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PROGRAM LOGANA sourcefile=LOGASRC

Function: This program summarizes a range of log files into one new file compatible with program LOGRPT. The log files analyzed are purged by this program.

Program documentation: For detail information on files, messages, and errors, see source listing lines 3/56.

Run instructions:

1. This program may be run either as job or session.

2. User must have system manager capability.

3. :RUN LOGANA.PUB.SYS

4. FILE NOT FOUND
   On beginning execution the program purges SORTLOG. This message appears if SORTLOG does not exist. No response is required.

5. ENTER BEGINNING LOG NBR? XXXX
   Enter 4 digit number of first log file in range. Example: if LOGØ123 is the first in the range, enter Ø123. (CR not required.)

6. ENTER ENDING LOG NBR? XXXX
   Enter 4 digit number of last log file in range.
   NOTE: The last log number must be greater than the first and all log files in the range must exist. If a log file within the range is missing, a dummy may be created with the command :BUILD LOGXXXX;REC=-5Ø8,1,V,BINARY;DISC=1,1,1.

7. The log files within the range are now summarized into SORTLOG and purged. A maximum of 20 jobs may be open at one time in the log files. Job records are not carried over between log files. The summary records in SORTLOG are now arranged in chronological order and contain the following:

   A. Time stamp-on
   B. Job type and number
   C. User name
   D. Job name
   E. Group name
   F. CPU time (seconds)
   G. Connect time (minutes)
   H. Records processed (all files except printer (LDEV=6) and terminals (LDEV>1Ø)).
   I. Lines printed (records processed LDEV=6).
   J. Time stamp-off

8. END OF PROGRAM

9. To prepare the file SORTLOG for use by program LOGRPT, SORT must be run as follows:

```
:FILE INPUT=SORTLOG
:FILE OUTPUT=SORTLOG
:RUN SORT;STACK=1ØØØØ
>KEY AT 16 IS 8 LONG
>KEY AT 32 IS 8 LONG
>KEY AT  8 IS 8 LONG
>KEY AT  Ø IS 6 LONG
>:EOD
END OF PROGRAM
```

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PROGRAM LOGRPT sourcefile=LOGRSRC

Function: This program produces a report of usage for all jobs, users, groups, and accounts. Input is from the file SORTLOG as prepared by programs LOGANA and SORT plus a rate file RATES. The output is a printed report which shows the following information for each job:

A. Job name
B. Job number
C. Date-on
D. Time-on
E. Time-off
G. Connect time and connect time charge
H. CPU time and CPU time charge
I. Records processed and record processing charge
J. Lines printed and printer charge
K. Total job charge.

The output is ordered by user, group, and account and totals are given at each level plus grand totals.

Program Documentation: For detail information on files (including file RATES), messages, and errors, see source listing lines 3/55, 79/95. Note: This program requires that procedure DOLLAROUT be in SL.PUB.SYS as an intrinsic.

Run instructions:

1. This program may be run either as job or session.
2. User must have system manager capability.
3. :RUN LOGRPT
   The report is now printed on the line printer.
4. END OF PROGRAM

The file SORTLOG remains intact and LOGRPT may be rerun.

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Program FOOTBALL

Basic program file = FOOTBALL
Basic data file = DATA1
Basic data file = DATA2

Function: This program simulates a regulation football game using two terminals. Each team's plays (offensive and defensive) are called by a "quarterback" at a separate terminal. The files DATA1 and DATA2 contain probabilities for each kind of play (DATA1) and defensive skew factor (DATA2).

Run Instructions:

1. The I/O table (MPE) must be modified to allow terminals to accept data (JAID).

2. Determine the LDEV # for the "visitors'" terminal. This may be done by logging on and running WHO.PUB.SYS.

3. Enter a :DATA command* on the "visitors'" terminal.

4. Log on* the "home" terminal and determine its LDEV #.

5. Enter these file commands on the "home" terminal:
   :FILE TEAM1;DEV=("home" terminal LDEV #)
   :FILE TEAM2;DEV=("visitors'"terminal LDEV #)

6. Run the program as follows:
   :BASIC
   >RUN FOOTBALL
   .
   .
   .

7. The "visitors'" terminal will be released when

   a. FOOTBALL ends, or
   b. The home terminal hangs up, or
   c. The visitors' terminal enters :EOD.

8. All rules, options, etc are explained as the program runs.

* The DATA command in Step 3 must use exactly the same job identification as the user in Step 4.

Example

Home Terminal

```
:HELLO PRO.GAMES
:FILE TEAM1;DEV=14
:FILE TEAM2;DEV=15
:BASIC
>RUN FOOTBALL
      .
      .
      .
```

Visitors' Terminal

```
:DATA PRO.GAMES

      .
      .
      .
```

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PROGRAM WHO sourcefile = WHOSRC

Function: This program, when executed, prints a formatted dump of the information available from the intrinsic WHO. The output is to $STDLIST; a sample is shown below.

```
:RUN WHO.PUB.SYS

YOUR CURRENT ATTRIBUTES ARE AS FOLLOWS:
USER = FIELD
HOME GRP = PUB
LOGON GRP = USERS
ACCT = SUPPORT
INTERACTIVE, DUPLICATIVE, SESSION

USER ATTRIBUTES: GL, AL, AM,
FILE ACCESS:  SF, ND
CAPABILITY CLASS: IA, BA
LOGICAL DEV # = 13


END OF PROGRAM
```

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PROCEDURE `DOLLARIN(word,string,length);`

```
VALUE length;
INTEGER length;
DOUBLE word;
BYTE ARRAY string;                          sourcefile=SLPUBSRC
```

Function: This procedure converts an ASCII string containing a dollar amount into a double word representing the corresponding number of cents. Dollar signs ($), commas (,), blanks ( ), and plus signs (+) in the ASCII string are ignored. A minus sign (-) or the letters (CR) anywhere in the string will cause the returned value to be negative. Any other non-numeric characters except the decimal point (.) will cause an error condition.

word	The double word into which the converted value is placed.
string	The byte array containing the ASCII string to be converted.
length	The length of the byte array (cannot be negative).

The DOLLARIN command can result in the following condition codes:

CCE	Successful conversion.
CCG	Illegal character found in string.
CCL	(This condition code is not returned.)

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PROCEDURE DOLLAROUT(word,string,length,type);

```
VALUE word,length,type;
DOUBLE word;
INTEGER length,type;
BYTE ARRAY string;                          sourcefile=SLPUBSRC
```

Function: This procedure converts a double word into an ASCII string with the two low order digits to the right of the decimal point. A dollar sign ($) and/or commas are optionally included in the string. The double word is assumed to represent an integer number of cents, not dollars.

word	The double word to be converted to ASCII code. Its value is interpreted as an integer number of cents, and may be positive or negative.
string	The byte array into which the converted value is placed. The result is right justified.
length	The length of the byte array. (Note that $4 \leq$ length ≤ 132.)
type	An integer identifying the kind of conversion desired (see HP 3000 Compiler Library: INEXT'):

type<Ø	-2 PFw.2 format,example:	1234.56
type=Ø	-2 PNw.2 format,example:	1,234.56
type>Ø	-2 PMw.2 format,example:	$1,234.56

The DOLLAROUT command can result in the following condition codes:

CCE	Successful conversion.
CCG	No conversion; length>132.
CCL	No conversion; length not long enough to contain the results.

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PROCEDURE DUMPSTACK; sourcefile = SLPUBSRC

Function: This procedure, when called, prints the following information: the contents of DL, DB, Q, S, Z, Index, Status and P followed by a dump of the stack from DB+Ø to S. The values printed correspond to the values just before the call to DUMPSTACK is made. All values are in octal and are clearly labeled. Output is to file "LIST" which defaults to device "LP" with characteristics ASCII, CCTL, WRITE ONLY. The output file must have a record width of 66 words or greater.

With this procedure the condition code remains unchanged. Any errors encountered will cause the program to print "*ERROR" followed by termination.

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PROCEDURE DUMPREG; sourcefile = SLPUBSRC

Function: This procedure prints the current contents of the stack registers (DB, DL, Z, STAT, X, Q, S) on $STDLIST when called. The values printed correspond to the values just before the call to DUMPREG is made. Note that DL, Z, Q, and S are DB relative and that DL is normally negative in two's complement form. This is useful in debugging programs where stack overflow or underflow occurs.

With this procedure the condition code remains unchanged.

Sample output:

```
DB = %156250
DL = %177732
 Z = %001605
ST = %060151
 X = %000007
 Q = %000273
 S = %000314
```

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PROCEDURE READCARD (buffer);

ARRAY buffer;

sourcefile = SLPUBSRC

Function: When called, this procedure causes a card to be read from the card reader (logical device #5), and stores the data in column-binary form. Each card column is stored in the corresponding word of buffer with the bit in row 12 stored in bit 11 and the bit from row 9 stored in bit Ø.* READCARD bypasses the MPE file system. Therefore the following should be noted:

1. A :DATA card is not required to precede the data.

2. Cards with a colon in column 1 are not intercepted or otherwise recognized by MPE. Therefore these cards may be read as data.

3. No check is made for other users on the card reader. Care must be used not to "steal" another user's data.

4. An :EOF card is not needed or required. The user must determine programatically when the last card has been read.

buffer — The logical array into which the column binary data is stored. It must be at least 80 words in length.

The READCARD command can result in the following condition codes:

CCE — The card read was successful.

CCL — An error occurred during the read operation or insufficient stack space exists for the operation.

CCG — (This condition is not returned.)

This procedure must be compiled by a user with privileged mode capability.

* See 30106-90001 Maintenance Manual: 30106A Card Reader Subsystem for details.

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PROCEDURE HOLTH (source,dest,cnt,code);

```
ARRAY source;
INTEGER cnt;
LOGICAL code;
BYTE ARRAY dest;                          sourcefile = SLPUBSRC
```

Function: This procedure converts data from column binary form to ASCII or IBM 1620 BCD form. It is normally used with procedure READCARD to process cards containing part ASCII and part binary data.

source — The word array containing the column binary data to be converted.

dest — The byte array into which the converted output is stored.

cnt — An integer whose value indicates the number of words to be converted.

code — A logical word indicating the type of conversion:

TRUE = IBM 162Ø BCD,
FALSE = ASCII.

With this procedure the condition code remains unchanged.

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Running Compilers as programs instead of subsystems

Occasionally it is useful to have more than one version of a compiler available at one time. This may be done by storing one version and running it as a program.

Example: a new version of SPL is received but the old version is kept until the new one is checked out. The following commands save the old version and put up the new one:

```
:HELLO MANAGER.SYS
:RENAME SPL,SPLOLD
:FILE TAPE;DEV=TAPE
:RESTORE *TAPE;SPL;SHOW     (new SPL is up as
                              subsystem)
:BYE
```

The new version may now be invoked with the :SPL command in the usual manner. To call the old version it is first necessary to put in file equations using the formal designators of the compiler. Example:

```
:FILE SPLTEXT=MYPGMSR
:FILE SPLUSL=$NEWPASS
:FILE SPLLIST;DEV=LP
:FILE SPLMAST=$NULL
:FILE SPLNEW=$NULL
```

To run the compiler, give a RUN command with parameter=31. Example:

```
:RUN SPLOLD.PUB.SYS;PARM=31
```

With appropriate file names, this procedure should work for other compilers as well.

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Report on Multiprogramming Efficiency and File System Overhead Under MPE B.1.S4

November 8, 1973

Introduction

The accounting system of MPE version B does not count CPU time used by the system on behalf of a user (such as I/O handling) as part of the user's CPU time. This experiment was conducted to determine:

1. If the unaccounted for CPU time could be correlated with the number of records processed;
2. What the average overhead is per record processed;
3. What additional overhead is incurred by multiprogramming.

Conclusions

1. Unaccounted for CPU time correlates very highly with the number of records processed.
2. The average overhead per record processed is approximately 65 msec.
3. The additional overhead incurred by multiprogramming is about two percent when code can be shared.

Description

A single job was selected which made heavy use of the file system, was short enough to be tested in a reasonable time, and which could be run simultaneously by several users. The job was to compile and prepare an SPL program of 402 lines of source code (LOGRPT). Paper tapes were prepared with the following commands:

```
:HELLO CR.CC
:SPLPREP LOGRSRC
:BYE
```

The source file (LOGRSRC) included a NOLIST command in the second line.

Initially this job was run, from paper tape, with no other users on the system. Following this session, the same job was run from three

terminals with all sessions starting within a 20 second period. In each case the session was run entirely from paper tape, eliminating human response-time as a factor. The following table shows the results obtained. All times are in seconds; sessions 2-4 were run at the same time.

Job	Connect time	CPU time	Records processed
#S1	107.9	27	1344
#S2	329.6	28	1267
#S3	297.5	27	1232
#S4	283.8	25	1155

Discussion

1. The formula CON=CPU+T*REC was applied to the above data where:

   CON is total elapsed time for one or more sessions,
   CPU is total CPU time for one or more sessions,
   T is a factor to be assigned as overhead time per record,
   REC is the number of disc records processed by one or more sessions.

   In the case of #S1 the factor T was found to be 60.1 msec. per record while in the combined run of #S2,3,4 it was found to be 67.6 msec. The difference is probably due to the additional system overhead involved in running three simultaneous jobs.

   The close agreement between these figures would indicate that a value of 60-70 msec. is very consistent when averaged over a medium sized job.

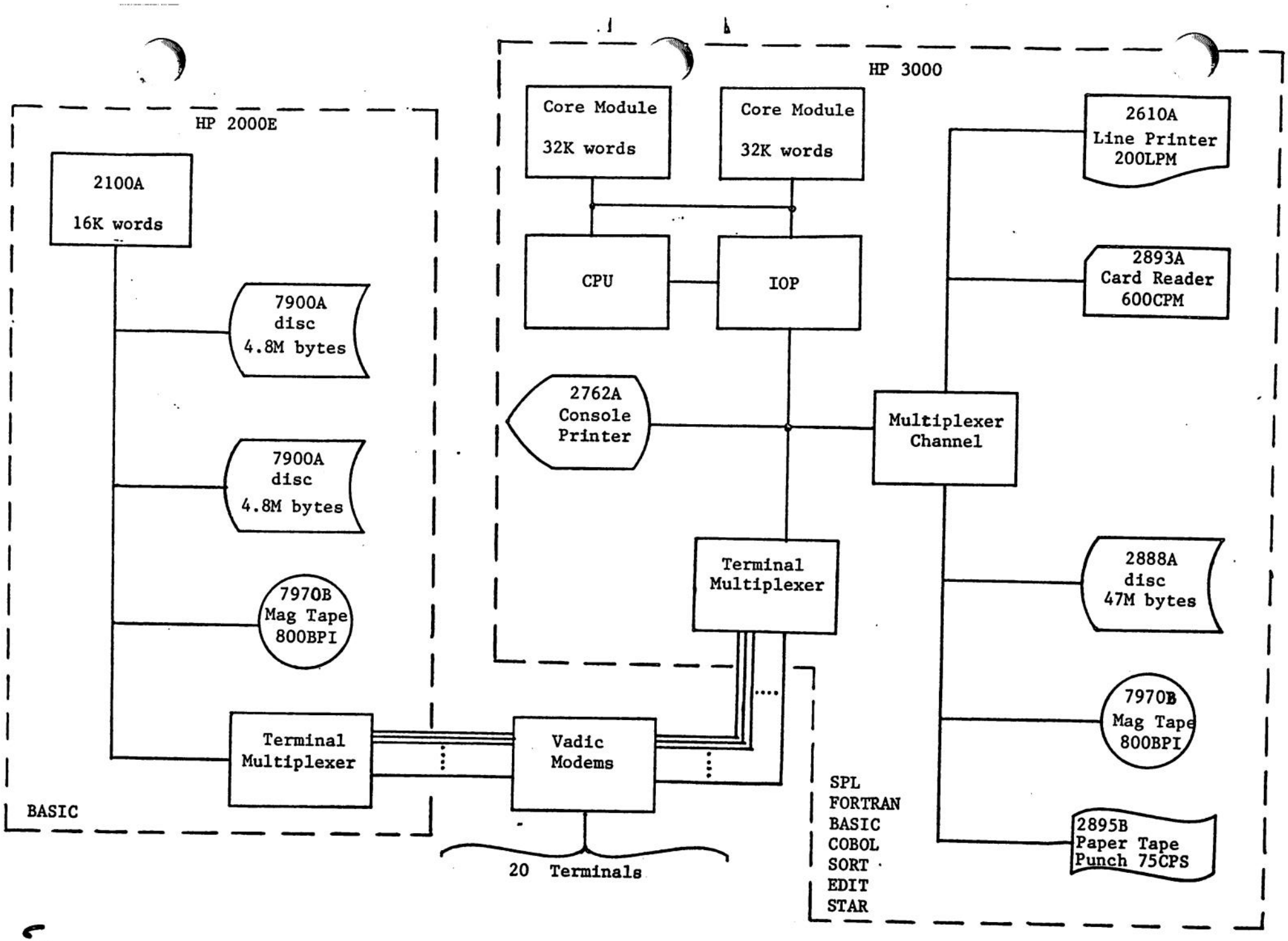
2. The total elapsed time for #S2,3,4 was 329.6 seconds. This compares closely with 323.7 seconds which is triple the time for #S1. The difference is less than 2%. Since sessions #S2,3,4 were run very nearly in synchronism, they would be expected to be either I/O bound or compute bound simultaneously, thus negating any gain in efficiency due to multiprogramming. In actual experience the sessions seemed to leap-frog past each other and #S2 which started first was the last to finish. This is probably due to the nature of code sharing as noted below.

3. The following table shows the files closed by each session with the number of records processed.

	File	Records	Session #S1	#S2	#S3	#S4
1.	LOAD.PUB.SYS	2	X	X		
2.	SL.PUB.SYS	47	X	X		
3.	SPL.PUB.SYS	63	X	X		
4.	SPL.PUB.SYS	2	X	X	X	X
5.	$NEWPASS	384	X	X	X	X
6.	TEMPLIST	Ø	X	X	X	X
7.	TEMPCODE	282	X	X	X	X
8.	SPLINTR.PUB.SYS	20	X	X	X	X
9.	LOGRSRC	422	X	X	X	X
10.	SPLLIST	8*	X	X	X	X
11.	LOAD.PUB.SYS	2	X		X	
12.	SL.PUB.SYS	52	X		X	
13.	SEGPROC.PUB.SYS	23	X		X	
14.	SEGPROC.PUB.SYS	2	X	X	X	X
15.	$NEWPASS	37	X	X	X	X
16.	$OLDPASS	6	X	X	X	X

* $STDLIST, not counted in totals.

It can be seen that #S2 bore the cost of allocating the compiler (files 1-3) while #S3 bore the cost of allocating the segmenter (files 11-13). Thus in each case the other two sessions were given a "free ride" because they could share the allocated code. The efficiency thus gained appears to nearly (but not entirely) compensate for the added overhead involved in multiprogramming.



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