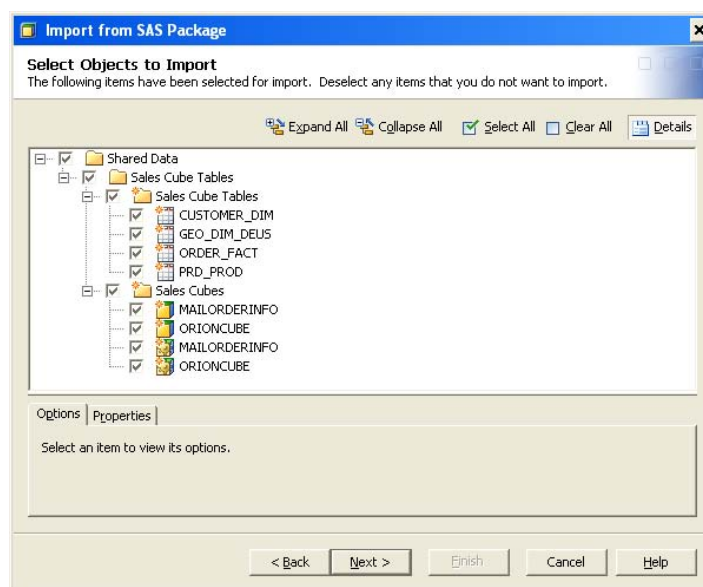

Figure 14. Import SAS Package Wizard

As you are importing the cubes, you can specify the cube's connections to other objects that already exist in your target system. Depending on what you import with the cube, this can include the following objects:

- OLAP schema.

- Tables (These include fact tables, dimension tables, drill-through tables, or aggregation tables).

- Libraries.

- SAS Application Server.

- Directory paths (These include the cube path and, optionally, data, index paths, and library path).

The metadata for your cubes is promoted with these wizards but the associated data content is not promoted. After your cube metadata is promoted, you can either move the associated cube physical files to your target environment or rebuild your cubes on your target system.

CREATE CUBE METADATA BY EXPORTING AND RUNNING PROC OLAP CODE

In SAS 9.2, just as in SAS 9.1.3, you can use SAS OLAP Cube Studio to export the OLAP procedure code that can be used to define your cube metadata and your cube data in a different environment.

Export the SAS files from your source environment, modify the SAS code to reflect the settings in your target environment, and execute the SAS jobs. Your cube metadata and data will be created in the target system.

PLANNING YOUR STRATEGY

The following table can be used to help decide the specific strategy you want to use for your migration or promotion.

Your Goals	Method to Use to Move Cubes
If you are migrating your entire BI solution from SAS 9.1.3 to SAS 9.2	SAS Migration Utility and SAS Deployment Wizard
Selectively move specific cubes from SAS 9.1.3 to SAS 9.2, with or without security metadata included	Export Cubes and Import Cubes batch command line tools
Move specific cubes and their tables from SAS 9.2 to another SAS 9.2 environment, with or without security metadata included	SAS Export Package and SAS Import Package wizards
Define cube metadata and build cube data in a target SAS 9.1.3 or SAS 9.2 environment, without security metadata	Export PROC OLAP code in SAS OLAP Cube Studio

Table 15. Strategies for Moving Your Cubes

CONCLUSION

In SAS 9.2 your choices for moving your OLAP cube metadata have increased in number. The information in this paper will help you navigate and understand the choices you have, and help you select the method that matches your project requirements.   In addition, a better understanding of your strategy will help you plan and succeed in migrating and promoting your cube metadata and data from one metadata environment to another.

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APPENDIX 1: PROMOTING SAS® OLAP CUBES FROM SAS® 9.1.3 TO SAS 9.2 IF THE SECOND 9.2 MAINTENANCE RELEASE IS NOT INSTALLED

If you do not have the second SAS 9.2 maintenance release installed, then you must use the following process to promote SAS OLAP Cubes from SAS 9.1.3 to SAS 9.2.

1. Export the cube-related metadata from the SAS 9.1.3 metadata server by creating two separate packages, as follows:

    a. First, export the relational objects (including libraries, tables, information maps, reports, and stored processes) that are associated with your cubes. Use BI Manager in SAS Management Console 9.1.3 to export these objects to a package called RelationalObjects.spk.

    > When you select the tables, you can choose to include or exclude the associated physical data for the input tables. If you exclude the physical data, you will need to move it in a separate step. You might want to exclude the physical data from the package in the following situations:
    >
    > - The target metadata server has a different operating system environment than the source metadata server.
    >
    > - The tables contain non-English data.

    b. Next, export your OLAP objects (including information maps, reports, and data explorations). Use BI Manager in SAS Management Console 9.1.3 to export these objects to a package called OLAPObjects.spk

2. If you did not include physical table data in the first package that you created (RelationalObjects.spk), use the CPORT and CIMPORT procedures to move the data to the SAS 9.2 environment. For instructions, see the Base SAS Procedures Guide.

3. In SAS OLAP Cube Studio 9.1, use the Save PROC OLAP Code function to export your PROC OLAP code. For instructions, see the SAS OLAP Cube Studio Help.

4. Update the exported PROC OLAP code to incorporate changes that are needed for the SAS 9.2 environment. You might need to change metadata server connection information, OLAP schema names, physical paths to cube file storage, and temporary work locations.

5. Perform the following steps on the SAS 9.2 system:

    a. Import the package that contains your SAS 9.1.3 relational objects (RelationalObjects.spk). This is the package that you created in step 1.a. To perform the import, you can use the Import SAS Package wizard in SAS Management Console 9.2, SAS Data Integration Studio 4.2, or SAS OLAP Cube Studio 4.2.

    b. Execute the PROC OLAP code that you updated in step 4. The code accesses the metadata that you imported in step 5.a and builds your SAS 9.2 cubes.

    c. Apply the appropriate permissions to your OLAP-based objects (including information maps, reports, and cubes). This step ensures that your reports and data explorations can access the OLAP cube data.

    d. Import the package that contains your SAS 9.1.3 OLAP objects (OLAPObjects.spk). This is the package that you created in step 1.b. To perform the import, you can use the Import SAS Package wizard in SAS Management Console 9.2, SAS Data Integration Studio 4.2, or SAS OLAP Cube Studio 4.2.

    e. Validate your OLAP cube content by running OLAP reports and data explorations

APPENDIX 2: SUMMARY TABLE

Moving cubes from the source environment (below) to the target environment (at right)	9.1.3 SP4	9.2
9.1.3 SP4	Export Cube Wizard PROC OLAP long form .sas files	SAS Migration Utility (Full system migration) Export Cube and Import Cube batch tools PROC OLAP long form .sas files
9.2	N/A	Import SAS Package and Export SAS Package PROC OLAP long form .sas files

Table 16. Summary

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