

To: Distribution  
From: Joan Scott  
Date: June 1, 1976  
Subject: Approved MCR's from May 1 - 15, 1976

Attached are the MCR's which were approved from May 1 - 15, 1976.

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Ver. 3  
741022

MULTICS CHANGE REQUEST

MCR 1800

TITLE: Provide for 3 logical storage pools in a process that default to a single pool.  
AUTHOR: Steve Webber

STATUS	DATE
Written	04/15/76
Status	<del>Post-176</del> ACE 10/15/76
Expires	10/15/76

Planned for System: MR 5.0  
Fixes Bug Number(s): not applicable  
Documented in MTB: not applicable  
Incompatible Change: yes  
User/Operations-visible Interface Change: yes  
Coded in:  PL/I  ALM  other-see below  
Performance:  better  same  worse  
Replaces MCR: 1736

CATEGORY (check one)

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

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect)                      MPAM (sect)  
MDSN (sect)                         MSAM (sect)  
PLMs (AN#)  
Info Segs  
Other  
None (reason) no change

OBJECTIONS/COMMENTS:

MCR for commands to list and change area attributes to follow.

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

SUMMARY:

Change the system so that the segments free\_, system\_free\_n\_, and the combined linkage regions are 3 logically distinct areas which are actually the same in a normal process.

REASONS:

1. In that the copy switch does not work on multiple ring segments such as free\_, some other mechanism must be provided for systems that are to be prelinked.
2. It would be convenient to allow the area used by system code (via the get\_system\_free\_area\_ interface) be the same as the area used by normal users when performing allocations in PL/I with no "in" clause.
3. It would be convenient, at times, to have this area be the same as the combined linkage segments.
4. It is valuable to have a run unit manager provide a separate area for certain allocations.

DISCUSSION:

There are 4 major unnamed regions in which allocations are performed by the system and users. These are:

1. combined linkage regions containing

- a. linkage sections
  - b. static sections, and
  - c. hcs\_\$assign\_linkage storage.
2. user free storage as used by PL/I allocate statements when no "in" clause is specified (free\_).
  3. (based) system free storage as used by PL/I allocate statements (system\_free\_n\_).
  4. PL/I external variables and FORTRAN common blocks (i.e., \*system links' storage).

Of these, it is desirable that 1a be somehow protected from accidental damage. The linker manages these allocations and is trustworthy. Similarly, any storage allocated by system code as well as the static (1b) for system code, is assumed to be reliably managed. However, user allocated storage (including PL/I externals and FORTRAN common blocks, both of which could contain arrays) is not as reliably managed. It is therefore proposed that 3 logical regions be provided for allocations. These regions would usually be referenced as based areas with the qualifying pointer being a stack header value.

To make it possible for system programs to find the stack header, the stack segment in each ring should be initiated with the name "stack" so that the code,

```
dcl based_area area based (addr (stack$)->stack_header.system_free_ptr);
allocate foo in (based_area);
```

will work and be a convenient way for system code to find the system free storage pool.

#### DETAILED PROPOSAL:

The proposed regions would be and include:

1. Combined linkage regions.

- linkage sections
- static sections

2. Free storage (user).

- user allocated storage
- PL/I externals
- Common blocks

3. Free storage (system).

- system allocated storage

Standard processes will be initialized so that all 3 pointers are equal.

## Notes

Users (and system code) allocating without an "in" clause would be forced to use region 2 (via a special PL/I operator).

User static is still allocated with system static and all linkage sections even though there is a potential danger. This is no different from today.

The initialization of the combined linkage region pointer is already done at ring initialization time. The other two pointers will be initialized to this same value. Either of these latter two pointers can later be set to any arbitrary value appropriate to the process.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>1801</u>
TITLE: Change combined linkage regions into areas.	AUTHOR: Steve Webber	STATUS: DATE Written: 04/15/76 Status: <del>PA123736</del> A.051067B Expires: 10/15/76
Planned for System: MP <b>5.0</b>	Fixes Bug Number(s): not applicable	CATEGORY (check one)
Documented in MTB: not applicable	Incompatible Change: yes	( ) Lib. Maint. Tools
User/Operations-visible Interface Change: yes	Coded in: (X)PL/I (X)ALM ( )other-see below	( ) Sys. Anal. Tools
Performance: (X)better ( )same ( )worse	Replaces MCR: 1736	( ) Sys. Prog. Tools
DOCUMENTATION CHANGES (specify one or more)		( ) 355
MPM (vol,sect) SWG MPAM (sect)		( ) BOS
MOSN (sect) MSAM (sect)		( ) Salvager
PLMs (AN#)		(X) Ring Zero
Info Segs yes		( ) Ring One
Other		( ) SysDaemon/Admin
		( ) Runtime
		( ) User Command/Subr
OBJECTIONS/COMMENTS:		

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

SUMMARY:

Change the system supported combined linkage regions, currently used for linkage sections, static sections, and storage allocated by hcs\_session\_linkage, into an area.

REASONS:

It would be beneficial to be able to reclaim storage in the linkage regions. This includes storage acquired via hcs\_session\_linkage as well as linkage sections and static sections that are released when a segment is made unknown.

IMPLICATIONS:

In that term\_ will now free linkage sections and static sections there arises a new risk that linkage segments may get scrambled by multiple freeing and the like. This should not be a problem as all manipulations will be performed by supposedly checked-out system code. (The problem of user's referencing static arrays, etc. will still exist.)

Some potential freeing problems could be avoided by using the "no\_freeing" feature of the new area management mechanism which causes free requests to be ignored and hence the storage not reclaimed.

## DETAILED PROPOSAL:

The implementation is straightforward except for the coding of `hcs_$assign_linkage`. If an `hcs_$assign_linkage` call is made (from the user ring) which causes the linkage area to be extended (by creating another segment in the process directory) then the code necessary to create and initialize the additional linkage segment must also be in ring 0. In the new area management strategy, which gets the extension done automatically, this means that `get_next_area_ptr_` and `get_temp_segments_` must reside in ring 0. It is proposed that this be done until `hcs_` itself is removed when it will then be possible to create additional linkage segments from user ring control.

TITLE: Fix Bug in stu_\$get_runtime_address		STATUS	DATE
AUTHOR: R. A. Barnes		Written	04/28/76
<input checked="" type="checkbox"/> PL/I <input type="checkbox"/> AIM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 4.0 -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 _____		Status	A 05/06/76
		Expires	11/06/76
		DOCUMENTATION CHANGES	
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 checked="" type="checkbox"/> Runtime <input type="checkbox"/> User Cmmd/Subr.		Document	Specify One or More
Objections/Comments:		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
		Info Segs	
		Other (Name)	
		None (Reason)	bug fix

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

SUMMARY: Fix bug in stu\_\$get\_runtime\_address that sometimes caused probe and debug to fault.

DETAILED PROPOSAL:

If a probe or debug user referenced an array with one or more subscripts below their respective lower bounds, stu\_\$get\_runtime\_address sometimes returned a wild address (causing a fault) because it attempted to add a negative bit offset into the address with the addr builtin. stu\_\$get\_runtime\_address has been changed to return null in this circumstance, which tells probe and debug that it could not get the address.

Multics Change Request

TITLE: Fix bug in where command		STATUS	DATE
AUTHOR: Steve Herbst		JWG	
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL		Written	4/20/76
-Planned for System MR		Status	A 05/06/76
-Fixes Bug Number(s)		Expires	11/06/76
-Documented in MTB		DOCUMENTATION CHANGES	
-User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		355	Document Specify One or More
-Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		BOS	MPM (Vol, Sect.)
-Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse		Salvager	PLMS (AN #)
-Replaces MCR		Ring Zero	MOSN (Sect.)
		Ring One	MPAM (Sect.)
		SysDaemon/Admin.	MSAM (Sect.)
		Runtime	
		X User Cmnd/Subr.	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason) DOC ok	

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

SUMMARY: Fix the where command with-all option to print an error message when the given segment is not found in the search path. "where -all" should behave the same as the default "where" in this case.



TITLE: New operator command: shift		STATUS	DATE
AUTHOR: T. Casey		Written	4/22/76
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL		Status	A 25/Del/76
		Expires	11/Del/76
-Planned for System MR 4.0		DOCUMENTATION CHANGES	
-Fixes Bug Number(s) -		Document	Specify One or More
-Documented in MTB		MPM (Vol, Sect.)	swg
-User/Operations-visible		PLMS (AN #)	
Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no		MOSN (Sect.)	
-Incompatible change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no		MPAM (Sect.)	
-Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same		MSAM (Sect.)	
<input type="checkbox"/> Worse			
-Replaces MCR			

Objections/Comments:	Info Segs
	Other (Name) MOH
	None (Reason)

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

SUMMARY: provide an operator command, shift, to allow the shift table to be over ridden until a specified time.

REASONS: allows for charging at appropriate rates and running low queue absentee jobs when the system is unattended during the day on a holiday.

DETAILED PROPOSAL:

Usage: shift n ending\_date\_time  
shift auto

where n is a number from 0 to 7 and ending\_date\_time is a string acceptable to convert\_date\_to\_binary\_. The first form causes the shift to change to n and remain n until the specified time and then change to the shift specified in the shift table. The second form is used to return immediately to the shift specified in the shift table.

Move the writeup of system\_info\_\$next\_shift\_change from the tools PLM to the SWG, and add a fourth argument, start\_time, to it, giving the time the current shift started. (Since system\_info\_ counts its arguments, existing calls to it will continue to work.) Change all of the datebin\_ entry points that return shift information to check whether the shift has been overridden, rather than just using the information in the shift table.

Publish the current shift and its starting and ending times in the header of whotab, where all users can access them. This allows procedures that estimate charges, based on the shift, to continue to operate correctly when the shift has been overridden, provided that they call `system_info_$next_shift_change`.

# MOVE FROM TOOLS PLM TO SWG

system\_info\_

system\_info\_

Entry *system\_info\_\$next\_shift\_change*

## Usage

```
declare system_info_$next_shift_change entry (fixed bin,  
        fixed bin(71), fixed bin), fixed bin (71)  
call system_info_$next_shift_change (nowshift, changetime,  
        newshf);
```

where:

*, starttime*

1. nowshift is the current shift number. (Output)
2. changetime is the time the shift changes. (Output)
3. newshf is the shift after changetime. (Output)
4. *starttime* is the time the current shift started. (Output)

Entry: system\_info\_\$shift\_table

This entry point returns the system's local shift definition table.

## Usage

```
declare system_info_$shift_table ((336) fixed bin);  
call system_info_$shift_table (stt);
```

where stt is a table of shifts, indexed by half-hour within the week. stt(1) gives the shift for 0000-0030 Mondays, etc. (Output)

TITLE: Make sub_err_ a support procedure		STATUS	DATE	
AUTHOR: M. Weaver THVV		Written	4/27/76	
<input checked="" type="checkbox"/> Coded in <input type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL <input type="checkbox"/> Planned for System MR 4.0 <input type="checkbox"/> Fixes Bug Number(s) _____ <input type="checkbox"/> Documented in MTB _____ <input type="checkbox"/> User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse <input type="checkbox"/> Replaces MCR _____	Category (Check One)	Status	AOS/06/76	
		Lib. Maint. Tools	Expires	11/06/76
		Sys. Anal. Tools	DOCUMENTATION CHANGES	
		Sys. Prog. Tools	Document	Specify One or More
	355			
	BOS			
	Salvager		MPM (Vol, Sect.)	
	Ring Zero		PLMS (AN #)	
	Ring One		MOSN (Sect.)	
	SysDaemon/Admin.		MPAM (Sect.)	
	Runtime		MSAM (Sect.)	
	X User Cmd/Subr.			
Objections/Comments:			Info Segs	
			Other (Name)	
			None (Reason)	

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

SUMMARY: Make sub\_err\_ a support procedure.

REASONS: So the messages for the condition sub\_error\_ will say the condition occurred in the caller of sub\_err\_ rather than in sub\_err\_, which is useless.

TITLE: Rewrite disk accounting tools  
AUTHOR: T. Casey TVV

STATUS	DATE
Written	4/20/76
Status	ACD/De/76
Expires	11/16/76

-Coded in:  PL/I  ALM  other-  
explain in DETAILED PROPOSAL  
-Planned for System MR 4.0  
-Fixes Bug Number(s) none  
-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 type="checkbox"/> Ring Zero
<input type="checkbox"/> Ring One
<input checked="" type="checkbox"/> SysDaemon/Admin.
<input type="checkbox"/> Runtime
<input type="checkbox"/> User Cmnd/Subr.

DOCUMENTATION CHANGES	
Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	72.
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	appendix a

Objections/Comments:

Info Segs
Other (Name)
None (Reason)

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

**SUMMARY:** Rewrite the disk accounting tools to implement charging for directory pages in a way that preserves the ability to detect inconsistencies between the time\_page product (tpp) recorded in projfile and the tpps in the directories themselves. (A tpp value in projfile greater than that obtained from the directories usually means that one of the two values has been clobbered.) Install a new tool, set\_top, which will allow the system administrator to print and/or set the tpp of a directory. Add options that will make these tools useful to system and project administrators for analyzing disk usage patterns within a subtree and in the entire hierarchy. Allow charging to be enabled or disabled for any specified logical volume. Record directory and segment pages used as separate figures in projfile.

**REASONS:** It is useful to be able to detect errors in disk accounting before they are put into users bills and to correct them. It is also helpful to be able to find out where all the disk space has gone.

**DETAILED PROPOSAL:** Rewrite sweep, disk\_stat\_print charge\_disk, and reset\_disk\_meters. Change the format of disk\_stat (disk\_stat.incl.pli); The above procedures are the only ones that use it. Rename an obsolete variable in projfile and use it for directory pages used. Install the set\_tpp command (see attached documentation).

To be put into the System Administrator's Manual:

Name: set\_tpp, stpp

This command prints and modifies the time-page product (tpp) of a specified directory. It should be used if the charge\_disk command reports an inconsistency between the total tpp for a project, as recorded in projfile, and the total tpp for that project, as computed from the tpp's of the project's directories. (This should be done only after it has been determined that the figure in projfile is the correct one, and the tpp of some directory has been damaged.)

Usage: set\_tpp directory -control\_args-

- 1) directory is the pathname of the directory whose tpp is to be printed or modified.
- 2) control\_args may be chosen from the following, and may appear in any order:
  - directory, -dr print or modify the tpp for directory pages.
  - segment, -sm print or modify the tpp for segment pages. This is the default.
  - print print the current tpp and its equivalent dollar charge.
  - long, -lg print the current tpp and its equivalent dollar charge, plus the quota, pages used, time tpp last updated, sons lvid, and quota switch.
  - set value modify the tpp as specified by value. See notes for the possible formats of value, and more details on the functioning of the set operation.

#### Notes

**IF none**

~~of the arguments; -print, -long, or -set~~ **is given, -print**  
~~must be~~  
**given;** more than one may be given.

Value may be in units of page-seconds or dollars and cents, a leading dollar sign (\$) indicating the latter. Value may be an absolute value or a relative value (i.e., a change to be applied to the current tpp), a leading plus (+) or minus (-) sign indicating the latter. When both a dollar sign and a plus or minus sign are given, they may appear in either order. No blanks may appear between the signs and the numeric value.

When an absolute value is given, the setting of that value will only be approximate. The equivalent change from the current tpp

is computed, and then applied as a change; since the tpp of an active directory is updated frequently by the storage system, the resulting tpp, after this change is applied, will be larger than the specified value by the number of page-seconds that have accrued during the execution of the command. Use of the relative form of the value argument is recommended over the absolute form.

When -set is specified, the size and direction of the change, and the (approximate) resulting new value, are computed and displayed, in both page-seconds and dollars, and the user is asked if the change should actually be made. If the answer is yes, the change is made and then the actual resulting new value is printed.

### Examples

Lines typed by the user are preceeded by "->" in this example only.

```
-> set_tpp >udd>sa -print  
tpp=5138695885 ($1189.51)  
-> set_tpp >udd>sa -set $+2.01
```

set\_tpp: This operation will INCREASE the segment page charge on >udd>sa by \$2.01 to 5147392077 (\$1191.54). Do you want to do that?

```
-> yes  
tpp is now 5147408682 ($1191.55)
```

```
-> set_tpp >udd>sa -set -$2.01
```

set\_tpp: This operation will DECREASE the segment page charge on >udd>sa by \$2.01 to 5140898662 (\$1190.02). Do you want to do that?

```
-> yes  
tpp is now 5140913009 ($1190.03)
```

Ver. 3	MULTICS CHANGE REQUEST	MCR 1821
741022		
TITLE: Fix bug in signal_		STATUS   DATE
		Written   04/27/76
AUTHOR: Paul Green	TVV	Status   AC5/06/76
		Expires   10/27/76
Planned for System: not applicable		
Fixes Bug Number(s): not applicable		CATEGORY (check one)
Documented in MTB: not applicable		( ) Lib. Maint. Tools
Incompatible Change: no		( ) Sys. Anal. Tools
User/Operations-visible Interface Change: no		( ) Sys. Prog. Tools
Coded in: (X) PL/I ( ) ALM ( ) other-see below		( ) 355
Performance: ( ) better (X) same ( ) worse		( ) 80S
		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		( ) Ring Zero
MPM (vol,sect) MPAM (sect)		( ) Ring One
MOSN (sect) MSAM (sect)		( ) Sys Daemon/Admin
PLMs (AN#)		( ) Runtime
Info Segs		( ) User Command/Subr
Other		(X) ring 0
None (reason) no change		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

Change signal\_ to initialize the continue flag to "0"b before calling a static handler.

REASONS:

Not all handlers set the continue flag at all. In particular, timer\_manager\_ does not do so.

IMPLICATIONS:

signal\_ will stop signalling some conditions "on the stack" when they have already been handled by the static handler. This will eliminate a problem in the Answering Service, which was recently changed to use static handlers, and treat the "alarm" and "cput" conditions as errors when signalled on the stack.

DETAILED PROPOSAL:

Replace signal\_.pl1 Submitted as an emergency fix to MIT.



Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1822
TITLE: Interim ring-1 mount and dismount		STATUS   DATE
AUTHOR: Vanvleck		Written   04/22/76
		Status   <del>PL/I</del> <del>ALM</del> <del>other</del>
		Expires   10/22/76
Planned for System: MR 4.0		
Fixes Bug Number(s): not applicable		CATEGORY (check one)
Documented in MTB: not applicable		( ) Lib. Maint. Tools
Incompatible Change: yes		( ) Sys. Anal. Tools
User/Operations-visible Interface Change: yes		( ) Sys. Prog. Tools
Coded in: (X) PL/I ( ) ALM ( ) other-see below		( ) 355
Performance: ( ) better (X) same ( ) worse		( ) BOS
		( ) Salvager
		( ) Ring Zero
		(X) Ring One
		( ) SysDaemon/Admin
		( ) Runtime
		( ) User Command/Subr
DOCUMENTATION CHANGES (specify one or more)		
MPM (vol,sect)	MPAM (sect)	
MOSN (sect) a001 rev 1	MSAM (sect)	
PLMS (AN#) an61		
Info Segs		
Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY: Modify ring 1 and ring 4 operator interfaces to provide an interim means for the operator to mount and demount logical volumes.

REASONS: The complete integration of RCP volume registration will take a long time to program. This interim facility provides as much function as possible in time for release 4.

IMPLICATIONS: The user will have to communicate his desire to mount a particular logical volume to the operator by telephone or send\_message.

DETAILED PROPOSAL:

Operational documentation is available for the following new operator commands:

<del>add_vol_registration</del> , avr	Register new <del>pack</del> <sup>volume</sup>
change_vol_registration, cvr	Modify logical or physical volume registration.
del_vol_registration, dvr	Unregister logical or physical volume.
list_vol_registration, lvr	Print registration information for logical or physical volume.
add_vol, av	Tell the system that a <del>pack</del> <sup>physical volume</sup> is on a disk drive. Read and check label.
add_lv, alv	Cause a logical volume to be accepted for paging.
del_vol, dv	Tell the system a <del>pack</del> <sup>physical volume</sup> is no longer on a drive.
del_lv, dlv	Demount a logical volume and all its <del>packs</del> <sup>physical volume</sup> .
init_vol	Write the label of a new <del>pack</del> <sup>physical volume</sup> . Set up its VTOC and volume map.
<del>list_disks</del> , ld	List the usage of all storage system disk drives.
reregister	Regenerate volume registration information after crash.
salvage, salv	Salvage the directory hierarchy.
salvage_pack, sp	Volume salvage: check VTOC and volume map.

See MOSN-A001.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1823
TITLE: Directory quota commands		STATUS   DATE
AUTHOR: VanVleck		Written   04/22/76
		Status   <del>ACE/CE/EE</del>
		Expires   10/22/76
Planned for System: not applicable		
Fixes Bug Number(s): not applicable		CATEGORY (check one)
Documented in MTB: not applicable		( ) Lib. Maint. Tools
Incompatible Change: no		( ) Sys. Anal. Tools
User/Operations-visible Interface Change: no		( ) Sys. Prog. Tools
Coded in: (X) PL/I ( ) ALM ( ) other-see below		( ) 355
Performance: ( ) better (X) same ( ) worse		( ) BOS
		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		( ) Ring Zero
MPN (vol,sect) swg	MPAM (sect)	( ) Ring One
MOSN (sect)	MSAM (sect)	( ) SysDaemon/Admin
PLMs (AN#)		( ) Runtime
Info Segs		(X) User Command/Subr
Other		
OBJECTIONS/COMMENTS:		
For documentation, see writings of related quota commands.		

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

SUMMARY:

Install commands to manipulate directory quota analogous to those for segment quota.

```

get_dir_quota, gdq
move_dir_quota, mdq
set_dir_quota

```

REASONS:

If users are charged for directory page use they must have the tools to control the quota cells.

The statement above is true regardless of whether the hardcore signals directory-quota-overflow or otherwise enforces directory quota.

Sites need not use directory quota at all. After the cold reload the only directory with directory quota will be the root. Unless directory quota is moved down, no directory will have a dir quota.

Ver. 3	MULTICS CHANGE REQUEST	MCR 1824
741022		
TITLE: New "control" mode for terminals		STATUS   DATE
AUTHOR: Robert S. Coren	TWG	Written   04/22/76
		Status   ROS/06/76
		Expires   10/22/76
Planned for System: MR 4.0		
Fixes Bug Number(s): not applicable		CATEGORY (check one)
Documented in MTB: not applicable		( ) Lib. Maint. Tools
Incompatible Change: no		( ) Sys. Anal. Tools
User/Operations-visible Interface Change: yes		( ) Sys. Prog. Tools
Coded In: <input checked="" type="checkbox"/> PL/I ( ) ALM ( ) other-see below		( ) 355
Performance: ( ) better <input checked="" type="checkbox"/> same ( ) worse		( ) BOS
		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		<input checked="" type="checkbox"/> Ring Zero
MPM (vol,sect) sub (tty_) MPAM (sect)		( ) Ring One
MOSN (sect) MSAM (sect)		( ) SysDaemon/Admin
PLMs (AN#)		( ) Runtime
Info Segs canon.info, pending_changes?		( ) User Command/Subr
Other Also MPM Ref.Guide		
OBJECTIONS/COMMENTS:		
Change name of mode from "control" to "ctl_char"		

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

SUMMARY: Add new mode, "control", to tty\_DIM to allow users to specify that ASCII control characters are to be accepted as input.

REASONS: There have been lots of complaints, especially from network users, against the restriction that makes these characters difficult to input.

IMPLICATIONS: In "control" mode, invisible control characters will be treated for purposes of canonicalization and erase/kill processing as if they occupied one column position each.

DETAILED PROPOSAL: See attached documentation. Note that NUL (zero) characters will still be discarded.

# addition to "modes" section of tty- MPM

`ctl_char, ctl_char`

specifies that ASCII control characters that do not cause carriage or paper motion are to be accepted as input. If the mode is off, all such characters are discarded. (Default is off.)

## Change to MPM Ref. Guide and canon.in fo

- A50  
A51  
A52  
Changed to:  
B50  
B51  
B52  
B53  
B54  
B55  
B56  
B57
7. Any ASCII control character other than backspaces, horizontal tab, newline, vertical tab, form feed, and carriage return is discarded.
  7. If the terminal is not in "`ctl_char`" mode, any ASCII control character other than backspace, horizontal tab, newline, vertical tab, form feed, and carriage return is discarded. If the terminal is in "control" mode, such characters will be treated as if they were printing graphics (with the exception of the NUL character, which is always discarded). The default is not to be in "`ctl_char`" mode.

Comparison finished.

Ver. 3	MULTICS CHANGE REQUEST	EDS	MCR 1825
741022			
TITLE: Prevent delentry from returning error_table_\$known_in_other_rings.			STATUS   DATE
AUTHOR: Richard Bratt			Written   04/26/76
			Status   A 250.76
			Expires   10/26/76
Planned for System: not applicable			CATEGORY (check one)
Fixes Bug Number(s): not applicable			( ) Lib. Maint. Tools
Documented in MTB: not applicable			( ) Sys. Anal. Tools
Incompatible Change: no			( ) Sys. Prog. Tools
User/Operations-visible Interface Change: yes			( ) 355
Coded in: (X)PL/I ( )ALM ( )other-see below			( ) BOS
Performance: ( )better (X)same ( )worse			( ) Salvager
DOCUMENTATION CHANGES (specify one or more)			(X) Ring Zero
MPM (vol,sect)	MPAM (sect)		( ) Ring One
MOSN (sect)	MSAM (sect)		( ) Sys Daemon/Admin
PLMs (AN#)			( ) Runtime
Info Segs			( ) User Command/Subr
Other			
None (reason) bug fix.			
OBJECTIONS/COMMENTS:			

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

Summary: Modify delentry to map the code "known in other rings" returned by makeknown into zero when terminating a multi-ring object.

Reason: delentry has not failed and furthermore there is nothing his caller can do with this information. Unfortunately, this error code is not expected by the delete command which causes it to fail in some instances.

Implication: The delete command/subroutine will operate correctly and will not report useless information.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1826
TITLE: Install list_mdir command		STATUS   DATE
AUTHOR: Larry Johnson	THVV	written   04/26/76
		Status   <del>05/06/76</del>
		Expires   10/26/76
Planned for System: MR 4.0		CATEGORY (check one)
Fixes Bug Number(s): not applicable		( ) Lib. Maint. Tools
Documented in MTB: 261		( ) Sys. Anal. Tools
Incompatible Change: no		( ) Sys. Prog. Tools
User/Operations-visible Interface Change: no		( ) 355
Coded in: (X)PL/I ( )ALM ( )other-see below		( ) BOS
Performance: ( )better (X)same ( )worse		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		( ) Ring Zero
MPM (vol,sect) SWG, list_mdir, PAM (sect)		( ) Ring One
MOSN (sect) MSAM (sect)		( ) SysDaemon/Admin
PLMs (AN#)		( ) Runtime
Info Segs		(X) User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

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

Summary

The list\_mdir command lists information on master directories and quota accounts.

Detailed proposal

Install the ring 1 interface and the list\_mdir command as described in the following command description.

---

list\_mdir

---

---

list\_mdir

---

Name: list\_mdir, lmd

The list\_mdir command allows the user to print information on logical volume quotas and master directories.

Usage

list\_mdir volume -control\_args-

where:

1. volume is the name of the logical volume
2. control\_args may be selected from the following:
  - quota specifies that only quota information is to be printed.
  - directory, -dr specifies that only master directory information is to be printed.
  - brief, -bf suppresses headings and shortens the output lines (see examples).
  - long cause more complete information to be printed, including the quota account for each directory.
  - owner list specifies a list of directory owners for which information is desired. The default is to print only information for directories owned by the user issuing the command. The star convention may be used for owner names.
  - account list specifies a list of quota account names for which information is desired. The star convention may not be used. Stars in account names will only match quota account names which contain stars.
  - all specifies that information is required for all users of the logical volume.

Notes



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list\_mdir

---

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list\_mdir

---

If neither the `-quota` or `-directory` arguments are specified, information about both quotas and directories will be printed.

It is not necessary that the logical volume be mounted to use this command.

Executive access to the logical volume is required to use the `-owner`, `-account`, and `-all` control arguments. If `-all` is specified, `-owner` and `-account` must be omitted. If both `-owner` and `-account` are specified, information will only be printed for directories which match both conditions.

### Examples

1. ->      `lmd fred`                    (issued by user George)  
          QUOTA            PATHNAME  
          100            >udd>m>George>sub  
          250            >udd>m>George>sub1>sub2  
          350 records of quota assigned, 500 available.
  
2. ->      `lmd fred -bf`            (issued by user George)  
          >udd>m>George>sub  
          >udd>m>George>sub1>sub2  
          Quota=500, used=350.
  
3. ->      `lmd fred -quota -bf` (issued by user George)  
          Quota=500, used=350.
  
4. ->      `lmd fred -all`            (issued by a volume executive)  
          OWNER            QUOTA            PATHNAME  
          George.Multics    100            >udd>m>George>sub  
          George.Multics    250            >udd>m>George>sub1>sub2  
          Ralph.Multics    900            >udd>m>Ralph>work  
  
          ACCOUNT            USED            VOLUME QUOTA  
          Ralph.Multics    900            1000  
          \*.Multics        350            500  
  
          Total volume quota: 1500  
          Total quota used: 1250

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1827
TITLE: Install master directory control commands		STATUS DATE
AUTHOR: Larry Johnson	THVV	Written 04/22/76
		Status A CE/06/76
		Expires 10/22/76
Planned for System: MR 4.0		CATEGORY (check one)
Fixes Bug Number(s): not applicable		( ) Lib. Maint. Tools
Documented in MTB: 261		( ) Sys. Anal. Tools
Incompatible Change: yes		( ) Sys. Prog. Tools
User/Operations-visible Interface Change: yes		( ) 355
Coded in: (X) PL/I ( ) ALM ( ) other-see below		( ) BOS
Performance: ( ) better (X) same ( ) worse		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		( ) Ring Zero
MPM (vol,sect) SWG, cmd MPAM (sect)		( ) Ring One
MOSN (sect) MSAM (sect)		( ) SysDaemon/Admin
PLMs (AN#)		( ) runtime
Info Segs		(X) User Command/Subr
Other		
OBJECTIONS/COMMENTS:		
SWG; register_mdir, set_mdir_account, set_mdir_owner, set_mdir_quota, set_volume_quota		
COM; create_dir		

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

Summary

Install the commands necessary to support master directory operations.

Reasons

MR4.0 requires this facility.

Detailed proposal

Install the following new commands and active function.

- set\_volume\_quota
- set\_mdir\_quota
- set\_mdir\_owner
- set\_mdir\_account
- register\_mdir

Install the following modified command and subroutine.

- create\_dir
- delete\_

Documentation

The change to delete\_ consists of allowing it to delete master directories, and, when doing a delete\_dir operation, to not delete the contents of any directory whose sons logical volume is not mounted to the process.

---

create\_dir

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---

create\_dir

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Name: create\_dir, cd

The create\_dir command causes a specified storage system directory branch to be created in a specified directory (or in the working directory). That is, it creates a storage system entry for an empty subdirectory. See the description of the create command for information on the creation of segments.

Usage

create\_dir paths -control\_args-

where:

1. paths specify the names of the subdirectories to be created.
2. control\_args may be chosen from the following:
  - access\_class XX, applies to each path<sub>i</sub> and causes each directory created to be upgraded to the specified access class. The access class may be specified with either long or short names.
  - acc XX
  - logical\_volume V, specifies that each directory created is to be a master directory whose segments are to reside on logical volume V.
  - lv V
  - quota n specifies the quota to be given to the directory when it is created. This arguments must be specified if either -access\_class or -logical\_volume is specified. If omitted, the directory will be given 0 quota. The value of n must be a positive integer and applies to each path<sub>i</sub>.

---

create\_dir

---

---

create\_dir

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### Notes

The user must have append permission on the containing directory of each directory created.

If the creation of a new subdirectory would introduce a duplication of names within the directory, and if the old subdirectory has only one name, the operation is not performed. If the old subdirectory has multiple names, the conflicting name is removed and a message to that effect issued to the user.

The user is given sma access on the created subdirectory.

All superior directories specified in `pathi` must already exist. That is, only a single level of storage system directory hierarchy can be created in a single invocation of the `create_dir` command.

In order to create a master directory, the user must have a quota account on the logical volume with sufficient volume quota to create the directory. A master directory must always have a non-zero quota; therefore the `-quota` argument must always be given. A master directory can be created even though the logical volume is not mounted.

Each upgraded directory must have a quota greater than zero and must have an access class that is greater than its containing directory. The specified access class must also be less than or equal to the maximum access authorization of the process. (See Section III in the NPM Subsystem writers' Guide for further details.)

When the `-access_class` control argument is specified, the command does not create a new directory through a link. Creating through links is allowed only when the access class of the containing directory is taken as the default.

---

create\_dir

---

---

create\_dir

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### Examples

```
create_dir sub >my_dir>alpha>new
```

creates the subdirectory sub immediately inferior to the current working directory and the subdirectory new immediately inferior to the directory >my\_dir>alpha. As noted above, the directories my\_dir and alpha must already exist. Both directories are assigned the access class of their containing directory.

```
create_dir subA -access_class a,c1,c2 -quota 5
```

creates the subdirectory subA with an access class of a,c1,c2 and a quota of 5 pages. The directory subA would be created immediately inferior to the working directory. (The access class names a, c1, and c2 used in the example represent possible names defined for the site. See the print\_auth\_names command for more details on access class names.)

```
create_dir subB -logical_volume work -quota 100
```

creates a master directory subB in the working directory. Segments created in this new directory will reside on the logical volume work. The directory subB is given a quota of 100 records.

---

register\_mdir

---

---

register\_mdir

---

Name: register\_mdir

The register\_mdir command is used to register an existing master directory in the ring 1 master directory control segment (MDCS) for its volume. This may be necessary if the MDCS has become damaged or lost.

Usage

register\_mdir -path- -control\_args-

where:

1. path is the name of the master directory to register, or if -all is used, the starting node of the hierarchy tree to be scanned for master directories. This argument can only be omitted if -all is specified, in which case it defaults to the root.
2. control\_args may be selected from the following list:
  - all specifies that the path given is the starting node to scan for master directories to register. All directories including the starting node will be checked and registered if they are master directories.
  - brief, -bf specifies that the names of master directories registered by this command are not to be printed. (Applies only when -all is used.)

Notes

This command is only required as part of an error recovery procedure in repairing a master directory control segment. Normally, all master directories are registered in the MDCS when they are created.

Access to the gate mdc\_priv\_ is required to use this command.

All master directories registered by this command will be charged to the quota account Initializer.SysDaemon, which is automatically created if it does not exist.

---

set\_mdir\_account

---

---

set\_mdir\_account

---

Name: set\_mdir\_account, smda

The set\_mdir\_account command is used by a volume executive to set the quota account of a master directory.

Usage

set\_mdir\_account path -account-

where:

1. path is the path name of the master directory to be changed.
2. account is the name of the new quota account of the master directory, specified as Personid.Project. If omitted, the quota account of the person issuing the command will be used.

Notes

The user must have "e" access on the logical volume that the master directory is for. The volume need not be mounted.

The quota for the master directory is returned to the old quota account and is withdrawn from the new quota account. The new quota account must have sufficient quota to do this.

---

set\_mdir\_owner

---

---

set\_mdir\_owner

---

Name: set\_mdir\_owner, smdo

The set\_mdir\_owner command is used by a volume executive to set the owner of a master directory.

Usage

set\_mdir\_owner path -owner-

where:

1. path is the path name of the master directory to be changed.
2. owner is the name of the new owner of the master directory, specified as Personid.Project. If omitted, the name of the person issuing the command is used.

Notes

The user must have "e" access on the logical volume that the master directory is for. The volume need not be mounted.



---

set\_mdir\_quota

---

---

set\_mdir\_quota

---

Name: set\_mdir\_quota, smdq

The set\_mdir\_quota command is used to set the quota on a master directory.

Usage

set\_mdir\_quota path<sub>1</sub> change<sub>1</sub> ... path<sub>n</sub> change<sub>n</sub>

where:

1. path<sub>i</sub> is the pathname of a master directory whose quota is to be changed.
2. change<sub>i</sub> is the amount of quota or quota change and can be specified as follows:
  - +n add n records of quota to path<sub>i</sub>
  - n subtract n records of quota from path<sub>i</sub>
  - n set the quota on path<sub>i</sub> to n

Notes

The user must have modify access on the directory, and must meet one of the following conditions:

1. Be the owner of the master directory, or
2. Be a volume executive, or
3. Have the same quota account as the master directory

If the quota is being increased, the master directory's quota account must have sufficient volume quota to satisfy the request.

The quota of a master directory can never be zero, and it can never be set less than the current numbers of records being charged against the directory.

---

set\_volume\_quota

---

---

set\_volume\_quota

---

Name: set\_volume\_quota, svq

The set\_volume\_quota is used to set a quota account's volume quota on a logical volume. This command is to be used by volume executives.

Usage

set\_volume\_quota volume change -account-

where:

1. volume is the name of the logical volume for which quota is to be set.
2. change is the amount of quota, or the amount of quota change, and can be specified as follows:
  - +n n records will be added to the quota
  - n n records will be subtracted from the quota
  - n the quota will be set to n
3. account is the name of the user the quota is for. The quota account name may contain stars. If omitted, the name of the user issuing the command is assumed.

Notes

To use this command, the process must have "e" access to the logical volume. It is not necessary that the volume be mounted.

If the volume quota is set less than the quota account's current quota used, the quota is changed as directed, but a warning message is printed.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1828
TITLE: Install master directory control pathname restrictions		STATUS   DATE
AUTHOR: Larry Johnson	THVV	written   04/26/76
		Status   <del>ACS/06/76</del>
		Expires   10/26/76
Planned for System: MR 4.0		CATEGORY (check one)
Fixes Bug Number(s): not applicable		( ) Lib. Maint. Tools
Documented in MTB: not applicable		( ) Sys. Anal. Tools
Incompatible Change: no		( ) Sys. Prog. Tools
User/Operations-visible Interface Change: no		( ) 355
Coded in: (X)PL/I ( )ALM ( )other-see below		( ) BOS
Performance: ( )better (X)same ( )worse		( ) Salvager
		( ) Ring Zero
DOCUMENTATION CHANGES (specify one or more)		( ) Ring One
MPM (vol,sect)SWG; MPAM (sect)		( ) SysDaemon/Admin
MOSN (sect) set_mdir_path MSAM (sect)		( ) Runtime
PLMs (AN#)		(X) User Command/Subr
Info Segs		
Other SRB		
OBJECTIONS/COMMENTS:		

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

Summary

Implement a method by which a volume executive or volume owner can control which portions of the hierarchy can reside on a logical volume.

Reason

To provide better administrative control over logical volume quota.

Detailed Proposal

When a master directory is created, its parent is matched against a list of restricting pathnames set by the volume executive. The directory will only be created if it passes this test. For example, if master directories are restricted to >udd>m, >udd>m>lej>work>foo is a valid master directory, but >nbdd>m>lej>work>foo would not be.

Actually, there are 3 lists of restricting pathnames, which are used as follows:

1. Each quota account has an optional list, used as described above, which is set by the volume executive.
2. There is a default list for each volume. If present, it is used by those quota accounts which do not have their own restriction list. This list is controlled by the volume owner.
3. Finally, there is a volume restriction list, set by the volume owner. If present, it is used to restrict the quota account lists set by the

volume executive. This gives the volume owner the final say on where  
quota on his volume is allocated within the hierarchy.

This function is controlled by the volume executive and the volume owner by  
the `set_mdir_path` command described on the following page.

---

set\_mdir\_path

---

---

set\_mdir\_path

---

Name: set\_mdir\_path, smdp

The set\_mdir\_path command is used by volume executive or the volume owner to control pathname restrictions on master directories.

Usage

set\_mdir\_path volume -paths- -control\_args-

where:

1. volume is the name of the logical volume.
2. paths are pathnames to be added or deleted to the list being updated.
3. control\_args may be selected from the following list:
  - add the list of paths specified is to be added to the pathname list being updated.
  - delete, -dl specifies that the list of pathnames should be deleted from the list being updated.
  - replace specifies that the list of pathnames should replace entirely the list being updated. If no paths are specified, the list is set empty.
  - voldef specifies that the volume default path list is being updated.
  - volres specifies that the volume restriction path list is being updated.
  - acct name specifies that the restriction list for the quota account name (in the form Personid.Projectid) is to be updated.

Notes

Only one control argument may be selected from the group of -delete, -add, and -replace. If none are chosen, -replace is assumed.

Only one control argument may be selected from the group of -voldef, -volres, and -acct. If none are specified, -acct is

---

set\_mdir\_path

---

---

set\_mdir\_path

---

assumed in which case the users quota account is updated.

Executive access to the logical volume is required to set an account pathname restriction list. Access to the gate mdc\_priv\_ is required to set a volume default or volume restriction pathname list.

The logical volume need not be mounted to use this command.

TITLE: Implement status active function		STATUS	DATE
AUTHOR: Steve Herbst		Written	4/30/76
<input checked="" type="checkbox"/> Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> AIM <input type="checkbox"/> other - explain in DETAILED PROPOSAL <input type="checkbox"/> Planned for System MR <del>5.0</del> <input type="checkbox"/> Fixes Bug Number(s) _____ <input type="checkbox"/> Documented in MTB _____ <input type="checkbox"/> User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no Incompatible change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse <input type="checkbox"/> Replaces MCR _____	Category (Check One)	Status	4/13 A 05/11/76
	<input type="checkbox"/> Lib. Maint. Tools	Expires	11/11/76
	<input type="checkbox"/> Sys. Anal. Tools	DOCUMENTATION CHANGES	
	<input type="checkbox"/> Sys. Prog. Tools	Document	Specify One or More
	<input type="checkbox"/> 355	MPM (Vol, Sect.)	AG92
<input type="checkbox"/> BOS	PLMS (AN #)		
<input type="checkbox"/> Salvager	MOSN (Sect.)		
<input type="checkbox"/> Ring Zero	MPAM (Sect.)		
<input type="checkbox"/> Ring One	MSAM (Sect.)		
<input type="checkbox"/> SysDaemon/Admin.	Info Segs		
<input type="checkbox"/> Runtime	Other (Name)		
<input checked="" type="checkbox"/> User Cmmnd/Subr.	None (Reason)		
Objections/Comments:			
<i>Status active function documentation should be extended to include characterizing formats of return arguments.</i>			

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

**SUMMARY:** Implement new control arguments to the status command and make it work as an active function. Modify the information printed by the following control args:

- mode prints only the effective mode as proposed; currently prints effective mode, ring brackets and safety switch.
- author prints only the author as proposed; currently prints both the author and the bit count author.

These two are the only incompatible changes.

**REASONS:** New control arguments are essential for status to work as an active function.

**IMPLICATION:** Status active function will not accept control arguments requesting more than one piece of information. See the attached documentation.

-----  
status  
-----

-----  
status  
-----

Name: status, st

The status command prints selected detailed status information about the storage system entry specified. For a description of the attributes listed, see "Entry Attributes" in Section II of the MPM Reference Guide.

### Usage

status paths -control\_args-

where:

1. paths are the pathnames of the segments, directories, multisegment files, or links for which status information is desired. The default pathname is the working directory, which can also be specified by -wd. The star convention can be used.
2. control\_args are chosen from the following list of control arguments. The control arguments can appear anywhere on the line after the command name and are in effect for the whole line.

The control\_args for any type of entry are:

- type, -tp prints the type of entry: segment, directory, multisegment file, or link.
- author, -at prints the author of the entry.
- date, -dt prints all the relevant dates on the entry.
- date\_time\_entry\_modified, -dtem
- date\_time\_dumped, -dtd
- date\_time\_used, -dtu
- name, -nm prints all the names on the entry.
- primary, -pri prints the primary name on the entry.

The control\_args for segments, multisegment files, and directories are:

- all, -a prints all relevant information returned by hcs\_\$status\_long (see the hcs\_\$status\_ subroutine described in the MPM Subroutines); i.e., the type of entry, names, unique identifier, date used, date modified, date branch modified, date dumped, author,



bit count, records used, current blocks (for segments, if different from records used), maximum length in words (if type is segment), safety switch (if it is on), user's mode, ring brackets, access class (if it is not null), and copy switch (if it is on).

**-date, -dt** prints all the dates on the entry: i.e., date used, date modified, date branch modified, date dumped.

DRAFT: MAY BE CHANGED 7/76

3-323

05/07/76

AG92C

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status  
-----

-----  
status  
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**-access, -ac** prints the user's effective mode, ring brackets, access class (if different from the default), and safety switch (if it is on).

**-length, -ln** for segments: prints the bit count, the number of records used, the current blocks (if different from records used), and the maximum length in words;

for multisegment files: prints the number of records used by the whole file, the sum of the bit counts of all components, and the number of components;

for directories: prints the number of records used and the bit count.

**-unique\_id, -uid** prints the entry's unique identifier.

**-date\_time\_contents\_modified, -dtdm**

**-bc\_author, -oca** prints the bit count author of the entry.

**-copy\_switch, -csw**

**-safety\_switch, -ssw**

**-mode, -md** prints the user's effective mode.

**-access\_class, -acc**

**-ring\_brackets, -ro**

**-bit\_count, -bc**

**-max\_length, -ml**

**-current\_length, -cl**

-records\_used, -ru

-device, -dv prints the logical volume on which the entry resides.

-logical\_volume, -lv is the same as -device.

The control\_args for links are:

-all, -a prints all relevant information returned by hcs\_\$status\_long, i.e., the pathname of the entry being linked to, names, unique identifier, date link modified, date dumped, and the author of the link.

-link\_path, -lp prints the target pathname.

### Notes

If no control argument is specified, the following information is printed for segments, multisegment files, and directories: names, type, date used, date modified, date branch modified, bit count, records used, user's mode, access class.

DRAFT: MAY BE CHANGED 9/75

3-324

05/07/76

AG92A

-----  
status  
-----

-----  
status  
-----

If no control argument is specified, the following information is printed for links: the pathname of the entry linked to, names, date link modified, date dumped. The -mode, -device, and -length control arguments are ignored for links.

Zero-valued dates (i.e., dates which have never been set) are not printed.

Directories that have been used to implement multisegment files are labeled as such.

### Examples

Name: status, st

This active function returns selected information about an entry.

Usage: status path control\_arg

or: status control\_arg path

where:

1. path is the pathname of a storage system entry.

2. control\_arg can be:

- name, -nm returns all the names on the entry, separated by spaces.
- mode, -md returns the user's effective mode of access to the entry.
- device, -dv returns the entry's logical volume identifier.
- logical\_volume, -lv is the same as -device.
- author, -at returns the author of the entry.
- type, -tp returns the entry's type: segment, directory, multisegment file, or link.
- unique\_id, -uid
- date\_time\_entry\_modified, -dtem
- date\_time\_contents\_modified, -dtcm (for files only)
- date\_time\_used, -dtu
- date\_time\_dumped, -dtd
- primary, -pri returns the primary name on the entry.
- bc\_author, -bca returns the bit count author of the entry.
- copy\_switch, -csw
- safety\_switch, -ssw
- access\_class, -acc

-ring\_brackets, -rb

-bit\_count, -bc

-max\_length, -ml

-current\_length, -cl

-records\_used, -ru

-link\_path, -lp (for links only)  
returns the target pathname of the link.

TITLE: Install tape_nstd_		STATUS	DATE
AUTHOR: R. Bratt		Written	04/08/76
SHW		Status	D 4/13/ A 05/11/76
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL		Expires	11/11/76
-Planned for System MR		DOCUMENTATION CHANGES	
-Fixes Bug Number(s)		Category (Check One)	Document Specify One or More
-Documented in MTB		Lib. Maint. Tools	
-User/Operations-visible		Sys. Anal. Tools	
Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		Sys. Prog. Tools	
-Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		355	
-Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same		BOS	
<input type="checkbox"/> Worse		Salvager	MPM (Vol, Sect.)
-Replaces MCR		Ring Zero	PLMS (AN #)
		Ring One	MOSN (Sect.)
		SysDaemon/Admin.	MPAM (Sect.)
		Runtime	MSAM (Sect.)
		<input checked="" type="checkbox"/> User Cmmd/Subr.	
Objections/Comments:			Info Segs
			Other (Name)
			None (Reason)

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

#### SUMMARY:

Currently there is no viable iox substitute for the ios nstd\_ dim. In particular, ntape\_ is not equavalend to nstd\_. Due to the design of iox, ntape\_ will not read past a tape mark. Not only does this prevent ntape\_ from reading infinitely many foreign tapes, but ntape\_ will not even read a Multics standard tape!

I have extensively modified ntape\_ to create a simple iox writearound for much of nstd\_. This writearound, by ignoring certain iox assumptions, allows tapes of arbitrary format to be read and written through iox. This module is not intended to be the end all of tape dims. However, since it is superior to ntape\_, I offer it for installation to fill a much needed gap until a more substantial and well designed alternative is available.

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tape\_nstd\_  
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-----  
tape\_nstd\_  
-----

Name: tape\_nstd\_

This I/O module supports I/O to/from tapes in non-standard or unknown formats. This module makes no assumptions about the format of the tape and returns one logical record for each physical record on the tape. Since the information upon the tape, including tape marks, is not interpreted by this I/O module, the user must detect the logical end of information on the reel.

Entry points in the module are not called directly by users; rather, the module is accessed through `iox_`. See "Multics Input/Output System" for a general description of the I/O system, and see "File Input/Output" for a discussion of files, both in Section IV of the MPM Reference Guide.

#### Attach Description

The attach description has the following form:

tape\_nstd\_ reel\_num -optional\_args-

where:

1. reel\_num is the tape reel number.
2. optional\_args may be the following arguments:

-track *n*, -tk *n* means that the tape is *n* track. Acceptable value for *n* are "7" and "9". If no track argument is supplied then 9 track is assumed.

-write means that the tape is to be mounted with a write ring. This argument must occur if the I/O switch is to be opened for output or

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tape\_nstd\_  
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tape\_nstd\_  
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input/output.

### Opening

The opening modes supported are sequential\_input, sequential\_output, and sequential\_input\_output. If an I/O switch attached via the tape\_nstd\_ I/O module is to be opened for output or input\_output, the -write argument must occur in the attach description.

### Control Operation

The following control operations are implemented by this I/O switch:

backspace\_file      the backspace\_file control order causes the tape to be positioned before the file mark next encountered while rewinding the tape (if no file mark is encountered then the tape is left at load point).

backspace\_record    the backspace\_record control order causes the tape to be positioned before the previous record on the tape (or file mark if the current record is preceded by a file mark).

binary              set hardware mode to binary (this is the default).

bcd                  set hardware mode to binary coded decimal (BCD).

d200                set density to 200 bpi.

d556                set density to 556 bpi.

d800                set density to 800 bpi.

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tape\_nstd\_  
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tape\_nstd\_  
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d1600 set density to 1600 bpl.

erase erase tape.

forward\_file the forward file order causes the tape to be positioned past the next file mark encountered on the tape.

forward\_record the forward\_record order causes the tape to be positioned after the next record (or file mark if one succeeds the current record) encountered on the tape.

io\_call supports the io\_call command protocol for orders which expect non-null info pointers. This order is prepared to interpret and print the status returned by the saved\_status and request\_status orders.

nine set hardware mode to eight/nine bit conversion.

protect set write inhibit regardless of the presence of a write permit ring in the tape reel. The tape unit will remain write inhibited until the tape is detached.

request\_status interrogates the tape controller and returns its status as a bit (12) aligned quantity.

rewind rewind the tape to load point.

saved\_status returns the last status returned from the tape controller as a bit (12) aligned quantity.

unload rewind tape and unload (done automatically when the tape is detached).

write\_eof writes an end of tape mark (EOF).



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tape\_nstd\_  
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tape\_nstd\_  
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### Modes Operation

This I/O module does not support the modes operation.

### Position Operation

This I/O module does not support the position operation.

### Read Length Operation

This I/O module does not support the read length operation.

### Note

1. On input, the logical record contains  $m = \text{ceil}(n/36)$  words, where  $n$  is the number of data bits in the physical record. The first  $n$  bits of the input record are the data bits, the last  $m-n$  bits are 0's.
2. On output, the physical record must contain 0 modulo 36 data bits.
3. The buffer supplied to the read and write entries of the I/O module must be full word aligned.
4. This I/O module violates those `iox_` conventions which seem ill suited to processing raw tapes. In particular, read record and skip record operations may pass file marks. For example, if a tape contains two records, A and B, separated by an file mark, then the first read request would read record A, a second read request would return `error_table_$end_of_info`, and a third read request would return record B.
5. This I/O module does not attempt any error recovery of its own. Instead it relies upon the error recovery provided by the `ios_olm_nstd_` which this module calls to perform its work. The module `nstd_` retries read requests ten time before reporting an error.

TITLE: IO Daemon Driver Bug Fixes		STATUS	DATE
AUTHOR: J. C. Whitmore		Written	4-28-76
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 4.0 -Fixes Bug Number(s) MPRF -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	DOCUMENTATION CHANGES	
	<input type="checkbox"/> Sys. Anal. Tools	Document	Specify One or More
	<input type="checkbox"/> Sys. Prog. Tools	MPM (Vol, Sect.)	
	<input type="checkbox"/> 355	PLMS (AN #)	
<input type="checkbox"/> BOS	MOSN (Sect.)		
<input type="checkbox"/> Salvager	MPAM (Sect.)		
<input type="checkbox"/> Ring Zero	MSAM (Sect.)		
<input type="checkbox"/> Ring One	Info Segs		
<input checked="" type="checkbox"/> SysDaemon/Admin.	Other (Name)		
<input type="checkbox"/> Runtime	None (Reason) no changes		
<input type="checkbox"/> User Cmmd/Subr.			

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

Summary:

1. Change the declarations of mode strings from char (128) to char (256). (printer\_driver\_, G115\_driver\_, iodd\_command\_processor\_)
2. Initialize the mode string in the output\_request\_data structure to null at the start of each copy requested. (printer\_driver\_, G115\_driver\_)

Reasons:

1. Recent MCS changes, adding to the mode string length, have caused mode truncation and undertermined results after an error during request processing. This change will correct this and allow for future expansion. **MPRF 9467**
2. For certain combinations of output modes, the users requested mode, printed on the tail sheet, will get concatenated with itself on each subsequent copy.

Example: copy 1 "noskip, single"  
 copy 2 "noskip, single, noskip, single"  
 copy 3 "noskip, single, noskip, single, noskip, single"

This is rare but ugly!

TITLE: Fix PL/I bug dealing with offsets.		STATUS	DATE
AUTHOR: R. A. Barnes		Written	5/3/76
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 4.0 -Fixes Bug Number(s) 1493 -Documented in MPB _____ -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)		DOCUMENTATION CHANGES Document Specify One or More MPM (Vol, Sect.) PLMS (AN #) MOSN (Sect.) MPAM (Sect.) MSAM (Sect.) Info Segs Other (Name) None (Reason)
		Lib. Maint. Tools	
		Sys. Anal. Tools	
		Sys. Prog. Tools	
		355	
		BOS	
		Salvager	
		Ring Zero	
		Ring One	
		SysDaemon/Admin.	
	Runtime		
	X User Cmmd/Subr.		
Objections/Comments:			

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

SUMMARY:

Fix bug 1493 in which the sequence if offset=null...fails. This code was broken in making improvements to the pointer builtins for MR4.0.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>1831</u>
TITLE: Resolve conflicting uses of lot.incl.pll.		STATUS : DATE
AUTHOR: Richard Bratt		Written: 04/28/76
Planned for System: not applicable		Status: <u>10/11/76</u>
Fixes Bug Number(s): not applicable		Expires: 10/28/76
Documented in MTB: not applicable		CATEGORY (check one)
Incompatible Change: no		( ) Lib. Maint. Tools
User/Operations-visible Interface Change: no		( ) Sys. Anal. Tools
Coded in: (X) PL/I ( ) ALM ( ) other-see below		( ) Sys. Prog. Tools
Performance: ( ) better (X) same ( ) worse		( ) 355
DOCUMENTATION CHANGES (specify one or more)		( ) BOS
MPM (vol,sect)	MPAM (sect)	( ) Salvager
MDSN (sect)	MSAM (sect)	(X) Ring Zero
PLMs (AN#)		( ) Ring One
Info Segs		( ) SysDaemon/Admin
Other		( ) Runtime
None (reason) <u>Fix installation error.</u>		( ) User Command/Subr
OBJECTIONS/COMMENTS:		

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

Summary: Two sets of programs in the system think lot.incl.pll contain different declarations. As a result, some programs can not be recompiled. declaration will be chosen and thoses programs using the other declaration will be converted.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1832
TITLE: Fix bugs in page_trace		STATUS   DATE
AUTHOR: Paul Green		Written   04/28/76
JWG		Status   ACB/11/76
Planned for System: MR4.0		Expires   10/28/76
Fixes Bug Number(s): not applicable	Documented in MTB: not applicable	CATEGORY (check one)
Incompatible Change: no	User/Operations-visible Interface Change: no	( ) Lib. Maint. Tools
Coded in: (X) PL/I ( ) ALM ( ) other-see below	Performance: ( ) better (X) same ( ) worse	( ) Sys. Anal. Tools
DOCUMENTATION CHANGES (specify one or more)		( ) Sys. Prog. Tools
MPM (vol,sect) MPAM (sect)	MOSN (sect) MSAM (sect)	( ) 355
PLMs (AN#)	Info Segs	( ) BOS
Other	None (reason) No change	( ) Salvager
OBJECTIONS/COMMENTS:		( ) Ring Zero
		( ) Ring One
		( ) SysDaemon/Admin
		( ) Runtime
		(X) User Command/Subr

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

SUMMARY:

Fix page\_trace to handle linkage fault's properly. Display number of faulting ring for page faults.

REASONS:

A recent change to the linker changed the format of the linkage fault trace entries. page\_trace must be changed to interpret the new format. The number of the faulting ring is kept in the trace array; it should be printed, as it is useful in determining which page faults are caused by the system, and which by user programs.

IMPLICATIONS:

None.

DETAILED PROPOSAL:

Replace page\_trace.pl1.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1833
TITLE: Add several control arguments to page_trace		STATUS   DATE
AUTHOR: Paul Green	JWG	Written   04/29/76
		Status   ACS/11/76
		Expires   10/29/76
Planned for System: MR4.0		CATEGORY (check one)
Fixes Bug Number(s): not applicable		( ) Lib. Maint. Tools
Documented in MTB: not applicable		( ) Sys. Anal. Tools
Incompatible Change: no		( ) Sys. Prog. Tools
User/Operations-visible Interface Changes: no		( ) 355
Coded in: <input checked="" type="checkbox"/> PL/I ( ) ALM ( ) other-see below		( ) BOS
Performance: ( ) better <input checked="" type="checkbox"/> same ( ) worse		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		( ) Ring Zero
MPM (vol,sect) MPM Comm MPAM (sect)		( ) Ring One
MOSN (sect) MSAM (sect)		( ) Sys. Admin/Operator/Admin
PLMs (AN#)		( ) Runtime
Info Segs page_trace.info		<input checked="" type="checkbox"/> User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

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

**SUMMARY:**

Add the following control arguments to page\_trace to make it more useful.

- output\_switch swname, -os swname
- from str, -fm str
- to str

**REASONS:**

Unlike most other commands, the output of page\_trace cannot be directed to a segment with file\_output without causing side effects (namely, filling the trace array with information about file\_output, which destroys the trace information one wished to see in the first place). The -output\_switch control argument enables one to direct the lengthy (about 200 lines) page\_trace output into a segment for convenient handling.

When the event one wishes to examine is brief enough that it does not fill the trace array completely, it is useful to insert a user-marker in the trace array before and after the event. The -from and -to control arguments enable one to specify that page\_trace should print the entries between these markers.

**IMPLICATIONS:**

None.

**DETAILED PROPOSAL:**

See attached documentation.

>udd>mpls>pg>bug\_fixes>page\_trace\_changes.i

04/29/76 page\_trace\_changes.info

The page\_trace command has been changed to properly interpret linkage fault entries. page\_trace will now print the name of the faulting procedure, and the procedure linked to. A new field has been added; the ring number of the procedure that took the page fault.

New control arguments:

-output\_switch swname, -os swname

swname must already be attached and open for stream\_output.

page\_trace will write all output on this switch.

-from str, -fm str

page\_trace will search the trace array for a user-marker matching str.

If one is found, printing will begin with it. Otherwise printing will begin with the first element in the array.

-to str

page\_trace will stop printing when it finds a user-marker matching str. If the -from control argument is also given, the "from" marker is searched for first. If no marker is found, printing will continue through the end of the array.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1834
TITLE: Crash system if partitions are not available.		STATUS
AUTHOR: VanVleck		DATE
Planned for System: MR 4.0		Written
Fixes Bug Number(s): not applicable		Status
Documented in MTB: not applicable		Expires
Incompatible Change: no		04/29/76
User/Operations-visible Interface Change: no		10/29/76
Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-see below		CATEGORY (check one)
Performance: <input type="checkbox"/> better <input checked="" type="checkbox"/> same <input type="checkbox"/> worse		<input type="checkbox"/> Lib. Maint. Tools
DOCUMENTATION CHANGES (specify one or more)		<input type="checkbox"/> Sys. Anal. Tools
MPM (vol,sect)	MPAM (sect)	<input type="checkbox"/> Sys. Prog. Tools
MOSN (sect)	MSAM (sect)	<input type="checkbox"/> 355
PLMs (AN#)      an61		<input type="checkbox"/> BCS
Info Segs		<input type="checkbox"/> Salvager
Other		<input checked="" type="checkbox"/> Ring Zero
		<input type="checkbox"/> Ring One
		<input type="checkbox"/> SysDaemon/Admin
		<input type="checkbox"/> Runtime
		<input type="checkbox"/> User Command/Subr
OBJECTIONS/COMMENTS:		

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

SUMMARY: During bootload, cause the system to crash if any PART card indicates a disk pack whose label cannot be read or interpreted.

REASONS: Currently the system proceeds in this case. But continuing to operate without the LOG or DUMP partitions inadvertently can lead to serious later operational anomalies.

If an installation wishes to operate without a particular partition, it should not have a PART card for it in the configuration deck.

Currently, if a volume containing partitions is not ready at collection 1 time, the operator can attempt to add it later from ring 1 or even ring 4. But although no warning is given, and the volume appears to be accepted correctly, the partitions on the volume will not be used.

IMPLICATIONS: Less peculiar behavior by the system.



Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1835
TITLE: Eliminate loss of RPV records.		STATUS DATE Written 04/29/76 Status <u>ACB/1/76</u> Expires 10/29/76
AUTHOR: VanVleck		
Planned for System: MR 4.0		
Fixes Bug Number(s): not applicable		
Documented in MTB: not applicable		
Incompatible Change: no		
User/Operations-visible Interface Change: no		
Coded in: (X)PL/I ( )ALM ( )other-see below		
Performance: ( )better (X)same ( )worse		
DOCUMENTATION CHANGES (specify one or more)		CATEGORY (check one)
MFM (vol,sect)	MPAM (sect)	( ) Lib. Maint. Tools
MOSN (sect) a001	MSAM (sect)	( ) Sys. Anal. Tools
PLMs (AN#) an61, an51		( ) Sys. Prog. Tools
Info Segs		( ) 355
Other		( ) BOS
		( ) Salvager
		(X) Ring Zero
		( ) Ring One
		( ) SysDaemon/Admin
		( ) Runtime
		( ) User Command/Subr
OBJECTIONS/COMMENTS:		

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

SUMMARY: Add a new bit to the SLTB which indicates that a segment must be deleted at shutdown. Set this flag on in the header for the salvager abs-segs and system\_free\_seg.

Modify the MSI generator to accept the statement

```
delete_at_shutdown: yes;
```

and set the SLTB bit.

Cause a volume salvage of the RPV (but not necessarily a directory salvage) whenever emergency shutdown is done.

REASONS: The current system loses several hundred records of RPV space every time a salvage is done, because the salvager working segments are withdrawn from the RPV paging area instead of the hardcore partition. It seems wasteful to reserve the maximum extent of all these segments (several thousand records) in the MC partition, when most sites will never need this much and when the salvager is rarely invoked.

System\_free\_seg is another example of the same sort of segment.

Segments like this should be deleted explicitly at shutdown time; or if shutdown cannot be done normally the lost pages should be recovered via a salvage\_vol of the RPV.

IMPLICATIONS: The system will not be in danger of running out of RPV space

no matter how many times it is booted.

- The hardcore partition need not be grown.

After crashes in which ESD succeeds, an automatic salvage\_vol of the HPV will be done by the next bootload. This requires about 30 seconds.

Multics Change Request

TITLE: add -brief to set_tty		STATUS	DATE
AUTHOR: Mike Grady		Written	4/29/76
		Status	A 05/11/76
		Expires	11/11/76
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL		Category (Check One)	
-Planned for System MR 5.0		<input type="checkbox"/> Lib. Maint. Tools	
-Fixes Bug Number(s) _____		<input type="checkbox"/> Sys. Anal. Tools	
-Documented in MTB _____		<input type="checkbox"/> Sys. Prog. Tools	
-User/Operations-visible		355	
Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no		BOS	
-Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		Salvager	
-Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same		Ring Zero	
<input type="checkbox"/> Worse		Ring One	
-Replaces MCR _____		SysDaemon/Admin.	
		Runtime	
		X User Cmmnd/Subr.	
Objections/Comments:		DOCUMENTATION CHANGES	
		Document Specify One or More	
		MPM (Vol, Sect.) Commands	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
		Info Segs	
		Other (Name)	
		None (Reason)	

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

SUMMARY: Add -brief(-bf) control arg to set\_tty, if specified with -print, set tty will print only those modes which are on plus line length(11) and page length(1).

REASONS: The mode string is getting very long and most people are only interested in the modes they have on, and not the others.

TITLE: Verify changed passwords.		STATUS	DATE
AUTHOR: T. Casey		Written	5/3/76
		Status	ACE 11/76
		Expires	11/11/76
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> AIM <input type="checkbox"/> other- explain in DETAILED PROPOSAL		Category (Check One)	
-Planned for System MR 4.0		<input type="checkbox"/> Lib. Maint. Tools	
-Fixes Bug Number(s) none		<input type="checkbox"/> Sys. Anal. Tools	
-Documented in MTB		<input type="checkbox"/> Sys. Prog. Tools	
-User/Operations-visible		<input type="checkbox"/> 355	
Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no		<input type="checkbox"/> BOS	
-Incompatible change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no		<input type="checkbox"/> Salvager	
-Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same		<input type="checkbox"/> Ring Zero	
<input type="checkbox"/> Worse		<input type="checkbox"/> Ring One	
-Replaces MCR		<input checked="" type="checkbox"/> SysDaemon/Admin.	
		<input type="checkbox"/> Runtime	
		<input type="checkbox"/> User Cmnd/Subr.	
		DOCUMENTATION CHANGES	
Objections/Comments:		Document	Specify One or More
Remove undocumented feature with this installation		MPM (Vol, Sect.)	Commands
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
		Info Segc	
		Other (Name)	
		None (Reason)	

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

SUMMARY: Ask for new password twice when the change password login argument is given, and refuse the password change and the login if the new password is not typed the same both times.

REASONS: Typing errors and line noise occurring while a user is changing his password can leave the user with an unknown password.

DETAILED PROPOSAL:

Say:

- Password:
- New Password:
- New Password Again:

If new passwords are not the same, say:

New password typed incorrectly second time.  
Please try again or type help for instructions.

The existing but undocumented feature of verifying a new password by typing it twice on the same line will be preserved; when it is used, the request to type the new password again will be omitted. (The main disadvantage of this existing feature is that the mask used on terminals without the printer off feature is not long enough to cover both copies of a new password.)

3. control\_args

- brief, -bf
- home\_dir path, -hd path
- process\_overser path,  
-po path
- no\_print\_off, -npf
- print\_off, -pf
- no\_preempt, -np
- no\_start\_up, -ns
- force
- change\_password, -cpw
- subsystem path, -ss path

can be selected from the following:

suppress messages associated with a successful login. If the standard process overseer is being used, then the message of the day is not printed.

set the user's home directory to the path specified, if the user's project administrator allows him to specify his home directory.

set the user's process overseer to the procedure given by the path specified, if the user's project administrator allows him to specify his process overseer.

cause the system to overtype a string of characters to provide a black area for the user to type his password.

suppress overtyping for the password.

refuse to log the user in if he can only be logged in by preempting some other user in his load control group.

instruct the standard process overseer not to execute the user's start\_up.ec segment, if he has one, and if the project administrator allows him to avoid it.

log the user in if at all possible, provided the user has the guaranteed login attribute. Only system users who perform emergency repair functions have the necessary attribute.

change the user's password to a newly given password. The login request asks for the old password before it requests the new one. If the old password is correct, the new password replaces the old for subsequent logins, and the message "password changed" is printed at the user's terminal. The user should not type the new password as part of the control argument.

create the user's process using the prelinked subsystem in the directory specified by path.

*It requests the new one twice, to verify the spelling. If it is not typed the same both times, the login and the password change are refused.*

Multics Change Request

TITLE: Fix bug in dump_segment.	STATUS	DATE
AUTHOR: T. Casey	Written	5/3/76

-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 4.0 -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 type="checkbox"/> Better <input type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR	Category (Check One)	SHW	Status	A 05/11/76
	Lib. Maint. Tools		Expires	11/11/76
	Doc. CHANGES		DOCUMENTATION CHANGES	
	Sys. Anal. Tools		Document	Specify One or More
	Sys. Prog. Tools		MPM (Vol, Sect.)	Commands
	355		PLMS (AN #)	
	BOS		MOSN (Sect.)	
	Salvager		MPAM (Sect.)	
	Ring Zero		MSAM (Sect.)	
	Ring One			

Objections/Comments:

Info Segs
Other (Name)
None (Reason)

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

SUMMARY: Change the interaction of the -block and -offset arguments so that they work as originally designed:

-block N -offset

will cause the segment to be dumped in N-word blocks, with the offset being reset to its initial value at the beginning of each block, so that it shows the offset within the block.

Accept -bk as an abbreviation for -block, and -addr as an abbreviation for -address, to conform to the standard argument abbreviations.  
 Fix bug that makes -name N not work.  
 Fix bugs in the output produced by use of -short.  
 Re-code sections to speed them up.

REASONS: Somehow, the feature of resetting the offset got left out.  
 Other bugs need to be fixed.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1839
TITLE: Make oc_trans_output_ translate non-ASCII chars properly		STATUS   DATE Written   04/30/76
AUTHOR: Gary C. Dixon	NIM	Status   AOS/11/76 Expires   10/30/76
Planned for System: MR 4.0		CATEGORY (check one)
Fixes Bug Number(s): ERF 143, 144		( ) Lib. Maint. Tools
Documented In MTB: not applicable		( ) Sys. Anal. Tools
Incompatible Changes: no		( ) Sys. Prog. Tools
User/Operations-visible Interface Changes: no		( ) 355
Coded in: (X) PL/I ( ) ALM ( ) other-see below		( ) BOS
Performance: ( ) better (X) same ( ) worse		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		(X) Ring Zero
MPM (vol,sect)	MPAM (sect)	( ) Ring One
MOSN (sect)	MSAM (sect)	( ) SysDaemon/Admin
PLMs (AN#)		( ) Runtime
Info Segs		( ) User Command/Subr
Other		
None (reason) no change to program interface		
OBJECTIONS/COMMENTS:		

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

#### SUMMARY:

Change oc\_trans\_output\_ to overlay the characters being translated to output on the operator's console as bin(9) values, rather than as fixed bin(8).

#### REASONS:

Overlaying them as fixed bin(8) causes non-ASCII values greater than \377 to be treated as negative numbers, resulting in use of a negative index into the translation table. Since the translation table is in the linkage section, this causes a reference before oc\_trans\_output\_'s linkage section, in fact before the beginning of wired\_sup\_linkage. The addressing hardware treats such negative addresses as large positive addresses. Thus, use of the negative table index attempts to reference beyond the end of wired\_sup\_linkage producing an oob fault in ring 0.

When oc\_trans\_output\_ is invoked by syserr\_real to translate a message being output on the Operator's console, it has previously masked interrupts to sys\_level, locked the wired syserr log and stored the message there, and generated a syserr logging interrupt which remains pending. When it then attempts to translate a message containing non-ascii characters greater than \377, the oob fault occurs. The FIM (fault interceptor module) then unmask interrupts before signalling the oob condition in ring 0. The syserr logging interrupt occurs, attempts to lock the wired syserr log, gets a mylock error, and crashes the system.

The change has already been installed in MIT System 28-4e as an emergency fix.

#### IMPLICATIONS:

Improper translation of non-ASCII characters is corrected.  
The source of such system crashes is avoided.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1840
TITLE: NSS Bug Fixes, Round 4		STATUS
AUTHOR: Bernard Greenberg		DATE
		Written 05/05/76
		Status ACS/11/76
		Expires 11/05/76
Planned for System: MR 4.0		CATEGORY (check one)
Fixes Bug Number(s): not applicable		( ) Lib. Maint. Tools
Documented in MTB: not applicable		( ) Sys. Anal. Tools
Incompatible Change: no		( ) Sys. Prog. Tools
User/Operations-visible Interface Change: no		( ) 355
Coded in: (X)PL/I ( )ALM ( )other-see below		(X) BOS
Performance: ( )better (X)same ( )worse		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		(X) Ring Zero
MPM (vol,sect)	MPAM (sect)	( ) Ring One
MOSN (sect)	MSAM (sect)	( ) SysDaemon/Admin
PLMs (AN#) 61		( ) Runtime
Info Segs		( ) User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY: Fix several bugs and misfeatures in 28-4 level NSS.

REASONS: Improved consistency, reliability.

IMPLICATIONS: n/a.

DETAILED PROPOSAL:

1. Disk MPC's broadcast special interrupt status to all Link Adapters connected to them. In configurations where a single MPC is being used to address several subsystems, disk\_control becomes confused by status delivered over inappropriate LA's, and crashes. Change disk\_control to ignore such status, as it will come over an appropriate LA as well.

2. Sites that number disk drives on a subsystem from other origins than 1 waste space in the PVT. There is no facility for describing drives that do not exist. Make model #0 on the PRPH DSKn config card describe such a drive.

3. It is possible to destroy the pdmap\_seg SDW in one's process by causing a fraudulent out\_of\_physical\_volume condition by rzd'ing an invalid address in pdmap\_seg. Change init\_pvt to set SDW bounds field correctly.

4. The Online Salvager incorrectly reports that all dates are invalid, and resets them. Change the Online Salvager to correctly initialize salv\_data\$salv\_time.

5. System shutdown state is not updated to the root label, as



originally designed. Update this quantity to root label, as well as system ESD state, a new variable allowing differentiation between ESD and shutdown complete.

6. Change bootload-time RPV salvage to always RPV Volume salvage if the previous shutdown was a successful ESD. It is necessary in this case to claim old descriptor segment pages.

7. Change free\_store to schedule a volume salvage for any volume on which a reused address is detected before crashing.

8. The program system\_startup\_ tries to flush the paging device upon invocation of certain subset of commands, but cannot if all volumes from the previous bootload have not been accepted. Change it to try to accept these volumes.

9. The system forgets pre-assumed and known volumes across three bootloads if they became that way during the second, and were not accepted. Cause system not to forget these volumes.

10. A change in storage system/IO drive status causes abandonment of the disk table. Modify ring-1 volume administration software so that any drive so changed loses all known or pre-assumed status.

11. Change vtoc\_man to schedule a volume salvage any time he decides to crash the system. The problem can always be isolated to a particular volume.

Ver. 3  
741022

MULTICS CHANGE REQUEST

MCR 1841

TITLE: Install dump\_vtoce command

AUTHOR: Bernard Greenberg

TVV

STATUS	DATE
Written	05/05/76
Status	<b>A 05/11/76</b>
Expires	11/05/76

Planned for System: MR 4.0  
Fixes Bug Number(s): not applicable  
Documented in MTB: not applicable  
Incompatible Change: no  
User/Operations-visible Interface Change: no  
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)                      MPAM (sect)  
MOSN (sect)                              MSAM (sect)  
PLMs (AN#)                              72  
Info Segs  
Other

OBJECTIONS/COMMENTS:

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

SUMMARY: Install a privileged-access command to inspect the contents of VTOC entries, and produce a formatted display.

REASONS: It has been found necessary to inspect VTOC entries in analyzing storage system problems, and a privileged gate entry to inspect them was installed in system 28-5.

IMPLICATIONS: The existence of the gate implies many things: the existence of this command implies greater ease in finding problem

DETAILED PROPOSAL: See attached writeup.

Name: dump\_vtoce

Usage: dump\_vtoce pvtx vtocx -control-args-

where

pvtx is the Physical Volume Table index of the drive containing the disk pack whose VTOC is being inspected

vtocx is the index in the VTOC of the VTOC entry to be inspected, on that disk.

The acceptable control arguments are:

-brief, -bf causes only a formatted summary of crucial information to be printed.

-long, -lg causes a formatted summary as well as an octal dump of the entire VTOC entry.

If no control arguments are supplied, only an octal dump of the entire VTOC entry is produced.

Ver. 3  
741022

MULTICS CHANGE REQUEST

MCR 1842

TITLE: Fix bug in add\_memory

AUTHOR: Bernard Greenberg

TUV

STATUS	DATE
Written	05/05/76
Status	ACS/11/76
Expires	11/05/76

Planned for System: MR 4.0  
Fixes Bug Number(s): not applicable  
Documented in MTB: not applicable  
Incompatible Change: no  
User/Operations-visible Interface Change: no  
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)                      MPAM (sect)  
MOSN (sect)                              MSAM (sect)  
PLMs (AN#)                      71  
Info Segs  
Other

OBJECTIONS/COMMENTS:

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

SUMMARY: Recent Conversion of a number of hardcore modules to the EIS PL/I compiler caused reinterpretation of aligned arrays of unaligned elements. Such a declaration of a mask in add\_memory, which had been overlooked, currently causes memory reconfiguration to fail.

REASONS: Make reconfiguration work in 4.0 again.

DETAILED PROPOSAL: Fix the declaration to new standard.

TITLE: REALTIME SCHEDULING		STATUS	DATE
AUTHOR: RE Mullen		Written	5/2/76
-Coded in: <input checked="" type="checkbox"/> PL/I <input checked="" type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL		Status	A 05/11/76
-Planned for System MR 4.0		Expires	11/11/76
-Fixes Bug Number(s)		DOCUMENTATION CHANGES	
-Documented in MTB		Document	Specify One or More
-User/Operations-visible		MPM (Vol, Sect.)	
Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		PLMS (AN #) 73	
-Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		MOSN (Sect.)	
-Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same		MPAM (Sect.)	
<input type="checkbox"/> Worse		MSAM (Sect.)	
-Replaces MCR		Info Segs	
		Other (Name)	
		None (Reason)	

Objections/Comments:  
Another MCR will describe administrative interface.

Use these headings: Summary of Proposal, Reasons for Proposal, Implications, Detailed Proposal.

Summary: Add realtime/deadline capability to scheduler. Place Initializer in a realtime workclass. Allow special creation of other realtime work-classes.

Reasons: This will solve the problem of Initializer & login response at some sites. Deadline capability proved useful on USGS benchmark, but limited exposure in more heterogeneous environments is needed before it can be wholly integrated.

Implications: Workclass table entries in tc\_data must be grown, reducing the number of available APTEs by 7 at sites where tc\_data is correctly and efficiently configured. The tuning parameters ocore, tforce, steh & tfmax will no longer have any effect. The percent scheduler of MR 3.0 will work as it currently does. Telast should be reduced from 2.0sec to 1.0.

Detailed proposal: A queue of processes with realtime deadlines will be maintained, sorted by deadline. Such process will be run at their deadline no matter what, and sooner if the cpu would otherwise idle.