Saltzer

Multics Task Report MTR - 139

To: Distribution

From: Peter B. Kelley, recorder

Date: February 8, 1977

Subject: Systems Assurance Task Report
January 9 - February 5

Significant events:

Gary Dixon has gone to work for Honeywell in Phoenix to teach people how to be Multicians. His presence will be missed. Hardware reliability seems to be turning into a continuous task. The software seems to be stable as far as crashes go, but incompatible system changes have been plaguing us. See "Problem Areas" below.

Crash Analysis:

Processor, memory and disk continue to confuse us. We've had crashes because of cache parity errors, because of memory parities, because of associative memory trouble, because of low order memory being wiped out, because of processor faults during the Idle process, because of the system clock being reset to 03/18/79, because of disk failures, and even our 'never-failed-in-a-year' bulk store. But NO software crashes!

The crashes of the CPU or memory variety have hit hardest. Each gives different sysmptoms, and each disappears just as quick as it comes. The diagnostic tests of the FE's refuse to show any failures. Multics will run fine for five days and then crash six times within two days just to make up for it.

We had one crash where a disk volume was destroyed and had to be rebuilt. A defective board in the disk unit was found and replaced.

Hardcore and BOS Installations:

MSS 30.4 and BOS 2.07 were installed on 01/13/77. Included were a new hash table mechanism for the SLT (segment loading table) and a bug fix for the area condition signalled by alloc_. MSS 30.5, installed on 01/27, included changes to allow the detachment of a tape drive, after

having been requested, but before having had a tape put on it. Before, an attempt to do this resulted in not being able to attach the device again. Other changes were bug fixes for disk DIM error reporting, system control_, and the BOS SAVE and CORE commands. MSS 30.5a contained a new pl1_operators_ for the upcoming release of the PL/1 compiler.

Online Installations:

The new Fortran compiler was installed as new_fortran. A new runtime version of fortran_io_ was also installed producing many unexpected incompatible results (See Problem Areas below). The old Fortran compiler will be the default Fortran until bugs have been worked out of the new_fortran and people have made any necessary conversions. The old Fortran will then be renamed to old_fortran for those who still need it.

The library tools have been installed!

Most other changes were minor bug fixes. There were thirty modifications made to the Online libraries during this reporting period.

Problem Areas:

Problems this month fall into two distinct categories: hardware reliability (or rather, lack thereof) and communication problems between people.

The lack of being able to determine, isolate, and fix hardware glitches frustrates us, the FE's, and most importantly, our users. Better diagnostic tools for the FE's is a definite need. Better support from Honeywell for their FE's would be a plus.

Two instances of online installations this month resulted in a lot of unnecessary confusion. The first was the installation of fortran_io_. Although we were aware of the differences between old_fortran and new_fortran, we were totally unprepared for the major differences between the fortran runtime programs. IO attachment definitions changed which resulted in the loss of files by some of Fortran users. The submission listed no such incompatible changes. After determining what the problems were, and what the implications would be to release this installation to other Multics sites, CISL has agreed to provide a fortran_io_

which is compatible with the previous version. Better documentation of design interface changes would have saved us and our users a lot of needless grief.

Another language problem arose with the submission of release 22 of the PL/1 compiler. It turns out that the Fortran compiler uses the PL/1 compiler's code generator, and since the interface for the code generator is changing, the Fortran compiler would stop working. Fortunately, this was noted before the compiler installation, and a submission for the necessary Fortran changes has been received.

Other:

Two model 451 disk drives will be arriving this month to replace two of our current 191 drives. The model 451 has twice the storage capacity of the 191, but access time is roughly the same. This will mean that the access of information on a 451 could be slower if there is heavy contention for this specific disk.

Detailed Crash Analysis:

	01/09 01/15	01/16 01/22	01/23 01/29	01/30 02/05	Totals
Hardware	0	2	3	6	11
Software?	1	0	0	0	1
Other	0	1	0	0	1
	1	3	3	6	13

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PROJECT Systems Assurance Subgroup AREA Continuing Tasks

TASK DESCRIPTION	PERSONNEL	START	FINISH	P-W	CHANGES-STATUS
Online Library Installations	Anderson	Continu	ing Task	50%	~10 changes per week is our performance goal
Supervisor and BOS Library Installations	Williams	Continu	ing Task	40%	1 system per week is our performance goal
Audit Supervisor Installations	Kelley	Continu	ing Task	3%	New Task to insure Hardcore Library consistency
System Performance Monitoring	Kelley	Continu	ing Task	5%	1 or 2 tests per week
Provide Input to System Design Process	ALL	Continu	ing Task	5%	continue reading MTBs, attending Design Reviews
Monitor Documentation Status	ALL	Continu	ing Task	1%	
Maintain System Libraries	ALL	Continu	ing Task	1%	
Maintain System Listings	Morrison	Continu	ing Task	25%	100 listings per week is our performance goal
Do Monthly, Weekly Maintenance - xrefs, maps, etc	Kelley	Continu	ing Task	1%	
Consulting	ALL	Continu	ing Task	1%	Serving as online_consultant

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PROJECT Systems Assurance Subgroup AREA Interrupt-Driven Tasks

TASK DESCRIPTION	PERSONNEL	START	FINISH	P-W	CHANGES-STATUS
Crash Analysis	Kelley	As	Needed	20%	
Problem Investigation and Correction	ALL	As	Needed	5%	10 to 20 problems occur per week
Provide Support for Operations	ALL	As	Needed	2%	
Monitor Configuration Requirements	ALL	As	Needed	1%	monitoring phone line and disk usage
Supervise Test Sessions on MIT Multics	ALL	As	Needed	<1%	protect MIT hierarchy during test session
Maintain I/O Daemon	Kelley	As	Needed	<1%	Little maintenance required now
Maintain Ring 1, Accounting Data Bases	ALL	As	Needed	1%	Little maintenance required now
Enforce and Publicize Submission Standards	ALL	As	Needed	<1%	Check with submitters about errors on installation forms

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PROJECT Systems Assurance Subgroup AREA Improvements

TASK DESCRIPTION	PERSONNEL	START	FINISH	P-W	CHANGES-STATUS
Improve Facilities and Strategies for Testing Software					no work underway due to lack of personpower
Install library_map and friends	Dixon			2 3	DONE.
Delete >tools from system search rules.					
Maintain, Improve Library Submission Tests					Nothing underway due to lack of personpower
Change format of news.info to support new help features	Kelley			.2 .2	deferred until time available
Upgrade Installation exec_coms, install and document					deferred
Honeywell PLM - AN80: Library Maintenance Manual	ALL				deferred
Investigate compare_source_statement program to replace compare_ascii					Compare PL/I source statements, ignoring differences in comments, formatting
Modify updater to give access to libraries before installation and remove afterwards					Low priority *