Conversion of a SAS/AF® Graphics Reporting System from Version 5.18 to Version 6.06 on the TSO environment

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ABSTRACT

In this paper I'll describe the process of converting a Release 5.18 SAS/AF® Graphics Reporting System to Release 6.06. I'll discuss enhancements such as DIRLIST which displays a list of datasets returning the user's selections. I'll also discuss the problems I encountered converting SAS/AF catalogs, printing graphs, and gaining experience with Screen Control Language(SCLI). This system was developed on a Compaq DESKPRO 286® connected to an IBM Model 3090®. All output was printed by a DEC LN03 Plus® printer using the TEKLNOI Device Driver.

GENERAL OBSERVATIONS

Do your first conversion on a small system one that you know inside and out. Don't give yourself a short timetable. This will cause you to rush and you may make mistakes that could take twice as long to correct. Give yourself plenty of time to test your converted system. As you're converting your system you'll find ways to improve what you were doing before.

If you're converting an existing production system, make a complete copy of all the 5.18 files. This will allow the existing system to continue running while you're converting to and modifying the new 6.06 system.

Have a complete set of the release 6.06 documentation available for easy reference. I used SUGI 15 papers and release 6.03 documentation to get me started. The papers were very helpful and still prove to be excellent reference material.

GETTING STARTED

Determine which files need converting and make a list of their names for later reference. I found the SUGI 15 6.06 paper on this topic very helpful[1].

Talk to your technical support to determine the correct dataset characteristics, e.g., LRECL, BLKSIZE, RECFORMAT, for your release 6.06 files. Create your new files and keep a list of their names. Make a combined list of your release 5.18 and 6.06 files, this will be an useful reference.

ACCESSING RELEASE 6.06 FOR THE FIRST TIME

The SAS Institute has changed and enhanced the PF Key assignments. You can either adapt to the new keys or use an alternate 5.18 set of keys. To use the alternate keys there is an initialization option PFKEY=ALTERNATE. A similar statement can also be included in a CLIST, to automatically enable the alternate set of keys.

Familiarize yourself with the release 6.06 help system by typing HELP on the command line. The help is extensive and explains topics well.

CONVERTING VERSION 5 FILES TO VERSION 6.06 FILES: USING PROC V5TOV6

The V5TOV6 procedure copies SAS files from a Version 5 SAS data library to a Version 6 SAS data library, changing the formats of the files as necessary so they can be used in Version 6. The original Version 5 library is kept intact. The V5TOV6 procedure can convert the following types of SAS files: the last three were not necessary for this application:

- Data sets
- SAS/AF® and SAS/FSP® catalogs
- SAS/GRAPH® catalogs
- formats and informats
- SAS/ETS® models
- SAS/IML® matrices and modules[1]
DATA SET CONVERSIONS

In both Versions 5 and 6, SAS stores data sets in SAS files of type DATA. When you convert a data set from Version 5 to Version 6 format, the file retains its name and type(1).

SAS/AF AND SAS/FSP CATALOGS

If an application uses SAS/AF or SAS/FSP catalogs, PROC VSTOV6 is required to convert the catalogs. If you convert a catalog that contains entries of type PROGRAM, remember to compile the entries before execution. Version 5 SAS/AF PROGRAMS will be converted by the VSTOV6 procedure to Screen Control Language (SCL) programs in your SAS/AF application.

When SAS converts an entry of type PROGRAM from Version 5 to Version 6, each ### macro in the entry is converted to a separate catalog entry of type AFMACRO. Each entry's name is the name of the original ### macro(1).

When I started converting entries of type PROGRAM, I ran into problems. First, if the program screen contains Job Control Language (JCL), watch out for a */JOBPARM card. The conversion procedure, PROC VSTOV6, will interpret the */ as the beginning of a comment. VSTOV6 will then search for a */ to end the comment and ignore anything after the */JOBPARM line. This can yield unexpected results. For instance, triple equal signs (===) allow substitution of user field values below the dashed line and route the results to an external file rather than to the SAS System(2). The first set of equal signs was located before the JCL and the second set at the bottom of the program. There was no ending */ to match with the */JOBPARM, so the conversion routine assumed that the closing equal signs were part of the comment and ignored them. The application was not converted due to errors.

There are two easy methods to correct this:

1) Edit the Version 5 application and insert a */ immediately after the */JOBPARM card. Convert the application. Edit the Version 5 application and delete the */.

2) Delete the */JOBPARM card from the Version 5 application, do the conversion, and edit the Version 6 application and add the */JOBPARM card back in.

The second problem that I had was that the conversion automatically indented the code in the new SCL source code. I had to shift all of the JCL code back over to the first column. If this step is not performed, many JCL errors will occur.

In most cases the catalog and the individual entries retain their names. However, if a name contains special characters that are allowed in Version 5 names but are not allowed in Version 6 names, the Version 6 name contains an underscore instead of the special character. If conversion does change the name of some catalogs, additional changes will have to be made to the code.

CONVERTING AN ENTIRE SAS DATA LIBRARY

LIBNAME SOURCE 'V5-SAS-DATA-LIBRARY';
LIBNAME DEST 'V6-SAS-DATA-LIBRARY';
PROC VSTOV6 IN=SOURCE OUT=DEST;
RUN;

EXAMPLE:

LIBNAME SOURCE 'J151.PAR.AFMENU';
LIBNAME DEST 'XKH.PAR.AFMENU';
PROC VSTOV6 IN=SOURCE OUT=DEST;
RUN;

IN = specifies the Version 5 SAS data library to read.
OUT = specifies the Version 6 SAS data library to write to.

There are additional ways to convert Version 5 files individually or by groups. Each of these procedures are explained more completely in Chapter 43 of the SAS Procedure Guide:

Selecting Files By Type
Selecting Files By Name
Selecting Files By Name and Type

There are also ways to convert specific Version 5 catalogs. They are:

Selecting Catalog Entries By Name
Selecting Catalog Entries By Type
Selecting Catalog Entries By Name and Type
When conversion of SAS/AF or SAS/FSP catalogs is completed you'll receive a message telling you to submit a batch compile statement. This will compile all correctly converted PROGRAM members to allow for execution. If you don't compile your members you won't be able to execute them.

**EXAMPLE:**

```sql
PROC BUILD C=DEST.PAR BATCH;
COMPILE;
RUN;
```

**CONVERTING ALL GRAPHS IN A GRAPHICS CATALOG**

Many of the graphs that I produce use Replay Templates. These templates are located in a graphics catalog which must be converted using a different process than that used with SAS/AF and SAS/FSP catalogs.

The GCAT SELECT and GCAT EXCLUDE statements are used to specify which graphs in a graphics catalog are to be converted. Each argument in a GCAT select or GCAT exclude list has the form:

```
member.entry
```

where:

- `member` is the name of a graphics catalog to process.
- `entry` is the name of a graph in the `member`.

To convert all graphs in a graphics catalog, use the GCAT SELECT statement with an asterisk as the entry name. For example, the following SAS statements convert all graphs in the graphics catalog `SOURCE.PAR` to catalog entries of type GRSEG in the Version 6 catalog `DEST.PAR`:

```sql
LIBNAME SOURCE 'J151.GRAPHS.MASTER';
LIBNAME DEST 'XKM.GRAPHS.MASTER';
PROC V5TOV6 IN=SOURCE OUT=DEST;
GCAT SELECT PAR.*;
RUN;
```

**SELECTING GRAPHS BY NAME**

To select a particular graph from a graphics catalog, simply replace the asterisk with the name of the graph. For example, the following SAS statements convert only graph `PAR.MPR1`:

```sql
PROC V5TOV6 IN=SOURCE OUT=DEST;
GCAT SELECT PAR.MPR1;
RUN;
```

**CHANGES TO THE CLIST AND CREATION OF THE AUTOEXEC MEMBER**

My release 5.18 system was accessed by typing `GRAPH` at the READY prompt. This required a CLIST, which required a few minor changes.

**Release 5.18 Part of the CLIST**

```sql
... CLIST statements
SET OPTIONS=STR(DMS MACRO)
SAS SHARE OPTIONS(‘50PTIONS’) + SAAUTOS(‘’J151.AFMENU.MACAUTOS’’) &TRACE
... more CLIST statements
```

**Release 6.00 Part of the CLIST**

If calling an AF application from a CLIST, you must use the AUTOEXEC option.

```sql
... CLIST statements
SET OPTIONS=STR(DMS MACRO + PPKEY=ALTERNATE &TRACE SYMBOLGEN)
SAS606 OPTIONS(‘’OPTIONS’’) + SAAUTOS(‘’XKM.MACRO.LIB’’) SHARE + AUTOEXEC(‘’XKM.SAS.PGM(AUTOXKMN)’’) + &TRACE
... more CLIST statements
```

The AUTOEXEC option specifies the autoexec file. The autoexec file contains SAS statements that are executed automatically when entering the SAS system. For an AF application, the autoexec file can contain the LIBNAME statements necessary to allocate the appropriate files. To go directly into the application, use a DM statement in the autoexec file. The code for this member is as follows:

```sql
LIBNAME CHART CLEAR;
LIBNAME CHART ‘XKM.PAR.APMENU’;
FILENAME GRAPHSUB ‘XKM.AP.SUBMIT’;
DM ‘AF C=CHART.PAR.MAINBLOC.PROGRAM’ AF;
```
The OM statement submits SAS Display Manager commands. The AF command takes the place of PROC DISPLAY. The AF command opens the AF window. The trailing AF is part of the DM command and makes the AF window the current window. Without it, the Program window remains the current window.

**EDITING AND EXECUTING THE CONVERTED CATALOGS FOR THE FIRST TIME**

Testing your application is the only way to discover differences between release 5.18 and release 6.06. And as these differences are found decisions have to be made whether to have the user adjust or perform changes to the programs. I did a lot of both at the beginning. Most of the screens look the same, but many of them have expanded capabilities. Seeing all of that foreign SCL code for the first time, and remembering to compile each program after making changes, were only two of the many adjustments that I had to make.

**PRINTING OF 6.06 AF SCREENS AND SOURCE CODE**

After making the changes that I understood, I determined the best way to proceed was to print out the Release 6.06 programs and compare them to the Release 5.18 programs.

The BUILD procedure in batch mode can be used to either print a hardcopy of your SAS/AF programs or send the output to a data set. **EXAMPLE 1** shows the Version 6 PROC BUILD syntax used to output all the programs screens to the printer. This enhancement to the BUILD procedure is documented in Chapter 2 of SAS Technical Report P-146[1996](4). You must have an existing form in a catalog referenced by the ddname CHART. In this application the form is DOC.FORM, only the minimum information was specified. **EXAMPLE 2** shows the modified Version 6 syntax, including options to control what information is printed, such as SOURCE, DISPLAY AND LISTDIR.

**EXAMPLE 1:**

```sas
X ALLOC F(CHART) DA('J151.PAR.AFMENU') OLD;
X ALLOC F(PRINTIT) SYSOUT(4) FORM(V29) DEST(PVAXPRT);
```  

**EXAMPLE 2:**

```sas
SUBMIT;
LIBNAME CHART 'XCM.PAR.AFMENU';
FILENAME OLD 'XCM.SAS.OUTPUT1';
PROC BUILD C=CHART.PAR,
PRINT SOURCE DISPLAY LISTDIR PRTFILE=OLD FORM=DOC /* SELECT=(FOLDERS.PROGRAM); INDIVIDUAL PROGRAMS */
RUN;
ENDSUBMIT;
```

After printing out the programs I was able to start making changes and performing many test runs. Don't forget to compile your programs after any type of modification.

Once I became more comfortable with SCL and it's syntax, I could start making enhancements to my system. The utility menus I made into program screens to help eliminate a looping problem. Then I modified the user menus by assigning numbers and function keys as selection codes.

I incorporated the DIRLIST function into the Update/Edit chart data option of the main menu. It displays a selection list window that lists members of a SAS data library and then returns the user's selection to the SCL program.
Minor modifications had to be made to the graph programs themselves. Changes to the GOPTIONS were made due to the type of device driver used.

CONCLUSION

In summary, this conversion has been a real learning experience. I'm looking forward to converting an even larger SAS/AF Report Generating System. Using PROC V5TOV6, with minor changes, made the conversion run pretty smoothly. With new releases users are always going to have an adjustment period. But with Release 6.06, the users are going to look forward to learning all the new capabilities.

REFERENCES

(1) - Converting Version 5 Files to Release 6.06 Files: Using the V5TOV6 Procedure by Helen Wolfson, SAS Institute Inc., Cary, NC.

(2) - SAS® Technical Report: P-146 Page 144, April 1986


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