CONVERTING SAS® DATA LIBRARIES UNDER MVS FROM A VERSION 5 TO A VERSION 6 FORMAT: WHEN AND HOW
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ABSTRACT

The advantages and disadvantages of converting Version 5 SAS data libraries to Version 6 format are discussed under a variety of operational circumstances. Tools for converting the different file types are presented with appropriate examples illustrating mechanisms and ease of use. Conversion strategies are discussed with an emphasis on tailoring these strategies to your particular site requirements.

DECIDING TO CONVERT

Depending upon the requirements of your application, conversion of the files within your Version 5 SAS data library may be required, impractical, or optional.

Conversion May Be Required

Conversion is required for some file types. A Version 5 SAS data library may contain five different types of files:

- SAS data set
- SAS/AF® and SAS/FSP® catalog
- SAS/GRAPH® catalog
- SAS/IML® work space
- SAS/ETS® model

Of these five types of files, only SAS data sets are directly accessible under Version 6 of the SAS System. All other types of files have to be converted to Version 6 format before they can be used.

Conversion May Be Impractical

Two features of Version 5 SAS data sets are not supported in Release 6.06, namely maintenance of history records and support for passwords. If you rely on either of these unsupported features, it may not be feasible for you to convert your Version 5 SAS data sets without compromising the integrity of your applications.

In Version 5 you could use the GEN = SAS system option to specify the number of generations of history records to save for each SAS data set. The default value for GEN = was 5. The CONTENTS procedure printed the saved generations of historical information for each data set. In Release 6.06 the GEN = system option is ignored and no history records are maintained. If you rely on the history records in Version 5 to provide an audit trail, then it may not be practical for you to convert your Version 5 SAS data sets to Version 6 format since that information is not maintained under Release 6.06.

Full password support is not provided in Release 6.06 of the SAS System. There is no support at all for passwords for Version 6 SAS data sets, and support is limited for passwords for Version 5 SAS data sets. You can use passwords in connection with Version 5 SAS data sets wherever you can specify the password as a data set option. This means that you can create password-protected data sets in a DATA step and read them in a PROC step. You cannot, however, modify passwords with PROC DATASETS or copy them with PROC COPY. If you rely on SAS password protection for the security of your data, you are advised to keep your data in Version 5 SAS data sets.

It may also prove impractical to convert your Version 5 SAS data sets in another situation. This occurs when you have a Version 5 application and a Version 6 application that reference the same data. If you want to maintain a single copy of the data, it must reside in a Version 5 SAS data set since Version 5 of the SAS System cannot access Version 6 SAS data sets.

Conversion May Be Optional

Conversion is an option for you if you have SAS data sets that don’t require the features that are unsupported in Release 6.06. Before you convert, you must consider the advantages of not converting and weigh them against the benefits of conversion.

NO CHANGES REQUIRED FOR SAS DATA SETS

There are a number of reasons why you might choose not to convert Version 5 SAS data sets. The most important of these is that you don’t have to convert your Version 5 SAS data sets to use them under Version 6. You can continue to run your SAS programs that access Version 5 SAS data sets under Release 6.06 of the SAS System. No changes to the SAS program or control language are required. If you allocated your SAS data library externally with an ICL DD statement or a TSO ALLOCATE command, you can continue to do that. If you used a LIBNAME statement, you can do that.

Version 5 SAS data sets can not only be read under Version 6, they can also be written and updated. This access is made possible by the Version 5 compatibility engine, also known as the V5 engine. Under Version 6, each SAS data library has an engine assigned to it. You can assign the engine yourself by specifying it on the LIBNAME statement, or you can let the SAS System assign it for you when the library is first referenced. The SAS System assigns the V5 engine automatically to existing Version 5 SAS data libraries.
NEW FUNCTIONALITY

The second major reason why you might decide not to convert your Version 5 SAS data sets right away is that you can take advantage of a lot of the new functionality available with Release 6.06 of the SAS System in accessing Version 5 SAS data sets. Included in this new functionality is the ability to:

• create new SAS data libraries easily
• manage Version 5 SAS data libraries with windows
• use the WHERE statement to subset data in a Version 5 SAS data set
• use PROC SQL to create a view to extract data from a Version 5 SAS data set
• use PROC FSVIEW and PROC FSEDIT to inspect or modify data in a Version 5 SAS data set
• use Screen Control Language in SAS/AF and SAS/FSP to access data in a Version 5 SAS data set.

Creating New Version 5 SAS Data Libraries

To create a new Version 5 SAS data library, you issue a LIBNAME statement, specifying the V5 engine, as follows:

```
libname newlib v5 'user.new.v5lib'
```

If you don't specify them, the SAS System uses default values for space allocation.

Using Windows to Manage Version 5 SAS Data Libraries

You can use the LIBNAME, DIR, and VAR windows to manage not only your Version 6 SAS data libraries, but also your Version 5 SAS data libraries. The LIBNAME window displays the libref and engine associated with each SAS data library you have assigned. You can use this window to determine the format of a SAS data library. If the engine is V5, it is a Version 5 SAS data library. If the engine is V606, it is a Version 6 SAS data library. There is a menu selection field preceding each libref. If you enter an S or an X in this field, the DIR window for that libref is displayed. You can also get to the DIR window directly by entering DIR libref on the command line.

By default, the DIR window shows the names and member types of all SAS files within the SAS data library. You can restrict the display to SAS files of a certain type by entering the memtype in the "Type" field. For a Version 5 SAS data library, for example, you could enter CAT, DATA, GCAT, IMLWK, or MODEL. Within the DIR window you can select any of a number of different functions:

• Select the VAR window for a SAS data set.
• Browse the observations in a SAS data set.
• Rename a member.
• Delete a member.

The Select and Browse functions are only available for members of memtype DATA, but Rename and Delete are available for all memtypes.

With the VAR window you can list the variables in a Version 5 SAS data set, rename them, modify the formats and informats associated with them, and change their descriptive labels.

Using the WHERE Statement to Subset Version 5 SAS Data Sets

You can use a WHERE statement with any SAS procedure that reads a SAS data set, even if it is a Version 5 SAS data set that is being read. This means that you can use a WHERE statement to subset observations from a Version 5 SAS data set, as in the following example:

```
libname vshort 'user.hort.sasdata';
title "Tall Annuals for Shade";
proc print data=vshort.flowers;
where height > 30 and type = 'A' and cond contains 'SHADE';
run;
```

The WHERE statement allows you to process a subset of the observations in a SAS data set without having to incur the overhead of creating a new SAS data set to do so.

Using VIEWS to Access Version 5 SAS Data Sets

If there is certain information from a Version 5 SAS data set that you need regularly, you can use PROC SQL to create a VIEW to extract the information from the Version 5 SAS data set. You must store the VIEW in a Version 6 SAS data library, but you can use it to access a Version 5 SAS data set. Consider the following SAS program to create a view:

```
libname vshort 'user.hort.sasdata';
libname v6data 'user.demo.sasdata';
proc sql;
    create view v6data.tallann as
        select * from vshort.flowers
        where height > 30 and type = 'A';
    quit;
run;
```

After the view has been created, you reference the view just as you would a SAS data set. In the following example, you supply the name of the view in the DATA= operand of the PROC PRINT statement. The data printed are those observations in the VSHORT.FLOWERS data set that satisfy the selection criteria in the view V6DATA.TALLANN at the time the PRINT procedure is executed.
libname v5hort 'user.hort.sasdata';
libname v6data 'user.demo.sasdata';

title "Tall Annuals";
proc print data=v6data.tallann;
run;

Access from PROC FSEDIT and PROC FSVIEW

A Version 5 SAS data set can be accessed using the FSEDIT and FSVIEW procedures in SAS/FSP. Although the data to be accessed by PROC FSEDIT can reside in a Version 5 SAS data set, the screen must reside in a catalog in a Version 6 SAS data library, as in the following example:

libname v5hort 'user.hort.sasdata';
libname v6data 'user.demo.sasdata';

proc fsedit data=v5hort.bulbs screen=v6data.screen;
run;

You can use the FSVIEW procedure to display observations of a Version 5 SAS data set in tabular format. You can define a formula to be used in conjunction with your Version 5 SAS data set. With a formula you can

• customize the size, position, and colors of the FSVIEW window
• identify which variables are displayed and in what order
• specify the formulas for any computed variables.

The formula entry must be stored in a SAS catalog in a Version 6 SAS data library, but it can be applied to either a Version 5 or a Version 6 SAS data set. In the following example, a formula is used in conjunction with a Version 5 SAS data set:

libname v5hort 'user.hort.sasdata';
libname v6data 'user.demo.sasdata';

proc fsviw data=v5hort.bulbs
   formula=v6data.hort.bulbs.formula;
run;

Access from Screen Control Language

Screen Control Language (SCL) is a programming language that provides functions and routines to manipulate data and control windows in SAS/AF and SAS/FSP applications. Some of the functions provided are used to access SAS data sets, including Version 5 SAS data sets. Data access functions are grouped into four general categories:

• data set functions
• selection list functions
• variable functions
• observation functions.

You can use functions in all of these groups to access Version 5 SAS data sets.

ADVANTAGES OF CONVERTING

Although a high degree of newly developed functionality is available to those accessing Version 5 SAS data libraries under Release 6.06, there is even more functionality available to those accessing Version 6 SAS data libraries. Some of the enhancements are available on all host systems; others are available only on MVS.

Compression

Compression of observations is available on all host systems for SAS data sets in a Version 6 SAS data library. You can turn on compression by specifying COMPRESS=YES as either a SAS system option or a data set option. Depending upon the characteristics of your data, you can achieve considerable savings in disk storage space. Reductions in disk storage space from 5 to 1 have been reported for some SAS data sets with many character variables.

Indexing

Indexing of SAS data sets is one of the new features available on all host systems in Release 6.06 of the SAS System. Creating indexes for Version 6 SAS data sets provides fast access to a subset of the observations and allows data to be retrieved in order for BY-group processing without first using the SORT procedure.

New Data Library Architecture

The implementation of the Version 6 SAS data library on MVS features a new architecture that provides

• better DASD space utilization
• improved I/O performance
• optimization of directory operations
• multivolume support
• device independence
• simplified backup and recovery.

HOW TO CONVERT

Before you can begin the conversion process, you must decide what you are going to convert. In previous sections the criteria for deciding when to convert were discussed. In this section the methodology for conversion is addressed.

First, you must inspect the contents of your Version 5 SAS data library to see which member types are represented by getting a
directory listing of your Version 5 SAS data library. You do this by invoking the DIR window or running PROC CONTENTS or PROC DATASETS. Then you should review the special considerations for each member type to be converted. Next, perform the conversion. And, finally, review the results.

Conversion Tools

The primary tool for converting Version 5 SAS files to Version 6 format is the V5TOV6 procedure. With this procedure you can convert the following types of SAS files to their Version 6 equivalents:

- SAS data sets (MEMTYPE=DATA)
- SAS/AF and SAS/FSP catalogs (MEMTYPE=CAT)
- SAS/GRAPH graphics catalogs (MEMTYPE=GCAT)
- SAS/ETS models (MEMTYPE=MODEL)
- SAS/IML matrices and modules (MEMTYPE=IMLWK).

To convert SAS data sets, you can also use the COPY procedure or the DATA step.

You cannot use the VSTOV6 procedure to move files between different host operating systems. But you can use PROC CPOR T and PROC CIMPORT to move SAS catalogs and SAS data sets from a host operating system running Version 5 to another host operating system running Release 6.06. For more information about the CPOR T and CIMPORT procedures, see the SAS Procedures Guide, Version 6, Third Edition and SAS Technical Report P-195, Transporting SAS Files between Host Systems.

Using the VSTOV6 Procedure

You use the VSTOV6 procedure to convert a whole Version 5 SAS data library to Version 6 format, to convert all members of a selected memtype, or to convert selected members. To convert all members in the Version 5 SAS data library USER.MISC.SASDATA to the Version 6 SAS data library USER.TARGET.V6DATA, you can use PROC VSTOV6, as follows:

```sas
libname v5misc 'user.misc.sasdata';
libname v6data 'user.target.v6data';
proc vstov6 in=v5misc
   out=v6data;
run;
```

Alternatively, you can use PROC COPY to convert Version 5 SAS data sets to Version 6 format. You can convert all the SAS data sets in a Version 5 SAS data library, or you can convert just one, as shown in the following example:

```sas
libname v5hort 'user.hort.sasdata';
libname v6data 'user.target.v6data';
proc copy in=v5hort
   out=v6data;
   select bulbs;
run;
```

To convert only members of selected memtypes you can include the MT= option on the PROC VSTOV6 statement. For example, if you want to modify the previous example to convert only the SAS/AF and SAS/FSP catalogs and SAS/GRAPH graphics catalogs, you could use the following statements:

```sas
libname v5misc 'user.misc.sasdata';
libname v6data 'user.target.v6data';
proc vstov6 in=v5misc
   mt=(af, fsp)
   out=v6data;
run;
```

You can use a SELECT statement to convert selected members, a CAT SELECT statement to convert selected entries from a SAS/AF and SAS/FSP catalog, or a GCAT SELECT statement to convert selected entries from a SAS/GRAPH graphics catalog. To convert members SCREEN and TEST from the Version 5 SAS data library used in the previous example, you could issue the following set of statements:

```sas
libname v5misc 'user.misc.sasdata';
libname v6data 'user.target.v6data';
proc vstov6 in=v5misc
   mt=(cat, gcat)
   out=v6data;
   select screen test;
run;
```

Converting SAS Data Sets

As mentioned earlier, conversion of SAS data sets is optional. You do not have to convert your Version 5 SAS data sets to Version 6 format in order to access them under Release 6.06. If you do decide to convert them, there are three methods that you can use. With the VSTOV6 procedure you can convert one or more SAS data sets in a Version 5 SAS data library. To convert the single SAS data set BULBS in the Version 5 SAS data library USER.HORT.SASDATA to its equivalent in the Version 6 SAS data library USER.TARGET.V6DATA, you can use PROC VSTOV6, as follows:

```sas
libname v5hort 'user.hort.sasdata';
libname v6data 'user.target.v6data';
proc vstov6 in=v5hort
   mt=(cat, gcat)
   out=v6data;
   select bulbs;
run;
```

Alternatively, you can use PROC COPY to convert Version 5 SAS data sets to Version 6 format. You can convert all the SAS data sets in a Version 5 SAS data library, or you can convert just one, as shown in the following example:

```sas
libname v5hort 'user.hort.sasdata';
libname v6data 'user.target.v6data';
proc copy in=v5hort
   out=v6data;
   select bulbs;
run;
```

Finally, for a single SAS data set you can use a DATA step with a SET statement, as follows:

```sas
libname v5hort 'user.hort.sasdata';
libname v6data 'user.target.v6data';
data v6data.bulbs;
set v5hort.bulbs;
run;
```

The conversion of SAS data sets is reversible. You can use either PROC COPY or a DATA step to convert a Version 6 SAS data set into a Version 5 SAS data set. Note, however, that you cannot use the VSTOV6 procedure to return a Version 6 SAS data set to its Version 5 format.
Converting Password-protected SAS Data Sets

Version 5 SAS data sets that are password-protected pose a number of problems. First, you must decide whether you really want to convert data sets that are password-protected to Version 6 format. There is no password support in Release 6.06 for Version 6 SAS data sets, so any password-protected data sets that you do convert lose their password protection. There is limited password support in Release 6.06 for Version 5 SAS data sets, so if you depend upon the SAS passwords for security, you may prefer to access these data sets under Release 6.06 in their Version 5 format.

The other major difficulty with password-protected data sets is that you must supply the READ= password in order to convert them. There is no mechanism for you to supply the READ= password in PROC COPY in Release 6.06, but you can supply it in the DATA step and with the VSTOV6 procedure. To convert a password-protected data set in the DATA step you supply the password as a data set option on the SET statement, as shown in this example:

```sas
libname v5hort 'user.hort.sasdata';
libname v6data 'user.target.v6data';
data v6data.bulbs;
set v5hort.bulbs (read=rpwd);
run;
```

With the VSTOV6 procedure, you can specify the READ= password as an option on either the PROC VSTOV6 statement or the SELECT statement. You can supply the password on the SELECT statement by including it in parentheses immediately after the member name or after a slash at the end of the statement. The VSTOV6 procedure determines the password to be used as follows:

1. By the value of the READ= option in parentheses immediately following the member name, if present
2. Otherwise, by the value of the READ= option after the slash in the SELECT statement, if present
3. Otherwise by the value of the READ= option in the PROC VSTOV6 statement, if present.

In the following example, the password used for the data set VSHORT.ANNUALS is RPWD3; for VSHORT.BULBS it is RPWD2; and for VSHORT.PEREHN it is RPWD1.

```sas
libname v5hort 'user.hort.sasdata';
libname v6data 'user.target.v6data';
proc vstov6 in=v5hort out=v6data read=rpwd;
select annuals bulbs (read=rpwd2);
select perenn;
run;
```

Converting SAS/AF and SAS/FSP Catalogs

Before you can access SAS/AF and SAS/FSP catalogs residing in a Version 5 SAS data library in Release 6.06, you must convert them to their Version 6 equivalents. You accomplish this with the VSTOV6 procedure. You can convert all catalogs in a Version 5 SAS data library, selected catalogs, or selected entries or entrytypes within a catalog. For complete syntax of the VSTOV6 procedure refer to the SAS Procedures Guide.

You can convert all SAS/AF and SAS/FSP catalogs by including MT=CAT on the PROC VSTOV6 statement, as follows:

```sas
libname v5misc 'user.misc.sasdata';
libname v6data 'user.target.v6data';
proc vstov6 in=v5misc out=v6data mt=cat;
run;
```

Alternatively, you can select individual catalogs to convert with the SELECT statement or individual entries to convert with the CAT SELECT statement. The following example illustrates the selection of catalog V5MISC.SCREEN and entry V5MISC.TEST.APPL:

```sas
libname v5misc 'user.misc.sasdata';
libname v6data 'user.target.v6data';
proc vstov6 in=v5misc out=v6data;
select screen; cat select test.appl;
run;
```

All entry types can be converted except type FSCALC. The conversion is, however, not reversible. There is no tool to convert entries in Version 6 SAS catalogs to their Version 5 equivalents.

Because of differences in naming conventions between Version 5 and Version 6, some Version 5 names are not valid in Version 6. You are not able to select catalogs and entries directly using these names. You must use only the PROC VSTOV6 statement, or use wild-card characters in subordinate statements. Special characters in catalog and entry names in the Version 5 SAS data library are converted to underscores (_) in the Version 6 SAS data library. In the case of an entry name collision, the existing entry is replaced.

After the conversion, all PROGRAM entries must be compiled before they can be used. You can do this with the COMPILE statement in the BUILD procedure. All PROGRAM entries in catalog V6DATA.TEST are compiled when the following set of SAS statements is submitted:

```sas
libname v6data 'user.target.v6data';
proc build cat=v6data.test batch; compile;
run;
```

An autocall macro (%COMPSCL) is available to allow you to convert all PROGRAM entries in all catalogs in a Version 6 SAS data library. Before invoking the macro, you must allocate a temporary work file for it to use. Then you must supply the
In the following example all PROGRAM entries in all catalogs in the Version 6 SAS data library USER.TARGET.V6DATA are compiled:

```sas
filename util '&util';
libname v6data 'user.target.v6data';
Xcompscl(v6data, util);
```

There are a number of changes in PROGRAM entries between Version 5 and Version 6. For instance, ### macros are converted to entrytype AFMACRO. Entrytypes CBTGO, CBTSAVE, and TRANSAVE are changed to AFGO, AFCBT, and AFGO, respectively. For more details about other changes see SAS Technical Report P-195.

### Converting SAS/GRAFH Graphics Catalogs

Before you can access SAS/GRAFH catalogs residing in a Version 5 SAS data library in Release 6.06, you must convert them to their Version 6 equivalents. You accomplish this with the VSTOV6 procedure. You can convert all graphics catalogs in a Version 5 SAS data library, selected catalogs, or selected entries within a catalog. For complete syntax of the VSTOV6 procedure refer to the SAS Procedures Guide.

You can convert all SAS/GRAFH catalogs by including MT=GCAT on the PROC VSTOV6 statement, as follows:

```sas
libname v5misc 'user.misc.sasdata';
libname v6data 'user.target.v6data';
proc v5tov6 in=v5misc
       out=v6data
       mt=gcат;
run;
```

Alternatively, you can select individual catalogs to convert with the SELECT statement, or individual entries to convert with the GCAT SELECT statement. The following example illustrates the selection of graphics catalog V5MISC.B531 and entry V5MISC.GSLIDE.GRAPH1:

```sas
libname v5misc 'user.misc.sasdata';
libname v6data 'user.target.v6data';
proc v5tov6 in=v5misc
       out=v6data;
       select b531;
       gcат select gslide.graph1;
run;
```

The conversion of graphics catalogs is not reversible. There is no tool to convert entries in Version 6 SAS catalogs to their Version 5 equivalents.

In Version 5 SAS/GRAFH catalogs, it is possible to have more than one entry with the same name. When multiple entries of the same name are converted, the first entry converted retains its name. Subsequent entries converted have a number appended to the name to create a unique entry name. If the name is too long with the number appended, then characters are dropped from the end of the original name. When you convert a graphics catalog from Version 5 to Version 6, each entry in the Version 5 catalog becomes an entry of type GRSEG in the Version 6 catalog.

### Converting SAS/IML Matrices and Modules

Before you can access SAS/IML matrices and modules residing in a Version 5 SAS data library in Release 6.06, you must convert them to their Version 6 equivalents. You accomplish this with the VSTOV6 procedure. You can convert all IML work spaces in a Version 5 SAS data library, or selected work spaces.

You can convert all SAS/IML work spaces by including MT=IMLWK on the PROC VSTOV6 statement, as follows:

```sas
libname v5misc 'user.misc.sasdata';
libname v6data 'user.target.v6data';
proc v5tov6 in=v5misc
       out=v6data
       mt=imlwk;
run;
```

Alternatively, you can select work spaces to convert with the SELECT statement. The following example illustrates the selection of work space IML205:

```sas
libname v5misc 'user.misc.sasdata';
libname v6data 'user.target.v6data';
proc v5tov6 in=v5misc
       out=v6data;
       select iml205;
run;
```

The conversion of IML work spaces is not reversible. Each matrix and module in the Version 5 IML work space becomes an individual entry within a Version 6 SAS catalog. Since there is no tool to convert entries in Version 6 SAS catalogs to their Version 5 equivalents, you cannot return Version 6 matrices and modules to their Version 5 format.

When you convert an IML work space from Version 5 to Version 6, each matrix and module in the original work space becomes a catalog entry of type MATRIX. Entries that were modules in the Version 5 work space must be compiled under PROC IML into a catalog entry of type IMOD. For instructions on how to compile modules under PROC IML, refer to the SAS Procedures Guide.

### Converting SAS/ETS Models

Before you can access SAS/ETS models residing in a Version 5 SAS data library in Release 6.06, you must convert them to their Version 6 equivalents. You accomplish this with the VSTOV6 procedure. You can convert all ETS models in a Version 5 SAS data library, or selected models.

You can convert all SAS/ETS models by including MT=MODEL on the PROC VSTOV6 statement, as follows:

```sas
libname v5misc 'user.misc.sasdata';
libname v6data 'user.target.v6data';
proc v5tov6 in=v5misc
       out=v6data
       mt=model;
run;
```

When you convert an ETS model from Version 5 to Version 6, each matrix and module in the original work space becomes a catalog entry of type MATRIX. Entries that were modules in the Version 5 work space must be compiled under PROC IML into a catalog entry of type IMOD. For instructions on how to compile modules under PROC IML, refer to the SAS Procedures Guide.

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Alternatively, you can select models to convert with the SELECT statement. The following example illustrates the selection of MODEL3:

```sas
libname v5misc 'user.misc.sasdata';
lbiname v6data 'user.target.v6data';
proc v5tov6 in=v5misc
   out=v6data;
   select model3;
run;
```

The conversion of SASJETS models is not reversible. Each model in the Version 5 SAS data library becomes an individual entry of type MODEL within a Version 6 SAS catalog. Since there is no tool to convert entries in Version 6 SAS catalogs to their Version 5 equivalents, you cannot return Version 6 models to their Version 5 format.

**CONVERSION STRATEGIES**

**Coexistence**

If your site does not have resources to allocate to a conversion effort, you can run Version 5 and Version 6 applications simultaneously. You can continue to run existing applications under Version 5 of the SAS System, while, at the same time, developing new applications to run under Version 6 of the SAS System. Data that you need to share between Version 5 and Version 6 applications must be kept in Version 5 SAS data sets.

**Phased Conversion**

Sites with many applications that reference SAS files of types other than DATA should adopt a phased approach to conversion. The conversion should be done one application at a time. Within each application, the non-DATA files should be converted first and the DATA files converted only after all applications which reference them have been converted.

Once you select an application to convert, you should halt development within the data libraries included in the application, and make backups of the libraries. If you have multiple applications referencing the same SAS data set, you should separate members of type DATA from the other types. One way you can do this is to divide the contents of a data library into two data libraries, leaving the SAS data sets (members of type DATA) in one data library and moving members of the other types into another. You can allocate a new, interim Version 5 SAS data library to contain members of type DATA, and copy members of these types to it. Then, you need to change existing applications to reference members in the new Version 5 SAS data library. Once the members in the new data library are being used, you can delete them from the old Version 5 SAS data library.

Now that you have different names to reference the Version 5 SAS data library containing the SAS data sets and the data library containing the catalogs, models, and work spaces, you can convert the latter without making any additional changes to your SAS program. Simply allocate a new Version 6 SAS data library and run PROC VSTOV6 to convert members of type CAT, GCAT, IMLWK, and MODEL into it. Then test your application, pointing at the new Version 6 SAS data library for catalogs instead of the interim Version 5 SAS data library, while continuing to access data sets in the original Version 5 SAS data library. When you are satisfied that your application works correctly with the Version 6 SAS data library, you should delete from the Version 5 SAS data library the members of type CAT, GCAT, IMLWK, and MODEL that you converted.

After all applications referencing the Version 5 SAS data sets have been converted, you can convert the Version 5 SAS data sets too. If you want to do so, you can put them in the same Version 6 data library in which you put the catalogs. You can continue to use one libref to access the catalogs and a different libref to access the data sets, even if they are in the same data library.

**Full Conversion**

Sites that have only SAS data sets in their Version 5 SAS data libraries (including all sites that have licensed only base SAS Software) should implement a full conversion of Version 5 SAS data libraries. Existing control language can be used without modification, except in the case of allocating new SAS data libraries. If you specify DSORG=DA as one of the DCB attributes, a Version 5 SAS data library will be created.

**Roles in Conversion**

The conversion of Version 5 SAS data libraries to Version 6 format should be planned and implemented by a team of personnel, including the people having responsibility for the functions of applications administration and DASD management.

The applications administrator, using his or her knowledge of the applications, should make the decisions about the conversion and supervise the process. Specifically, the applications administrator needs to

- decide which Version 5 SAS data libraries to convert
- decide the order in which they should be converted
- decide how to perform the conversion
- coordinate program and JCL changes
- perform the data library conversion
- review the results.

The DASD manager should serve in a support role to the applications administrator. The DASD manager can help the applications administrator by

- identifying Version 5 SAS data libraries
- identifying member types to be converted
- identifying password-protected data sets
making backups of programs and JCL to be modified
making backups of data libraries to be converted
providing conversion support.

An enhanced version of SAS/DMI®, available upon request from SAS Institute Inc., provides tools to assist in the conversion process. Using the supplied menu-driven application, you can quickly locate Version 5 and Version 6 SAS data libraries, examine their contents, and copy and convert SAS files. With this tool you can also allocate new data libraries and release space from existing data libraries.

CONCLUSION

With the information presented in this paper, you can evaluate the suitability of applications at your site as candidates for conversion, develop a methodology of conversion for those applications you choose to convert, and implement the conversion plan you develop.

REFERENCES

The following references provide details about the conversion process:


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