

MULTICS TECHNICAL BULLETIN

MTB-164

Date: March 3, 1975  
To: Distribution  
From: Betsy Kerr  
Division: CISL/CEO-P  
Subject: Multics Change Requests

Attached are the Multics Change Requests that were approved from February 15 - 28, 1975.

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Ver. 3  
741022

MULTICS CHANGE REQUEST

HC# 998

TITLE: Add checking on segment names to editors.

AUTHOR: VanVleck

STATUS	DATE
written	01/21/75
Status	planned A 2/18/75
Expires	07/21/75

Planned for System: not applicable  
Fixes Bug Number(s): not applicable  
Documented in MTB: not applicable  
Incompatible Change: ~~no~~ **yes**  
User/Operations-visible Interface Change: ~~no~~ **yes**  
Coded in: ()PL/I ()ALM ()other-see below  
Performance: ()better ()same ()worse

CATEGORY (check one)  
 Lib. maint. Tools  
 Sys. Anal. Tools  
 Sys. Prog. Tools  
 355  
 BOS  
 Salvager  
 Ring Zero  
 Ring One  
 SysDaemon/Admin  
 Runtime  
 User Command/Subr

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect) edm, **qedx** MPAM (sect)  
MOSN (sect) MSAM (sect)  
PLMs (AN#)  
Info Segs pending changes  
Other

OBJECTIONS/COMMENTS:

For user interface documentation

Headings are: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

SUMMARY:

Write a new subroutine, valid\_entry\_name\_, which will detect segment names which, although possibly legal to the file system, are probably the result of user error and which will cause difficulties in further use of the segment.

Modify qedx and edm to call this routine to check segment names typed by the user. When an invalid name is typed, the editor will refuse to write into the segment.

REASONS:

Communications line garbles and user errors in "w" commands can result in the production of segments in the user's directory (or elsewhere) with names containing characters with meaning to the command system, embedded blanks, unprintable characters, etc. These segments are not only sometimes hard for the nonexpert user to delete, but their silent creation also sometimes leads to the mysterious loss of several hours' editing.

IMPLICATIONS:

This is an incompatible change. Because the names to be discriminated against are so difficult to use, it will probably make no difference to the vast majority of users. Any user who wishes to edit a peculiarly-named segment may add a standard name to it or link to it with a standard name. Since names obtained from the command line will not be checked by the subroutine, the ability to edit existing segments will not be affected.

DETAILED PROPOSAL:

Valid entry names will consist only of

letters A-Z and a-z  
digits 0-9  
punctuation marks . \_ - ' ` ^ ~ + (may not lead)  
control character backspace  
trailing blanks

In addition, the entry name may not contain a null component or be all blank.

The following characters are not allowed:

star convention characters: \* ? = \$  
command language characters: ( ) " [ ] < > ; \$  
difficult to type characters: \ @ #  
control characters below blank, except backspace  
probable substitution delimiters: ! { } ! : /

(I am not sure about characters in the last class.)

The following text should be added to the MPM section on "Constructing and Interpreting Names" and referenced from the edm and qedx writeups. With appropriate changes, it should also be added to pc.info, edm\_changes.info, etc.

The edm and qedx editors have been modified to check the entryname of any segment specified in a "w" request, and to refuse to write segments with "troublesome" names. This change prevents communications equipment or user error from creating a segment which will be difficult for the user to access later.

The names which are now illegal are those which contain

- null name components
- embedded blanks
- leading minus
- troublesome characters

since these names are difficult for the nonexpert user to input in command lines, or since they have a special meaning to some part of the command system.

The troublesome characters are:

- \* ? = % (Star convention)
- ( ) " | [ ] < > ; \$ (Command processor)
- \ # @ (Typewriter input)
- control characters (Hard to input)  
except backspace
- ! , / (Probable substitution delimiter)

Multics Change Request

MCR 1020  
Page 1 of 1

TITLE: Allow use of disk through I/O Interfacer		STATUS	DATE
AUTHOR: Noel I. Morris		Written	75.02.05
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR <u>2 1</u> -Fixes Bug Number(s) _____ -Documented in MTB <u>158</u> -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	P 2/11/75, A2/18/75
		Expires	
		DOCUMENTATION CHANGES	
		Document	Specify One or More
			MPM (Vol, Sect.)
			PLMS (AN #)
			MOSN (Sect.)
			MPAM (Sect.)
			MSAM (Sect.)
Objections/Comments:		Info Segs	
Awaits MTB.		Other (Name)	
		None (Reason)	

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

SUMMARY:

A mechanism is to be provided to allow user ring access to disk drives through the I/O Interfacer. This mechanism must coexist with and provide isolation from the disk drives used by page control. The mechanism is described in detail in MTB-158.

Multics Change Request

TITLE: Emergency fix to hash_		STATUS	DATE
AUTHOR: T. Casey		Written	2/12/75
<input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR -Fixes Bug Number(s) unreported -Documented in MTB -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____	Category (Check One)		Status
	<input type="checkbox"/> Lib. Maint. Tools	<input type="checkbox"/> Sys. Anal. Tools	A 2/18/75
	<input type="checkbox"/> Sys. Prog. Tools	<input type="checkbox"/> 355	Expires
	<input type="checkbox"/> BOS	<input checked="" type="checkbox"/> Salvager	8/18/75
		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason) no interface change	

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

SUMMARY: hash\_ calls com\_err\_ before rehashing an almost-full hash table. The Initializer process catches command error and aborts whatever was being done. The pnt hash table at MIT is 99% full. Any attempts to register a new user, and every misspelled user name on login, causes an attempt to rehash the table. The attempt is aborted with an answering service dump.

As an emergency fix, the call to com\_err\_ in hash\_ is being removed. A better strategy for determining when to rehash, and how big the new table should be, will be the subject of a future MCR.

Multics Change Request

TITLE: Fix bug in adjust_bit_count_	STATUS	DATE
AUTHOR: Steve Herbst	Written	02/11/75

-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR -Fixes Bug Number(s) <u>NA</u> -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____	Category (Check One) <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input type="checkbox"/> SysDaemon/Admin. <input type="checkbox"/> Runtime <input checked="" type="checkbox"/> User Cmmnd/Subr.	Status <u>A 2/18/75</u> Expires <u>8/18/75</u> DOCUMENTATION CHANGES Document Specify One or More MPM (Vol, Sect.) PLMS (AN #) MOSN (Sect.) MPAM (Sect.) MSAM (Sect.)
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Objections/Comments:	Info Segs
	Other (Name)
	None (Reason) <u>no change</u>

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

SUMMARY:

Fix adjust\_bit\_count\_ to report an error when the bit count of a segment cannot be set because the user does not have write access.

REASONS:

adjust\_bit\_count\_ currently returns a zero code in this case (assuming there is read access) without changing the bit count and the abc command assumes that the work was done.

Multics Change Request

MCR 1026  
Page 1 of 1

TITLE: Remove absolute pathname from pVI_abs		STATUS	DATE
AUTHOR: Steve Herbst		Written	02/11/75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL	Category (Check One)		Status
	<input type="checkbox"/> Lib. Maint. Tools	<input type="checkbox"/> Sys. Anal. Tools	A 2/18/75
-Planned for System MR	<input type="checkbox"/> Sys. Prog. Tools	Expires	
-Fixes Bug Number(s) NA	355	8/18/75	
-Documented in MTB	BOS	DOCUMENTATION CHANGES	
-User/Operations-visible	Salvager	Document	Specify One or More
Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	Ring Zero	MPM (Vol, Sect.)	
-Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	Ring One	PLMS (AN #)	
-Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same	SysDaemon/Admin.	MOSN (Sect.)	
<input type="checkbox"/> Worse	Runtime	MPAM (Sect.)	
-Replaces MCR	<input checked="" type="checkbox"/> User Cmmnd/Subr.	MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason) No interface change	

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

SUMMARY:

Change pVI\_abs to look for the control segment translator\_absin.absin in pVI\_abs parent directory.

REASONS:

Currently it uses the absolute pathname >system\_library\_dev>translator\_absin.absin. Absolute pathnames are to be avoided in system programs.

TITLE: Fix bug in status command	STATUS	DATE
AUTHOR: Steve Herbst	Written	02/11/75

-Coded in:  PL/I  ALM  other-  
explain in DETAILED PROPOSAL

-Planned for System MR

-Fixes Bug Number(s) NA

-Documented in MTB

-User/Operations-visible  
Interface change?  yes  no

-Incompatible change?  yes  no

-Performance:  Better  Same  
 Worse

-Replaces MCR

Category (Check One)

Lib. Maint. Tools

Sys. Anal. Tools

Sys. Prog. Tools

355

BOS

Salvager

Ring Zero

Ring One

SysDaemon/Admin.

Runtime

User Cmnd/Subr.

Status A 2/18/75

Expires 8/18/75

DOCUMENTATION CHANGES

Objections/Comments:

Document Specify One or More

MPM (Vol, Sect.)

PLMS (AN #)

MOSN (Sect.)

MPAM (Sect.)

MSAM (Sect.)

Info Segs

Other (Name)

None (Reason) NO CHANGE

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

SUMMARY:

Make "status foodir>foo -dt" print an error message when the user lacks status permission on foodir.

REASONS:

Currently, when status is asked for certain information requiring "s" on the containing directory, it returns without saying anything. It should say:

"Insufficient access to return any information".

Multics Change Request

TITLE: Fix and Restructure setfaults		STATUS	DATE
AUTHOR: Richard Bratt		Written	02/10/75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR -Fixes Bug Number(s) -Documented in MTB -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input checked="" type="checkbox"/> Better <input type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR		Status	A 2/18/75
		Expires	8/18/75
		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MPM (Vol, Sect.)	
		PLMS (AN #)	AN60
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason)	

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

SUMMARY: Setfaults needs to be changed to fix a bug.

- REASONS:
- 1) It does not clear the hardware segment descriptor word associative memories when it modifies sdws!
  - 2) It does not provide a reasonable interface to makeunknown.
  - 3) It is poorly structured and therefore difficult to understand.

- PROPOSAL:
- 1) Make setfaults clear associative memories when necessary.
  - 2) Provide a new entry, setfaults\$disconnect which makeunknown can call with a segment number to disconnect that segment number from the object to which it is bound.
  - 3) Change makeunknown to call disconnect (this will remove a page of code from makeunknown as well as avoiding locking a directory).
  - 4) Remove several arguments to setfaults which have atrophied (trp, rsegno).
  - 5) Restructure setfaults.

Multics Change Request

TITLE: Move hcsent to active\_all\_rings\_data  
AUTHOR: Richard Bratt

STATUS	DATE
Written	02/10/75
Status	A 2/18/75
Expires	8/18/75

- Coded in:  PL/I  ALM  other-explain in DETAILED PROPOSAL
- Planned for System MR
- Fixes Bug Number(s)
- Documented in MTB
- User/Operations-visible  
Interface change?  yes  no
- Incompatible change?  yes  no
- Performance:  Better  Same  Worse
- Replaces MCR

Category (Check One)	
<input type="checkbox"/>	Lib. Maint. Tools
<input type="checkbox"/>	Sys. Anal. Tools
<input type="checkbox"/>	Sys. Prog. Tools
<input type="checkbox"/>	355
<input type="checkbox"/>	BOS
<input type="checkbox"/>	Salvager
<input checked="" type="checkbox"/>	Ring Zero
<input type="checkbox"/>	Ring One
<input type="checkbox"/>	SysDaemon/Admin.
<input type="checkbox"/>	Runtime
<input type="checkbox"/>	User Cmd/Subr.

DOCUMENTATION CHANGES	
Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	AN81
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY:

Active\_hardcore\_data contains hcsent, the system variable which specifies the maximum hardcore segment number. Unfortunately, "ahd" is readable only in ring zero. When we remove the linker and name space management from ring zero they will no longer be able to read hcsent. In preparation for such a move and in recognition of the unprotected nature of hcsent, I propose that hcsent be moved to active\_all\_rings\_data. In addition, I propose that a new variable, max\_segno, be added to active\_all\_rings\_data. This variable will specify the maximum segment number supported by the system. (The linker currently uses a very ugly algorithm to calculate an upper bound for this variable.)

It is further proposed that "stack\_base\_segno" be moved from the pds to active\_all\_rings\_data and that both "maxlinks" and "max\_tree\_depth" be moved from "ahd" to active\_all\_rings\_data.

Further, the name active\_all\_rings\_data should be added to active\_all\_rings\_data and this new name should be used when referencing the segment and in documentation.

Multics Change Request

TITLE: Provide interim solution in I/O Interfacer  
for "stuck" channel problem  
AUTHOR: Noel I. Morris

STATUS	DATE
Written	75.02.20
Status	A 2/25/75
Expires	8/25/75

- Coded in:  PL/I  AIM  other-  
explain in DETAILED PROPOSAL
- Planned for System MR \_\_\_\_\_
- Fixes Bug Number(s) \_\_\_\_\_
- Documented in MTB \_\_\_\_\_
- User/Operations-visible
- Interface change?  yes  no
- Incompatible change?  yes  no
- Performance:  Better  Same  
 Worse
- Replaces MCR \_\_\_\_\_

Category (Check One)	
<input type="checkbox"/>	Lib. Maint. Tools
<input type="checkbox"/>	Sys. Anal. Tools
<input type="checkbox"/>	Sys. Prog. Tools
<input type="checkbox"/>	355
<input type="checkbox"/>	BOS
<input type="checkbox"/>	Salvager
<input checked="" type="checkbox"/>	Ring Zero
<input type="checkbox"/>	Ring One
<input type="checkbox"/>	SysDaemon/Admin.
<input type="checkbox"/>	Runtime
<input type="checkbox"/>	User Cmmnd/Subr.

DOCUMENTATION CHANGES	
Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY:

Under certain conditions, an IOM channel may fail to deliver a termination interrupt. If an attempt is made to detach such a channel, the I/O Interfacer will go into an infinite loop waiting for channel termination. This problem has been causing many system crashes at M.I.T.

Proposal:

The I/O Interfacer will be modified to allow detaching a device which has not terminated within a reasonable amount of time. A counter will be placed on the wait loop to force an exit from the loop after the desired time period has elapsed.

Implications:

This is only a temporary solution. When the timeout mechanism is implemented in the I/O Interfacer, it will provide a permanent solution.

Multics Change Request

MCR 1034

Page 1 of 2

LE: Add message segment get_mode entries		STATUS	DATE
AUTHOR: S. Herbst		Written	2-20-75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	A 2/25/75
		Expires	8/25/75
		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MPM (Vol, Sect.)	
		PLMS (AN #)	AN69
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason)	

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

SUMMARY: Add the entry get\_mode\_index to the gate mailbox\_ and to mbx\_mseg\_. Add the entries get\_mode\_index and get\_mode\_file to the gate message\_segment\_ and queue\_mseg\_. Add an entry get\_mode to mseg\_access\_ that returns the effective extended access on a message segment, obtained by calling admin\_gate\_\$fs\_get\_ex\_mode.

REASONS: These entries allow a user process to find out its access to a message segment before attempting an expensive operation that depends on certain access.

Entry: mailbox\_\$get\_mode\_index

```
dcl mailbox $get_mode_index
    (fixed bin, bit (36) aligned, fixed bin (35));
call mailbox $get_mode_index
    (mseg_index, mode, code);
```

1. mseg\_index is an index to a mailbox (Input)
2. mode is the effective extended access (Output)
3. code is a status code (Output)

Entry: message\_segment\_\$get\_mode\_index

```
dcl message_segment $get_mode_index
    (fixed bin, bit (36) aligned, fixed bin (35));
call message_segment $get_mode_index
    (mseg_index, mode, code);
```

Entry: message\_segment\_\$get\_mode\_file

```
dcl message_segment_$get_mode_file
      (char(*), char(*), bit (36) aligned, fixed bin (35));
call message_segment_$get_mode_file
      (dn, en, mode, code);
```

1. dn is the directory name (Input)
2. en is the entry name of a message segment (Input)

Multics Change Request

TITLE: Bug fixes to answering service hash table routines		STATUS	DATE
AUTHOR: T. Casey		Written	19 February 75
		Status	A 2/25/75
		Expires	8/25/75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR -Fixes Bug Number(s) <u>unreported</u> -Documented in MTB -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input checked="" type="checkbox"/> Better <input type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR	Category (Check One)		
	<input type="checkbox"/>	Lib. Maint. Tools	DOCUMENTATION CHANGES
	<input type="checkbox"/>	Sys. Anal. Tools	
	<input type="checkbox"/>	Sys. Prog. Tools	
	<input type="checkbox"/>	355	
	<input type="checkbox"/>	BOS	
	<input type="checkbox"/>	Salvager	
	<input type="checkbox"/>	Ring Zero	
	<input type="checkbox"/>	Ring One	
	<input checked="" type="checkbox"/>	SysDaemon/Admin.	
<input type="checkbox"/>	Runtime		
<input type="checkbox"/>	User Cmmd/Subr.		
Objections/Comments:		Document	Specify One or More
		MFPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
		Info Segs	
		Other (Name)	
		None (Reason)	no interface change

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

SUMMARY:

Modify hash\_, hash\_table, up\_pnt\_, and lg\_ctl\_ to maintain the hash tables for the pnt and urf in a more sensible and bug-free manner.

REASONS:

hash\_ allows a hash table to get to about 99% full before trying to rehash it. It also tries to rehash while a user is logging in, if the user has misspelled his name and the misspelled name hashes into a very dense part of the hash table. up\_pnt\_ and lg\_ctl\_ (which rehashes if it finds a discrepancy between the hash table and the pnt) use a constant (currently 3000) number of entries when building pnt.ht. The number of registered users at MIT recently passed 3000, with disastrous results.

IMPLICATIONS:

The hash tables will be able to grow as needed, and they will be kept below a reasonable percent full, for efficiency in searching.

The hash tables will occupy more pages (about 40 pages instead of 30, for the current MIT tables).

DETAILED PROPOSAL:

Modify hash\_ to rehash only when an entry is being added.

If a supposedly-existing entry hashes into a dense part of the table such that rehashing is desirable, return the not-found indication (assuming that the entry is not there, since the table would have been rehashed when it was added).

(The criterion used for a dense part requiring rehashing is a run of used entries whose length is more than half the length of the hash table.)

Knuth recommends 75% full as most efficient for hash tables of the form maintained by hash\_. Therefore we will modify hash\_ to rehash a table that is more than 85% full, into a larger size that makes it 70% full. It will then be able to accommodate a number of new entries equal to 15% of its new size, before requiring rehashing.

Modify up\_pnt\_\$make\_hash to take a 5th argument: the number of entries already in the table, and call hash\_\$make with an initial table size such that the table will be 70% full after the existing entries are added to it. Modify up\_pnt\_ and lg\_ctl\_ to call up\_pnt\_\$make\_hash with a new argument.

Modify the hash\_table command to use the max table length value in hashst.incl.pll (which corresponds to 255K), rather than a constant in the program (which corresponds to 65K).

TITLE: Fix build355 and map355 access problem  
AUTHOR: Robert S. Coren

STATUS	DATE
Written	02-20-75
Status	A 2/25/75
Expires	8/25/75

- Coded in:  PL/I  ALM  other-  
explain in DETAILED PROPOSAL
- Planned for System MR
- Fixes Bug Number(s) unreported
- Documented in MTB
- User/Operations-visible  
Interface change?  yes  no
- Incompatible change?  yes  no
- Performance:  Better  Same  
 Worse
- Replaces MCR

Category (Check One)	
<input type="checkbox"/>	Lib. Maint. Tools
<input type="checkbox"/>	Sys. Anal. Tools
<input checked="" type="checkbox"/>	Sys. Prog. Tools
<input type="checkbox"/>	355
<input type="checkbox"/>	BOS
<input type="checkbox"/>	Salvager
<input type="checkbox"/>	Ring Zero
<input type="checkbox"/>	Ring One
<input type="checkbox"/>	SysDaemon/Admin.
<input type="checkbox"/>	Runtime
<input type="checkbox"/>	User Cmmnd/Subr.

DOCUMENTATION CHANGES	
Document	Specify One or More
	MPM (Vol, Sect.)
	PLMS (AN #)
	MOSN (Sect.)
	MPAM (Sect.)
	MSAM (Sect.)

Objections/Comments:

Info Segs
Other (Name)
None (Reason)

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

SUMMARY: Change build355 and map355 commands so that they no longer require access to >pdd.

REASONS: In order to get the pathnames of various temporary files in the shortest possible form, the build355 and map355 routines attempt to ascertain the shortest name on the process directory and all containing directories. As of system 24.5, users have null access to >pdd, so this fails.

PROPOSAL: build355 and map355 will find the shortest pathname of the parent of the process directory rather than the process directory itself. Since the process directory in general has only one name, the net effect will be the same as at present.

IMPLICATIONS: None.

Multics Change Request

TITLE: pioi_\$set_max_buffer_length (interim)		STATUS	DATE
AUTHOR: R. Mullen		Written	2/14/75
<input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input checked="" type="checkbox"/> Better <input type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	A 2/25/75
		Expires	8/25/75
		DOCUMENTATION CHANGES	
Category (Check One)		Document	Specify One or More
<input type="checkbox"/> Lib. Maint. Tools		MFM (Vol., Sect.)	
<input type="checkbox"/> Sys. Anal. Tools		PLMS (AN #)	
<input type="checkbox"/> Sys. Prog. Tools		MOSN (Sect.)	
<input type="checkbox"/> 355		MPAM (Sect.)	
<input type="checkbox"/> BOS		MSAM (Sect.)	
<input type="checkbox"/> Salvager		Info Segs	
<input checked="" type="checkbox"/> Ring Zero		Other (Name)	
<input type="checkbox"/> Ring One		None (Reason) NA	
<input type="checkbox"/> SysDaemon/Admin.			
<input type="checkbox"/> Runtime			
<input type="checkbox"/> User Cmnd/Subr.			
Objections/Comments:			

SUMMARY: It is proposed that an entry in the gate pioi\_ be provided to set the maximum allowable size of wired io buffers.

REASONS: This is needed by the reloader, which will run faster if it can wire as many pages as it pleases.

IMPLICATIONS: This may require closer attention to the ACL of pioi\_.

Multics Change Request

TITLE: <u>rtape_ for reloader (interim)</u>		STATUS	DATE
AUTHOR: <u>R. Mullen</u>		Written	<u>2/18/75</u>
<input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR <u>2.1</u> -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input checked="" type="checkbox"/> Better <input type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	<u>A 2/23/75</u>
		Expires	<u>8/25/75</u>
		DOCUMENTATION CHANGES	
Category (Check One)		Document	Specify One or More
<input type="checkbox"/> Lib. Maint. Tools			
<input type="checkbox"/> Sys. Anal. Tools			
<input type="checkbox"/> Sys. Prog. Tools			
<input type="checkbox"/> 355			
<input type="checkbox"/> BOS			
<input type="checkbox"/> Salvager			MPM (Vol, Sect.)
<input type="checkbox"/> Ring Zero			PLMS (AN #)
<input checked="" type="checkbox"/> Ring One			MOSN (Sect.)
<input type="checkbox"/> SysDaemon/Admin.			MPAM (Sect.)
<input type="checkbox"/> Runtime			MSAM (Sect.)
<input type="checkbox"/> User Cmmnd/Subr.			
Objections/Comments:		Info Segs	
<u>move rtape_ from system tape to tools.</u>		Other (Name)	
		None (Reason)	

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

SUMMARY: It is proposed that the reloader be provided with a special tape package allowing larger tape buffers.

REASONS: The reloader currently spends 20% or more of its total real time waiting for the completion of tape reads. It has been verified that the reloader will use 10% less real time if tape buffers were 4 times as large. Flexible new tape modules will not be available in the immediate future. A new module "rtape\_" can be easily constructed from tape\_, differing only in being compiled with modified include files and two one line fixes.

IMPLICATIONS: Attachment will be done through rtape\_ only if the reloader is entered at the reload or iload entries, and if debugsw is off. In this case the privileged call to allow rotation of tape drives will also be made.

DETAILED PROPOSAL: A new segment, bound\_rtape\_, will be added to the system. It will contain the rtape\_ module and will parallel bound\_tape\_ except as noted above. There will be two new include files rtdcn\_info.in and rtseq.in which will also parallel existing include files. This module will be documented in the bindfile for bound\_rtape\_.

TITLE: Implement set\$set\_for\_reloader

AUTHOR: R. Mullen

- Coded in:  PL/I  ALM  other-  
explain in DETAILED PROPOSAL
- Planned for System MR 2.1
- Fixes Bug Number(s)
- Documented in MTB
- User/Operations-visible  
Interface change?  yes  no
- Incompatible change?  yes  no
- Performance:  Better  Same  
 Worse
- Replaces MCR

Category (Check One)

- Lib. Maint. Tools
- Sys. Anal. Tools
- Sys. Prog. Tools
- 355
- BOS
- Salvager
- Ring Zero
- Ring One
- SysDaemon/Admin.
- Runtime
- User Cmd/Subr.

Written

2/13/75

Status

A 2/23/75

Expires

8/23/75

DOCUMENTATION CHANGES

Document

Specify One or More

MPM (Vol, Sect.)

PLMS (AN #) AN59

MOSN (Sect.)

MPAM (Sect.)

MSAM (Sect.)

Objections/Comments:

Info Segs

Other (Name)

None (Reason)

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

**SUMMARY:** A storage system primitive is proposed to allow the setting of a large number of branch attributes by a process with access to the highly privileged gate.

**REASONS:** Currently the reloader must make a number of calls on the storage system in order to reload a branch. The targets of a several of these calls are programs which for reasons of modularity, reliability, and simplicity should not be combined. However there are 6 (soon 7) calls to various entrypoints in the program set which at great cost set about 30 words of information in each branch. These calls can easily be combined into a single call. This call must require access to hohcs\_ as some of the calls it replaces require such access. Reloads from the user ring will still be supported by calls through hcs\_ where possible.

**IMPLICATIONS:** The reloader will use about 20 to 30% less cpu\_time, and about 10% less real time.

**DETAILED PROPOSAL:**

Implement hphcs\_\$set\_for\_reloader, set\$set\_for\_reloader, and modify the reloader to call the new entry. The calling sequence will be:

```
call hohcs_$set_for_reloader (dirname, ename, rsi_ptr, code);
```

where rsi\_ptr points to the structure described below.

```
/* BEGIN INCLUDE FILE ... reload_set_info.incl.pll ... last modified Feb
```

```
/* This structure is input to set$set_for_reloader. */
```

```
lcl 1 reload_set_info aligned,  
2 version fixed bin,  
2 should_set, /* if should_set.item then set item */  
3 safety_sw bit (1) unal,  
3 actind bit (1) unal,  
3 actime bit (1) unal,  
3 author bit (1) unal,  
3 bc_author bit (1) unal,  
3 max_length bit (1) unal,  
3 entry_bound bit (1) unal,  
3 dtem bit (1) unal,  
3 dtd bit (1) unal,  
3 dtu bit (1) unal,  
3 dtm bit (1) unal,  
3 pad bit (25) unaligned,  
2 safety_sw bit (1) aligned, /* safety switch */  
2 actind bit (18) aligned, /* activity indicator */  
2 actime bit (36) aligned, /* activity time */  
2 author char (32) aligned,  
2 author_code fixed bin (35), /* ^0 => erred setting author */  
2 bc_author char (32) aligned,  
2 bc_author_code fixed bin (35), /* ^0 => erred setting bc_author */  
2 max_length fixed bin (19),  
2 max_length_code fixed bin (35), /* ^0 => erred setting max length */  
2 entry_bound fixed bin (14),  
2 entry_bound_code fixed bin (35), /* ^0 => erred setting eob */  
2 dtem bit (36) aligned, /* date time entry modified */  
2 dtd bit (36) aligned, /* date time dumped */  
2 dtu bit (36) aligned, /* date time used */  
2 dtm bit (36) aligned; /* date time contents modified */
```

```
/* END INCLUDE FILE ... reload_set_info.incl.pll */
```

Multics Change Request

TITLE: pxss bug fixes		STATUS	DATE
AUTHOR: R. Mullen		Written	2/24/75
-Coded in: <input type="checkbox"/> PL/I <input checked="" type="checkbox"/> AIM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 2.1 -Fixes Bug Number(s) hrd0014p -Documented in MTB -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input checked="" type="checkbox"/> Better <input type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR	Category (Check One)		Status A 2/25/75
	Lib. Maint. Tools		Expires 8/25/75
	Sys. Anal. Tools		DOCUMENTATION CHANCES
	Sys. Prog. Tools		Document Specify One or More
	355		MPM (Vol, Sect.)
	BOS		PLMS (AN #)
	X Salvager		MOSN (Sect.)
	X Ring Zero		MPAM (Sect.)
	Ring One		MSAM (Sect.)
	SysDaemon/Admin.		Info Segs
Runtime		Other (Name)	
User Cmmd/Subr.		None (Reason) none needed	
Objections/Comments:			

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

SUMMARY: Two locking bugs will be fixed --  
 hrd0014p: Notifies, occuring while apt is unlocked for process loading, may be lost.  
 unreported: Use of an invalid working set estimate for a process which is made eligible while apt is unlocked for post\_purging. This causes a cumulative error in the scheduler leading to excessive multiprogramming. The fix is to never make a process eligible if its dbr is loaded on a different cpu.

TITLE: Fix 2 CPU bug in IOI queuing module		STATUS	DATE
AUTHOR: Noel I. Morris		Written	05.02.21
-Coded in: <input type="checkbox"/> PL/I <input checked="" type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 2.1 -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	A 2/25/75
		Expires	8/25/75
		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MFM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason)	

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

SUMMARY:

A bug in the module "ioi<sup>4</sup>queue" can cause a free queue to appear empty when in fact, it is not. This bug, which can occur only on a multiple CPU system, has caused several crashes at M.I.T.

Proposal:

Correct the code in "ioi<sup>3</sup>queue" to properly test for an empty free queue.

Implication:

The message "ioi<sup>3</sup>connect: Connect queue overflow." should no longer appear.

Ver. 3	MULTICS CHANGE REQUEST	MCR 1042
741022		
TITLE: New Library Tools: library_map, library_print, library_descriptor		STATUS : DATE Written : 02/20/75 Status : <del>A 2/25/75</del> Expires : 08/20/75
AUTHOR: Gary C. Dixon		
Planned for System: MR 3.0		
Fixes Bug Number(s): not applicable		CATEGORY (check one)
Documented in MTB: 133, 134		<input checked="" type="checkbox"/> Lib. Maint. Tools
Incompatible Change: no		<input type="checkbox"/> Sys. Anal. Tools
User/Operations-visible Interface Change: no		<input type="checkbox"/> Sys. Prog. Tools
Coded in: <input checked="" type="checkbox"/> PL/I <input checked="" type="checkbox"/> ALM <input type="checkbox"/> other-see below		<input type="checkbox"/> 355
Performance: <input type="checkbox"/> better <input type="checkbox"/> same <input type="checkbox"/> worse		<input type="checkbox"/> BOS
		<input type="checkbox"/> Salvager
DOCUMENTATION CHANGES (specify one or more)		<input type="checkbox"/> Ring Zero
MPM (vol,sect) MPAM (sect)		<input type="checkbox"/> Ring One
MOSN (sect) MSAM (sect)		<input type="checkbox"/> SysDaemon/Admin
PLMs (AN#) AN80		<input type="checkbox"/> Runtime
Info Segs		<input type="checkbox"/> User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

Headings are: SUMMARY, REASONS, IMPLICATIONS, DETAILED PROPOSAL (optional)

**SUMMARY:**

Install the new library maintenance tools, library\_map, library\_print and library\_descriptor. These tools are documented in MTB-133, and the design logic of library descriptors is described in MTB-134.

There is one minor change between the documentation in MTB-133 and the installed tools. The library name data\_net\_355\_library (355) is being changed to communications\_library (com) because the 355 hardware is likely to be renamed/replaced in the near future.

**REASONS:**

Make these new tools available to Phoenix and to other Multics sites.

**IMPLICATIONS:**

The tools will be documented and installed for all to use.

**DETAILED PROPOSAL:**

1) Create a new bound segment, bound\_library\_tools\_, in the tools library. Install in this new bound segment the following programs: library\_map, library\_print, lib\_descriptor\_, multics\_libraries\_, multics\_library\_search\_, lib\_get\_tree\_, lib\_sort\_tree\_, lib\_output\_node\_, lib\_output\_node\_list\_, and lib\_error\_list\_. multics\_libraries\_ is an ALM data base created by the library\_descriptor\_compiler. All other programs are coded in PL/I. (Note that the library\_descriptor\_compiler will be proposed for installation by a subsequent MCR, once it has gone through the design review process.)

2) Move msa\_manager\_ from bound\_utility\_tools\_ to bound\_library\_tools\_. The combination of this MCR and approved MCR 683 will remove the last

component from bound\_utility\_tools\_, and this bound segment will be deleted. msa\_manager\_ is used by library\_map and lib\_print to create a chain of areas in which the library status tree is built. The chain of areas is not used in more than one process.