Roach

Multics Task Report MTR - 033

TO: Distribution

FROM: Gary C. Dixon

DATE: March 18, 1974

SUBJECT: ANSI Standard Tape DIM Project Status

I. SIGNIFICANT EVENTS

Frank Canali has completed the design of tapeio_, the interface to the Tape DCM (tdcm_) which will be used by the ANSI Standard Tape DIM (astd_). A preliminary design review meeting of Honeywell and PDO people working on tapes has approved the design. Now, an MTB describing the design has been submitted for publication, and a full design review meeting will be held shortly after the release of this MTB.

II. TASK STATUS

astd_ Label Handling & File Positioning (Janice Phillipps)

Work on the label handling and file positioning section of the ANSI Standard Tape DIM is proceeding well. The basic reading and writing of labelled, U-format tape files has been checked out, for the most part. Testing for bad attachment modes, check out of rewriting a file which already exists on a tape, testing tape detachment disposals and order codes are all that remain. Then a formal test run, consisting of a sequence of attachments and detachments using various file positions and detachment disposals, will be conducted on Multics and on OS/370 as a final check on the code. Estimated completion for this testing is early April.

Problems in hardware detection of write-rings in tape reels and of hardware denial of write permission on a tape have been traced, in part, to tape handler failures and to undocumented tdcm_/tape-handler "features". These problems had previously delayed testing for about one week, but have since been corrected or bypassed.

lrec_io_ (Ross Klinger)

Using XTAPDUMP, an IPC program which performs OS/370 tape I/O at the EXCP level, Ross has demonstrates that lrec_io_ correctly generates within the word-only limitations of the

Multics tape hardware. However, attempts to read Multics-generated tapes using OS/370 Utility programs have not been so encouraging. These utilities (eg, IEBPTPCH and IEBGENER) use the Basic Sequential Access Method (BSAM) to perform their I/O, and are therefore required to do their own logical record blocking/de-blocking. Unfortunately, the utilities were written before the ANSI standard was adopted by IBM. Therefore, they do not support the ANSI D- and S-format record de-blocking. Since these utilities are now in Support Class C (minimal support), there is little hope of getting them fixed to accept all ANSI record formats.

Testing of OS tape record formats has encountered similar problems in the way IBM handles physical records which have been padded out to word boundaries to meet the requirements of Multics tape hardware. F- and FB-record formats which were padded beyond the blocksize specified to the utility proved unreadable (wrong-length records were reported). V- and VB-formats accepted one byte of 0 padding (which they shouldn't have according to IBM specifications), but died when two or more pad characters were encountered. As a result, OS-format logical records will have to be padded with space characters out to word boundaries, and the program on the OS side which reads these records will have to accept the spaces.

Finally, Ross wrote an OS/370 PL/I program which uses the Queued Sequential Access Method (QSAM) to read and de-block ANSI D-format logical records. QSAM accepted these records -- as long as the physical blocks were not padded with the ANSI pad character (~). However, the first pad character encountered, was interpreted as the first byte of the next record's Record Control Word (RCW), causing QSAM to incorrectly interpret the record length. Since the ANSI Standard allows unlimited padding of physical records, hopefully IBM will provide a fix for this QSAM bug. We are investigating such a fix.

In summary, F- and FB-format records, with logical record length which is a multiple of 4 characters, seem like the only Multics/OS-compatible tape formats for the moment.

Ross will begin coding some changes to [rec_io_] to ease its conversion from the [ios_] interface to the new [iox_] interface, and which incorporates the new logical record padding requirements for OS-format records which testing has shown to be necessary. In addition, this interim version will use the newly-designed interfaces to Frank Canali's [tapeio_], and a [tapeio_] simulator which calls [nstd_] will be written.

cv_char_$ebcdic_to_ascii (Ross Klinger)

cv_char_$ebcdic_to_ascii is a special-purpose ALM program which uses the EIS MVT (MoVe with Translation) instruction to translate an EBCDIC character string into an ASCII string. It uses a conversion table which is slightly different than either the Multics Card Code (which was originally based upon EBCDIC) or the ASCII-EBCDIC conversion used by the OS/370 QSAM access

method. The differences provide equivalent mappings for the few ASCII characters which heretofore had no EBCDIC equivalents by using characters in the OS/370 extension to EBCDIC. An ALM program had to be written because the Multics PL/I translate instruction only translates character strings which lie entirely within the ASCII character set, and EBCDIC strings do not meet this requirement.

tape_in/tape_out (Ross Klinger)

Coding is almost complete on the tape_in/tape_out command. The program has gottem somewhat larger than original estimates of its size (1200 PL/I statement, excluding the syntatic and semantic analysis code generated by the reduction_compiler). Debugging of this code awaits the code changes in the interim version of lrec_io_.

tapeio_ (Frank Canali)

As mentioned above, Frank has completed the design for tapeio_, has submitted an MTB for publication, and will schedule a design review meeting when the tapeio_ MTB is released. Some initial coding on tapeio_ is beginning to test the performance feasibility of the design, and we hope that final coding will be complete by the end of April.

Project Coordination (Gary Dixon)

Planning for the MTB describing the ANSI Standard Tape DIM has been postponed until Janice Phillipps can finish work on the ANSI label handling and file positioning code, until Frank finishes the design for tapeio_, and until Ross completes work on tape_in/tape_out. This planning should occur in mid-April, and the MTB outlining features of astd_ and proposing an installation strategy will be published shortly thereafter.

GROUP_____PDO: MULTICS SUPPORT GROUP_____ DATE___03/18/74_____ PAGE__1___/___2_____

PROJECT_____ANSI Standard Tape DIM_____ AREA_Attach-Detach:file positioning-R/W/Order_

TASK DESCRIPTION	PERSONNEL	START	FINISH	M-W	CHANGES-STATUS
ATTACH: attach (write) a new volume and write a single file	JP	02/01/74 01/28/74	02/07/74 02/05/74	.5	Checked out.
ATTACH: attach (read) a file of a single-file volume	JP	02/08/74 02/05/74	02/14/74 03/06/74	.5	Checked out.
ATTACH: attach (write) to append a file to a multi-file volume	JP	02/15/74 02/01/74	02/19/74 02/05/74	.25	Checked out.
ATTACH: attach (read) a file of a multi-file volume after label chain has been constructed	JP	02/19/74	02/21/74 03/11/74	.25	Checked out.
ATTACH: test for bad attacnment modes	JP	03/11/74	03/13/74	.25	
ATTACH: attach (read) a file not found on tape	JP	02/26/74	02/28/74 03/07/74	.25	Checked out.
ATTACH: attach (write) a file already on tape	JP	03/14/74	03/20/74	.5	
DETACH: test detaching file with unload and leave disposals.	JP	03/06/74 02/05/74	03/08/74 02/08/74	.13	Checked out.
DETACH: Test detaching file with disposals rewind and reread.	JP	03/20/74	03/21/74	.13	
ORDERS: test order calls	JP	03/21/74	03/25/74	.25	
WRITE: write file (ASCII, 9-mode, U-format)	JP	03/13/74 02/06/74	03/23/74 02/08/74	.75	Checked out.
READ: read file (ASCII, 9-mode, U-format)	JP	03/23/74 02/07/74	04/02/74 03/06/74	.75	Checked out.

GROUP_____PDO: MULTICS SUPPORT GROUP_____ DATE___03/18/74_____ PAGE__2___/___2_____

PROJECT_____ANSI Standard Tape DIM_____ AREA_Attach-Detach:file positioning-R/W/Order_

TASK DESCRIPTION	PERSONNEL	START	FINISH	M-W	CHANGES-STATUS
Create and run test sequence to attach and detach several different tapepositions and combinations of positions.	JP	03/25/74	04/01/74	1	
MULTICS-OS/370: write tape on Multics, read into OS; write on OS, read into Multics	JP	04/02/74	04/09/74	.5	

GROUP_____PDO: MULTICS SUPPORT GROUP_____ DATE___03/18/74_____ PAGE__1___/___2_____

PROJECT_____ANSI Standard Tape DIM_____ AREA_____Read/Write Interface_____

TASK DESCRIPTION	PERSONNEL	START	FINISH	M-W	CHANGES-STATUS	
lrec_io_: ANSI Standard Tape DIM read/write interface for U, F, D, V, and S record formats	Klinger	12/10/73	12/18/73	1.4	Done	
file_ DIM simulator for asynchronous tape io	Klinger	12/19/73	12/21/73	.6	Done	
testing with file_ DIM	Klinger	12/26/73	01/07/74	1.1	Done	
nstd_ simulator for asynchronous tape io	Klinger	01/10/74 01/08/74	01/14/74 01/11/74	.6 .8	Done	
testing with nstd_	Klinger	01/15/74 01/14/74	01/23/74 01/30/74	1.0 2.0	Done	
cv_char_ : alm subroutine for ascii - ebcdic / ebcdic - ascii conversion	Klinger	01/18/74	01/22/74	.6	Done	
tape interchange testing: Multics tapes on OS; OS tapes on Multics	Klinger	02/04/74 02/04/74	02/22/74	3.0	Multics to OS: all formats except VBS.	+
Interim lrec_io_: bridge between ios_ and iox_ using tapeio_ interface	Klinger	03/11/74 03/11/74	03/22/74	2.0	75% of changes made	*
Research and recode cv_char_ conversion tables	Klinger	03/12/74	03/13/74	.4	Done: needed due to difference between Multics and IBM ascii-ebcdic map	*
split lrec_io_ into ansi_lrec_io_ and os_lrec_io_	Klinger	03/25/74	04/05/74	2.0		*
nstd simulator for tapeio_	Klinger	03/25/74	03/28/74	.8		*
SPS documentation of lrec_io_ and cv_char_	Klinger				ongoing task	

GROUP_____PDO: MULTICS SUPPORT GROUP_____ DATE___03/18/74_____ PAGE__2___/___2_____

PROJECT_____ANSI Standard Tape DIM_____ AREA_____Read/Write Interface_____

TASK DESCRIPTION	PERSONNEL	START	FINISH	M-M	CHANGES-STATUS
inclusion of !rec_io_ in ANSI DIM	Klinger				when work on non-read/write interfaces of ANSI DIM is complete
!rec_io_: testing with asynchronous tape io package	Klinger				when asynchronous tape io package becomes available

GROUP_____PDO: MULTICS SUPPORT GROUP_____ DATE___03/18/74_____ PAGE__1___/___1_____

PROJECT_____ANSI Standard Tape DIM_____ AREA_____Asynchronous Tape I/O_____

TASK DESCRIPTION	PERSONNEL	START	FINISH	M-M	CHANGES-STATUS	
tapeio_: design asynchronous tape I/O interface for ANSI DIM	Canali	12/25/73	01/14/74	1.5	MTB complete	*
		12/25/73	03/12/74	3.0		
tapeio_: code subroutine	Canali	04/01/74	04/30/74	4	Preliminary coding underway to test design's performance	*
		03/13/74	04/30/74			

GROUP_____PDO: MULTICS SUPPORT GROUP_____ DATE___03/18/74_____ PAGE__1___/___1_____

PROJECT_____ANSI Standard Tape DIM_____ AREA_____Interim Tape I/O Command_____

TASK DESCRIPTION	PERSONNEL	START	FINISH	M-W	CHANGES-STATUS	
Design phase: extension of ostape to a general tape I/O command.	Klinger	02/07/74 02/07/74	02/15/74 02/20/74	1.4 2.0	Done	+
Coding phase: general tape I/O command.	Klinger	02/18/74 02/21/74	03/01/74 03/14/74	2.0 3.1	Done	+
Testing phase: general tape I/O command.	Klinger	03/04/74	03/15/74	2.0	Will begin when interim [rec_io_ (bridge between ios_ and iox_ versions) is finished.	+