

## **BRINGING IN THE NEW STUFF**

**Introducing Release 6.06 to a Large-Scale, Diverse, End-User Oriented IBM Environment**

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**What is SAS Doing in a Place Like the Comptroller's Office?**

**What We Do**

The Comptroller of Public Accounts of the State of Texas is charged with collecting the taxes, paying the bills, and estimating how much money will be coming in and going out over then next several years. The organization required to do this includes around 2600 auditors, enforcement officers, accountants, economists, account management specialists, taxpayer service specialists, administrative support people, and a substantial data processing organization.

The computing hardware environment is a Class E mainframe running MVS with a nationwide network, several departmental local area networks, some standalone workstations and equipment for special tasks from scanning tax returns to designing computer systems.

**How We Use SAS**

SAS is used primarily as a utility tool in our environment. It came to us through the Revenue Estimators, many years ago, and has spread through an informal network of users to almost all corners of the agency. We use it for everything from ad hoc reporting to interactive applications. Primarily, however, we run SAS in batch, usually under ROSCOE.

For many years, SAS was the only computing tool available to the non-data processing community, so it has been used for a remarkable range of tasks, few of which are related to the statistical functions commonly associated with SAS. We use it heavily for file management, data analysis, specialized reporting, mainframe performance monitoring, and even occasionally in production systems.

I estimate that about 10% of the agency's workers are SAS users. Levels of expertise range from casual acquaintance to daily coding. Since the variety of options offered by SAS is so extensive, someone in my position sees a remarkable range of coding styles and strategies. The official support staff consists of two people, one in Language Support and one in Systems Support, both of whom do this as only part of their job. We install the software, answer trouble calls, do some training, disseminate new information, and handle the standard functions associated with software support. Clearly, however, we have a very sophisticated and self-reliant core group of users who fill in and help each other out.

The agency approach to training for user-oriented tools, as SAS is in our environment, has varied over the years, depending upon staffing levels, available expertise and money. For long periods of time, it was provided and supported by the users themselves. Most recently, we have offered a Basics class several times a year, an Intermediate class

sporadically, some specialized classes such as a SAS MACROs class and a SAS FSP class, and occasional special-purpose workshops.

## Bringing In the New Stuff: Release 6.06, SAS/ACCESS for DB2 and SAS/ASSIST

### Why Did We Do It When We Did?

From the first rumblings about SAS 6.06, we were a little nervous about bringing it in right away. It sounded like a lot of very big changes, and it wasn't at all clear in the beginning how big the changes were going to be. There were some features that the "beta" users really liked. We also thought there might be some real benefits from SAS Assist for our less sophisticated user community

The biggest motivation for converting to 6.06 turned out to be the availability of SAS/ACCESS for DB2. The first couple of production DB2 applications were coming up and there were users that needed access to this data. The options for providing it were to supply either frequent custom extracts or to supply a tool that was acceptable to both the users and data base administration.

The facilities under SAS Release 5.18 were regarded as insufficiently secure by the data base administrators. With staffing limited, doing extracts didn't seem like a viable long-term option. We looked at several other software "solutions" and none of them had the appeal that SAS/ACCESS did. After all, the people who needed it already knew how to use SAS.

The problem was, in order to run SAS/ACCESS we needed to be running under Release 6.06.

### What We Did

The plan was to install 6.06, run a two week pilot period for the community as a whole, and then switch the default SAS PROC to 6.06, leaving the 5.18 PROC available as an alternative option. We provided 3 one-day workshops to introduce the changes to the community. These were focussed on the features that we expected to be most relevant to our environment. We did introduce the new Display Manager features though there were few current users. Although there had been some interest in it, we did not, at this point, introduce or offer to support PROC REPORT. In our initial shakedowns, we found that it was subject to unexpected failures, possibly operator-induced. (The prospect of helping users who were not very familiar with interactive SAS anyway, through the perils of PROC REPORT over the phone was not very appealing.)

We provided an online list of known problems, work-arounds, fixes, and news about installations of updates.

After about 4 weeks, we were comfortable enough with the new release that we installed SAS/ACCESS to DB2 for evaluation. The evaluation team was made up of core users from the most active divisions. We started off with a day-long workshop on SAS/ACCESS and DB2 concepts.

For a test environment, we were allowed access to all the public tables in the Test DB2 environment, and exceptions were made for users whose individual test plans included a

need for non-public DB2 tables. We had asked the team to come up with test plans that were representative of the work that they normally do. While they were completing and executing their test plans, the technical support staff covered areas of concern that were not addressed in any of the user plans and also provided trouble-shooting. Each participating user provided an evaluation report.

The data base administration group coded the access descriptors in a special library. They were uncomfortable at the time with the concept of the users having this much contact with DB2. The users coded their own view descriptors.

Somewhat later, we installed the SAS/Assist software. It is available for general use at this point, but we have not yet actively promoted it or offered classes.

## How It Worked

### Release 6.06

Our primary objective was to make sure that everybody could do everything he was doing before the installation, after the installation as well. We didn't encourage a lot of creative effort with the new features, but we didn't discourage it, either.

During the 6.06 briefings, we encountered some head-scratching about the new file structure concepts, considerable enthusiasm for some of the specific new features, such as the new IN operator, a surprising amount of interest in PROC SQL, and a lot of fumbling in the new Display Manager exercise. These were mostly people who used SAS in batch and used a lot friendlier software on PCs. Also, we are not generally a TSO users; that added an additional mystery to the process.

As the problems began turning up, we were seeing some specific categories of problems. Users of SAS/GRAPH had a lot of adjustments to make. An inhouse format written in IBM Assembler to write unsigned packed decimal no longer worked. This is used widely in the agency to read selected records from production files. Suddenly jobs that had been running routinely for years began looking strange. We began hearing from people who had no idea what language the programs were written in and hadn't heard there was going to be a change. SAS Technical Support suggested the following solution:

```
PROC FORMAT;    VALUE $PDTRANS  '0C'X = '0F'X
                                   '1C'X = '1F'X
                                   '2C'X = '2F'X
                                   .
                                   .
                                   '9C'X = '9F'X;

DATA _NULL_;
  LENGTH VKEY $ 11;
  VKEY = PUT(NUMKEY,PD11.);
  SUBSTR(VKEY,11,1)=PUT(SUBSTR(VKEY,11,1),$PDTRANS.);
  INFILE  XXXXX  VSAM KEY=VKEY;
```

We discovered that a few coding misdeeds that would still work under earlier releases would no longer work for Release 6. These were easily fixed. The quirks that showed up when dealing with DATA \_NULL\_ and FILE PRINT report formatting were more difficult to work through, since we have a lot of variations on this and some very complex custom reporting programs. One that caused particular problems for us was the conflict between PUT # and OVERPRINT.

There were several problems, usually showing up with 0C4 abends, that were related to space management. These were eventually solved by applying fixes from SAS.

In general, our best resource for problem resolution was SASNOTES. We did have to use SAS Technical Support on some items. We did find, from time to time, that when we applied a fix or set of updates that it caused additional problems and we would have to back it off. Altogether, the transition went more smoothly than I expected for a change of this magnitude. We are still, however, turning up an occasional problem as people try to do new things.

Also, there are several situations in which we still have not converted to Release 6.06 and don't intend to. The most prominent case is the MICS database used by the Systems group to monitor performance. Legent Corp., the vendor of the MICS software does not support it under Release 6.06.

## SAS/ACCESS to DB2

The user evaluation team unanimously recommended that we choose this for the user interface to DB2. There were a few problems, however. It was clear that system performance was going to be an issue, and the problem had more to do with how DB2 works than how SAS works. Some problems we were able to solve through improved coding strategies. Some were substantially improved by setting up custom DB2 views, but this tends to involve a wait. This is not always well accepted by people who are used to a great deal of autonomy. Some problems here cannot be resolved very well under release 6.06. Presumably, the upgrades available under 6.07, which will allow direct pass through of DB2 SQL code if I understand correctly, will help this situation.

Security access, particularly managing DB2's security, became an inconvenience fairly quickly. Also, after we were ready to make the SAS/ACCESS available to the community in general, the data base administrators decided that they would provide a master set of access descriptors and matching view descriptors.

We have not, at this point, widely advertised the availability of the DB2 interface. We are planning to present some day-long workshops during November and December to cover SAS/ACCESS usage and basic DB2 concepts. Because of the remaining resource issues, we are trying to approach this cautiously.

## SAS/Assist

It is our hope that SAS/Assist will eventually be a big help for the group of less sophisticated users in our environment that could be provided substantial autonomy by supplying them with some "template" applications with access to the most commonly used files. We have not been able to pursue this to the extent that we would have liked. In part this is because of continuing staffing problems, but we are also discovering that there is a certain core body of knowledge about SAS that you have to have, even to use SAS/Assist.

In addition, there is the problem of overcoming the reluctance to use TSO. Eventually, I expect that we will find this tool very useful, but it will certainly require a training program (or programs) of a very special kind. Which brings us to ...

### Training: Towards "SAS/Lite" -- A Tech Support Analyst's Hope for the Future

Training, of course, is key to leveraging the power of any tool in any environment. A tool with the versatility of SAS requires a lot of training to establish moderate levels of competence. There are many ways to get it: SAS Institute, local universities, sympathetic co-workers, reading manuals, and formal classes are some of the options. The classes that we offer in our shop are dependent upon the workloads of the technical people called upon to teach them. Those resources are becoming very scarce these days.

Addressing the complexity and diversity of SAS as a tool and the wide range of applications it is used for in our environment has already affected the design of the courses we offer. We have restricted the concepts and constructs that we teach to the specific ones that we encourage in our inhouse coding standards. In Basics, for instance, we touch upon the many styles of INPUT statements, but emphasize formatted input. In Intermediate, we spend a lot of time on efficiencies and handling large files, because we have a lot of very large files, and we are very concerned right now about resource utilization.

Even with these modifications in the body of knowledge covered, however, we often find that the groups we are teaching, especially in Basics, include two general categories of students: the programmer types who have substantial background in one or more other programming language, and the real beginners, who have limited and often very specialized needs. Our classes are hands on. Even with very small classes of 6 to 8, it is difficult to manage this range.

The programmer types tend to become true believers pretty quickly, although the learning curve on SAS is by no means trivial. They pick up the concepts fairly quickly and incorporate them into their current work.

The beginners, however, do not find this easy at all, and really do not need much of the power available in the complexity. They do need enough structure to give them ways to keep using it.

At the last SUGI, Grant Blank, mentioned the concept of "SAS/Lite" in his paper, "The Obsolescence of the SAS System Revisited." His proposal was for SAS to make available in a PC version, a subset of SAS that is limited in conceptual versatility but very attractive and easy to use, like the PC software that people are already familiar with.

Among our long-range dreams for the SAS community is some version of this concept. -- teaching a "SAS/Lite", perhaps based upon SAS/Assist with some help from AF, that will make SAS the tool of choice and empowerment for the beginners and people with less technical needs.

In addition, and with this we have been more successful, we are moving in the direction of shorter, more modular classes and workshops, with specific objectives. We are in times of scarce resources and limited options. With this in mind, we're looking for ways to get more out of what we've got. Sometimes SAS doesn't make this easy for us, but we're trying.

We'd like to hear your ideas about this.