

To: Distribution
From: M. S. Hodges
Date: July 10, 1974
Subject: Multics Change Requests

Attached are copies of Multics Change Requests which were approved from June 16 - 30, 1974.

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MULTICS CHANGE REQUEST		MCR <u>545</u> Page <u>1</u> of <u>1</u> Pages
TITLE: Prevent "deadly embrace" in get_aste		STATUS
		DATE
AUTHOR: <u>E. Stone</u>		Written <u>5/24/74</u>
		Approved <u># 6/18/74</u>
SOURCE: (if external) e.g., "User", "Marketing"		Rejected
		Postponed <u># 5/28/74</u>
		Withdrawn
		Expires <u>12/18/74</u>

CLASSIFICATION	JUSTIFICATION	REASON
<input type="checkbox"/> Incompatible Change	Marketing Requirement	Replaced by proposal MCR _____
<input type="checkbox"/> Extension	Conformance to Standard	Implemented in System _____
<input type="checkbox"/> Restriction	Increased Consistency	Objections/Comments: Further review of solution required.
<input type="checkbox"/> Performance Improvement	Simplification	
<input checked="" type="checkbox"/> Reliability Improvement	Generalization	
<input type="checkbox"/>	<input checked="" type="checkbox"/> Bug Fix 262	
		Note: Reduces occurrences of, but does not eliminate the problem.

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

REASONS:

The procedure get_aste violates a ring_0 locking rule regarding locking order. The global ast lock is set prior to a directory lock attempt. This action was done for some time with impunity for the following reasons:

- 1) An attempt is made to lock the parent of any active segments suitable for deactivation; the choice of segment is anonymous.
- 2) If the parent cannot be locked and the next aste in the list is scrutinized.
- 3) Usually the size of each ast list is large enough to contain an entry whose parent could be locked.
- 4) If no parent can be locked, another loop through the entire list is done. The third condition was not met when 256k segments first were made available and few astes of this size were allocated.

Several times a deadly embrace resulted with one process waiting to lock the aste having locked a directory containing several 256k active segments and a second process looping through the ast list unable to lock the parent containing the 256k segments.

PROPOSAL:

If no parent can be locked, unlock the ast and wait for the first such parent to be unlocked. Then try the whole process again.

MULTIGS CHANGE REQUEST		MGR. 583
TITLE: Protect accounting job from blowup if files destroyed		STATUS DATE
AUTHOR: VanVleck		Written 06/08/74
SOURCE: (if external; e.g., "User", "Marketing")		Approved# 6/18/74
		Rejected
		Postponed
		Withdrawn
		Expires 12/18/74
CLASSIFICATION	JUSTIFICATION	
Incompatible	Marketing	Replaced by proposal MGR
Change	Requirement	Implemented in System
Extension	Conformance	Objections/Comments:
Restriction	to Standard	
Performance	Increased	
Improvement	Consistency	
Reliability	Simplification	
Improvement	Generalization	
	(Unreported)	
	Bug Fix	

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

REASONS:

The segments reqfile and proffile seem to be especially vulnerable to destruction by the salvager. On many occasions, the salvager has truncated these segments, leaving the branch intact. (This may be due to the use of the copy switch option of initiate in some of the administrative tools.) When the crank runs and encounters a zero-length reqfile, the program compute_bill assumes that the reqfile entry for each project was inadvertently lost, and creates a dummy entry, with all fields set to "(unknown)" or zero. Similar action is taken if proffile is truncated. This causes all projects to be added to the reqfile and proffile with an open requisition balance, and an already-expired requisition cutoff date. This, in turn, causes all users to be unable to log in.

SUMMARY:

Modify compute_bill to check for the case of an empty reqfile and proffile, and abort by signalling "crank_cant_run." Also change the editors for the proffile and reqfile to check for this condition and exit with an error message, to prevent user accounts office personnel from attempting to add data to a damaged file; and change these editors to eliminate use of the copy switch in an attempt to prevent the problems. Rename erf to edit_reqfile and epro to edit_proffile in the interest of clarity.

Protect accounting job from blowup if
files destroyed

06/08/74

IMPLICATIONS:

If the cause of the truncations has been diagnosed correctly, this change should make the problem happen much less often. When reqfile is truncated, the crank will abort with a sensible error message rather than making it impossible for all users to log in.

The crank already keeps backup copies, a day old, of reqfile and profile. Causing the crank to stop short before over-writing the backup copies will enable a system administrator, investigating why the crank cannot run, to restore the backup copies with minimum loss of data. The renaming of the modules will have no effect, since the old names will be kept as alternate names for a suitable period.

MULTICS CHANGE REQUEST

MCR 584

TITLE: New Programs for System Administration:
new_proj, edit_proj

STATUS | DATE

AUTHOR: VanVleck

Written 06/08/74

Approved 6/18/74

Rejected

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

Postponed

Withdrawn

Expires 12/18/74

CLASSIFICATION | JUSTIFICATION

Replaced by proposal MCR

Incompatible | Marketing

Change | Requirement

Implemented in System

Extension | Conformance

Restriction | to Standard

Objections/Comments:

Performance | Increased

Improvement | Consistency

Reliability | Simplification

Improvement | Generalization

Bug Fix

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

REASONS:

The current method used by the system administration subsystem to add a new project or to modify an existing project's attributes consists of running several programs under control of the master exec.com. If the system crashes while a project is being added, the restricted system administrator cannot, in general, recover without the assistance of a programmer. Furthermore, the interfaces presented by the system administrator subsystem for the editing of project data are difficult to learn, which has often led to errors and problems.

SUMMARY:

Install new programs "new_proj," "edit_proj," "rename_proj," "edit_proj_," "delete_proj," and "parse_attributes_." These programs present a uniform and relatively foolproof interface for adding, deleting, and changing project registration data. Compilation of an SMF into an SAT is eliminated, except during initial setup of the system, since these programs work directly on the binary SAT. The use of "epro" and "erf" will be replaced by use of "edit_proj" (although the projfile and reqfile editors will still work for unrestricted system administrators). System administrators will also be able to specify several project attributes which previously could only be set by unrestricted system administrators, including project attributes, load control group, additional project administrators, and maximum grace.

New Programs for System Administration:
new_proj, edit_proj

06/08/74

IMPLICATIONS:

Project management should become easier, require less intervention by system-programmer class administrators, and consume less machine time.

MULTICS CHANGE REQUEST

MCR 585

TITLE: Remove Obsolete Code from
daemon_user_manager_.

STATUS | DATE

AUTHOR: VanVleck

Written 06/09/74

Approved # 6/18/74

Rejected

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

Postponed

Withdrawn

Expires 12/18/74

CLASSIFICATION	JUSTIFICATION
<input type="checkbox"/> Incompatible	Marketing
<input type="checkbox"/> Change	Requirement
<input type="checkbox"/> Extension	Conformance
<input type="checkbox"/> Restriction	to Standard
<input type="checkbox"/> Performance	Increased
<input type="checkbox"/> Improvement	Consistency
<input type="checkbox"/> Reliability	
<input type="checkbox"/> Improvement	Simplification
	Generalization
	Bug Fix

Replaced by proposal MCR

Implemented in System

Objections/Comments:

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

REASONS:

The initial version of the "console-less daemon" facility allowed for use of actual TTY channels for daemon process I/O instead of message coordinator attachments. This enabled us to check out the daemon login facility before the message coordinator was ready.

This feature is not currently used. It provides no particular advantage over use of the message coordinator and adds complication to the code and documentation for the answering service. Furthermore, it is a likely source of operational errors unless its operation is understood.

SUMMARY:

Remove this code from daemon_user_manager_ and admin before some installation finds it and starts depending on it.

IMPLICATIONS:

The answering service code will be slightly smaller and cleaner. One source of confusion about the state of and control responsibility for a terminal will be eliminated. No functional incompatibility exists, because the message coordinator routing tables can be set up to dedicate a particular terminal to a single process -- and use of the message coordinator allows the installation to recover if the terminal goes down.

Remove Obsolete Code from
daemon_user_manager_.

06/09/74

Daemon users can still be logged in from the terminal with a "login" command instead of by the operator, although this practice is considered unwise because there is no recovery from terminals going down and because it requires the operator to know a password.

MULTICS CHANGE REQUEST		MCR 586 Page 1 of 1 Pages
TITLE: BOS DELREC Command to Protect Disk Record		STATUS
AUTHOR: <u>Noel I. Morris</u>		DATE
SOURCE: (if external) e.g., "User", "Marketing" Internal		Written 6/10/
		Approved <u>H</u> 6/18/
		Rejected
		Postponed
		Withdrawn
		Expires 12/18/

CLASSIFICATION	JUSTIFICATION	Replaced by proposal MCR _____
<input type="checkbox"/> Incompatible Change	<input checked="" type="checkbox"/> Marketing Requirement	Implemented in System _____
<input checked="" type="checkbox"/> Extension	<input checked="" type="checkbox"/> Conformance to Standard	Objections/Comments:
<input type="checkbox"/> Restriction	<input checked="" type="checkbox"/> Increased Consistency	
<input checked="" type="checkbox"/> Performance Improvement	<input checked="" type="checkbox"/> Simplification	
<input checked="" type="checkbox"/> Reliability Improvement	<input checked="" type="checkbox"/> Generalization	
	<input checked="" type="checkbox"/> Unreported Bug Fix	

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

REASONS:
 If a bad record exists on a disk pack (or if a record becomes bad), Multics may attempt to mark the record as used and continue operation when that record is encountered. In some cases, however, Multics can not recover from such a disk error. Also, any disk records marked as used, but not actually part of a segment, will be freed up when a salvager is run. A scheme is needed to prevent Multics from using bad disk records.

Summary:
 The following is proposed as a temporary measure,
 A BOS command called DELREC will be provided which, when entered, will read input lines from the operator's console, the card reader, or a runcom file. Each input line will specify a device address in a format accepted by the 'argbos' device address scanner. Such a device address may be of the form

DEVNAM RECORD#

or

DEVNAM BOS AREA# SECTOR#

If the fsdct bit corresponding to that record indicates that the record is free, the bit will be set to indicate that the record is in use. Multics will then never assign a page of a segment to that record.

Implications:
 The new DELREC command should be invoked after every salvager run. If disk packs are swapped, the device addresses are subject to change. Therefore physical addresses should be used when possible.

MULTICS CHANGE REQUEST		MCR <u>587</u> Page <u>1</u> of <u>1</u> Pages
TITLE: <u>Implement I/O Buffer Manager</u>	STATUS	DATE
AUTHOR: <u>B. Greenberg</u>	Written	<u>6/18/74</u>
SOURCE: (if external) e.g., "User", "Marketing"	Approved <u>H</u>	<u>6/18/74</u>
	Rejected	
	Postponed	
	Withdrawn	
	Expires	<u>12/18/74</u>

CLASSIFICATION	JUSTIFICATION	REASON
<input checked="" type="checkbox"/> Incompatible Change	<input checked="" type="checkbox"/> Marketing Requirement	Replaced by proposal MCR _____ Implemented in System _____
<input checked="" type="checkbox"/> Extension	Conformance to Standard	Objections/Comments:
Restriction	Increased Consistency	
Performance Improvement	Simplification	
Reliability Improvement	<input checked="" type="checkbox"/> Generalization	
	Bug Fix	

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

REASONS: Proposal: Implement the I/O Buffer Manager as described in MTB 74.

IMPLICATIONS: SWG and PLM documentation required.

MULTICS CHANGE REQUEST		MCR 588 Page 1 of 1
TITLE: Move cam/connect generator to page_fault		STATUS: Written 6/10/74 Approved <i>H</i> 6/18/74 Rejected
AUTHOR: B. Greenberg		
SOURCE: (if external) e.g., "User", "Marketing"		Postponed Withdrawn Expires 12/18/74

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: There is duplicate code in privileged_mode_ut and page_fault to generate CAMs and connects. Each change to these routines requires changing both. This code should be localized in page_fault, eliminating wired code in pmut.

SUMMARY: Add entries page\$cam, page\$cam_cache, page\$cam_ptws to page. Move connect-and-hold function to page_fault code.

IMPLICATIONS: Change four programs to call page instead of pmut.

COMMENTS: Memory deletion strategy is under modification to use new interfaces made available to I/O Buffer Manager. ALM code within bound_page_control will need to call connect-abd-hold function - this is a logical time to move the entire connect/cam code into page_fault.

MULTICS CHANGE REQUEST		MCR 589 Page 1 of 1 Pages
TITLE: Unify PL/I Coded Page wait strategy		STATUS
AUTHOR: B. Greenberg		DATE
SOURCE: (if external) e.g., "User", "Marketing"		Written 6/10/74
		Approved H 6/18/74
		Rejected
		Postponed
		Withdrawn
		Expires 12/18/74

CLASSIFICATION	JUSTIFICATION	
<input type="checkbox"/> Incompatible Change	<input type="checkbox"/> Marketing Requirement	Replaced by proposal MCR _____
<input type="checkbox"/> Extension	<input type="checkbox"/> Conformance to Standard	Implemented in System _____
<input type="checkbox"/> Restriction	<input type="checkbox"/> Increased Consistency	Objections/Comments:
<input checked="" type="checkbox"/> Performance Improvement	<input checked="" type="checkbox"/> Simplification	
<input type="checkbox"/> Reliability Improvement	<input type="checkbox"/> Generalization	
<input type="checkbox"/>	<input type="checkbox"/> Bug Fix	
<input type="checkbox"/>	<input type="checkbox"/>	

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

REASONS: There is duplicate code in pc, pc_abs, pc_wired, and delete_pd_records to await the completion of page control events. This code involves the decoding of the event ID to obtain a device ID, calls to addevent, unlock_ptl, wait (&n device_control), and lock_ptl. Page_fault communicates with the traffic controller primitives via a much cleaner strategy which involves unlocking the page table lock once the traffic controller lock has been locked.

The proposal is to introduce a primitive, page\$wait, callable with an event ID, and the page table lock locked, which decodes the event, calls the traffic controller if necessary (via a new entry which merges with page_fault's entry), and relocks the page table. The interface is simple, clean, and efficient.

SUMMARY: Change the above programs to call this new primitive.
IMPLICATIONS: PLM documentation.

COMMENTS: The I/O Buffer manager (MTB 074) would implement a further program which would have to engage in the current addevent protocol. This is a logical time to save code and time all around and simplify the interface.
Code already written.

MULTICS CHANGE REQUEST

MCR 590
Page 1 of 1 Pages

TITLE: Implement 2 CPU Cache software.
AUTHOR: B. Greenberg

STATUS	DATE
Written	6/10/7
Approved H	6/18/7
Rejected	
Postponed	
Withdrawn	
Expires	12/18/7

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

CLASSIFICATION	JUSTIFICATION	Replaced by proposal MCR _____
<input type="checkbox"/> Incompatible Change	<input checked="" type="checkbox"/> Marketing Requirement	Implemented in System _____
<input checked="" type="checkbox"/> Extension	Conformance to Standard	Objections/Comments:
<input type="checkbox"/> Restriction	Increased Consistency	
<input checked="" type="checkbox"/> Performance Improvement	Simplification	
<input type="checkbox"/> Reliability Improvement	Generalization	
<input type="checkbox"/>	Bug Fix	
<input type="checkbox"/>		

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

REASONS: Implement 2-cpu cache software as described in MTB-54.

IMPLICATIONS: PLM documentation.

MULTICS CHANGE REQUEST		MCR <u>591</u> Page <u>1</u> of <u>1</u> Pages
TITLE: <u>change translator_ec.ec</u>		STATUS
AUTHOR: <u>Steve Herbst</u>		DATE
SOURCE: (if external) e.g., "User", "Marketing"		Written <u>6-10</u>
		Approved <u># 6/18/74</u>
		Rejected
		Postponed
		Withdrawn
		Expires <u>12/18/74</u>

CLASSIFICATION	JUSTIFICATION	
<input type="checkbox"/> Incompatible Change	Marketing Requirement	Replaced by proposal MCR _____
<input type="checkbox"/> Extension	Conformance to Standard	Implemented in System _____
<input type="checkbox"/> Restriction	Increased Consistency	Objections/Comments: Delete from alm_abs also.
<input checked="" type="checkbox"/> Performance Improvement	<input checked="" type="checkbox"/> Simplification	
<input type="checkbox"/> Reliability Improvement	Generalization	
<input type="checkbox"/>	Bug Fix	
<input type="checkbox"/>		

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

REASONS: p11_abs, alm_abs and fortran_abs run this exec_com. If a listing segment is produced by the compiler or assembler, it appends to it the output from a print_link_info. p11 and fortran listings already contain all the print_link_info information so this is redundant.

SUMMARY: Append print_link_info only to alm listings.

IMPLICATIONS: References to print_link_info in the mpm documentation of p11_abs and fortran_abs have to be removed.

MULTICS CHANGE REQUEST

MCR 592
Page 1 of 1

TITLE: add "-bftb" option to pl1_abs

STATUS	DATE
Written	6-10-74
Approved #	6/18/74
Rejected	
Postponed	
Withdrawn	
Expires	12/18/74

AUTHOR: Steve Herbst

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

CLASSIFICATION	JUSTIFICATION	
Incompatible Change	Marketing Requirement	Replaced by proposal MCR _____
Extension	Conformance to Standard	Implemented in System _____
Restriction	Increased Consistency	Objections/Comments: PL1.abs, Fortran abs, and alm abs should accept all control arguments accepted by the respective translators and by dprint.
X Performance Improvement	Simplification	
Reliability Improvement	X Generalization	
	Bug Fix	

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

REASONS: pl1_abs does not recognize the "brief_table" option which was recently added to pl1. This option causes a partial symbol table to be produced containing only statement labels.

SUMMARY: Implement the new option in pl1_abs.

MULTICS CHANGE REQUEST		MCR 594 Page 1 of 1 Pages
TITLE: Special version of GCOS Library for MIT	STATUS	DATE
AUTHOR: T. Casey	Written	6-11-74
	Approved <i>H</i>	<i>6/18/74</i>
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing" User	Postponed	
	Withdrawn	
	Expires	<i>12/18/79</i>

CLASSIFICATION	JUSTIFICATION	REASON
<input type="checkbox"/> Incompatible Change	<input type="checkbox"/> Marketing Requirement	Replaced by proposal MCF _____
<input type="checkbox"/> Extension	<input type="checkbox"/> Conformance to Standard	Implemented in System _____
<input checked="" type="checkbox"/> Restriction	<input type="checkbox"/> Increased Consistency	Objections/Comments:
<input type="checkbox"/> Performance Improvement	<input type="checkbox"/> Simplification	
<input type="checkbox"/> Reliability Improvement	<input type="checkbox"/> Generalization	
<input type="checkbox"/>	<input type="checkbox"/> Bug Fix	
<input type="checkbox"/>	<input checked="" type="checkbox"/> Customer Request	

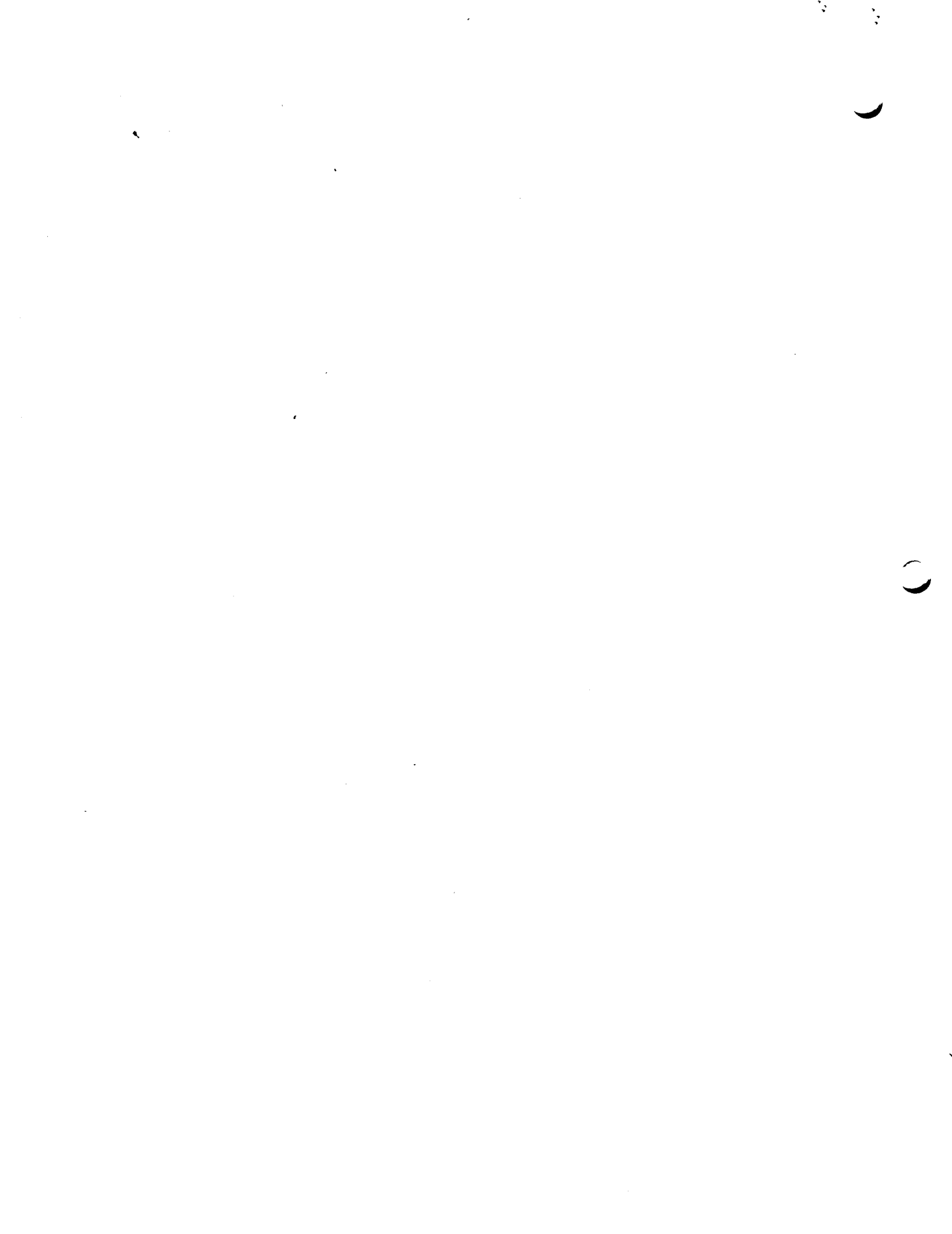
Use these headings: REASONS, SUMMARY, IMPLICATIONS, DETAILED PROPOSAL (Optional)

REASONS & SUMMARY:

MIT does not use the GCOS simulator for anything other than preparing software for Multics. Thus, they use GMAP, 355 MAP, 355sim, and GELOAD, but none of the other compilers, etc., supported by the simulator. The library containing this software is in two multisegment files, whose total size is 617 records at MIT, and 1027 records in the latest version at PCO. MIT has requested that we create a version of the library for them, containing only the software necessary for preparing Multics software, in order to save storage.

IMPLICATIONS:

- 1) Development, testing, and demonstrations of the capabilities of the simulator will no longer be able to be done at MIT.



MULTICS CHANGE REQUEST

MCR 595
Page 1 of 2 Pages

TITLE: Change directory hashing algorithm to use entire hash table

STATUS	DATE
Written	6-7-74
Approved #	6/18/74
Rejected	
Postponed	
Withdrawn	
Expires	12/18/74

AUTHOR: Eleanor Stone

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

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	
Reliability Improvement	Generalization	
	hrd0017p	
	X Bug Fix unreported	

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

REASONS: The on-line installation procedures push the current hashing algorithm to its limits by the practice of saving all of the old names of a modified segment with a suffix. Several installations have aborted in the middle due to an overflow of the directory hash table.

In general the behavior of the hashing algorithm with regard to the number of entries is anomalous. A directory has a full hash table if the number of probes of the table exceeds half its size. The actual number of names any one directory may contain depends on the order in which names are added, the order in which names are deleted and the characteristics of the names themselves. There may be situations in which two directories contain the same names, but one is judged to have a full hash table and one does not. In the worst case with the present scheme, a directory may be able to use only half the size of the hash table, if all names hash to the same value.

Further problems ensue in trying to repair directories whose hash table is full. Often deletion of names does not permit new names to be added nor the directory to be searched. This is because the same criterion for judging the fullness of the hash table is applied for removing, locating and adding a name.

To a limited extent, users have encountered similar problems.

PROPOSAL:

1. Make the following changes to the module hash to alleviate these problems.
 - A. Search the entire hash table whether adding, deleting or locating a name. Currently the number of searches may not exceed half the size of the hash table.
 - B. Indicate that the hash table is full only when adding a name.
 - C. Provide better cleanup of the hash table if all entry names of a directory have been deleted. The hash table should be cleared completely in this case. (Bug hrd0017p)
2. Make the following unrelated changes to the module hash while it is being worked on.
 - A. Fix an unreported bug which prevented the first location of the hash table from being used if it was marked as a deleted bucket. A variable containing the first available location is initialized to zero; zero is a valid available location since the hash table is indexed starting at zero.
 - B. Use EIS-style coding to check an entry name being added.
 - C. Remove a trap for a bug which has been found. The detection of the bug involved checking for an entry pointer with a zero offset.

IMPLICATIONS:

Possible performance degradation if many directories increase number of names. It will take longer to search directories very full of names. If a measurable performance effect occurs, variable size hash tables will probably have to be implemented.

Performance improvement in that pathname processing will be inherently faster.

A new salvager must be made and installed at the same time this change is made.

MULTICS CHANGE REQUEST

MCR 596

TITLE: Temporary modification to online updating tool.

STATUS DATE

AUTHOR: P. Kelley

Written 06/11/74

Approved # 6/18/74

Rejected

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

Postponed

Withdrawn

Expires 13/18/74

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

Replaced by proposal MCR

Implemented in System

Objections/Comments:

Approved as permanent modification.

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

Reasons:

There currently exists a directory hash table problem in the online system libraries where hash tables are fairly "full". This results in increased time searching a directory for a name, and, occasionally, both at MIT and Phoenix, the hash table overflows resulting in an inconsistent directory. The online updating tool contribute in part to this problem by retaining all entry names of a segment being "replaced" by simply renaming them to "name.i" where "i" is an integer.

Summary:

The proposal is to temporarily modify the updating tool to retain only two names on "replaced" segments; a unique name given to all "replaced" segments, plus the renamed primary name of the segment for easy identification. When an installation has to be backed up (i.e. de-installed) the complete name list of the old "replaced" segment is derived from a data base maintained by the updating tool so that no names are lost because of this modification.

Implications:

This proposal is meant to temporarily alleviate the hash table problem in the online system libraries. The chances of a hash table overflow will only be reduced, not eliminated.

MULTI-STEP CHANGE REQUEST		MCR <u>597</u> Page <u>1</u> of <u>1</u> Pages
TITLE: <u>Remove outdated compatibility features in real_sdh_</u>	STATUS	DATE
AUTHOR: <u>M. Weaver</u>	Written	<u>6/12/74</u>
SOURCE: (if external) e.g., "User", "Marketing"	Approved	<u>H 6/18/74</u>
	Rejected	
	Postponed	
	Withdrawn	
	Expires	<u>12/18/74</u>

CLASSIFICATION	JUSTIFICATION	
<input type="checkbox"/> Incompatible Change	Marketing Requirement	Replaced by proposal MCR _____
<input type="checkbox"/> Extension	Conformance to Standard	Implemented in System _____
<input type="checkbox"/> Restriction	Increased Consistency	Objections/Comments:
<input type="checkbox"/> Performance Improvement	<input checked="" type="checkbox"/> Simplification	
<input checked="" type="checkbox"/> Reliability Improvement	Generalization	
<input type="checkbox"/>	<input checked="" type="checkbox"/> Unreported Bug Fix	
<input type="checkbox"/>		

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

REASONS: real_sdh_ currently contains code to handle PL/I conditions in two different ways, depending on how the conditions are signalled. Now that these conditions are signalled only in the new way, the old compatibility code can be removed. This will also remove a bug whereby the handling of the area condition, when signalled by a user area package, transfers default_handler_for_pll_ which does not work and officially no longer exists.

SUMMARY: Change real_sdh_ to send all conditions except alarm, cput and quit to default_error_handler_.

MULTICS CHANGE REQUEST

MCR 598
Page 1 of 3 Pages

TITLE: Install cumulative_page_trace, cpt

STATUS	DATE
Written	6-13-74
Approved <i>H</i>	6/18/74
Rejected	

AUTHOR: John Gintell

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

Postponed	
Withdrawn	
Expires	12/18/74

CLASSIFICATION	JUSTIFICATION	
<input type="checkbox"/> Incompatible Change	<input type="checkbox"/> Marketing Requirement	Replaced by proposal MCR _____
<input checked="" type="checkbox"/> Extension	<input type="checkbox"/> Conformance to Standard	Implemented in System _____
<input type="checkbox"/> Restriction	<input type="checkbox"/> Increased Consistency	Objections/Comments:
<input checked="" type="checkbox"/> Performance Improvement	<input type="checkbox"/> Simplification	
<input checked="" type="checkbox"/> Reliability Improvement	<input checked="" type="checkbox"/> Generalization	
<input type="checkbox"/>	<input type="checkbox"/> Bug Fix	
<input type="checkbox"/>	<input type="checkbox"/>	

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

REASONS: We must substantially improve Multics system performance. This tool will assist us in finding performance (and reliability) problems.

This tool is a complement to page_trace and can also be used by users in analyzing their own programs.

- SUMMARY:
- A) Install cpt. The attached info segment describes what it does and how it does it.
 - B) Add entrypoint print_trace_entry to the page_trace command to facilitate the implementation of the -trace feature of cpt.

IMPLICATIONS: None

June 11, 1974

The `cumulative_page_trace` command (`cpt`) accumulates page trace data so that the total set of pages used during the invocation of a command or subsystem can be determined. The command can accumulate data from one invocation to the next. Output from the command is in tabular format showing all pages that have been touched. A trace in the format of that produced by the `page_trace` command can also be prepared.

It operates by sampling and reading the system trace array after invocation of a command and at repeated intervals. Control arguments are given to specify the detailed operation of `cpt`.

The command line used to invoke `cpt` includes the command or subsystem to be traced as well as an optional number of control arguments.

The usage is as follows:

```
cumulative_page_trace (cpt) "command line" -control arguments-
```

At least one of three generic operations must be requested, they may all be combined and will be performed in the following order:

- reset the table of accumulated data,
- call the command to be metered applying the various options specified,
- print the results applying the various options specified.

The following control arguments are accepted:

<code>-reset , -rs</code>	reset the table of accumulated data
<code>-flush</code>	flush core before each invocation of the command line
<code>-loop n</code>	call the command to be metered n times
<code>-sleep n</code>	sleep for n seconds after each call to the command to be metered
<code>-interrupt n</code>	interrupt execution every n VCPU milli-seconds for pagefault sampling
<code>-int n</code>	
<code>-debug</code>	write dump of array on <code>cpt.dump</code> if special markers can't be found, the user must attach and detach this switch himself
<code>-timers</code>	include all faults between signal and restart
<code>-trace path</code>	write trace on file named <code>path</code> using <code>io_switch</code> named <code>cpt.out</code> , <code>cpt</code> will attach and detach this switch
<code>-print , -pr</code>	print the accumulated results
<code>-count , -ct</code>	print the accumulated results giving the number of faults for each page
<code>-shortline</code>	format output for a <code>linelength</code> of 80

Some examples follow:

```
cpt "list -p >udd>Multics" -loop 2 -sleep 10
```

will call the `list` command twice, and sleep for ten seconds between each call.

```
cpt "pl1 test" -interrupt 500 -trace trace_out
```

will call `pl1` to compile `test`, requesting an interrupt every

500 ms to obtain page trace information. Write file of trace onto
file named trace_out.

cpt -print

will print the accumulated results.

MULTICS CHANGE REQUEST

MCR 599
Page 1 of 2 Pages

TITLE: New version of create_lines_file

STATUS	DATE
Written	6/13/74
Approved H	6/18/74
Rejected	

AUTHOR: D. R. Vinograd

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

Postponed	
Withdrawn	
Expires	12/18/74

CLASSIFICATION	JUSTIFICATION	
	Incompatible Change	Marketing Requirement
		Replaced by proposal MCR _____
		Implemented in System _____
<input checked="" type="checkbox"/>	Extension	Conformance to Standard
	Restriction	Increased Consistency
	Performance Improvement	Simplification
<input checked="" type="checkbox"/>	Reliability Improvement	Generalization
		<input checked="" type="checkbox"/> Bug Fix lib 0021p
		Objections/Comments:

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

REASONS: The create_lines_file command is presently inoperative due to a change from tty cards to ls1a cards in the config deck.

SUMMARY: The code will be changed to correctly handle the present configuration deck as well as add an option that is required for use in starting up a system.

IMPLICATIONS: It will work again.

DETAILED PROPOSAL: See attached draft documentation

Special Command
Administrative/User Ring
6/28/72

Name: create_lines_file

This program is used to generate an initial copy of the "lines" segment for a new site. It creates this segment by examining the configuration deck.

Usage

```
create_lines_file-control_arg1.....arg 1.....argn  
-control_arg2.      argn....argm.....
```

- 1) control_argi may be one of the following items.
 - pathname, -pn the next argument will be taken to be the pathname of the output file.
 - skip, -sk the next 'n' arguments until either the end of the argument list or the next control argument will be "commented out" in the output segment. The arguments must be in the form " ttyxxx" where xxx is same three character string.
- 2) If no control arguments are specified the first argument will be assumed to be the pathname of the output file.

MULTICS CHANGE REQUEST		MCR <u>600</u> Page <u>1</u> of <u>1</u> Pages
TITLE: <u>Fix to map355 and build355</u>		STATUS
AUTHOR: <u>R. Snyder</u>		DATE
SOURCE: (if external) e.g., "User", "Marketing" <u>local</u>		Written <u>6-12-74</u>
		Approved <u>H 6/18/74</u>
		Rejected
		Postponed
		Withdrawn
		Expires <u>12/18/74</u>

CLASSIFICATION	JUSTIFICATION	Replaced by proposal MCR _____
<input type="checkbox"/> Incompatible Change	<input type="checkbox"/> Marketing Requirement	Implemented in System _____
<input checked="" type="checkbox"/> Extension	<input type="checkbox"/> Conformance to Standard	Objections/Comments:
<input type="checkbox"/> Restriction	<input checked="" type="checkbox"/> Increased Consistency	
<input type="checkbox"/> Performance Improvement	<input checked="" type="checkbox"/> Simplification	
<input checked="" type="checkbox"/> Reliability Improvement	<input checked="" type="checkbox"/> Generalization	
<input type="checkbox"/>	<input type="checkbox"/> Bug Fix	

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

REASONS: A number of improvements are being made to map355 and build355 to provide new features and insure compatibility with future gcos simulators.

SUMMARY: 1) The option "-ag" (as in enter_absentee_request) has been added to allow arguments to be passed to the gcos simulator when it is called by map355 or build355.

2) The program cv_printfile_to_ascii_will no longer be used by map355 or build355 to convert the bcd output file to lower case ascii. Instead the gcos_sysprint command will be called with the -lower_case option.

3) All file cards will be put after the \$ 355map or \$ 355sim cards since a future gcos simulator installation will require this.

4) The output files that aren't needed will be deleted.

5) In map355, gcos will be called with the -truncate option so that source lines > 80 chars will be truncated rather than having the simulator abort.

6) Both map355 and build355 will call gcos with the -brief option to disable the printing of some useless information by gcos.

IMPLICATIONS: Can get rid of cv_printfile_to_ascii_ and have a smoother running job.

MULTICS CHANGE REQUEST		MCR <u>602</u> Page <u>1</u> of <u>1</u> Pages
TITLE: Recompile user-ring I/O in EIS.	STATUS	DATE
AUTHOR: <u>M. Smith</u>	Written	6/12/74
SOURCE: (if external) e.g., "User", "Marketing"	Approved H	6/18/74
	Rejected	
	Postponed	
	Withdrawn	
	Expires	12/18/74

CLASSIFICATION	JUSTIFICATION	Replaced by proposal MCR _____
<input type="checkbox"/> Incompatible Change	<input type="checkbox"/> Marketing Requirement	Implemented in System _____
<input type="checkbox"/> Extension	<input checked="" type="checkbox"/> Conformance to Standard	Objections/Comments: .
<input type="checkbox"/> Restriction	<input type="checkbox"/> Increased Consistency	
<input checked="" type="checkbox"/> Performance Improvement	<input type="checkbox"/> Simplification	
<input checked="" type="checkbox"/> Reliability Improvement	<input type="checkbox"/> Generalization	
<input type="checkbox"/>	<input type="checkbox"/> Bug Fix	
<input type="checkbox"/>	<input type="checkbox"/>	

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

REASONS: The improved code generated by the EIS compiler should make user-ring I/O consume less system resources.

SUMMARY: Recompile the following modules:
 *"attach_ioname.pl1", "find_iocb.pl1",
 "get_at_entry.pl1", "io.pl1", "ios.pl1",
 "pat.pl1", "propagate.pl1", "syn_attach.pl1",
 and "tty_attach.pl1".

IMPLICATIONS: All user processes should experience a performance improvement.

* "pl1" = p - l - one

MULTICS CHANGE REQUEST

MCR 603
Page 1 of 1 Pages

TITLE: Fix "tty_attach.pl1" error code returns

STATUS	DATE
Written	6/12/74
Approved <i>H</i>	6/18/74
Rejected	
Postponed	
Withdrawn	
Expires	12/18/74

AUTHOR: M. Smith

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

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	
<input checked="" type="checkbox"/> Reliability Improvement	Generalization	
	lib 0025p	
	<input checked="" type="checkbox"/> Bug Fix	

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

REASONS: In module "tty_attach.pl1", which implements the I/O module "tty_" as well as the write-arounds which map IOX calls into IOS calls, the operations "get_line", "get_chars", and "put_chars" do not always pass back to their caller error codes they receive.

SUMMARY: Fix the three operations so that they do pass back encountered error codes.

IMPLICATIONS: Some situations in which users were deceived into believing that I/O had successfully taken place when it had not will be correctly diagnosed. For example, a file-output to a segment lacking the "w" attribute.

MULTICS CHANGE REQUEST		MCR <u>604</u> Page <u>1</u> of <u>1</u> Pages
TITLE: <u>Fix "ioa_\$ioa_stream" error code return</u>		STATUS: <u>Written</u> <u>6/12/74</u>
AUTHOR: <u>M. G. Smith</u>		Approved <u>H</u> <u>6/18/74</u>
SOURCE: (if external) e.g., "User", "Marketing"		Rejected
		Postponed
		Withdrawn
		Expires <u>12/18/74</u>

CLASSIFICATION	JUSTIFICATION	Replaced by proposal MCR _____
<input type="checkbox"/> Incompatible Change	Marketing Requirement	Implemented in System _____
<input type="checkbox"/> Extension	Conformance to Standard	Objections/Comments:
<input type="checkbox"/> Restriction	Increased Consistency	
<input type="checkbox"/> Performance Improvement	Simplification	
<input type="checkbox"/> Reliability Improvement	Generalization	
<input checked="" type="checkbox"/> Unreported Bug Fix	Unreported Bug Fix	
<input type="checkbox"/>		

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

REASONS: In module "rest_of_ioa_p11", when "ioa_\$ioa_stream" is called to perform I/O on a non-existent stream, an incorrect error code of zero is passed to "ios_signal_".

SUMMARY: Fix "rest_of_ioa_p11" to pass the IOX error code returned by the "put_chars" I/O operation.

IMPLICATIONS: The resulting error message to the user will be correct and more informative.

MULTICS CHANGE REQUEST		MCR <u>605</u> Page <u>1</u> of <u>1</u> Pages
TITLE: <u>Fix title parse in "attach_ioname".</u>	STATUS	DATE
AUTHOR: <u>M. G. Smith</u>	Written	<u>6/12/74</u>
	Approved <u>#</u>	<u>6/18/74</u>
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	<u>12/18/74</u>

CLASSIFICATION	JUSTIFICATION	REASON
<input type="checkbox"/> Incompatible Change	<input type="checkbox"/> Marketing Requirement	Replaced by proposal MCR _____
<input type="checkbox"/> Extension	<input type="checkbox"/> Conformance to Standard	Implemented in System _____
<input type="checkbox"/> Restriction	<input type="checkbox"/> Increased Consistency	Objections/Comments:
<input type="checkbox"/> Performance Improvement	<input type="checkbox"/> Simplification	
<input checked="" type="checkbox"/> Reliability Improvement	<input type="checkbox"/> Generalization	
<input type="checkbox"/>	<input type="checkbox"/> Unreported	
<input type="checkbox"/>	<input checked="" type="checkbox"/> Bug Fix	

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

REASONS: In the extraction of the I/O module name from the supplied title in module "attach_ioname.pl1" an incorrect test sometimes rejects legal names (the test incorrectly limits the pathname to 26 characters).

SUMMARY: Correct the test to allow full pathnames.

IMPLICATIONS: Long pathnames will no longer be erroneously rejected.

MULTICS CHANGE PROJECT		MCR <u>606</u> Page <u>1</u> of <u>1</u> Pages
TITLE: Delete obsolete IOS "print_attach_table".	STATUS	DATE
AUTHOR: <u>M. G. Smith</u>	Written	6/12/74
SOURCE: (if external) e.g., "User", "Marketing"	Approved #	6/18/74
	Rejected	
	Postponed	
	Withdrawn	
	Expires	12/18/74

CLASSIFICATION	JUSTIFICATION	
Incompatible Change	Marketing Requirement	Replaced by proposal MCR _____
Extension	Conformance to Standard	Implemented in System _____
Restriction	Increased Consistency	Objections/Comments:
<input checked="" type="checkbox"/> Performance Improvement	<input checked="" type="checkbox"/> Simplification	
Reliability Improvement	Generalization	
	Bug Fix	

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

REASONS: Now that the new IOX I/O system is installed, the old IOS version of the "print_attach_table" command is no longer required. The IOX command of the same name replaces it.

SUMMARY: Delete the module "print_attach_table.pl1" from "bound_io_commands_archive". Remove the lines in "pat.pl1" (the IOX replacement) which call the IOS version when IOX is not running.

IMPLICATIONS: The I/O library will become smaller due to deletion of unnecessary code.

MULTICS CHANGE REQUEST		MCR <u>607</u> Page <u>1</u> of <u>1</u> Pages
TITLE: Recompile APL in EIS.	STATUS	DATE
AUTHOR: <u>M. G. Smith</u>	Written	6/12/74
	Approved H	6/18/74
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	12/18/74

CLASSIFICATION	JUSTIFICATION	REASON
<input type="checkbox"/> Incompatible Change	<input type="checkbox"/> Marketing Requirement	Replaced by proposal MCR _____
<input type="checkbox"/> Extension	<input checked="" type="checkbox"/> Conformance to Standard	Implemented in System _____
<input type="checkbox"/> Restriction	<input type="checkbox"/> Increased Consistency	Objections/Comments:
<input checked="" type="checkbox"/> Performance Improvement	<input type="checkbox"/> Simplification	
<input type="checkbox"/> Reliability Improvement	<input type="checkbox"/> Generalization	
<input type="checkbox"/>	<input type="checkbox"/> Bug Fix	
<input type="checkbox"/>	<input type="checkbox"/>	

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

REASONS: The improved code generated by the EIS compiler should speed up APL and reduce its cost.

SUMMARY: Recompile all modules of APL. APL is already in Version Two, so few changes to the source code, if any, will be needed.

IMPLICATIONS: APL will run faster and cheaper.

MULTICS CHANGE REQUEST		MCR <u>608</u> Page <u>1</u> of <u>1</u> Pages
TITLE: <u>Fix APL transpose bug.</u>		STATUS
AUTHOR: <u>M. G. Smith</u>		DATE
SOURCE: (if external) e.g., "User", "Marketing"		Written <u>6/12</u>
		Approved <u>H 6/18/74</u>
		Rejected
		Postponed
		Withdrawn
		Expires <u>12/18/74</u>

CLASSIFICATION	JUSTIFICATION	Replaced by proposal MCR _____
<input type="checkbox"/> Incompatible Change	Marketing Requirement	Implemented in System _____
<input type="checkbox"/> Extension	Conformance to Standard	Objections/Comments:
<input type="checkbox"/> Restriction	Increased Consistency	
<input type="checkbox"/> Performance Improvement	Simplification	
<input checked="" type="checkbox"/> Reliability Improvement	Generalization	
	<input checked="" type="checkbox"/> APL bug #1	
	<input checked="" type="checkbox"/> Bug Fix	

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

REASONS: The APL transpose operation fails when coordinate numbers are repeated on the left hand side, due to an incorrectly declared constant.

SUMMARY: In module "transpose.pl1", make the constant 1.0e20 into double-precision so it compares correctly.

IMPLICATIONS: Transpose will work as documented.

MULTICS CHANGE REQUEST		MCR <u>609</u> Page <u>1</u> of <u>1</u> Pages
TITLE: <u>Fix APL take/drop bug</u>	STATUS	DATE
AUTHOR: <u>M. G. Smith</u>	Written	<u>6/12/74</u>
	Approved H	<u>6/18/74</u>
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	<u>12/18/74</u>

CLASSIFICATION	JUSTIFICATION	REASON
<input type="checkbox"/> Incompatible Change	Marketing Requirement	Replaced by proposal MCP _____
<input type="checkbox"/> Extension	Conformance to Standard	Implemented in System _____
<input type="checkbox"/> Restriction	Increased Consistency	Objections/Comments:
<input type="checkbox"/> Performance Improvement	Simplification	
<input checked="" type="checkbox"/> Reliability Improvement	Generalization	
<input type="checkbox"/>	Unreported	
<input type="checkbox"/>	X Bug Fix	

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

REASONS: The APL operators take and drop do not work correctly on a scalar. They should ravel it first, but instead they produce nonsensical answers.

SUMMARY: Fix "take.pll" and "drop.pll" to ravel their right argument if it is a scalar.

IMPLICATIONS: Takes and drops of a scalar will work correctly.

MULTICS CHANGE REQUEST		MCR <u>610</u> Page <u>1</u> of <u>1</u> Pages
TITLE: <u>no_s_permission with status command</u>		STATUS
AUTHOR: <u>Steve Herbst</u>		DATE
SOURCE: (if external) e.g., "User", "Marketing"		Written <u>6-13</u>
		Approved <u># 6/18/74</u>
		Rejected
		Postponed
		Withdrawn
		Expires <u>12/18/74</u>

CLASSIFICATION	JUSTIFICATION	
<input type="checkbox"/> Incompatible Change	<input type="checkbox"/> Marketing Requirement	Replaced by proposal MCR _____
<input type="checkbox"/> Extension	<input type="checkbox"/> Conformance to Standard	Implemented in System _____
<input type="checkbox"/> Restriction	<input type="checkbox"/> Increased Consistency	Objections/Comments:
<input checked="" type="checkbox"/> Performance Improvement	<input type="checkbox"/> Simplification	
<input type="checkbox"/> Reliability Improvement	<input checked="" type="checkbox"/> Generalization	
<input type="checkbox"/>	<input type="checkbox"/> Bug Fix	
<input type="checkbox"/>	<input type="checkbox"/>	

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

REASONS: If the user has no status permission on the parent directory but has non-null access on the segment, hcs_\$status_long will still return:

type
effective access
bit count
records used
current length

The status command should print this information.

SUMMARY: Test for error_table_\$no_s_permission and print the above minimal information.

MULTICS CHANGE REQUEST		MCR <u>611</u> Page <u>1</u> of <u>1</u> Pages
TITLE: New GCOS Simulator	STATUS	DATE
AUTHOR: <u>T. Casey</u>	Written	<u>6/12/74</u>
	Approved #	<u>6/18/74</u>
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	<u>12/18/74</u>

CLASSIFICATION	JUSTIFICATION	REASON
<input checked="" type="checkbox"/> Incompatible Change	<input checked="" type="checkbox"/> Marketing Requirement	Replaced by proposal MCR _____
<input checked="" type="checkbox"/> Extension	Conformance to Standard	Implemented in System _____ Objections/Comments:
<input checked="" type="checkbox"/> Restriction	Increased Consistency	
Performance Improvement	Simplification	
<input checked="" type="checkbox"/> Reliability Improvement	Generalization	
	<input checked="" type="checkbox"/> Bug Fix see below	

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

REASONS: Parts of the currently installed GCOS simulator have an internal structure completely different from that of the real GCOS. As a result, many GCOS features that are not explicitly described in user documentation operate differently in the simulator. The differences are great enough to make the current simulator unacceptable for release to customers.

SUMMARY: Install new `bound_gcoss_` and `bound_gcoss_utilities_`. The major change is a complete rewrite of the simulator's handling of files, making its internal operation more like the real GCOS. In addition, many bugs, both reported and unreported, have been fixed, including bug numbers 19, 21, 29, 33, 46, 47, 50, 57, 59, and 66, in the gcs bugfile on System M.

IMPLICATIONS: Certain illegal GCOS jobs will no longer be accepted by the simulator. Since the 355 installation tools used to generate these illegal jobs, the new tools (MCR 600) must be installed first (the new tools are compatible with both simulators).

DETAILED PROPOSAL: The detailed list of changes made to each procedure in the simulator is 10 pages long. Copies may be obtained from the author.

MULTICS CHANGE REQUEST		MCR 012
TITLE: Make fixes to get_library_segment and its control files	STATUS	DATE
AUTHOR: A. J. Scherer	Written	06/14/74
SOURCE: (if external; e.g., "User", "Marketing")	Approved	6/18/74
	Rejected	
	Postponed	
	Withdrawn	
	Expires	12/18/74
CLASSIFICATION	JUSTIFICATION	
Incompatible	Marketing	Replaced by proposal MCR
Change	Requirement	Implemented in System
Extension	to Standard	Objections/Comments:
Restriction	Increased	
Performance	Consistency	
Improvement	Simplification	
Reliability	Generalization	
Improvement	(Unreported)	
	Bug Fix	

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

REASON:

Add network library to get_library_segment and to control files os.control, .object.control
 Add network.control file and network.object.control file for same purpose.
 Fix bug which prevents extracting an archive component with the -rename option when the original-named entry already resides in that directory.
 Remove obsolete entry get_library_source.
 Add the IIS directory path to the info_files.control segment so it can pick contents of IIS.

SUMMARY:

When the rename option is used, extract the archive component into the user's access directory, and from there, copy it by its new name into the user's working directory to avoid name-dups which now occur when another version of the component exists in the working directory (a primary reason for wanting to use the -rename option).

MULTICS CHANGE REQUEST

MCR 613
Page 1 of 1 Pages

TITLE: Fix bug in ipc_message_facility

STATUS	DATE
Written	6-18-74
Approved	# 6/25/74
Rejected	
Postponed	
Withdrawn	
Expires	12/25/79

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

X Reliability
Improvement

Generalization

X Bug Fix 297

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

REASONS: send_message causes a stack overflow trying to put too long a message from the command line into its 132-char. buffer.

SUMMARY: Test message length when concatenating args to form the message. Report if the message has to be truncated.

MULTI-CHANGE REQUEST		MCR <u>615</u> Page <u>1</u> of <u>1</u> Pages
TITLE: <u>Add entry msf_acl to copy_acl_</u>		STATUS
AUTHOR: <u>Steve Herbst</u>		DATE
SOURCE: (if external) e.g., "User", "Marketing"		Written <u>6-18-</u>
		Approved <u>H</u> <u>6/25/74</u>
		Rejected
		Postponed
		Withdrawn
		Expires <u>12/25/74</u>

CLASSIFICATION	JUSTIFICATION	
<input type="checkbox"/> Incompatible Change	Marketing Requirement	Replaced by proposal MCR _____
<input type="checkbox"/> Extension	Conformance to Standard	Implemented in System _____
<input type="checkbox"/> Restriction	Increased Consistency	Objections/Comments:
<input type="checkbox"/> Performance Improvement	Simplification	
<input checked="" type="checkbox"/> Reliability Improvement	<input checked="" type="checkbox"/> Generalization	
<input type="checkbox"/>	Bug Fix	
<input type="checkbox"/>		

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

REASONS: copy_acl currently uses hcs_\$acl_list, hcs_\$acl_delete and hcs_\$acl_replace on multi-segment files, treating them like segments. msf_manager has entries to read and set acl's on MSF's; copy_acl should use these. Since copy_acl is called almost exclusively by the copy command which knows whether a file is a segment or an MSF, save copy_acl the trouble of deciding and add a new entry, copy_acl_\$msf_acl.

SUMMARY: add new entry which calls msf_manager_\$list_acl and msf_manager_\$replace_acl.

MULTICS CHANGE REQUEST		MCR <u>617</u> Page <u>1</u> of <u>1</u> Pages
TITLE: Implement the "-long" option with abc		STATUS: _____ DATE: _____
AUTHOR: <u>Steve Herbst</u>		Written <u>6-18-74</u>
SOURCE: (if external) e.g., "User", "Marketing"		Approved <u>H 6/25/74</u>
		Rejected _____
		Postponed _____
		Withdrawn _____
		Expires <u>12/25/74</u>

CLASSIFICATION	JUSTIFICATION	Replaced by proposal MCR _____
<input type="checkbox"/> Incompatible Change	<input type="checkbox"/> Marketing Requirement	Implemented in System _____
<input type="checkbox"/> Extension	<input type="checkbox"/> Conformance to Standard	Objections/Comments:
<input type="checkbox"/> Restriction	<input type="checkbox"/> Increased Consistency	
<input checked="" type="checkbox"/> Performance Improvement	<input type="checkbox"/> Simplification	
<input type="checkbox"/> Reliability Improvement	<input checked="" type="checkbox"/> Generalization	
<input type="checkbox"/>	<input type="checkbox"/> Bug Fix	
<input type="checkbox"/>	<input type="checkbox"/>	

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

REASONS: `adjust_bit_count` should implement the "-long" option.

SUMMARY: "abc -long" prints a message:

- 1) when the bit count of a segment is changed.
"bit count changed from xxxx to xxxx."
- 2) when the bit count of the last component of an MSF is changed, if and when `adjust_bit_count` is allowed to work on MSF's.
"bit count of last component changed from xxxx to xxxx."
- 3) when the msf indicator (number of components) of an MSF is changed, if and when etc.
"number of components changed from xxxx to xxxx."

MULTICS CHANGE REQUEST		MCR <u>618</u> Page <u>1</u> of <u>1</u> Pages	
TITLE: Implement Security Attributes in Storage System, Part 1	STATUS		DATE
	Written		6-18-74
AUTHOR: <u>A. Kobziar</u>	Approved #		7/2/74
	Rejected		
SOURCE: (if external) e.g., "User", "Marketing"	Postponed #		6/25/74
	Withdrawn		
	Expires		1/2/75

CLASSIFICATION	JUSTIFICATION	Replaced by proposal MCR _____
<input type="checkbox"/> Incompatible Change	<input checked="" type="checkbox"/> Marketing Requirement	Implemented in System _____
<input checked="" type="checkbox"/> Extension	<input type="checkbox"/> Conformance to Standard	Objections/Comments: 1. Needs detailed definition of "appropriate" in Item 3. 2. Don't use phcs_ for checkout gate.
<input type="checkbox"/> Restriction	<input type="checkbox"/> Increased Consistency	
<input type="checkbox"/> Performance Improvement	<input type="checkbox"/> Simplification	
<input type="checkbox"/> Reliability Improvement	<input type="checkbox"/> Generalization	
<input type="checkbox"/>	<input type="checkbox"/> Bug Fix	

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

REASONS: Install all changes required to create a test environment for security. These changes are part of the MTB-081 proposal.

- SUMMARY:**
- 1) Change PDS and dir_entry.incl to contain security information.
 - 2) Change access_mode to return 3 types of mode: raw, security factored, and both security and ring bracket factored.
 - 3) Change all callers of access_mode to use the appropriate entry. (This implies removal of local ring bracket factoring).
 - 4) Create a special temporary procedure, accessible through a temporary privilege gate, to set any value of security information in the PDS and in any normally modifiable branch.

IMPLICATIONS: The above installation will allow a timing test to be performed on the security design. The gate will allow on-line testing of user interactions in a security system, as well as testing of non-hardcore modifications.

DETAILED PROPOSAL:

The following callers of `access_mode` will use the "security and ring bracket factored" entry as well as having internal ring bracket factoring removed:

`del_dir_tree`, `dir_control_error`, `fs_get`, `initiate`,
`makeunknown`, `move_device`, `set` and `truncate`.

The following will use the "raw" entry:

`dc_pack`, `quota` (to the lower depth directory), `status_` (this includes `get_user_eff` mode) and `star_`.

In cases where the user does not have status permission on the parent, `status_` will use the "ring bracket" entry for the mode to the branch.

The remaining callers are `seg_fault`, which will use the "security" entry and `sum_$get_ring` which will be eliminated as no procedures call this entry.

MULTIPL CHANGE REQUEST		MCR <u>619</u> Page <u>1</u> of <u>1</u>
TITLE: <u>Implement Security Attributes in Storage System, Part 2</u>	STATUS	DATE
	Written	<u>6-18-74</u>
AUTHOR: <u>A. Kobziar</u>	Approved <i>H</i>	<u>6/25/74</u>
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	<u>12/25/74</u>

CLASSIFICATION	JUSTIFICATION	
<input type="checkbox"/> Incompatible Change	<input checked="" type="checkbox"/> Marketing Requirement	Replaced by proposal MCR _____
<input checked="" type="checkbox"/> Extension	Conformance to Standard	Implemented in System _____
<input type="checkbox"/> Restriction	Increased Consistency	Objections/Comments: .
<input type="checkbox"/> Performance Improvement	Simplification	
<input type="checkbox"/> Reliability Improvement	Generalization	
<input type="checkbox"/>	Bug Fix	
<input type="checkbox"/>		

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

REASONS: Complete the hardcore changes to implement on-line security. (Salvager and Retriever remain for Parts 3 & 4).

- SUMMARY:
- 1) Write a `create_upgrade_directory` primitive which does the following: Appends a new directory, moves quota to it, and upgrades the security information.
 - 2) Change quota to be able to increase quota on an upgraded directory.
 - 3) Add user accessible entries which return security information (in `status_` & `get_group_id`).

DETAILED PROPOSAL FOR 1): The PDS will have the user's current security level as well as his maximum possible level. Requests to upgrade larger than the maximum will not be performed.

MULTICS CHANGE REQUEST		MCR <u>620</u> Page <u>1</u> of <u>2</u>
TITLE: <u>Improve add_copyright command</u>	STATUS	DATE
AUTHOR: <u>John Gintell</u>	Written	<u>6-19-74</u>
	Approved	<u>H 6/25/74</u>
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	<u>12/25/74</u>

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

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

REASONS: The add_copyright command which is used to implement and enforce the Multics copyright convention should be upgraded to allow the specification of other than the "joint" copyright and to place the current year in the copyright notice.

SUMMARY: The Multics copyright notice is a comment or set of comments embedded in the source program at "the beginning". It commences with a line of *'s and after several blank lines contains the string:

Copyright (c) yearlist by owner
 where yearlist is the set of years (separated by commas) during which changes were made and installed, and owner is the appropriate member of the set

- Massachusetts Institute of Technology
- Honeywell Information Systems, Inc.
- or both joined with "and".

The add_copyright command will be modified to place the current year in an old copyright notice and to place the correct owner as specified by control argument. A subroutine interface will be added that will return the copyright information so that it can be used as part of a report preparing program to summarize the status of a library of programs.

IMPLICATIONS:

This change is an extension to that implemented by the current version of the `add_copyright` command which management people have agreed is adequate.

This command does not implement the policy of choosing which owner to place in the copyright notice but leaves that decision to the user of the command.

DETAILED PROPOSAL:

Name: `add_copyright`

Usage

`add_copyright` `pathname` `-control arguments-`

`pathname` is the pathname of the segment whose copyright notice is to be checked or modified.

Control arguments

`-check` print a message stating what the notice would contain and what was changed.
`-his` make the owner be HIS.
`-mit` make the owner be MIT.
`-joint` make the owner be MIT and HIS.

The default action for the owner is to not change the owner if it is already there and to make the owner be MIT and HIS for new copyright notices.

Name: `return_copyright_`

Usage

call `return_copyright_ (segptr, length, owner, year, code);`

`segptr` is a pointer to the segment to be checked (Input)
`length` is the length (in characters) of the segment (Input)
`owner` is a varying character string giving the control argument used to specify the owner (Output)
`year` is a varying character string giving the year(s) (Output)
`code` is a fixed binary field
= 0 if a copyright is present
= 1 if there is no copyright (Output)

MULTICS CHANGE REQUEST

MCR 621

TITLE: Fix bug in enter command.	STATUS	DATE
AUTHOR: VanVleck	Written	06/19/77
SOURCE: (if external; e.g., "User", "Marketing")	Approved #	6/25/77
	Rejected	
	Postponed	
	Withdrawn	
	Expires	12/25/79

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

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

REASONS:

The "enter" ("e") command stopped working in answering service 7.5. I tried to look up the user in the password table.

SUMMARY:

Add missing line of code to dialup_.

IMPLICATIONS:

Anonymous users which do not require password checking will work again.

MULTICS CHANGE REQUEST		MCR <u>622</u> Page <u>1</u> of <u>1</u>
TITLE: <u>Recompile vfile_</u>	STATUS	DATE <u>6-20-74</u>
AUTHOR: <u>M.D. MacLaren</u>	Written	
	Approved <u>H</u>	<u>6/25/74</u>
	Rejected	
SOURCE: (if external) e.g., "User", "Marketing"	Postponed	
	Withdrawn	
	Expires	<u>12/25/74</u>

CLASSIFICATION	JUSTIFICATION	Replaced by proposal MCR _____
<input type="checkbox"/> Incompatible Change	<input type="checkbox"/> Marketing Requirement	Implemented in System _____
<input type="checkbox"/> Extension	<input type="checkbox"/> Performance to Standard	Objections/Comments:
<input type="checkbox"/> Restriction	<input type="checkbox"/> Increased Consistency	
<input checked="" type="checkbox"/> Performance Improvement	<input type="checkbox"/> Simplification	
<input type="checkbox"/> Reliability Improvement	<input type="checkbox"/> Generalization	
<input type="checkbox"/>	<input type="checkbox"/> Bug Fix	

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

REASONS: Performance improvement, avoid future problem if a new version of indexed files is introduced.

SUMMARY: Recompile all of vfile_ with EIS compiler. Add check that indexed files have version number 1.