DATE: April 1, 1974

TO: Distribution

FROM: M. S. Hodges

SUBJECT: Multics Change Requests

Attached are copies of all Multics Change Requests which
were approved from March 16 through March 31, 1974.

MULTICS CHANGE REQUEST	MCR 399
	Page 1 of 1 Pages

TITLE: Make I/O daemon perform deletions after crash	STATUS	DATE
	Written	3/7/74
AUTHOR: Robert S. Coren	Approved	3/19/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	9/19/74

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 #268	

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

REASONS: Segments printed by I/O daemon whose retention time hasn't expired when system shuts down or crashes aren't deleted.

SUMMARY: Change I/O coordinator so that when it comes up, it deletes any segments left over from previous session.

DETAILED PROPOSAL: When coordinator comes up, before accepting wakeups from device drivers, it goes through the list of "saved" requests. For each one, it deletes the file if requested, and then unthreads and frees the request descriptor. The areas for requests and descriptors are not reinitialized until after this has been done.

IMPLICATIONS: 1. All files printed in response to "dprint -dl" commands will actually be deleted.
          2. If the time between shutdown and startup is less than the I/O daemon's retention interval, some files may be deleted sooner than they would have been if the system hadn't crashed.

NOTE: This could be regarded as the first step in making the coordinator's operation essentially continous across crashes, i.e. enabling the re-starting of requests performed before the most recent crash if their retention intervals were unexpired, etc. If this next phase is ever imple-mented, implication 2 above will go away.

MULTICS CHANGE REQUEST

MCR	400
Page 1 of 1 Pages	

TITLE: Restrict traps at first reference

AUTHOR: M. Weaver

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

STATUS	DATE
Written	3/7/74
Approved *H*	3/19/74
Rejected	
Postponed	
Withdrawn	
Expires	9/19/74

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

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

REASONS: Traps at first reference as currently defined have deficiencies; i.e., they do not get invoked if the segment is not referenced via the linker. In order not to encourage more extensive use of these traps, it is proposed that they be restricted to their current usage, i.e., only one at a time per object segment. As now defined, an object segment may have an array of traps, but it is believed that no one used this feature. Only the first element of the array the binder produces is actually usable.

DETAILED PROPOSAL:
a. Change standard object segment document to mention restriction of one trap.
b. Change binder to allow only one input component with a trap and to generate only one trap.
c. Change the linker's user ring trap invoking procedure to invoke only one trap.
d. Change alm to generate only one trap per segment.
   The trap structure will not be redified at this time because the above must be done in any case for existing segments and there seems no need to further complicate the changes.

IMPLICATIONS: Potential generality will be lost, especially for the binder. It will no longer be able to claim to bind any group of standard object segments. As mentioned above, it does not now actually regenerate more than one usable trap.

SUMMARY: Restrict number of traps at first reference to one per object segment.

MULTICS CHANGE REQUEST		MCR 401	
		Page 1 of 2 Pages	
TITLE: Fix bugs in binder and make improvements		STATUS	DATE
		Written	3/8/74
AUTHOR: M. Weaver		Approved	3/19/74
		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
		Expires	9/19/74

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

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

REASONS: There are several improvements which should be made to the binder.
1. It should be better adapted for binding and producing segments > 64k.
2. It can benefit greatly from use of EIS instructions.
3. There are several bugs to be fixed (see attached copy of binder_status.info).

SUMMARY:
1. Be sure it can bind at least the combined pl1 and fortran compilers. This primarily requires an increase in the input component limit.
2. Recompile with the EIS compiler.
3. Fix as many of the bugs on the list as I can in a reasonable amount of time.

IMPLICATIONS: None

DETAILED PROPOSAL: Most of this work is already done.

binder_status.info

3/06/74

This file contains bi'nder BUGS and PLANNED IMPROVEMENTS.

8   next free number

BUGS

7   74.03.04   type 3 and equivalent type 6 links prelinked
with Global: no_link; in binfile

6   74.03.01   traps at first reference are not properly relocated

5   74.02.11   repatch table sometimes overflows

4   74.02.06   definitions that have the retain bit on are not
always retained

3   74.02.06   command does not accept input name foo.archive (MPRF 6220)

2   74.02.06   bitcount sometimes set < current length, causing fault;
seems to happen only with simultaneous No_Table
and Global: no_link binfile options

1   74.02.06   extra segname definitions sometimes generated

MULTICS CHANGE REQUEST		MCR ___404___	
TITLE: Programs for processing SYSERR log.		STATUS	DATE
		Written	03/08/74
AUTHOR: T H Van Vleck		Approved	3/19/74
		Rejected	
SOURCE: (if external: e.g., "User", "Marketing")		Postponed	
		Withdrawn	
		Expires	9/19/74

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: The new SYSERR logging mechanism provides a hardcore segment
   which records messages output by ring zero programs. It is desirable
   to be able to examine part or all of this log in the process of
   system administration, maintenance, and programming. Daily reports
   with selections of this log should also be prepared automatically.

SUMMARY: Install   new   programs   "print_syserr_log"   and
   "daily_syserr_process", which examine the SYSERR log.

   The print_syserr_log program extracts the syserr log from the
   hardcore and prints all or part of the log. The user may specify a
   starting date and time, a starting sequence number, or a character
   string which must be contained in the lines printed.

   The daily_syserr_process program extracts the syserr log from the
   hardcore, and scnas the portion of the log added since the last time
   the program was run. Under control of an ASCII control file,
   "syserr_select_file," the program examines each message and may
   output the line on one or more I/O streams. Thus, one report
   containing only disk error messages might be produced, and another
   report might contain only system-crash messages.

   The location of the "last line looked at" data is the segment
   sys_admin_data. The daily_log_process program will be modified to
   use this same strategy, so that daily log processing need not require

write access on the log file (a problem the network group ran into
when they attempted to use daily_log_process on the net_log.)

IMPLICATIONS: New reports on system operation will be available.

The use by programmed tools of the SYSERR messages makes the contents
of the administrative reports more sensitive to minor changes in the
format of hardcore error messages. This suggests that a more formal
mechanism for installations of modules with new error messages or
changes to the text of old error messages would be very useful. (We
should be doing this anyway.)

.Since daily_sys-rr_process considers only one line at a time, its
usefulness is degraded to the extent that a message cannot be
identified by simple string matching. In particular, it would be
helpful to add to such messages as the octal dump of the control unit
produced by the op-not-complete handler, an indication of which
program produced the output line. These message improvements can of
course be done incrementally. (The suggestion that, if a message
pertains to the previous message, it begin with some character such
as "-" to indicate the continuation, won't work on a multiple-CPU
system.)

MULTICS CHANGE REQUEST	MCR	406
	Page 1 of 1 Pages	

TITLE: Change to config card format	STATUS	DATE
	Written	3/11/74
AUTHOR: N.I. Morris	Approved #	3/19/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
internal	Withdrawn	
	Expires	9/19/74

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	X	Generalization	
			Bug Fix	

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

REASONS: Required for on_line T & D, MPC firmware laoding, etc.
(See MTB-048)

MULTICS CHANGE REQUEST	MCR 407
	Page 1 of 1 Pages

TITLE: 355 Fix

AUTHOR: R. Snyder

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

STATUS	DATE
Written	3/11/74
Approved #	3/19/74
Rejected	
Postponed	
Withdrawn	
Expires	9/19/74

CLASSIFICATION	JUSTIFICATION	
Incompatible Change	Marketing Requirement	Replaced by proposal MCR _____
Extension	Conformance to Standard	Implemented in System _____
Restriction	Increased Consistency	Objections/Comments:
Performance Improvement	Simplification	
Reliability Improvement	Generalization	
	x Bug Fix #267	

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

REASONS: A bug was discovered in the stop_channel portion of the 355 software. This bug would cause writes to the 6180 to not be dequeued when they were supposed to be.

SUMMARY: The bug will be fixed.

IMPLICATIONS: Fewer Crashes.

MULTICS CHANGE REQUEST

MCR   408

Page 1 of 1 Pages

TITLE:

Entry Bound fix

AUTHOR: Bernard S. Greenberg

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

STATUS	DATE
Written 3/12/74	
Approved H	3/19/74
Rejected	
Postponed	
Withdrawn	
Expires	9/19/74

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

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

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

REASONS: Call limiters are not set in user's SDW's for hardcore gates. This is a security hole. An interim mechanism set up to   fix this problem fails to work at all.

SUMMARY: Partially implement full entry bound mechanism, with special case in initialization for hardcore gates.

IMPLICATIONS: When and if the call limiter of a segment is made a user-settable attribute, no change need be made to the SDW creation mechanism.

DETAILED PROPOSAL: Modify seg_fault to extract entry bound and gate switch from segment branch.   Modify init_branches to place this information in the branches of hardcore gates. Modify both of these programs to remove special-case trailer mechanism which attempted to solve this problem. All branches are created with entry bound switch off and entry bound of zero, allowing all user segments to be handled as now.

STATUS: Proposed software written and debugged - operational. .

MULTICS CHANGE REQUEST

TITLE: Fix bugs in BOS TSTCHN command

AUTHOR: N. I. Morris

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

    internal

STATUS	DATE
Written	3/13/74
Approved #	3/19/74
Rejected	
Postponed	
Withdrawn	
Expires	9/19/74

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	unreported Bug Fix	

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

REASONS: TSTCHN uses index registers which are not saved across BOS calls.
    A change to the BOS typewriter subroutines brought this problem
    out.

SUMMARY: Change TSTCHN to use those index registers which are saved
    across a call.

MULTICS CHANGE REQUEST	MCR 410	
	Page_1_of_1_Pages	

TITLE: TTYDIM Fixes	STATUS	DATE
	Written	3/13/74
AUTHOR: R.B. Snyder	Approved # 3/19/74	
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	9/19/74

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

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

REASONS: A number of small bugs exist in the ttydim. They should be fixed. In addition, it is proposed to not make the default terminal type for 150 $ 300 baud be tty37 with acks & naks to turn on/off the proceed lite as these characters often foul up non-tty37 like terminals.

SUMMARY: The following bug fixes & improvements will be made:
1. the set graphic position (045) character will be made to work (MPRF 005864)
2. lost carriage returns in crecho mode will be fixed (MPRF #6285 & 6276)
3. certain control characters will no longer be sent to the ARDS (MPRF# 5865.)
4. Escaping the escape character will be fixed (MPRF#5657)
5. the case shift will be remembered correctly for terminals like the 1050 (MPRF #6985)
6. only those terminals which really are model 37 ttys will have ACK/NAK sequences sent to them to turn on/off the proceed lite.
7. time delays will be put in for backspacing on a TN300 (MPRF 6660)
8. the form feed will be made a legal character on a TN300 (MPRF 6626)
9. the TI700 answerback will be recognized and saved.

IMPLICATIONS: Users will be told of no ACK/NAK-shouldn't be any problems.

MULTICS CHANGE REQUEST		MCR 411	
		Page 1 of 1 Pages	
TITLE: bug in proc_brackets_		STATUS	DATE
		Written	3/13/74
		Approved #	3/19/74
AUTHOR: Steve Herbst		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
		Expires	9/19/74

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 #274	

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

REASONS: proc_brackets_$return_value returns an unintentional error code
of 102 instead of 0. This results in the message "code 102 not found
in error_table_." When there are nested brackets in a command line.

SUMMARY: Initialize code to 0 at return_value and nested_brackets entries.

MULTICS CHANGE REQUEST	MCR 412

TITLE: Command Name Usage Monitor	STATUS	DATE
	Written	03/13/74
AUTHOR: D. Kayden and R. Roach	Approved	3/19/74
	Rejected	
SOURCE: (if external; e.g., "User", "Marketing")	Postponed	
MIT	Withdrawn	9/19/74
	Expires	

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

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

REASONS: To provide some method of monitoring usage of various commands
(by name).

SUMMARY: Install a check in find_command_ to see if command being issued
is on a list defined dynamically by the installation.

IMPLICATIONS: This proposal would be installed in the tools library to be
used by an installation when needed. Should a better method be
developed, the change can easily be replaced.

DETAILED PROPOSAL: See MTB-032 - modified as follows:

The check to see if the command being issued is on the list of
commands being monitored was moved from an external routine to an
inline check. This eliminates most of the overhead when checking
is being done.

MULTICS CHANGE REQUEST

MCR 413
Page 1 of 1 Pages

TITLE: Fix bg in BOS PRINT Command	STATUS / DATE
	Written 3/14/74
AUTHOR: N. I. Morris	Approved # 3/19/74
	Rejected
SOURCE: (if external) e.g., "User", "Marketing"	Postponed
	Withdrawn
	Expires 9/19/74

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	
	☒ Bug Fix / Unreported	

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

REASONS:
The PRINT command expects an argument to be supplied specifying the tape
to be printed. It should assume a default tape number of 1 if the argument
is missing.

Summary:
A default tape number of 1 will be used.

MULTICS CHANGE REQUEST		MCR 414
		Page 1 of 1 Pages

TITLE: Change OPC configuration card	STATUS	DATE
	Written	3/14/74
AUTHOR: N. I. Morris	Approved #	3/19/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
Internal	Withdrawn	
	Expires	9/19/74

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, DETAILED PROPOSAL (Optional)

REASONS:
A special OPC configuration card is currently used to define the IOM number,
channel number, and operating parameters for the operator's console.
Since the operator's console is really a peripheral device, a PRPH card
should be used.

Summary:
The configuration card for the operator's console will be changed to
the followin g format:

        PRPH   OPC   IOM#   ch#   type   buf_split

where:

        IOM#, ch#, and buf_split are as described in MOSN 4.3.1.
        type   is either "IBM", "EMC", or "SCC" to describe an
                  IBM selectric console, an entry model console, or
                  a system control console, respectively.

Detailed proposal:
The oc_data_init module will be modified to search for the new PRPH card.
The configuration deck can be changed immediately to have both old and new
format cards. When the new software is installed, the old format OPC card
can be removed.

MULTICS CHANGE REQUEST	MCR 415
	Page 1 of ___ Pages

TITLE: upgrade and fix bugs in some bound_debug_util_ routines	STATUS	DATE
	Written	3/18/7
AUTHOR: M. Weaver	Approved #	3/26/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	9/26/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
x	Extension	x	Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	Submit info segment warning users of structure version numbers.
	Performance Improvement		Simplification	
	Reliability Improvement	x	Generalization	
		x	unreported Bug Fix	

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

REASONS: get_entry_name does not know about the new entry sequence definition as defined by MCR 119. It also does not validate entry sequences for procedures compiled by basic or the new EIS pl1 compiler (the latter because the compiler name as stored in the object segment has recently been changed to "PL/I").
find_condition_info_ treats the version number in its structure "argument" as output rather than input. This defeats the number's purpose for future upward compatibility. find_pathname_ is now duplicated in bound_error_handlers_.

SUMMARY: Delete find_pathname from bound_debug_util_. Fix and extend get_entry_naem_. Change find_condition_info to look at version number. For the time being, any version number will be equivalent to 1 (see below).

IMPLICATIONS: Since the current version of get_entry_name_ appears to return correct names for PL/I and basic no change should be apparent to its users.
Because many callers of find_condition_info_ do not now set the version number, find_condition_info_ will for the time being treat all version numbers as equivalent to 1. If and when a new version of the structure is defined, find_condition_info_ will look for that version number explicitly but still treat all others as equivalent to 1.

MULTICS CHANGE REQUEST

MCR __416__
Page _1_ of _1_ Pages

TITLE: Fix bug in LD355 and Blast

AUTHOR: M. J. Grady

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

STATUS	DATE
Written	3/14/74
Approved	H 3/26/74
Rejected	
Postponed	
Withdrawn	
Expires	9/26/74

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	unreported Bug Fix	

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

REASONS: Fix bug in LD355 which caused all but first HSLA config card to be ignored.

SUMMARY: Change index register used by ld355 to scan config cards.

IMPLICATIONS: Allows use of all-HSLA subchannels.

MULTICS CHANGE REQUEST

TITLE: bound_full_cp_ with EIS

AUTHOR: Steve Herbst

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

STATUS	DATE
Written	3/14
Approved	H 3/26/74
Rejected	
Postponed	
Withdrawn	
Expires	9/26/74

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

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

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

REASONS: Time can be saved by using builtin functions under EIS in place of array calculations.

SUMMARY: Some of the programs to be optimized are:

    abbrev
    full_command_processor_
    proc_quotes_
    proc_parens_
    proc_brackets_
    full_find_command_

MULTICS CHANGE REQUEST

TITLE: EIS version of find_command_

AUTHOR: Steve Herbst

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

STATUS	DATE
Written	3/14/74
Approved #	3/26/74
Rejected	
Postponed	
Withdrawn	
Expires	9/26/74

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

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

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

REASONS: find_command_ uses a small associative memory to keep pointers to most-used command entries. This memory is currently handled as an array.

SUMMARY: Use of index and substr under EIS will speed up the searching and setting of data, and may allow a larger associative memory.

MULTICS CHANGE REQUEST

MCR 419
Page 1 of 1 Pages

TITLE: Correct bug in salv_truncate

AUTHOR: E. Stone

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

STATUS	DATE
Written	3/15/74
Approved	H 3/26/74
Rejected	
Postponed	
Withdrawn	
Expires	9/34/74

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

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

REASONS: When doing an on-line salvage, salv_truncate calls pc$truncate incorrectly. Arguments 6 and 7 (did and file map size index) are reversed. This causes pc$truncate to think that the size of the file map is either 64 words or 256 words. If this is not the case, information in the directory is overwritten.

IMPLICATIONS: Nothing but the best.

MULTICS CHANGE REQUEST	MCR __420__

TITLE: New version of indent command	STATUS	DATE
AUTHOR: T H Van Vleck	Written	03/14/74
	Approved # 3/26/74
	Rejected	
SOURCE: (If external: e.g., "User", "Marketing")	Postponed	
	Withdrawn	
	Expires	9/26/74

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

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

REASONS:

The change made a few months ago to cause indent to provide additional levels of indentation for compound IF statements caused confusing and unpleasing indentation when there were more than two IF's and a DO-group in the statement. Furthermore, the indentation of ELSE clauses was not keyed to the indentation of the corresponding IF, which tended to conceal the structure of complicated statements.

A new version of indent was written to take full advantage of the EIS compiler, to fix the problems mentioned above, and to cure several other minor problems.

SUMMARY:

The new version of indent is more than twice as fast as the currently installed version.

The command knows somewhat more about the structure of a PL/I program than it used to: It keeps a switch which tells when it is at the beginning of a statement, and will not recognize most reserved identifiers unless the switch is on. This change provides a speed improvement, and also means that a statement like

    go to begin;

will no longer confuse the indentation counters. As a side effect of
this change, indent can recognize some gross errors, such as
beginning a statement with a punctuation mark, and will print an
error message if a syntax error of this type is encountered.

The major change has been to the indentation of complex IF-THEN-ELSE
statements.   Like the current version, the new indent increases the
indentation level for every IF encountered; however, DO groups are
now indented at the depth which a single statement subject to the
THEN would be, and ELSE clauses are lined up with the corresponding
IF. For example, the new indent produces

```
    if a then
        if b then
            if c then do;
                x = 1;
                y = 1;
            end;
            else y = 4;
        else y = 3;
    else y = 2;
```

where the old indent produces

```
    if a then
        if b then
            if c then do;
        x = 1;
        y = 1;
    end;
    else y = 4;
    else y = 3;
    else y = 2;
```

Statements which are continued over more than one line have an extra
indentation of five spaces for all lines of the statement but the
first.

MULTICS CHANGE REQUEST	MCR 421
	Page 1 of 1 Pages

TITLE: Fix Bugs in BOS PATCH Command	STATUS	DATE
	Written	3/15/74
	Approved	A 3/26/74
AUTHOR: N. I. Morris	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
Internal	Expires	9/26/74

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	
	▣ Unreported Bug Fix	

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

REASONS:

1.   A bug in PATCH causes the modified bit in the PDMAP entry for a page not to be set when modifying a page. This causes the patch to be "lost".

2.   A deficiency in the BOS appending simulation package causes the paging device map to be used when in fact it is invalid..

Summary:

1.   The wrong field in a PTW was being tested. PATCH will be changed to test the proper field.

2.   The appending simulation package must examine the fsdct to determine if the paging device ID is non-zero before using the PDMAP..

MULTICS CHANGE REQUEST

MCR   422
Page 1 of 1 Pages

TITLE: Change "assign-device" algorithm

AUTHOR: N. I. Morris

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

DSO

STATUS	DATE
Written	3/15/74
Approved	3/26/74
Rejected	
Postponed	
Withdrawn	
Expires	9/26/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
☒	Incompatible Change	☒	Marketing Requirement	Implemented in System _____
☒	Extension	•	Conformance to Standard	Objections/Comments:
	Restriction		Increased Consistency	Will not work with more than two disk subsystems.
	Performance Improvement		Simplification	
	Reliability Improvement	☒	Generalization	
			Bug Fix	

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

REASONS:
The current device assignment algorithm was designed for an environment in
which several non-identical disk subsystems could be in use. It assumed
that the highest-level (lowest device ID) device was faster than the lowest
level device, and attempted to assign segments to the highest-speed device
whenever possible.

Now, when more than one disk subsystem is to be used, the subsystems will
be identical. Therefore, a different device assignment algorithm is desired.
This algorithm will attempt to equalize the load between two disk subsystems.

Summary:
A new version of "assign_device" will be coded. New segments will be assigned
to the device containing the greater amount of free storage.

Implications:
When two disk subsystems are used, one will not tend to overflow before the
other one. The new algorithm will tend to equalize the space remaining on
both disk subsystems.

The device spillover threshold mechanism implemented by use of the THRS config
card will no longer be used. The code to read the THRS card can be removed.

MULTICS CHANGE REQUEST	MCR _423_____	

TITLE: Fix bugs in Version 1 APL	STATUS	DATE
	Written	03/14/74
AUTHOR: Paul A. Green and Maxim G. Smith	Approved	3/26/74
	Rejected	
SOURCE: (if external: e.g., "User", "Marketing")	Postponed	
	Withdrawn	
	Expires	9/26/74

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

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

REASONS:
    In the process of testing the new APL (Multics Version 2 APL), a
number of unreported bugs were found in the old APL. As they were all
rather trivial to fix, and are rather serious bugs, they should be fixed no
matter what the status of the two APLs is.

SUMMARY:
    Replace the programs sorti.pl1, rev_sorti.pl1, sortf.pl1, and
rev_sortf.pl1. This will fix a bug causing the APL grade (sort) operator
to fail to sort properly. Replace the program matinv.pl1 with one that is
more accurate; this will give better results for the APL matrix divide and
matrix invert operators.

IMPLICATIONS:
    Sorting will work for all cases, and matrix division and inversion
will be more accurate (meaning, of course, that the answers returned will
change). The improved accuracy obviously outweighs any compatibility
issues.

DETAILED PROPOSAL:
    Coded, tested, and ready for submission.

MULTICS CHANGE REQUEST		MCR 425	
		Page 1 of 1 Pages	
TITLE: Modify the acl commands to work for MSFs.		**STATUS**	**DATE**
		Written	3/18
AUTHOR: Eleanor Stone		Approved	3/26/74
		Rejected	
SOURCE: (if external) e.g., "User", "Marketing"		Postponed	
		Withdrawn	
		Expires	9/26/74

CLASSIFICATION		JUSTIFICATION		Replaced by proposal MCR _____
	Incompatible Change		Marketing Requirement	Implemented in System _____
	Extension	X	Conformance to Standard	Objections/Comments:
	Restriction	X	Increased Consistency	Components which are links should be chased to their target segments.
	Performance Improvement		Simplification	Review initial acl implications.
	Reliability Improvement		Generalization	
			Bug Fix	

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

REASONS:
The acl commands (setacl, listacl, deleteacl) are the only major commands
that do not distinguish directories and MSFs.
This is a request that these commands be changed to manipulate the acl
of an MSF consistently. To accomplish this, the following steps should
be taken.

    A. Add 2 new entries to msf_manager_:
        msf_manager_$acl_add and
        msf_manager_$acl_delete.
        (There exists an entry to list the acl of an MSF.)

    B. Change acl_commands to recognize MSFs and to call the appropriate
        entry in msf_manager.

    C. Change tssi_ to call the new entries to msf_manager when
        appropriate.

IMPLICATIONS: The listacl and deleteacl commands will give misleading
results for MSFs with non-standard acls.

MULTICS CHANGE REQUEST

MCR   426
Page 1 of 1 Pages

TITLE:	STATUS	DATE
New Core Freeing Mechanism	Written	3/19/74
	Approved	H 3/26/74
AUTHOR: Bernard S. Greenberg	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	9/26/74

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

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

REASONS: It has recently been discovered that there are 13 usable
pages of Multics core which never get added to the paging pool. This
is due to three independent bugs: a technically illegal PL/I statement,
a misinterpretation of a variable, and three pages worth of oversight.
      This MCR implements a new mechanism which systematically collects
all pages of usable core, eliminating the oversights, all future over-
sights, and much special-casing, including the code containing the illega
statement. The misinterpreted variable is also re-interpreted.
      A bug related to this problem, not contributing to it, but neces-
sary for the new mechanism, is fixed.

SUMMARY: A program doing a marking-type garbage collection on core
at the end of collection 1 initialization will catch all cases of
unused pages. Ad hoc code to explicitly free several pages is removed.

IMPLICATIONS: Expected performance improvement.

DETAILED PROPOSAL: After the establishment of paging by update_sst_plI,
a program called collect_free_core runs through the initializer's
descriptor segment, looking at SDW's of unpaged segments. The core
map entry of page containing a word of such a segment is specially
flagged. The pages containing the BOS toehold and the page table for the
SCAS are also flagged. The core map array is then scanned. Specially
flagged core map entries are unflagged, core map entries already in
the paging pool are skipped, and all others are added to the free page
pool.
      A bug in bootstrapI causes zero-length segments (e.g., disk data
segments for disks not present in the configuration) to acquire SDW's
which describe all of core. This bug would cause the proposed algorithm
to fail in all cases. bootstrapI will be changed to create SDW's which
would create segment faults if referenced for such segments.

Version 2
730919

MULTICS CHANGE REQUEST

TITLE: Fix bug in SAC command

AUTHOR: T.H. VanVleck/D.R. Vinograd

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

STATUS	DATE
Written	3/19/74
Approved	H 3/26/74
Rejected	
Postponed	
Withdrawn	
Expires	9/26/74

CLASSIFICATION		JUSTIFICATION	
	Incompatible Change		Marketing Requirement
	Extension		Conformance to Standard
	Restriction		Increased Consistency
	Performance Improvement		Simplification
x	Reliability Improvement		Generalization
		x	Bug Fix #272

Replaced by proposal MCR _____

Implemented in System _____

Objections/Comments:

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

REASONS: If the master initializer console is used for input after the issuance of any "sac" command, the system will crash. This occurs because an internal proc is used as the target of an event call channel. In this case the "environment pointer" needed by the internal proc is not restarted by the event call and a required start variable is over-written.

SUMMARY: Correct the problem

IMPLICATIONS: None; Emergency fix already installed.

MULTICS CHANGE REQUEST	MCR 428
	Page 1 of 1 Pages

	STATUS	DATE
TITLE: Restore ability to call online salvager from use rings.	Written	3/19/74
	Approved	*H* 3/26/74
AUTHOR: A. Kobziar	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	9/26/74

CLASSIFICATION	JUSTIFICATION	
Incompatible Change	Marketing Requirement	Replaced by proposal MCR _____
Extension	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: Call online_salvager$salvage_dir has been inadvertently removed from hphcs_. This is a safety valve which can be used to unscramble a directory or just test the online salvager.

SUMMARY: Add online_salvager$salvage_dir to hphcs_.

MULTICS CHANGE REQUEST	MCR 429
	Page 1 of 1 Pages

TITLE:	STATUS	DATE
Fix Network portion of Answering Service to properly re-initialize pseudo-TTY	Written	3/19/
	Approved	*H 3/26/74*
AUTHOR: D. Wells	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	*9/26/74*

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

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

REASONS:
The recent changes to the Answering Service to handle the "new" TELNET protocol failed to properly re-initialize some variables. These variables were only used if cases where a foreign host "offered" to perform one of the negotiated options. Because few servers on the Network offered this type of negotiation, this code did not get tested.

SUMMARY: Change programs to:
1) reinitialize each pseudo-TTY upon each "dialup."
2) as a backup measure, truncate the on-line segment where such data is kept, each time that the Answering Service "Logger" is initialized.

THIS MCR IS SUBMITTED PER THE "EMERGENCY INSTALLATION" PROCEDURE. THE BUG FIXES WERE SUBMITTED ALREADY.