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JOBLIB/3000 - AN INTERACTIVE PRE-PROCESSING SYSTEM

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Introduction

This presentation is a progress report on the development work made at Oy Porasto Ab since 1977 to make better use of the automatic data processing capabilities in HP3000 systems. For earlier reports refer to /1/ and /2/.

Most automatic processing is in batch mode, but the old way of batch using "fixed" stream files suffers from some severe drawbacks:

-       security of passwords on JOB stream files
-       troublesome updating of parameters and optional parts of streams when using general purpose editor programs, which often leads to mistakes, and
-       many copies and versions of same stream files on disc
-       documentation problems of stream updating with editors in transferring the JOB preparation and initiation work to end users of the system
-       a typing error in the filename of a :STREAM command may start an undesired JOB.

Too often these problems are avoided by letting end users do the work from time to time, making them wait for the execution of a series of tasks on-line, even if all responses could be supplied beforehand.

These problems can be solved easily by pre-processing techniques. That is by updating the stream file under control of a general purpose pre-processing program, according to stored processing rules for the particular job stream (or task). To provide best support for the user this pre-processing must be interactive.

JOBLIB/3000 system

The problems listed above are solved by JOBLIB/3000, general purpose pre-processing system for HP3000, in the following ways:

In the JOBLIB system, job streams are gathered as "job templates" into special library files, leaving all information concerning user, account, group and passwords out of the !JOB-lines.

To initiate a job stream, a user simply starts the program JOBGEN, provides the name of job-library (default is JOBLIB) and the particular JOB required. Passwords are either supplied automatically from some secure data base (this is a new option in JOBGEN 5.5) or they are prompted from the user.

Updating of parameter values in the stream is made by character string replacement operations, using **mnemonic string variables**, the only data format for variables in JOBLIB command language - job generation language (JGL), the lines of which are inserted in the job templates to control the flow of pre-processing. The string variable processing is implemented in a very powerfull way providing full text processing capabilities found in many programming languages, and they can be used also as numeric variables if the character string value assigned to them happens to be numeric. Of course this can be ensured by some data checking facilities of JGL.

In many pre-processing systems, the value assignment for string variables is made by commands such as
        DEFINE (identifier, "value")
(see /3/ p. 251), but in JOBLIB system we use automatic assigments of the type
        ..SET identifier="value"
        ..COMP identifier=(arithmetic expression)
and **interactive** assignments of type
        ..DISP <advice>
        ...
        ..READ identifier . ="default"; checking rules .
where the preceeding ..DISP commands are used to provide the user with further information concerning the prompted parameter value.

Values of string variables can be any character strings of 0 to 80 ASCII characters in length and restricted only by the data checking rules, if used. Currently there can be up to 150 different string varibles used in one job definition.

The assigned string value will then be replaced at every occurence of the variable name, preceded by "&", in any lines of the job template that the name occurs. These are then copied into JOBGEN work memory before they are interpreted and/or copied into the final stream file.

Values of string variables can also be used to control the flow of pre-processing by the structured commands
        ..IF , ..WHILE   and   ..CASE
where the values of string variables can be tested in the condition part of the command using relational and logical operators (which will be fully implemented in release 5.5). This provides the possibility to select alternative or optional parts in the final stream automatically, according to parameters supplied by the user.

To achieve full flexibility and automaticity in assignments, replacements and conditions, we have implemented substring operations and string processing functions such as: $LEN(s)$, $UPS(s)$, etc.

For maintenance of parts common to many JOBs and to make use of generalized parts, we have also implemented a **procedure library** facility in JGL. This feature has been especially appreciated by those users of JOBLIB system, who are familiar with the procedure library facility of IBM's operating systems. The procedure library provides an easy way to:
- use parametrized QUERY reports included in different JOBs
- maintain tables of parameter values in separate libary files
- define generalized parts of JOBs for making backups or for other routines, etc.

The procedure calls (..INCL -commands) can be hierarchical and even recursive. The outer pre-processing can be secured by using local string variables inside the procedures, and using string variables as parameters in procedure call. Values can be transfered into and out of the variables used in procedures, just like in programming languages.

Instead of a procedure, a whole file can be included during the pre-processing. This provides possibilities for including for example
- stream parts generated by some other programs into the final stream
- source programs with inserted JGL control lines and string replacements into a compilation stream, making use of interactive pre-processing for COBOL programming. This goes even far beyond the capabilities of COBOLII.

Benefits

The JOBLIB system makes batch jobs easier to use, and it provides a comprehensive technique for system personnel to submit job preparation work to operators and even to end users. All the user has to know is the name of the JOBLIB, the name of the job, and how to answer the questions presented in the job template.

For system personnel, the JOBLIB system provides the possibility of tool-jobs, a flexible test environment, a procedure library for common parts, and a good on-line documentation technique. From elements of macro processing and programming languages, we have created a new and efficient "productivity tool" that provides a dynamic and flexible extension of traditional job streams. The JOBLIB system is not just a library system, but a new approach to batch processing in an on-line environment.

The benefits of JOBLIB system are clear: it saves human and computer resources, time and money, eliminating errors and increasing security and productivity.

Future plans

We are currently (August 1981) using release 5.4 of the JOBLIB/3000 system and we are developing release 5.5.

As the main trend of development we are making JOBLIB/3000 as "open ended" a system as possible. This means that it can be used in different kinds of system environments, it can be integrated with different software, and it will be more and more customizable. Examples of this are:

- We have separated all program messages of JOBGEN into a separate catalog file, so that they can be easily customized or translated into any other national language that can be written using ASCII letters.
- We have added the option of using a fully customizable data base, to supply required passwords into !JOB-lines of stream files. This is delivered with sources of interface modules and using pre-processable installation streams.
- Currently JOBGEN supports SLEEPER as the scheduling monitor, but this will be made more open to other systems using a separate :STREAM -time reservation module delivered on source level.
- JOBGEN will also be accessible as a son process of customer's own application monitor programs and it can be controlled directly by a message file of procedure type, generated by the father process.

Availability

We at Porasto belive that the JOBLIB system is of use in almost all HP3000 installations and we have made it available on an yearly rental basis. Currently it has been installed in 20 HP3000 systems in Finland and Sweden. For further information, please contact **Oy Porasto Ab**, att: Martti Laiho, Toolontullinkatu 8, SF-00250 Helsinki 25, FINLAND.

References

/ 1 /   JOBLIB - Generalized Job Library and Interactive Job Generating System, Martti Laiho, Proceedings of HPIUG Fall Meeting 1980, pp 9.5.1-9.5.10

/ 2 /   JOBLIB/3000 - Job-library and Pre-processing System, Simon Harryman et al, HPIUG Spring Meeting 1981

/ 3 /   Kernighan, Plauger: SOFTWARE TOOLS Addison-Wesley, 1976, ISBN 0-201-03669-X.

(This presentation has been written with DAISY/3000 text processing system)