DATE: November 16, 1973

TO: Distribution

FROM: M. S. Hodges

SUBJECT: Multics Change Requests

Attached are copies of Multics Change Requests which were approved
from November 1 through November 15, 1973.

MULTICS CHANGE REQUEST	MCR 124	
	Page 1 of 1 Pages	

TITLE: Fix to 1050 addressing problems	STATUS	DATE
	Written	10/25/73
	Approved	11-6-73
AUTHOR: R. B. Snyder	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5-6-74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	
				Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
X	Reliability Improvement		Generalization	
		X	Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: A problem using IBM 1050's has existed wherein a user trying to type while the system was trying to send output resulted in the output being lost.

SUMMARY: A bug was found in the 355 code and a timing change was made in the tty control tables.

IMPLICATIONS: None

MULTICS CHANGE REQUEST		MCR 125
		Page 1 of 1 Pages

TITLE: Add disk to Multics via Salvager	STATUS	DATE
	Written	10/26/73
	Approved #	11-6-73
AUTHOR: A. Kobziar	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
Marketing	Withdrawn	
	Expires	5-6-74

CLASSIFICATION		JUSTIFICATION	Replaced by proposal MCR _____
	Incompatible Change	X	Marketing Requirement	Implemented in System _____
X	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
			Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: Adding more disk requires increasing the device maps in the FSDCT which may
have to grow onto another page(s). Since the FSDCT has no branch, the normal
Multics mechanisims cannot be used.

SUMMARY: Adding more disk is accomplished simply by changing the PART cards and
running a long salvage.

DETAILED PROPOSAL: If the salvager finds that the FSDCT constructed from PART cards is
larger than the one Multics had previously, it will obtain free addresses from the
Multics partition, update the FSDCT map (which is in the 1st page of the FSDCT) and
write out the new FSDCT.

MULTICS CHANGE REQUEST

MCR	126
Page 1 of 1 Pages	

TITLE: Remove null address dependence from Salvager	STATUS	DATE
	Written	10/26/73
AUTHOR: A. Kobziar	Approved	11-6-73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5-6-74

CLASSIFICATION		JUSTIFICATION		
	Incompatible Change	X	Marketing Requirement	Replaced by proposal MCR _____
X	Extension		Conformance to Standard	Implemented in System _____
	Restriction	X	Increased Consistency	Objections/Comments:
	Performance Improvement		Simplification	
	Reliability Improvement	X	Generalization	
			Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: Currently the Salvager views addresses starting with 777 . . . as well as
a device id = $\emptyset$ as being null addresses. Page control recognizer only did = $\emptyset$ as
a null address.

SUMMARY: Remove the recognition of addresses starting with 777 . . . as null addresses,
thus making these available for use if needed (and configured).

MULTICS CHANGE REQUEST	MCR 127
	Page 1 of 1 Pages

TITLE: Salvager Emergency Shutdown	STATUS	DATE
	Written	10/26
AUTHOR: A. Kobziar	Approved #	11-6-73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5-6-74

CLASSIFICATION	JUSTIFICATION	Replaced by proposal MCR _____
Incompatible Change	Marketing Requirement	
Extension	Conformance to Standard	Implemented in System _____
Restriction	Increased Consistency	Objections/Comments:
Performance Improvement	Simplification	
X Reliability Improvement	Generalization	
	X Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: If the Salvager crashes and ESD is typed on the operators console, the
Multics emergency shutdown sequence is executed rather than one for the Salvager.
This will always crash.

SUMMARY: Change emergency shutdown to call salv_esd if the salvager is running.

TITLE: Fix bug in delete_ subroutine	STATUS	DATE
	Written	10/29/73
AUTHOR: E. Stone	Approved #	11-4- ?
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5-6-7?

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
		X	Unreported Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: This procedure does not delete segments whose copy switch is on, but
deletes the copy.

SUMMARY: The change involves altering a call to hcs_ initiate.

STATUS: Coded and tested.

MULTICS CHANGE REQUEST

MCR 129
Page 1 of 1 Pages

TITLE: Fix access violation in creation of outer ring stacks

AUTHOR: E. Stone

SOURCE: (if external) e.g., "User", "Marketing"

STATUS	DATE
Written	10/29/73
Approved #	11-6-73
Rejected	
Postponed	
Withdrawn	
Expires	5-6-74

CLASSIFICATION		JUSTIFICATION	
	Incompatible Change		Marketing Requirement
	Extension		Conformance to Standard
	Restriction		Increased Consistency
	Performance Improvement		Simplification
	Reliability Improvement		Generalization
		X	Unreported Bug Fix

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: Remove security hole. Prevent user from using segment numbers reserved for stacks. Prevent user from creating stack explicitly.

SUMMARY: Change makestack to return a status code to segfault if an error results in creating the stack segment or in initiating it with the reserved segment number.

Change makestack to call terminate_proc; change terminate_proc to generate the code error_table_$illegal_stack_creation.

Remove the entry make_seg $ stack from make_seg.

STATUS: Coded and tested.

TITLE: Fix bugs in obtaining initializer console channel name	STATUS	DATE
	Written	10/29/73
AUTHOR: E. Stone	Approved H	11-4-73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5-6-74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	
	Extension	·	Conformance to Standard	Implemented in System _____
	Restriction		Increased Consistency	Objections/Comments:
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
		X	Unreported Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: These bugs were discovered while installing 21.0 in Phoenix and will affect
other sites as well.

SUMMARY: Change leading blanks to leading zeros after picking up tty channel
from opty configuration card, since present conversion from decimal number to
character has no provision for this option.

Change default channel in active_all_rings_data_ to otw_; change default dim to oc_.

STATUS: Coded and tested.

MULTICS CHANGE REQUEST

		STATUS	DATE
TITLE:	Extend "list", "status", "copy", "move" to understand multi-segment files.		
		Written	10/29/73
		Approved ✗	11-6-73
AUTHOR: M. G. Smith		Rejected	
		Postponed	
SOURCE: (if external) e.g., "User", "Marketing"		Withdrawn	
		Expires	5-6-74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
X	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement	X	Generalization	
			Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: In order to make multi-segment files behave as much like single-segment files as possible, the "list", "status", "copy", and "move" commands should be upgraded to handle them similarly.

SUMMARY: The "list" command will have a new option, "-files", which will cause it to list both single- and multi-segment files. The default option will become "-files" instead of "-segments". The existing options "-segments" and "-msf" will continue to work as they do today.

The "status" command will be changed to print the total bitcount and records used for multi-segment files by summing their components.

The "move" and "copy" commands will be changed to properly move and copy multi-segment files instead of considering this to be an error. No new options are required.

IMPLICATIONS: Some conditions which used to be treated as errors by "copy" and "move" will now be processed without error indication.

Procedures "copy_seg_" and "nd_handler_" will have to be changed along with the commands mentioned.

MULTICS CHANGE REQUEST

30919

TITLE: Signal "finish" and close files at process termination	STATUS / DATE

STATUS	DATE
Written	10/29/73
Approved	11-6-73
Rejected	
Postponed	
Withdrawn	
Expires	5-6-74

AUTHOR: M. G. Smith

SOURCE: (if external) e.g., "User", "Marketing"

CLASSIFICATION		JUSTIFICATION		
X	Incompatible Change		Marketing Requirement	Replaced by proposal MCR _____
X	Extension	X	Conformance to Standard	Implemented in System _____
	Restriction		Increased Consistency	Objections/Comments:
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
			Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: In order that files not be left in an inconsistent state, they should be automatically closed at process termination. This will ensure that buffers are flushed to devices, indices updated, locks unlocked, etc. Proper support of PL/I structured files requires this.

In addition, user programs maintaining data bases may also wish notification of process termination, in order to do the same kind of things.

SUMMARY: The "logout" and "new_proc" commands will be changed to signal the "finish" condition. While a user will be able to use this condition for whatever he wishes, the system's default handler for it will close all FORTRAN files, all PL/I files, and any open I/O control blocks.

It is not proposed at this time to catch bumps, fatal process errors, or to signal "finish" in other than the user ring, though these would be desirable extensions.

IMPLICATIONS: While the changes proposed here will signal "finish" upon most process terminations, users must be aware that bumps, fatal process errors, and crashes will still sometimes leave files in an inconsistent state.

If a user's "finish" handler never returns, then his process will not terminate. Since at this time "finish" is signalled only in response to a user-issued command, this should not pose a problem.

Users must have adequate notification of the new condition so that they can adjust their default handlers to accommodate it.

MULTICS CHANGE REQUEST

TITLE: Replace "endfile" command by "close_file".

AUTHOR: M. G. Smith

SOURCE: (if external) e.g., "User", "Marketing"

STATUS	DATE
Written	10/29/73
Approved	11-6-
Rejected	
Postponed	
Withdrawn	
Expires	5-6-74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
X	Incompatible Change		Marketing Requirement	Implemented in System _____
X	Extension		Conformance to Standard	Objections/Comments:
	Restriction	X	Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement	X	Generalization	
			Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: The "endfile" command and its interface are presently suitable only for FORTRAN files. Now that FORTRAN and PL/I files are being unified by the new I/O system, a single command which understands the new files is needed.

SUMMARY: A new command, "close_file", will be provided. It will accept the option "-all" or else a series of names. When given "-all", it will close all FORTRAN and PL/I files. When given specific names, it will close all so-named files.

For compatibility, the existing "endfile" command should remain for some time.

IMPLICATIONS: None.

MULTICS CHANGE REQUEST	MCR 134
	Page 1 of 1 Pages

TITLE: New "error_table_" codes	STATUS	DATE
	Written	10/29 73
AUTHOR: M. G. Smith	Approved #	11-6-?
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	3-6-??

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
X	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
			Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: The implementation of the new I/O system (see MSB-113) requires several new messages to be added to "error_table_".

SUMMARY: Add to "error_table_" the new error messages mentioned in MSB-113.

IMPLICATIONS: None.

MULTICS CHANGE REQUEST	MCR 135
	Page 1 of 1 Pages

TITLE: Install upgraded PL/I runtime	STATUS	DATE
	Written	10/29/73
	Approved #	11-6-73
AUTHOR: B. L. Wolman	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5-6-74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	
				Implemented in System _____
X	Extension	• X	Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
		X	Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: A number of changes have been made to bound_PL/I_runtime_ which are currently or will soon be required by standard PL/I; these include bug fixes as well as new features. All changes are currently installed in experimental library. Changes are:

1) New routines for getting and setting oncode, onsource, and onchar pseudo-variables.
2) Fix for bug causing fatal process error in translate_.
3) Convert date and time BIF's to use single precision arithmetic and give correct time
4) New routine for decimal exponentation.
5) Fix before BIF to return value of first arg when second arg does not occur in first.

730919

TITLE: Fix bug in remote formats (#744)	STATUS	DATE
	Written	10/29/73
AUTHOR: B. L. Wolman	Approved	11-6-3
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5-6-74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
		X	Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS:
      The most common case of remote formats in PL/I stopped working because
of error editing runtime program which handles them. A one-line change is required
to correct problem. The change is installed in experimental library.

MULTICS CHANGE REQUEST

TITLE: Fix to syserr_real unlock bug

AUTHOR: ___Bill Silver_____

SOURCE: (if external) e.g., "User", "Marketing"

STATUS	DATE
Written	10/29 3
Approved #	11-6-73
Rejected	
Postponed	
Withdrawn	
Expires	5-6-74

CLASSIFICATION		JUSTIFICATION	
	Incompatible Change		Marketing Requirement
	Extension		Conformance to Standard
	Restriction		Increased Consistency
	Performance Improvement		Simplification
X	Reliability Improvement		Generalization
		X	Bug Fix

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: Change syserr_real to use stacq to unlock.

	MULTICS CHANGE REQUEST,	MCR _138_

		STATUS	DATE
TITLE: Fix mail command to use set_lock_			
		Written	10/..17
AUTHOR: T. H. Van Vleck		Approved	11-6-13
		Rejected	
SOURCE: (If external; e.g., "User", "Marketing")		Postponed	
		Withdrawn	
		Expires	5-6-74

CLASSIFICATION	JUSTIFICATION	
		Replaced by proposal MCR
		Marketing	
Incompatible	Requirement	Implemented in System
Change	Conformance	
Extension	to Standard	Objections/Comments:
	[X] Increased	
Restriction	Consistency	
Performance	[X]	
Improvement	Simplification	
[X] Reliability		
Improvement	Generalization	
	[X]	
	Bug Fix	

REASONS:

Currently, the mail command uses the STAC builtin function to
attempt to lock the mailbox, before reading or writing it. If a
process which is reading or writing the mailbox terminates, or
the system crashes, while the lock is set, the mailbox will
continue to appear locked indefinitely, until "mail$unlock" is
used to clear the lock.

The set_lock_ subroutine has been provided for just this
situation. It has help from the hardcore, and can determine
whether a lock ID corresponds to a currently valid process.

SUMMARY:

Replace STAC operation in mail by call to set_lock_. Announce to
users that the mail$unlock entry point is no longer necessary and
will be removed soon.

IMPLICATIONS:

Removes a glitch from the user interface. Should eliminate the
possibility of a user blasting the lock on a mailbox while a
message is being added.

A new version of mail is being worked on by Peter Haber, which
will use message segments, integrate mail and send_message, be
accessible by subroutine and usable by the system, and do a lot
of other good things. However, this small change may still be
worth doing for the interim.

MULTICS CHANGE REQUEST	MCR 139

	STATUS	DA''
TITLE: Install improved disk statistics program.	Written	10/31/73
AUTHOR: T. H. Van Vleck	Approved #	11-6-73
	Rejected	
SOURCE: (if external; e.g., "User", "Marketing")	Postponed	
	Withdrawn	
	Expires	5-6-74

CLASSIFICATION	JUSTIFICATION	
		Replaced by proposal MCR
[X] Incompatible Change	[ ] Marketing Requirement	Implemented in System
[X] Extension	[ ] Conformance to Standard	Objections/Comments:
[ ] Restriction	[ ] Increased Consistency	
[ ] Performance Improvement	[ ] Simplification	
[ ] Reliability Improvement	[X] Generalization	
[ ]_____	[ ] Bug Fix	
[ ]	[ ]	

REASONS: Several improvements have been made in the disk usage statistics program, disk_usage_stat. These include improved output format, better segment name classification, ability to handle 256K segments, and better histogram scaling.

SUMMARY:

New version is checked out and in use locally.

IMPLICATIONS:

This tool is used by system administrators only. The driving file "suffix_list" is replaced by a file in a different format, called "starname_list".

MULTICS CHANGE REQUEST	MCR _140_

	STATUS	DATE
TITLE: Improve active functions for arithmetic and string manipulation	Written	10/30/
AUTHOR: T. H. Van Vleck	Approved #	11-4-73
	Rejected	
SOURCE: (if external: e.g., "User", "Marketing")	Postponed	
	Withdrawn	
	Expires	5-6-74

CLASSIFICATION	JUSTIFICATION	
		Replaced by proposal MCR
[ ] Incompatible Change	[ ] Marketing Requirement	Implemented in System
[X] Extension	[ ] Conformance to Standard	Objections/Comments:
[ ] Restriction	[X] Increased Consistency	
[ ] Performance Improvement		
[ ] Reliability Improvement	[X] Simplification	
	[ ] Generalization	
[ ] _____	[ ] Bug Fix	
[ ]	[ ]	

REASONS:

The arithmetic and string-manipulating active functions would
also be useful as commands. Quick calculations and experiments
to find out what a particular PL/I construct does are two
particular examples. In addition, this proposal corrects some
observed deficiencies in the current active functions, and adds
four new active functions.

SUMMARY:

The functions affected are:

        plus, minus, times, divide, mod, max, min
        length, index, substr, index_set
        search, verify

All of these active functions have been modified to type their
value if invoked as commands.

In addition, the plus and times functions have been modified to
handle any number of arguments; the substr active function will
accept the two-argument form of substr as well as the
three-argument form; and new active functions have been written
for search, verify, max, and min. (max and min take any number
of arguments.)

IMPLICATIONS:

No new programs are involved -- just new entry points in existing
programs -- but this does make the system a little larger as
perceived by the user.

MULTICS CHANGE REQUEST	MCR _141____

	STATUS	DATE
TITLE: Extended Star Convention (Phase Two)		
	Written	10/27/7
AUTHOR: Gary C. Dixon	Approved A	11-6-73
	Rejected	
SOURCE: (If external; e.g., "User", "Marketing")	Postponed	
	Withdrawn	
	Expires	5-6-74

CLASSIFICATION	JUSTIFICATION	
		Replaced by proposal MCR
[ ] Incompatible Change	[ ] Marketing Requirement	Implemented in System
[X] Extension	[X] Conformance to Standard	Objections/Comments:
[ ] Restriction	[ ] Increased Consistency	
[ ] Performance Improvement	[ ] Simplification	
[ ] Reliability Improvement	[ ] Generalization	
[ ]	[ ] Bug Fix	
[ ]	[ ]	

REASONS:

Complete the implementation of the extended Star Convention,
as described in MSB-103.

SUMMARY:

1)   Change the finite state table in the hardcore program,
     match_star_name_, to make it treat the *'s in star names of
     the form, !*** or *** or abc*d*, as illegal characters.
     Phase one of the extended Star Convention treats these *'s
     as if these were ?'s to allow users to convert such *'s to
     ?'s.

2)   This same change will enable the * in star name components
     of the form abc*def to be interpreted as meaning "matches
     any number of characters in the corresponding component and
     letter position".

This change will complete the implementation of the extended Star
Convention.

IMPLICATION:

     Users will be given 1 month between the installation of
phase one and phase two of the extended Star Convention. During
this month, they can change the *'s in star names of the form
shown above to ?'s. Users have already been notified of this
pending change to the Star Convention via pending_changes.info,
star_equals.info and TOS-P (MSB-103). They will be given further
warning (probably via notices.info or motd.info) shortly before
phase two is installed.

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|                                               |              |
|            MULTICS CHANGE REQUEST             | MCR __142___ |
|_____|_____|
|                                               | STATUS | DATE|
| TITLE:  compare_entry_names (bug fix)         |_____|_____|
|                                               | Written  |1042.77|
| AUTHOR: Gary C. Dixon                         | Approved |II-6  |
|_____| Rejected |_____|
| SOURCE: (if external: e.g., "User", "Marketing")| Postponed|_____|
|                                               | Withdrawn|     |
|_____| Expires  |5-6-74|
| CLASSIFICATION  | JUSTIFICATION  |            |
|_____+_____| Replaced by proposal MCR_____
| | Incompatible | | Marketing    |
|_|_Change_____|_|_Requirement__| Implemented in System_____
| |              |☒| Conformance  |
|_|_Extension____|_|_to Standard__| Objections/Comments:
| |              |☒| Increased    |
|_|_Restriction__|_|_Consistency__|
|☒| Performance  | |              |
|_|_Improvement__|_|Simplification|
| | Reliability  | |              |
|_|_Improvement__|_|Generalization|
| |              |☒|              |
|_|_____|_|_Bug Fix_____|
| |              | |              |
|_|_____|_|_____|
```

SUMMARY:

1)   Call get_equal_name_ to handle equal names, instead of
      handling them internally.

2)   Change the name comparison algorithm to scan the two name
      arrays which are being compared only once, rather than twice
      as they are now.

3)   Allocate the two name arrays in system free area instead of
      in an area created in the stack.

REASONS:

1)   Follow system standards for the handling of equal names,
      rather than applying an internal standard.

2)   Improve the performance of name comparison.

3)   Fix the bug which currently prevents the comparison of the
      names on two entries when either or both has many names by
      allocating the name arrays in a very large area.

IMPLICATIONS:

      After the changes, compare_entry_names will work as the user
expects and with improved performance. The external interface to
the command will not change.

Page 1

MULTICS CHANGE REQUEST	MCR 143

	STATUS	DAT
TITLE: Fix bug in start_dump (not printing maps)		
	Written	10/23/73
AUTHOR: Roger A. Roach	Approved	11-6-73
	Rejected	
SOURCE: (If external: e.g., "User", "Marketing")	Postponed	
MIT IPC (Operations)	Withdrawn	
	Expires	5-6-74

CLASSIFICATION	JUSTIFICATION	
		Replaced by proposal MCR
[ ] Incompatible	[ ] Marketing	
Change	Requirement	Implemented in System
	[ ] Conformance	
[ ] Extension	to Standard	Objections/Comments:
	[ ] Increased	
[ ] Restriction	Consistency	
[ ] Performance		
Improvement	[ ] Simplification	
[■] Reliability		
Improvement	[ ] Generalization	
	[■]	
[ ]	[ ] Bug Fix	
[ ]	[ ]	

REASONS: Currently the dumper (start_dump) is not printing maps
for complete dumps. It is necessary to use
backup_cleanup to get the maps dprinted.

SUMMARY: The problem has been traced to a missing "end"
statement. I purpose to insert it.

IMPLICATIONS: It will work again.

MULTICS CHANGE REQUEST		MCR 144	
		Page 1 of 1 Pages	
TITLE: Fix zeroing reused page in salvager		STATUS	DATE
		Written	11/1/73
AUTHOR: A. Kobziar		Approved #	11/13/7
		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
		Expires	5/13/7

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
X	Reliability Improvement		Generalization	
		X	Bug Fix #206	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: Salvager wires down a reused page before zeroing it. This causes a salvager crash since cleanup can never get all of this segment's pages out of core.

SUMMARY: Change salv_check_map to call pc_wired$read instead of $wired_wait. Also include an auditing suggestion not to regard an address starting with 777 as null. (Only rely on did = 0 as a null address)

MULTICS CHANGE REQUEST

MCR 145
Page 1 of 1 Pages

TITLE: Fix bug in signaller causing EIS problems

AUTHOR: Steve Webber

SOURCE: (if external) e.g., "User", "Marketing"

STATUS	DATE
Written	11/1/73
Approved #	11/13/73
Rejected	
Postponed	
Withdrawn	
Expires	5/13/74

Replaced by proposal MCR _____

Implemented in System _____

CLASSIFICATION		JUSTIFICATION	
	Incompatible Change		Marketing Requirement
	Extension		Conformance to Standard
	Restriction	X	Increased Consistency
	Performance Improvement		Simplification
X	Reliability Improvement		Generalization
		X	Bug Fix #199

Objections/Comments:

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: There is currently a bug in the signaller which causes restarted faults (record quota overflows, e.g.) to execute incorrectly because the EIS pointers and lengths are not reloaded.

SUMMARY: The necessary instruction to load the pointers and lengths should be added.

IMPLICATIONS: None.

MULTICS CHANGE REQUEST

		STATUS	DATE
TITLE: Fix bugs in pxss		Written	11/1/73
		Approved ≠	11/13/73
AUTHOR: Steve Webber		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
		Expires	5/13/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction	X	Increased Consistency	
	Performance Improvement		Simplification	
X	Reliability Improvement		Generalization	
		X	Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: There are a few bugs in pxss which have appeared over the last few weeks.
These are:

#205 1) The set_proc_required code has a bug which can (and has) crashed the system.
     2) A bug in the new "deact proc mechanism" allowing the initializer to block rather than wait was discovered.

#200 3) The cpu timer mechanism uses real_cpu_time to set the timer but checks against elapsed virtual_cpu_time.

SUMMARY: Minor edits to the program pxss.alm are required.

IMPLICATIONS: None.

MULTICS CHANGE REQUEST	MCR 147
	Page 1 of 1 Pages

TITLE: Correction of stringsize fault handling	STATUS	DATE
	Written	11/5/73
AUTHOR: M. Weaver	Approved H	11/13/73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5/13/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension	X	• Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
X	Reliability Improvement		Generalization	
		X	Unreported Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: The truncation fault is really a stringsize condition and should be signalled
as such for the sake of PL/I programs. Also, the default handling should be an
automatic start, but this now results in an op_not_complete fault.

SUMMARY: If pds$pll_machine = 0 then the fault will continue to be signalled as it
is now but called stringsize instead of truncation. Otherwise, the fim will
adjust the machine conditions so that a restart is possible and then signal
stringsize. Change handler for stringsize to return.

IMPLICATIONS: None.

MULTICS CHANGE REQUEST

TITLE: New I/O Daemon

AUTHOR: Robert S. Coren

SOURCE: (if external) e.g., "User", "Marketing"

STATUS	DATE
Written	11/5/ 3
Approved ⊬	11/13/73
Rejected	
Postponed	
Withdrawn	
Expires	5/13/

CLASSIFICATION		JUSTIFICATION	
X	Incompatible Change	X	Marketing Requirement
X	Extension		Conformance to Standard
	Restriction		Increased Consistency
	Performance Improvement		Simplification
	Reliability Improvement	X	Generalization
			Bug Fix

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: 1. The I/O Daemon needs to be extended to operate remote devices.
2. Potential conflicts between multiple independent I/O daemon processes should be resolved.

SUMMARY: Separate I/O Daemon functions into coordinator which manages the queues and device drivers which perform output requests.

IMPLICATIONS &

DETAILED PROPOSAL: See MTB-004.

TITLE:	Install Profile Command	STATUS	DATE
		Written	10/31/73
AUTHOR: B. Wolman		Approved ⧣	11/13/73
		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
		Expires	5/13/74

CLASSIFICATION		JUSTIFICATION	
	Incompatible Change	X	Marketing Requirement
X	Extension		Conformance to Standard
	Restriction		Increased Consistency
	Performance Improvement		Simplification
	Reliability Improvement		Generalization
			Bug Fix

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

Control agrument shall apply to whole line.

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: The profile command is used to print the execution statistics made available by the PL/I "profile" option. See attached documentation.

Name: profile

The profile control argument of the pl1 and fortran commands causes the compiler to generate an internal static table containing an entry for each statement in the source program; the table entry contains information about the source line as well as a counter that starts out as zero. Each statement in the program is modified to start with an instruction to add one to the counter associated with the statement. The profile command allows the user to print and reset these counters.

Usage

profile name1 ... namen -ctl_arg1- ... -ctl_argn-

1) name1   is the pathname or reference name of a program whose counters are to be printed or reset.

2) ctl_arg1   is selected from the following list. Control arguments take effect immediately and apply to all programs whose names appear later in the command line.

   -print, -pr   -causes profile to print the following information for each statement in the specified programs.

                    1. line number

                    2. statement number

                    3. number of times the statement has been executed.

                    4. cost of executing the statement measured in number of instructions executed online plus the number of jumps into pl1_operators_. Note that each instruction and each jump into pl1_operators_ count as only one unit.

                    5. the names of all operators in pl1_operators_ used by this statement.

                    The total cost for all statements is printed at the end.

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-brief, -bf   causes profile to omit from the statement
                     list statements that have never been
                     executed.

-long, -lg   causes profile to include the statement list
                     statements that have never been executed.

-reset, -rs   causes profile to reset to zero all counters
                     in the specified program.

                     The default control arguments are -print and
                     -brief.

Example

The PL/I program shown below counts the number of
occurrences of one string in another string. It was compiled
with the -profile control argument and executed once. The output
from the profile command, which is printed below, shows an
anomaly of the current inplementation -- there is only one
counter for the statement:

    if ... then ...

so that one cannot determine the number of times the condition
was satisfied.

The source code for the program is:

```
example:  proc(s1,s2);

declare   (s1,s2) char(*),
          (i,k) fixed bin,
          ioa_ options (variable);

          k = 0;
          do i = 1 to length(s1) - length(s2);
              if substr(s1,i,length(s2)) = s2 then k = k + 1;
              end;

          call ioa_("¬d",k);
          end example;
```

After executing the program once, the output from the profile command is:

LINE	STM	COUNT	COST	PROGRAM
				example
7	1	1	1	
8	1	1	8	
9	1	27	351 + 54 (set_cs cp_cs)	
10	1	27	54	
12	1	1	14 + 1 (call_ext_out_desc)	
13	1	1	0 + 1 (return)	
TOTAL			428 + 56	

MULTICS CHANGE REQUEST	MCR 150
	Page 1 of 1 Pages

TITLE: Install corrected EIS conversion routines	STATUS	DATE
	Written	10/31/73
AUTHOR: B. Wolman	Approved ✗	11/13/73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5/13/74

CLASSIFICATION		JUSTIFICATION	Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
		X	Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: A number of bugs have been fixed in the EIS conversion package located in >ldd>exl>0. We propose to update the installed copy in >lang.

SUMMARY: The following bugs were fixed:
1) When conversion is signalled, a copy of input string is used, thus onsource and onchar BIF's do not alter original input.
2) Assignment (via conversion package) does not try to go char → number → char.
3) Sign was getting lost in conversion of scaled decimal with value such as -0.75.
4) Conversions involving varying strings were not working in all cases.
5) Conversion bit → fixed dec gave lpr fault.

IMPLICATIONS: None.

TITLE: Message Segment Primitive Changes	STATUS	DATE
	Written	11/8/73
AUTHOR: Peter Haber	Approved ⊬ 11/13/	
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5/13/7⊬

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
X	Extension	x	Conformance to Standard	Objections/Comments:
	Restriction	x	Increased Consistency	This is a subset of modifications proposed from feedback to MTB-006.
	Performance Improvement		Simplification	
	Reliability Improvement	x	Generalization	
			Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: 1) The message segment primitives do not provide all the operations which they could to enhance caller subsystem operation.

2) The message segment facility is not clearly defined.

3) The message segment primitive pointer entries violate access control restrictions.

SUMMARY: Message segment primitive changes

1) Change the format of the message segment header to include a unique bit pattern, a version number, some free storage and a block of "special storage" in the header.

2) Provide "write_special_storage" and "read_special_storage" entries to read and write "special storage" in the header. Both entries will be callable from ring 1 and will provide the handle for a "send wakeup" facility with protected event channel and process id for the new send_message command.

3) Change the pointer entries to accept and return a unique index rather than pointers.

4) Provide a "rewrite_message" primitive for absentee.

5) Change ex_acl calls to calls to new ACL primitives.

6) Split out the ".ms" name check code into the "queue" message
   segment procedure.

For conversion make current message segment gate call a write-around
which first makes sure the message segment is in the new format and
if not converts it, then passes the call to the new primitives.

IMPLICATIONS: Empty message segments cannot be truncated unless
               special header information is all zeroes.

MULTICS CHANGE REQUEST		MCR 153	
		Page 1 of 1 Pages	

TITLE: Remove "pdir" abbrev mechanism from print_apt_entry. Also add -brief option.	STATUS	DATE
	Written	11/2
AUTHOR: Steve Webber	Approved H	11/13/73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5/13/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
X	Extension		Conformance to Standard	Objections/Comments:
	Restriction	X	Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
			Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: The print_apt_entry command currently defines the abbreviation "pdir". This is inconvenient.

SUMMARY: The abbrev mechanism is removed. A new option (-brief, -bf) is added which will only print out the state, flags and wait event for the process of interest.

IMPLICATIONS: None

MULTICS CHANGE REQUEST	MCR	154

TITLE: fix bug in star_	STATUS	DATE
	Written	11/05/73
AUTHOR: Gary C. Dixon	Approved ⊬	11/13/73
	Rejected	
SOURCE: (if external; e.g., "User", "Marketing") MIT MPRF	Postponed	
	Withdrawn	
	Expires	5/13/74

CLASSIFICATION		JUSTIFICATION	
			Replaced by proposal MCR
☐	Incompatible Change	☐ Marketing Requirement	
			Implemented in System
☐	Extension	☐ Conformance to Standard	
			Objections/Comments:
☐	Restriction	☐ Increased Consistency	
☒	Performance Improvement	☒	
		Simplification	
☒	Reliability Improvement	☐	
		Generalization	
☐		☒	
		Bug Fix	
☐			

Use these headings: REASONS, SUMMARY, IMPLICATIONS, and optionally DETAILED PROPOSAL

REASONS:

1) Fix the long-standing bug in hcs_$star_ (and hcs_$star_list_) which causes zero entry counts (or branch and link counts) to be returned when called with a null area pointer (i.e., the caller wants totals only) and a star name which is not "**".

2) Increase the performance of the loop which compares the names of directory entries with the star name.

SUMMARY:

1) Update the matching-name counter before branching out of the name comparison loop when a matching name is found and totals only are required.

2) The star name is compared with each entry name according to the type of the star name, as determined by check_star_name_. Type 0 means "contains no *'s or ?'s", type 2 means "is equivalent to **", and all other star names are type 1. Currently, the value of type is tested by a series of if-statements to determine what type of comparison should be performed. Change this testing of type to a branch through a constant label array to the appropriate comparison code.

IMPLICATIONS:

1) An annoying bug will be eliminated.
2) Code in the name comparison loop will be more efficient and simple to understand.

TITLE: Creation of system trace table		STATUS	DATE
		Written	11/7/73
AUTHOR: R. B. Snyder		Approved ⤴	11/13/73
		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
local		Expires	5/13/7⊬

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	
				Implemented in System _____
X	Extension		Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	
	Performance Improvement		Simplification	
	Reliability Improvement		Generalization	
		X	Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: A system trace routine is required in order to find 355 bug.
This routine could be generally usable to enable the finding
of subsequent bugs in any area of the system.

SUMMARY: A trace routine will be constructed which will copy its
arguments (which vary in number and type) into a system wide
trace table in circular fashion. This table will normally
be of 0 length but will be grown into an integral number of
1024 word wired core blocks by the presence of a SYST
config card. This card specifies the size of the trace
buffer. Calls to this system trace routine are being put
in dn355 and tty_inter. These calls will be taken out when
the bug is found.

IMPLICATIONS: Must coordinate with operators on insertion of SYST
card.

MULTICS CHANGE REQUEST	MCR 156
	Page 1 of 2 Pages

TITLE: Improve listing tape system	STATUS	DATE
	Written	11/7/73
AUTHOR: M. A. Meer	Approved	11/13/73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5/13/7↑

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
X	Extension	X	Conformance to Standard	Objections/Comments:
	Restriction	X	Increased Consistency	Keywords shall be revised to conform to standards and accepted practice.
	Performance Improvement	x	Simplification	
	Reliability Improvement	x	Generalization	
			Bug Fix	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: 1) To ease printing of tapes
2) To ease error recovery
3) To ease error interpretation
4) To ease extraction of subsets of files

SUMMARY: 1) allow operations on tapes starting at other than the first reel of a set of reels.

2) rewrite error messages for better analysis of errors

3) add to syntax in the control file for printing, deleting or outputting subsets of a listing tape.

IMPLICATIONS: None

DETAILED PROPOSAL:
1) Disable with an input argument checking that the operation begins with the first reel of a sequence. This is a change to lts_tape_ and listing_tape_print.

2) Review and rewrite some error messages (changes to possibly all 5 routines)

3) Change lts_file_ to check expanded syntax and call appropriate internal subroutines to mark files for printing, deleting or output as required.

PROPOSED SYNTAX:

-output   set switch to mark for output (this is
                                         automatic for printing)

-delete   set switch to mark for deletion

-area_name, -an   use either separately or in conjunction
        use   with -sn, -dc or -these. Mark only
-an zilch   files with the area name which follows.

-sys_num, -sn   mark only files with system number
        use $\geq$ or $\leq$ the one which follows.
-sn   20-1
-sn   20-2

-date_created, -dc   mark only files created before or after
        use   date and time which follows.
-dc $<$ "10/25/73 0."
-dc $>$ "7/1/73 1043.0"

-these   mark the files which follow.
        use
-these hcs_.list -hardcore
        reload.list
        apnd.list -BOS
        blast.list
        salvager.list   -SALV

The syntax is free form.

The area name used with another control operates as a logical and.

MULTICS CHANGE REQUEST	MCR 157
	Page 1 of 1 Pages

TITLE: ACL extended access change	STATUS	DATE
	Written	11/7/73
AUTHOR: Peter Haber	Approved ✓	11/13/73
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	5/13/74

CLASSIFICATION		JUSTIFICATION	Replaced by proposal MCR _____
	Incompatible Change	Marketing Requirement	Implemented in System _____
X	Extension	Conformance to Standard	Objections/Comments:
	Restriction	Increased Consistency	
	Performance Improvement	Simplification	
	Reliability Improvement	Generalization	
		Bug Fix	
	x	simplifies debugging ring 1 procedures	

Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: Currently, debugging procedures which manipulate extended access requires creating an environment to simulate extended access. There is not now an adequate environment to test the extended access primitives well. Creating that environment would be expensive. The proposed change is cheap.

SUMMARY: Provide a priviledged entry to the access control primitives which allow the caller to manipulate extended access on a segment which resides in any ring greater or equal to the callers ring. Currently extended access can only be manipulated on segments in ring 1.

IMPLICATIONS: Requires changes to ACL primitives for testing or duplicate ACL primitives in ring 0, and a new gate into ring 0.

DETAILED PROPOSAL: Put field in pds with ring number checked by acl primitives. Default value of ring number is 1; changeable via phcs_ to caller ring number.