DATE: January 2, 1974
TO: Distribution
FROM: Marilyn Hodges
SUBJECT: Multics Change Requests

Attached are copies of Multics Change Requests which were approved from December 16, through December 31, 1973.

Multics Project internal working documentation. Not to be reproduced or distributed outside the Multics Project.
### Subject:
Enhance the capability of the online updating tools to update large modifications with a single installation.

### Reasons:
Currently, it takes at least three separate installations to perform a major update of the v2pl1 compiler. During the time it takes to perform these three installations, the compiler is in an inconsistent state.

### Summary:
Make changes to update_segi to handle installations the size of a large compiler update.

### Implications:
This implementation would increase the number of segments which the online updating tools can update in a single installation. User interface will remain unchanged.
**TITLE:** REVISE approved_routines_TABLE FOR NEW ACL PRIMITIVES  

**AUTHOR:** SCHERER  

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

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

**REASONS:**  
The approved_routines_table is used by object_submission_test to check for illegal, obsolete or unapproved calls in procedures submitted for library installation.  

This change will delete the outmoded hcs_acl calls and add the new acl primitives to the table so that we may begin to eliminate the outmoded entries from library programs.

Entries to be deleted:  
- hcs$_acl_add  
- hcs$_acl_add1  
- hcs$_acl_delete  
- hcs$_acl_list  
- hcs$_acl_replace

Entries to be added:  
- hcs$_add_acl_entries  
- hcs$_add_dir_acl_entries  
- hcs$_delete_acl_entries  
- hcs$_delete_dir_acl_entries  
- hcs$_list_acl  
- hcs$_list_dir_acl  
- hcs$_replace_acl  
- hcs$_replace_dir_acl
The table called approved_routines_ is used by object_submission_test to check for illegal or unapproved calls in procedures submitted for library installation.

This change will revise that table to reflect changes for the extended star and equals conventions.

Specifically, approved calls check_star_ and equal_ will be removed from the table.

New approved calls check_star_name_, match_star_name_ and get_equal_name_ will be added.

Implications:
Users shall be warned (via pc info) to change their calls to equal_ and check_star_
TITLE: Fix bug in IMP DIM initialization

AUTHOR: D. Wells

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

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

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

REASONS:

This change fixes a bug which has caused crashes 397 & 408.

SUMMARY:

This change should eliminate a software confusion during IMP DIM initialization, wherein the interrupt handler was still active when the call side thought that it was not.

This change has been checked out on the Development machine.
**MULTICS CHANGE REQUEST**

**TITLE:** Install tape reconfiguration command.

**AUTHOR:** VanVleck

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

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Use these headings: REASONS, SUMMARY, IMPLICATIONS, and optionally DETAILLED PROPOSAL.

**REASONS:**

The MTS-500 tape subsystem does not permit the operator to designate an arbitrary tape drive as a given tape unit number; the correspondence is permanently established by the physical cables.

When a particular physical drive becomes unusable, the software drive-assignment mechanism must be informed that the drive cannot be used, so that the supervisor will not request that the tape be mounted on an inoperable drive.

**SUMMARY:**

An entry in `tdcm` already supports this function, and `homs_tdcn_add_drive` exists and may be called to perform the addition and deletion of drive numbers. The "ajttape" and "felltape" commands are already part of system_control_ and are documented in MOSN 6.2.2.

A very small program has been written which will call `homs_tdcn_add_drive` correctly; this program should be added to `bound_reconfigure`.

**IMPLICATIONS:**

The system will work as documented. Lack of this facility has not been crucial up to now as we are not yet using MTS-501's, but it will be important when the new drives are put into the system.
TITLE: Complete installation of EIS conversion routines

AUTHOR: B. L. Wolman

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

CLASSIFICATION

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REASONS: EIS versions of conversion routines are faster and more accurate than currently installed routines.

SUMMARY: The EIS conversion routines have been installed for some time now. We propose to add names to the write-around segment assign so that existing PL/I programs will start using EIS conversion routines.

DETAILED PROPOSAL: Remove following names from >lang>bound plio2_ and add them to >lang>assign_

- arith_to_char
- arith_to_auth
- char_to_auth
- char_to_bit
- bit_to_arith
- bit_to_char

IMPLICATIONS: Until EIS PL/I compiler is installed, different conversion routines (the old ones) will be used by PL/I stream I/O program. This should not cause any difficulties.
**MULTICS CHANGE REQUEST**

**TITLE:** Install the `set_cc` command

**AUTHOR:** Robert Freiburghouse

**SOURCE:** User (R. Daley)

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

**REASONS:** A FORTRAN user should not be required to write commands or PL/I programs in order to use Multics to run FORTRAN jobs.

**SUMMARY:** The `set_cc` command sets the carriage-control mode of a FORTRAN formatted file. The mode is either ON or OFF. If ON, the file is written by the FORTRAN run-time I/O system as a print-image file; otherwise, it is not.

**IMPLICATIONS:** None

**DETAILED PROPOSAL:** See attached MPM draft.

The command has been written and tested.
MULTICS CHANGE REQUEST

TITLE: Place traps in system looking for "lost notify's"

AUTHOR: Steve Webber

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

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

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

REASONS: Place the following 2 traps in the system to help find the "lost notify" problem:

1) check to see if a notify succeeded a short time after it was done. This will be a simple check to see if a wait event was successfully zeroed out. Crash if not zeroed.

2) keep a recent history of all (some) notifies in the system. This can be done via the system_trace mechanism.

SUMMARY: Minor changes to pxss

IMPLICATIONS: System crash if notify lost (as soon as it's lost).

NOTE: We could use a DEBG card to determine whether to crash the system or retry the notify.
Name: set_cc
Usage: set_cc filenn -control_arg

where: nn is number of fortran file, it is in the range 01 to 99. And

where: control_arg is either -on or -off.

set_cc turns on or off carriage control for the fortran file specified by filenn.
If nn is out of range, an error message is printed.
For example, set_cc file06 -off. Carriage control will be turned off for fortran file 06.
MULTICS CHANGE REQUEST

TITLE: Add meters to page control.

AUTHOR: Steve Webber

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

CLASSIFICATION | JUSTIFICATION | Replaced by proposal MCR
---|---|---
Incompatible Change | Marketing Requirement | Implemented in System
X Extension | Conformance to Standard | 
Restriction | Increased Consistency |
Performance Improvement | Simplification |
Reliability Improvement | X Generalization |
| | X Bug Fix |
| | X Gain insight |

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

REASONS: As part of what will become a more intensive effort in a little while it is thought that some new meters are needed to help us gain insight into the performance problems of the system. The following new meters are proposed:

1) count page faults on directories (possibly as a function of page number)

2) count page faults in ring 0

3) count page faults in segments 1 level removed from the root. This will get the system libraries and some other random stuff

4) count page faults in process dirs

In addition, the following entries should be added to the system trace list which currently gives page faults, segfaults and bound faults.

1) linkage faults

2) scheduling

3) signalling/restarts
SUMMARY: The changes will be made to the following programs:

1) link_snap
2) pxss
3) page_fault
4) signaller
5) restart_fault

The include files

trace_types.incl.(alm pl1)

will also be changed.

At our leisure we should upgrade the page_trace command to know about these new types. It will continue to work as is - printing a special message for the entries not currently recognized.
TITLE: More history register and associative memory data to the PRDS

AUTHOR: Steve Webber

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

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
Reliability Improvement | Generalization

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

REASONS: Currently the processor saves its history registers and associative memories in the PDS for each fault. It is proposed that these data be placed in the PRDS instead thereby freeing up 256 words of each PDS which can be used for another 128 trace entries. This would allow the (page/system) trace list to grow from 190 to 318 entries. There seems to be no need for this data on a per-process basis (there is little need for the data at all).

SUMMARY: The following programs are affected:
- wired_fim
- fim
- pds
- prds

IMPLICATIONS: None. When the time comes that a user program will want to look at history registers (on-line T & D) some mechanism will have to be worked out for saving the history registers for the user.
**MULTICS CHANGE REQUEST**

**TITLE:** Fix to the "stars and bells" bug in the message coordinator.

**AUTHOR:** Dennis Capps

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

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<td>x Improvement</td>
<td>Bug Fix bug 223</td>
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**REASONS:** The message coordinator's device driver occasionally gets stuck trying to print an alarm message. Neither that message nor any other comes out on the device in question.

**Summary:** The variable designating the number of characters typed should be reset inside a loop rather than before entering the loop. Not to do so allows the number of characters from a previous iteration to be used in one rare circumstance.

**IMPLICATIONS:** None.
TITLE: "%" bug in debug command

AUTHOR: R. Coren

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

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

Objections/Comments:

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

REASONS: There is a bug in debug whereby the "%" registers (dummy arguments) can get clobbered.

SUMMARY: Remove declaration from db_parse's automatic storage to main program.

IMPLICATIONS: None.

STATUS: Fix coded and tested.
### Math Routines

**Author:** D. S. Levin

**Title:** Math Routines

**Status:** Written

**Date:** 12/14

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

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<td>Objections/Comments:</td>
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<tr>
<td>X Restriction</td>
<td>Increased Consistency</td>
<td>No algorithms were changed, but rounding was done via the round builtin function, rather than by a subroutine call.</td>
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<td>X Performance Improvement</td>
<td>Simplification</td>
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**Reasons:**

- Bug fixes
  - Improved coding: invoke built-in round func instead of external function.
  - Many modules have not been compiled since 1969.

**Implications:**

- Must have EIS operators
  - New routines may differ from the present routines by returning correct values.
TITLE: boundFortranio

AUTHOR: D. S. Levin

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

REASONS: This is required by new Fortran compiler. Existing Fortran programs will continue to work.

Several bug fixes are made
Namelist I/O is implemented
List-directed I/O is implemented
New entry points for the above are defined
Interfaces for close_file and set_cc are included
I/O conversions are done in-line by EIS code

IMPLICATIONS: EIS operators must be installed.

Slightly different results may be produced for output due to use of improved conversion algorithms.
TITLE: Fortran compiler

AUTHOR: D. S. Levin

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

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

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

REASONS: 1) A new Fortran compiler is needed to interface with the EIS call generator. The existing compiler does not interface correctly.
2) The compiler must be extended to conform with the FORTRAN-Y language.

SUMMARY: This compiler must be installed concurrent with the EIS compiler. It must be installed to implement the Fortran language requirement for the standard product.

IMPLICATIONS: A new Fortran run-time and the EIS operators must be installed before this installation. Existing user programs will continue to work.
TITLE: Install EIS version of PL/I Compiler

AUTHOR: R. A. Barnes

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

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

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

REASONS: In order to improve system performance. Programs compiled with this compiler will run faster, and may be shorter. This compiler runs 15-20% faster than the currently installed compiler.

SUMMARY: The EIS compiler generates fast inline-code for string and decimal operations and built-in functions. It also implements pictures and picture formats, completely implements the bool built-in function, reimplements fixed binary scaled arithmetic, and generates faster (often inline) code for conversions. The compiler also fixes the starred bugs on the accompanying listing of V2pl1_status.info.

IMPLICATIONS: Requires previous installation of EIS version of plI operators. Requires that EIS hardware works correctly. See plI_eis.info for other implications and restrictions. The currently installed Fortran compiler will not work with this compiler, therefore, the new Fortran compiler must be installed simultaneously.
**MULTICS CHANGE REQUEST**

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<td>Expires</td>
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**TITLE:** Deletion of obsolete subsystem from tools

**AUTHOR:** Arlene Scherer

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

**CLASSIFICATION**

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**REASONS:** To delete an unused portion of the Tools library.

**SUMMARY:** This installation MUST wait on the installation of the upcoming hardcore updater, which still calls msl routines. After the updater has been installed, however, bound msl in Tools will no longer be needed. This request will, if approved, encompass the deletion of components msl_util, msl_util, msl_util, msl_global_format, msl_short_format, msl_info, msl_transmog and msl_ud. A request to delete the documentation will be submitted if this MCR is approved.
Addition of -date option to the print_log command

Author: Kenneth T. Pogran

SUMMARY: A -date option is added to print_log. The character string argument following -date is converted to a clock time using convert_date_to_binary, and this clock time is compared with the clock time associated with each log entry; if the log entry was made after the specified time, and if it also matches whatever other selection criteria are in effect, it is printed.

IMPLICATIONS: Addition of this option does not affect the operation of print_log if the option is not invoked.

STATUS: This new version of print_log has been coded and tested, and is in use in a private library. (\udd\CompNet\lib)
**MULTICS CHANGE REQUEST**

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<th>TITLE:</th>
<th>sort error_table_ alphabetically by entry name</th>
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<tr>
<td>AUTHOR:</td>
<td>Gary Dixon</td>
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**CLASSIFICATION | JUSTIFICATION**

- Incompatible
- Change
- Requirement
- Extension
- Conformance
- Standard
- Restriction
- Consistency
- Performance
- Improvement
- Simplification
- Reliability
- Improvement
- Generalization
- Bug Fix

| REASONS:

Currently, the entries in `error_table_` are not in any order, and it is difficult for system programmers to find an existing error code which to fit a particular error condition.

| SUMMARY:

Sort the entries in `error_table_` by their entry name (e.g., `error_table_\$badstar` would be sorted by the name, `badstar`).

| IMPPLICATIONS:

Most `error_table_` entry names begin with syllables which characterize the semantic concept embodied by error message. For example, the syllables bad-, illegal-, incorrect-, and invalid-all characterize the concept of "badness". Sorting `error_table_` messages into conceptual categories (similar to those of a thesaurus) would simplify the task of finding an error message which best describes a particular error condition. Finding a message would then be a matter of determining the character (or conceptual category) of the ideal error message, and searching existing messages in that conceptual category for the one which best matches the ideal.

However, because some codes would fall into more than one category, and because of the difficulty of maintaining a list sorted on such categories, I am proposing sorting on entry name as a good approximation to this categorization. Such sorting
sort error_table_ alphabetically by entry name

would allow quick scanning of the error_table_ to identify prefixes which fall into the desired error message category, and more careful scanning of the messages within matching categories to find the best error message. The actual sorting could be done by removing the "system" keyword from the beginning and "end" keyword from the end of error_table_.et, and sorting the table with sort_file.

Such sorting might have implications on the paging characteristics of the error_table_, but because of the random nature of the current error_table_, the effects of sorting are not predictable (the paging characteristics might even be improved by sorting).

I have found a sorted error_table_ quite useful for locating error messages which characterize a particular condition.
MULTICS CHANGE REQUEST

MCR    223

TITLE: accept star names containing ascii control characters

AUTHOR: Gary Dixon

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

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

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

REASON:
According to the specifications published in MS9-103, names input to the extended Star Convention are not acceptable if they contain ascii control characters (i.e., \000 through \037). This means that names containing backspaces, among other characters, may not be used as input to storage system commands (e.g., status, create, delete, list, etc). This specification has been reconsidered in light of recent user experience with the extended Star Convention.

SUMMARY:
Accept star names which contain any ascii character (i.e., \000 through \177). Continue to reject star names which contain non-ascii characters (i.e., \200 through \777). This change should be installed with Phase Two of the extended Star Convention, which is scheduled for installation in MSS 21-8.

IMPLICATIONS:
This change relaxes the restrictions placed on the content of star names by the extended Star Convention. It should resolve the problems which users are having now with star name characters without introducing new problems. The forthcoming MP4 revision includes specifications for the restricted star name character set, and will have to be revised.

Page 1 of 1
### MULTICS CHANGE REQUEST

**TITLE:** Remove 'a' segment access references from online installation tools.

**AUTHOR:** P. Kelley

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

**CLASSIFICATION** | **JUSTIFICATION**
--- | ---
Incompatible Change | Replaced by proposal MCR
Extension | Marketing Requirement
Restriction | Conformance to Standard
Performance Improvement | Increased Consistency
Reliability Improvement | Simplification
Bug Fix | Generalization

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

**Reasons/Summary:**

The procedures `update_seg` and `upd_copy_seg_task` will be changed to give the user 'rw' access (instead of 'rwa') when appending a branch; and, `cv_mode` will be changed to reject the 'a' segment access representation by returning an error code. (Currently, `cv_mode` ignores its presence rather than report an error.)

This modification will conform to the final phase of directory control changes.
### Reason

According to the specifications published in MS8-103, names input to the extended Equal Convention are not acceptable if they contain ASCII control characters (i.e., \000 through \037). This means that names containing backspaces, among other characters, may not be used as input to storage system commands (e.g., rename, addname, copy, move, etc). This specification has been reconsidered in light of recent user experience with the extended Equal Convention.

### Summary

Accept equal names which contain any ASCII character (i.e., \000 through \177). Continue to reject equal names which contain non-ASCII characters (i.e., \200 through \777).

### Implications

This change relaxes the restrictions placed on the content of equal names by the extended Equal Convention. It should resolve the problems which users are having now with equal name characters without introducing new problems. The forthcoming MPM revision includes specifications for the restricted equal name character set, and will have to be revised.
**MULTICS CHANGE REQUEST**

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

**REASONS:** Current basic_system command is written in REPL and calls Dartmouth Version 3 BASIC. It is slow.

**SUMMARY:** Convert to EIS Version II PL/I. Change to call new Multics Basic.

**IMPLICATIONS:** None
MULTICS CHANGE REQUEST

TITLE: Fix double freeing of an allocation in acl_commands

AUTHOR: A. Kobziar

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

CLASSIFICATION

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<td>Unreported Bug Fix</td>
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Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS: Invoking deleteacl or listacl with a "." person name will cause an allocation to be doubly freed. This may cause an out_of_bounds later in the process on system_free_a.

SUMMARY: Fix acl_commands not to doubly free, and do some cleanup that will speed up proc slightly, and allow initial acl commands to work on the root.

IMPLICATIONS: User interface not affected.
## MULTICS CHANGE REQUEST

### TITLE:
Checking author and bit_count author names for non-ascii in Salvager

### AUTHOR:
A. Kobziar

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

### CLASSIFICATION

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<td>Improvement</td>
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### REASONS:
Salvager does not presently validate author and bit count author names for ascii.

### SUMMARY:
Change salv_rebuild_directory to check if the names contain valid ascii. If they do not then replace with the name "Salvager.SysDaemon.z".

### IMPLICATIONS:
Since salv_rebuild_directory will be changed when the system that removes cacls and segment append permission is installed, this change will be entered at that time. The only system that can be run after this salvager is a no cacl system.
MULTICS CHANGE REQUEST

TITLE: Remove CAQLs and segment "a" permission from Salvager

AUTHOR: Andrew Kobziar

STATUS | DATE
---|---
Written | 12/18/73
Approved | 1/12/73
Rejected | 
Postponed | 
Withdrawn | 
Expires | 6/30/74

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: Since CAQLs are being purged from the system, the Salvager should not try to check CAQLs. (MCB-969 and MSB-111)

SUMMARY: Take out code from the Salvager which checks CAQLs. Turn off append bit on all segments.

IMPLICATIONS: A long salvage will leave the hierarchy without CAQLs and append permission as all directories are rebuilt (and the salvager will not rebuild CAQLs).
**TITLE:** Implement DSU-191s for Multics

**AUTHOR:** N. Morris

**SOURCE:** Internal

**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 |

**REASONS:** Allow use of more than one disk subsystem to increase storage capacity and implement software to drive DSU-191 disks. See MTB-023.

**IMPLICATIONS:** The code to support DSU-170s and DSU-270s will be removed. Also, the code for software pre-seeking will be removed.
## MULTICS CHANGE REQUEST

**TITLE:** Fix to tty_ctl  
**AUTHOR:** R. B. Snyder  
**SOURCE:** (if external) e.g., "User", "Marketing"  
**CLASSIFICATION:** Incompatible Change

### REASONS:

- **REASONS:** A stop_channel operation is needed on tty_ctl to correctly stop a channel before hanging it up.

### SUMMARY:

A one line fix will be made.

### IMPLICATIONS:

None.
**TITiLe:** Establish cleanup handlers in ringo ttydim

**AUTHOR:** R. B. Snyder

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

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

**REASONS:**

As of system 21.6, gates no longer set up cleanup handlers and therefore the ring 0 ttydim must set up its own.

**SUMMARY:**

tty_read, tty_write, and tty_index will set up tty_unlock as the condition handler for "cleanup".

**IMPLICATIONS:**

Will prevent any more crashes (caused by...).
# Centralization of debug card checking

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

## REASONS:
There are currently many programs that read the "debug" config card. This should only be done by "debug_check".

## SUMMARY:
Code that reads debug card will be removed from all programs and placed in debug check. In addition, ttydim will be changed to call system_trace only if debug card option is present.

## IMPLICATIONS:
None.
TITLE: Fix bug which allows fsdct pages to get milled out

AUTHOR: S. Webber

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

CLASSIFICATION | JUSTIFICATION | Replaced by proposal MCR
---|---|---
Incompatible Change | Marketing Requirement | Implemented in System 21.6b (emergency)
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: It is possible for page control to throw away one of the device address for the fsdct if the page is all zeros. This creates problems later on when page control wants to reference the page.

SUMMARY: Most of the work has already been installed. One minor change to initialize_dims.
## TITLE:
Fix bugs in compare command

## AUTHOR:
Steve Herbst

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

---

### 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 |
| | | |

### Reasons:
1. When two segments to be compared are really the same segment, e.g.,

   `compare a path>a`

   where `path>a` is a link back to `a`, the message printed is
   "No discrepancies found." It is possible to get the mistaken impression that there are two copies of a segment.

2. If one segment has more words than the other within the range of the comparison, the extra words are ignored.

### Summary:
1. Add a check to see if two segment pointers point to the same place. If so, the message "Both are the same segment." is printed and `compare` returns.

2. Between the end of the smaller segment and the end of the search, the other segment's words are printed out and counted as discrepancies.

### Implications:
none
# MULTICS CHANGE REQUEST

## TITLE:
Fix bugs in walk_subtree

## AUTHOR:
Steve Herbst

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

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## STATUS

| Written | 12/13/73 |
| Approved | 12/20/73 |
| Rejected | |
| Postponed | |
| Withdrawn | |
| Expires | 6/26/74 |

## CLASSIFICATION JUSTIFICATION

- Replaced by proposal MCR
- Incompatible Change
- Marketing Requirement
- Implemented in System

## Standard Objections/Comments:

- Performance
- Generalization
- Bug Fix # 222

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

### REASONS:

1. **walk_subtree** copies the command line to be executed into a fixed length temporary of length 132. This truncates long command lines.

2. When executing in a directory to which there is no access, an extra message is printed (one by the executed command and one by walk_subtree when looking for subdirectories).

3. Update to Version II

### SUMMARY:

1. Temporary becomes the same length as the command line.

2. Message when looking for subdirectories is omitted.

3. Updated to Version II PL/1

### IMPLICATIONS:

- none
TITLE: Install procedure tracing program

STATUS: Written

AUTHOR: B. Wolman

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

CLASSIFICATION

Incompatible Change

JUSTIFICATION

Marketing Requirement

IMPLEMENTATION

Implemented in System

Objections/Comments:

REASONS:

A procedure tracing program is a very useful debugging tool.

SUMMARY:

Install the trace debugging package described in MTB-012.
Trace has been in private use for some time.