

TO: Distribution
FROM: Joan Scott
DATE: 1 September 76
SUBJECT: Multics Change Requests

Enclosed are the Multics Change Requests which were approved from 1 August 76 through 15 August 76.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2044</u>
TITLE: Notify user if absentee job bombs or cannot log in.		STATUS DATE
AUTHOR: VanVleck		Written 07/14/76
	JWG	Status 07/27/76
		Expires 01/14/77
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: yes		() Sys. Prog. Tools
User/Operations-visible Interface Change: yes		() 355
Coded in: <input checked="" type="checkbox"/> PL/I () AIM () other-see below		() BOS
Performance: () better <input checked="" type="checkbox"/> same () worse		() Salvager
DOCUMENTATION CHANGES (specify one or more)		() Ring Zero
MPM (vol,sect) MPAM (sect)		() Ring One
MOSN (sect) MSAM (sect)		<input checked="" type="checkbox"/> SysDaemon/Admin
PLMs (AN#) 66		() Runtime
Info Seqs		() User Command/Subr
Cther		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

If an absentee process terminates abnormally or if an absentee job cannot be logged in, send the user a message.

REASONS:

This action will be a convenience to users, who must otherwise keep testing the absentee queues to see whether a job is still queued, and if it is not infer that it was started and failed, or could not be started.

IMPLICATIONS:

This is an incompatible change. Users will start getting messages they did not before. Absentee jobs whose "normal" termination is to have the process blow up instead of calling logout will start to cause messages.

In fact, absentee jobs which encounter an unclaimed signal and attempt to reenter command level terminate because the process overseer calls logout; so this most common failure will not lead to a message. A future MCR will propose a change to this practice.

It would be possible to implement a "-notify" control argument for enter_abs_request and provide an optional notification when a job terminates normally, in a fashion similar to dprint and dpunch. Such a facility does not seem necessary, since the user may put a send_message command at the bottom of his absin file.

pending changes.info

Absentee facility: will be changed to send an inter-user message to the user if a job cannot be started or if it terminates abnormally.

enter_abs_request

enter_abs_request

**-time dtime,
-tm dtime**

indicates that the user wishes to delay creation of the absentee process until a specified time. It must be followed by a character string representing this time. The format of the deferred time is any character string acceptable to the `convert_date_to_binary` subroutine (described in Section II of the MPM Subroutines). If the time string contains blanks, it must be enclosed in quotes.

-brief, -bf

indicates that the message "j already requested." is to be suppressed.

1. **-arguments, -ag**

is an optional control argument that indicates that the absentee control segment requires arguments. If present, it must be followed by at least one argument. All arguments following `-ag` on the command line are taken as arguments to the absentee control segment. Thus `-ag`, if present, must be the last control argument to the `enter_abs_request` command.

2. **optional_args**

are arguments to the absentee control segment.

list

If the pathname of the output segment is not specified, the output of the absentee process is directed to a segment whose pathname is the same as the absentee control segment, except that it has the suffix `absout` instead of `absin`. If the pathname of the output segment is specified, the named segment may or may not already exist and it need not have the suffix `absout`.

The command checks for the existence of the absentee input segment and rejects a request for an absentee process if it is not present.

The effect of specifying the `-time` option is as if the `enter_abs_request` command were issued at the deferred time.

See also the descriptions of the commands `list_abs_requests` and `cancel_abs_request` for information on displaying and cancelling outstanding absentee requests.

If an absentee job cannot be run or if it terminates abnormally, the system will send an inter-user message to the submitter's mailbox.

MESSAGES FROM THE SYSTEM

Some system messages are directed to the user as a result of conditions detected in system daemon processes. These messages are sent via the inter-user message facility if the user's mailbox exists. (See the description of the `accept_messages` command for more information about inter-user messages and mailboxes.) Messages sent in this manner include:

- o Absentee job cannot be run or terminated abnormally
- o IO daemon cannot perform request
- o IO daemon performed request and user requested notification
- o System installed table for an administrator
- * Warning of imminent automatic logout
- * Warning from operator
- * Warning from answering service that an attempt has been made to login the user from another terminal

Messages indicated by an asterisk (*) above are considered urgent; if the system cannot find a mailbox for the user the message will be written on the user's terminal in the midst of other output.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2052</u>
TITLE: New arguments to set_tty		STATUS: <u>written</u> DATE: <u>01/10/70</u>
AUTHOR: Robert S. Coren	MTG	Status: <u>P7/27A08/03/76</u>
Planned for System: MR 5.0		Expires: <u>01/10/71</u>
Fixes bug number(s): not applicable		CATEGORY (check one)
Documented in MIB: 290		<input type="checkbox"/> Lib. maint. Tools
Incompatible Change: no		<input type="checkbox"/> Sys. Anal. Tools
User/operations-visible Interface Change: yes		<input type="checkbox"/> Sys. Prog. Tools
Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-see below		<input type="checkbox"/> 355
Performance: <input type="checkbox"/> better <input checked="" type="checkbox"/> same <input type="checkbox"/> worse		<input type="checkbox"/> BUS
DOCUMENTATION CHANGES (specify one or more)		<input type="checkbox"/> Salvager
MPM (vol,sect) Commands MPAM (sect)		<input type="checkbox"/> Ring Zero
MCSN (sect) MSAM (sect)		<input type="checkbox"/> Ring one
PLMs (AN#)		<input type="checkbox"/> SysDaemon/Admin
Info segs		<input type="checkbox"/> Runtime
Other		<input checked="" type="checkbox"/> User Command/Buffer
OBJECTIONS/COMMENTS:		

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

SUMMARY: Add new control arguments to set_tty for additional control over terminal behavior as described in MIB 290.

REASONS: The new features are made more useful by being accessible through a command interface.

IMPLICATIONS: None.

DETAILED PROPOSAL: See attached draft MPM documentation of new control arguments.

Additional Control Arguments to set_tty

-delay values,

-dly values sets the delay timings for the terminal according to values, which must be six decimal integers specifying vert_nl, horz_nl, const_tab, var_tab, backspace, and vt_ff, in that order. The meanings of the values are as follows:

vert_nl is the number of delay characters to be output for all newlines to allow for the linefeed. If it is negative, it is the complement of the minimum number of characters that must be transmitted between two linefeeds (for a device such as a Terminet 1200).

horz_nl is a factor used to determine the number of delays to be added for the carriage return portion of a newline, depending on column position. The formula for calculating the number of delay characters to be output following a newline is:

$$ndelays = vert_nl + (horz_nl * column) / 512$$

const_tab is the constant portion of the number of delays associated with any horizontal tab character.

var_tab is a factor used to determine the number of additional delays associated with a horizontal tab depending on the number of columns traversed. The formula for calculating the number of delays to be output following a horizontal tab is:

$$ndelays = const_tab + (var_tab * n_columns) / 512$$

backspace is the number of delays to be output following a backspace character. If it is negative, it is the complement of the number of delays to be output with the first backspace of a series only (or a single backspace). This is for terminals such as the Terminet 300 which need delays to allow for hammer recovery in case of overstrikes, but do not require delays for the carriage motion associated with the backspace itself.

vt_ff is the number of delays to be output following a vertical tab or form-feed.

-edit edit_chars,

-ed edit_chars

changes the input editing characters to those specified by edit_chars. edit_chars is a 2-character string consisting of the erase character and the kill character, in that order.

`-print_delay,`
`-pr_dly` prints the delay timings for the terminal.

`-print_edit,`
`-pr_ed` prints the input-editing characters for the terminal.

`-all, -a` is the equivalent of `-print -print_edit -print_delay`.

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Revised Documentation for MCR 2052

Additional_Control_Arguments_to set_tty

-delay values,
-dly values

sets the delay timings for the terminal according to values, which is either the word "default" or a string of six decimal values separated by commas. If "default" is specified, the default values for the current terminal type and baud rate are used. The values specify vert_nl, horz_nl, const_tab, var_tab, backspace, and vt_ff, in that order. The meanings of the values are as follows:

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vert_nl is the number of delay characters to be output for all newlines to allow for the linefeed. If it is negative, its absolute value is the minimum number of characters that must be transmitted between two linefeeds (for a device such as a TermiNet 1200).

horz_nl is a number to be multiplied by the column position to obtain the number of delays to be added for the carriage return portion of a newline. The formula for calculating the number of delay characters to be output following a newline is:

$$\text{ndelays} = \text{vert_nl} + \text{fixed}(\text{horz_nl} * \text{column})$$

const_tab is the constant portion of the number of delays associated with any horizontal tab character.

var_tab is the number of additional delays associated with a horizontal tab for each column traversed. The formula for calculating the number of delays to be output following a horizontal tab is:

$$\text{ndelays} = \text{const_tab} + \text{fixed}(\text{var_tab} * \text{n_columns})$$

backspace is the number of delays to be output following a backspace character. If it is negative, its absolute value is the number of delays to be output with the first backspace of a series only (or a single backspace). This is for terminals such as the TermiNet 300 which need delays to allow for hammer recovery in

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case of overstrikes, but do not require delays for the carriage motion associated with the backspace itself.

`vt_ff` is the number of delays to be output following a vertical tab or form-feed.

`horz_nl` and `var_tab` are floating-point numbers; all other values are integers. If any of the six values is omitted, the corresponding delay value is not changed; if values are omitted from the end of the list, trailing commas are not required.

`-edit edit_chars,`

`-ed edit_chars`

changes the input editing characters to those specified by `edit_chars`. `edit_chars` is a 2-character string consisting of the erase character and the kill character, in that order. If the erase character is specified as a blank, the erase character is not changed; if the kill character is omitted or specified as a blank, the kill character is not changed.

`-print_delay,`

`-pr_dly`

prints the delay timings for the terminal.

`-print_edit,`

`-pr_ed`

prints the input-editing characters for the terminal.

`-all, -a`

is the equivalent of `-print -print_edit -print_delay`.

Revised Documentation for MCR 2052

Examples:

```
set_tty -delay 6,0,0,0,-6,59
```

sets all six delay values to those used by a TermiNet 300.

```
set_tty -delay 5,0.6,,,2,63
```

sets the delay values so that 5 delays will be output with a newline, plus 3 more for every 5 columns of carriage return; 2 delays will be used for each backspace, 63 for a vertical tab or form-feed, and whatever values were already in force for horizontal tabs.

```
set_tty -delay ,1.3,,.8
```

sets horz_nl to 1.3 and var_tab to 0.8, while leaving all other delay values as they were before.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 2060
TITLE: Increasing maximum message size in message-segments.		STATUS DATE
AUTHOR: Steven A. Swernofsky		Written 07/16/76
TVU		Status A 08/03/76
		Expires 02/03/77
Planned for System: not applicable		CATEGORY (check one)
Fixes Bug Number(s): none		<input type="checkbox"/> Lib. Maint. Tools
Documented in MTB: none		<input type="checkbox"/> Sys. Anal. Tools
Incompatible Changes: no		<input type="checkbox"/> Sys. Prog. Tools
User/Operations-visible Interface Changes: no		<input type="checkbox"/> 355
Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-see below		<input type="checkbox"/> BOS
Performance: <input type="checkbox"/> better <input checked="" type="checkbox"/> same <input type="checkbox"/> worse		<input type="checkbox"/> Salvager
Replaces MCR: none		<input type="checkbox"/> Ring Zero
DOCUMENTATION CHANGES (specify one or more)		<input checked="" type="checkbox"/> Ring One
MPM (vol,sect)	MPAM (sect)	<input type="checkbox"/> SysDaemon/Admin
MOSN (sect)	MSAM (sect)	<input type="checkbox"/> Runtime
PLMs (AN#)	AN/69 (message segments)	<input type="checkbox"/> User Command/Subr
Info Segs		
Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

The maximum message size in queue message segments and mailbox message segments is increased to the size of a full segment less header size. Version 4 message segments are introduced with an expanded message-length field, to allow specification of longer message lengths.

REASONS:

Messages are currently limited to a length of 2**18 bits, or 7+ pages. It is not now possible to receive or queue for sending Network Mail which exceeds this limit. This is important to the Network community, as often Network Mail is used for exchange of documents.

IMPLICATIONS:

Current message segments (version 3) will be converted to new message segments (version 4) as they are referenced. mseg_return_args.incl.pl1 will be changed.

A compatible change is assured by the fact that the current declaration of ms_len as "fixed bin(18)" occupies a full word, which is sufficient space for a declaration of "fixed bin(24)."

DETAILED PROPOSAL:

The present segments: bound_mseg_, queue_mseg_, and mbx_mseg_ will be renamed to their version 3 counterparts. New versions will be provided for each of these.

mseg_return_args.incl.pl1 will be modified. mseg_convert_v3_ will be provided.

Variables in current message-segment primitives which specify message length will be changed from bit(18) to bit(24) and from fixed bin(18) to fixed bin(24) as appropriate.

The following is an alphabetized list of arguments used in the described calls.

acl_count (fixed bin) is the number of entries in the structure pointed to by aclp.

aclp (pointer) is a pointer to the following structure:

```
declare 1 acl_entries (acl_count) aligned based (aclp),
      2 access_name char(32) aligned,
      2 modes bit(36) aligned,
      2 extended_access bit(36) aligned,
      2 retrerr fixed bin(35);
```

where:

access_name is the access name (in the form Person_id.Project_id.tag) that identifies a class of users.

modes is the real access for this access name.

extended_access is the extended access for this access name.

reterr is a standard Multics status code.

areap (pointer) is a pointer to a user defined area.

argp (pointer) is a pointer to the following structure:

```
declare 1 mseg_return_args aligned based (argp),
      2 ms_ptr ptr,
      2 ms_len fixed bin(18), — 24
      2 sender_id char(32) aligned,
      2 level fixed bin,
      2 ms_id bit(72) aligned,
      2 sender_authorization bit(72),
      2 access_class bit(72);
```

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 2062
TITLE: Correct bugs in probe		STATUS: DATE
AUTHOR: Susan Barr		Written: 07/21/76
		Status: A 08/05/76
		Expires: 01/21/77
Planned for System: not applicable 5.0		
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: 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
MPM (vol,sect) MPAM (sect)		() Ring One
MOSN (sect) MSAM (sect)		() Sys Daemon/Admin
PLMs (AN#)		() Runtime
Info Segs		(X) User Command/Subr
Other		
None (reason) bug fix		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

1. Correct a bug that causes offsets to be printed as null pointers.
2. Correct a bug that causes the symbol request to treat all arguments as invalid.
3. Correct a bug that prevents several requests grouped with a break.
4. Convert output of source lines to use one lox_call instead of several loa_calls.

PROPOSAL:

1. Change probe so that it prints offsets as an octal word offset followed by a decimal bit offset. (ie. 21 (9))
2. and 3. Set flags properly in a portion of code shared by several probe requests.

Ver. 3	MULTICS CHANGE REQUEST	MCR 2063
741022		
TITLE: Remove the 61K limit in cu_\$grow_stack_frame		STATUS DATE
AUTHOR: Susan Barr		Written 07/22/76
	MJG	Status 08/03/76
		Expires 01/22/77
Planned for System: not applicable 5-0		CATEGORY (check one)
Fixes Bug Number(s): not applicable		() Lib. Maint. Tools
Documented in MTB: not applicable		() Sys. Anal. Tools
Incompatible Changes: no		() Sys. Prog. Tools
User/Operations-visible Interface Change: no		() 355
Coded in: (X)PL/I ()ALM ()other-see below		() 80S
Performance: ()better (X)same ()worse		() Salvager
DOCUMENTATION CHANGES (specify one or more)		() Ring Zero
MPM (vol,sect) MPAM (sect)		() Ring One
MOSN (sect) MSAM (sect)		() SysDaemon/Admin
PLMs (AN#)		() Runtime
Info Segs		() User Command/Subr
Other		(X)runtime
None (reason) bug fix		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

The procedure cu_\$grow_stack_frame returns the error code for stack overflow if the amount requested would cause the stack to exceed 61K. If the stack has already been extended past 64K, ~~this~~ this procedure can not be used.

PROPOSAL:

Remove the check since a more general mechanism is available with default error handler which extends the stack.

REASONS:

Many procedures call this procedure which should be expected to work after a stack overflow. (ex. listen_, full_command_processor_, exec_com, calc, do)

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 2064
TITLE: Cause message if absentee job dies due to fault.		STATUS DATE
AUTHOR: VanVleck	JWG	Written 07/22/76 Status A08/03/76 Expires 01/22/77
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)		() SysDaemon/Admin
PLMs (AN#)		() Runtime
Info Segs pending_changes		() User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

Cause absentee processes to signal a process termination message instead of a logout if the job is aborting due to an unclaimed signal.

REASONS:

When an absentee job encounters an attempt to cap the stack via a call to cu_\$cl, it now calls logout, so no interuser message is sent to the user informing him that the job died. This message would be a convenience to the user.

IMPLICATIONS:

Users will get a new message when a job bombs.

DETAILED PROPOSAL:

The "logged out" message can still be printed.

Ver. 3	MULTICS CHANGE REQUEST	MCR 2065
TITLE: Make default search rules installation changeable.		STATUS: DATE
AUTHOR: VanVleck	JWG	Written: 07/22/76
		Status: 08/03/76
		Expires: 01/22/77
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: 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) COMMANDS MPAM (sect)		() Ring One
MOSN (sect)	MSAM (sect) ✓	() SysDaemon/Admin
PLMs (AN#) an61		() Runtime
Info Segs		() User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

Generalize the current search rule mechanism so that the installation can change the default search rules and define keywords for use by hcs_\$initiate_search_rules.

Install privileged command to set the default search rules from a segment. Install tool to print default search rules.

REASONS:

Installations may wish to modify the current default rules supplied with the system (e.g. remove >tools), or they may wish to define keywords which expand into a list of rules for the convenience of subsystems.

IMPLICATIONS:

We will be able to remove >tools from the search path.

Name: set_system_search_rules

This highly-privileged command is used in the Initializer process to set the installation's default search rules for all processes.

Usage

```
set_system_search_rules path
```

1) path is the path name of a default search rules segment.

Default Search Rules Segment

Each line in the default search rules segment may be either a keyword or the absolute pathname of a directory to be searched. The order of the lines in the default search rules segment gives the order in which the rules will be applied by a user process.

The legal keywords are:

```
initiated_segments
referencing_dir
working_dir
home_dir
process_dir
```

The absolute pathname rules may be tagged with one or more identifiers, which name a group of rules. A user process may specify the tag instead of specifying the entire list of directories containing that tag. The order of the expanded list will be the same as the order of the directories in the file. Recursion is not allowed.

Up to 10 tags and up to 50 rules may be specified.

The maximum number of search rules which can be specified is a system constant. It is currently equal to 22.

Example

If the installation places the following lines in its default search rules segment, it will recreate the default rules used if set_system_search_rules was not called:

```
initiated_segments,default
referencing_dir,default
working_dir,default
>system_library_standard,default,system_libraries
>system_library_unbundled,default,system_libraries
>system_library_1,default,system_libraries
>system_library_tools,default,system_libraries
>system_library_auth_maint,default,system_libraries
```

NAME: get_system_search_rules

This command prints the current system default search rules. The output format is identical to that accepted by set_system_search_rules.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 2066
TITLE: Fix bug in message coordinator		STATUS DATE
AUTHOR: VanVleck		Written 07/22/76
	JWG	Status 10/03/76
		Expires 01/22/77
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: no		() 355
Coded in: (X) PL/I () ALM () other-see below		() 80S
Performance: () better (X) same () worse		() Salvager
		() Ring Zero
DOCUMENTATION CHANGES (specify one or more)		() Ring One
MPM (vol,sect) MPAM (sect)		(X) SysDaemon/Admin
MOSN (sect) MSAM (sect)		() Runtime
PLMs (AN#)		() User Command/Subr
Info Segs		
Other		
None (reason) bug fix		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

When a destination is removed from the routing of a source, ensure that the source does not wait forever for output to be typed.

REASONS:

The fix for message coordinator flooding overlooked the possibility of removing a terminal while a source was in output wait, or powering off a hardwired terminal.

IMPLICATIONS:

More reliable operation.

Ver. 3	MULTICS CHANGE REQUEST	MCR__ 2067
741022		
TITLE: Add PARM option to crash on connection failure		STATUS DATE
AUTHOR: VanVleck		Written 07/26/76
		Status <i>A 08/10/76</i>
		Expires 01/26/77
Planned for System: not applicable		
Fixes Bug Number(s): not applicable		CATEGORY (check one)
Documented in MTR: 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)		(X) Ring Zero
MPM (vol,sect) MPAM (sect)		() Ring One
MOSN (sect) moh MSAM (sect)		() SysDaemcn/Admin
PLMs (AN#)		() Runtime
Info Segs		() User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

MTG

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

SUMMARY:

Add the option to the DEBG card

PARM CNFL

to crash the system if a connection failure occurs.

REASONS:

On two occasions the Phoenix system has encountered connection failures during startup. This problem is not understood or reproducible. We wish to lay a trap for the bug.

Another MCR describes how this option will be reset by answering service startup so that normal operation will not fall afoul of the trap.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 2070
TITLE: Make print_log arguments like print_syserr_log		STATUS DATE Written 07/26/76
AUTHOR: VanVleck	MTG	Status A08/01/76 Expires 01/26/77
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: 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) MPAM (sect)		() Ring One
MOSN (sect) MSAM (sect) sa		<input checked="" type="checkbox"/> SysDaemon/Admin
PLMs (AN#)		() Runtime
Info Segs		() User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

Change print_log, which prints the answering service logs, to take arguments like print_syserr_log.

Change default severity to 0 instead of 1.

Remove documentation for old control arguments, but continue to accept them. REASONS:

The arguments to print_syserr_log are easier to use and provide more flexibility. Having two similar commands with different argument conventions is inconvenient.

The default severity of 1 has proven to be a mistake.

IMPLICATIONS:

The default severity change is incompatible.

print_log

print_log

Name: print_log

This command prints selected entries from a log segment of the format created by the answering service and the network daemon.

Usage

print_log -path- -control_args-

where:

1. path is the pathname of the log segment to be printed. If path is omitted, the active log (<system_control_dir>log) will be printed.
2. control_args

Control arguments fall into three groups:

1. Those that specify the range of the log to be scanned.
2. Those that specify which messages are to be printed (or not printed).
3. Those that control the format of the messages printed.

The following control arguments specify the range of the log to be scanned:

- from t, where t is a decimal integer or a date/time.
-fm t This argument specifies the starting point of the scan. If t is an integer, it represents a sequence number, otherwise it represents date and time.
- to t where t is a decimal integer, or a date/time. This argument defines the ending point in the scan by sequence number, or time.
- for t, where t is a decimal integer or a date/time.
-next t If a decimal integer is used, it specifies the number of messages to scan. If a date/time is used, it must be a relative time (such as "1 day"), which specifies how far from the starting point to scan the log.
- last n where n is a decimal integer. This argument specifies that the scan is to start n messages back from the end of the log.

The starting point is specified by either -from or -last, but not both. If both are omitted, the scan starts at the earliest recorded message. The ending time is specified by -to or -for(-next), but not both. If both are omitted, the scan will end with the most recent message in the log. Date/time arguments used with -from, -for, or -to must be in a format acceptable to the convert_date_to_binary_subroutine.

The following control arguments specify which messages in the range scanned are to be printed:

`-match s1 .. sn` where `s1` are strings to be matched against messages in the log. Any message that contains an `s1` is a candidate to be printed.

`-exclude s1 .. sn,`
`-ex s1 .. sn` where `s1` are strings that are matched against the log, as for `-match`. Any message that contains an `s1` will not be printed. (Therefore, any message that does not contain an `s1` is a candidate to be printed.)

`-severity N`
`-sv N` only entries whose severity is greater than or equal to `N` will be printed. It may be 0, 1, or 2. The default is 0.

If none of these control arguments are used, all messages in the range will be printed. If some of the above control arguments are used, only messages that pass all these tests will be printed.

The following control arguments specify the format of the messages printed.

`-no_header,`
`-nhe` specifies that the header which contains the range of the log under consideration will not be printed.

Examples

`print_log`

Prints all entries, starting with the first, ~~which have a severity of 1 or greater~~ in the active log. A header precedes the log entries giving the pathname of the log and the number of entries.

`print_log -sv 0 -last 50 -match "no l" -nhe`

Prints any entry of the last 50 in the active log which contains the 4-character string "no l". No header is printed.

`print_log log_17 -sv 2 -nhe`

Prints any severity 2 or 3 messages in "log_17". No header is printed.

TITLE: Change operation of set_lock_

STATUS

DATE

AUTHOR: S. Herbst

JWG

Written

07/22/76

Status

A 08/20/76

Expires

02/03/77

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

Category (Check One)

-Planned for System MR 5.0

Lib. Maint. Tools

-Fixes Bug Number(s)

Sys. Anal. Tools

-Documented in MTB

Sys. Prog. Tools

-User/Operations-visible

355

DOCUMENTATION CHANGES

Interface change? yes no

BOS

Document Specify One or More

-Incompatible change? yes no

Salvager

MPM (Vol, Sect.)

-Performance: Better Same

X Ring Zero

PLMS (AN #)

Worse

Ring One

MOSN (Sect.)

-Replaces MCR

SysDaemon/Admin.

MPAM (Sect.)

Runtime

MSAM (Sect.)

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:

Change set_lock_ to create an event_call channel only if it needs to use one (i.e., when the lock is already locked). Currently, set_lock_ does this the first time it is called.

REASON:

The event-call channel is seldom needed and expensive to set up.

TITLE: Delete extra set_lock_ and create_ips_mask_		STATUS	DATE
AUTHOR: S. Herbst		Written	07/22/76
JWG		Status	A 08/03/76
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> AIM <input type="checkbox"/> other- explain in DETAILED PROPOSAL		Expires	02/03/77
-Planned for System MR 5.0		DOCUMENTATION CHANGES	
-Fixes Bug Number(s)		Document	Specify One or More
-Documented in MTB		MPM (Vol, Sect.)	
-User/Operations-visible		PLMS (AN #)	
Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		MOSN (Sect.)	
-Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no		MPAM (Sect.)	
-Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same		MSAM (Sect.)	
<input type="checkbox"/> Worse		Info Segs	
-Replaces MCR		Other (Name)	
Category (Check One)		None (Reason)	
<input type="checkbox"/> Lib. Maint. Tools			
<input type="checkbox"/> Sys. Anal. Tools			
<input type="checkbox"/> Sys. Prog. Tools			
<input type="checkbox"/> 355			
<input type="checkbox"/> BOS			
<input type="checkbox"/> Salvager			
<input type="checkbox"/> Ring Zero			
<input type="checkbox"/> Ring One			
<input type="checkbox"/> SysDaemon/Admin.			
<input type="checkbox"/> Runtime			
<input checked="" type="checkbox"/> User Cmnd/Subr.			
Objections/Comments:			

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

SUMMARY:

Delete the extra copies of create_ips_mask_ and set_lock_ that reside in >sss (they also exist in >sl1).

TITLE: Convert version I PL/I		STATUS	DATE	
AUTHOR: S. Herbst		Written	07/22/76	
JWG		Status	A 08/08/76	
<input checked="" type="checkbox"/> PL/I <input type="checkbox"/> AIM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR <u>n/A</u> -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____	Category (Check One)		Expires	
	Lib. Maint. Tools		02/03/77	
	Sys. Anal. Tools		DOCUMENTATION CHANGES	
	Sys. Prog. Tools		Document	Specify One or More
	355		MPM (Vol, Sect.)	
	BOS		PLMS (AN #)	
	Salvager		MOSN (Sect.)	
	Ring Zero		MPAM (Sect.)	
	Ring One		MSAM (Sect.)	
	SysDaemon/Admin.		Info Segs	
Runtime		Other (Name)		
X User Cmnd/Subr.		None (Reason)		
Objections/Comments:				

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

SUMMARY:

Convert the remaining version I PL/I programs in the system to the current version. Start with those most frequently used.

REASON:

We might be able to delete version I PL/I operators when this is done. Meantime, fewer users will need version I PL/I operators in their process.

TITLE: Implement mailbox_\$open_if_full
 AUTHOR: S. Herbst JWG

STATUS	DATE
Written	07/22/76
Status	A 02/03/76
Expires	02/03/77

-Coded in PL/I ALM other-
 explain in DETAILED PROPOSAL
 -Planned for System MR 5.0
 -Fixes Bug Number(s) _____
 -Documented in MTB _____
 -User/Operations-visible
 Interface change? yes no
 -Incompatible change? yes no
 -Performance: Better Same
 Worse
 -Replaces MCR _____

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

DOCUMENTATION CHANGES

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

Objections/Comments:

Info Segs
Other (Name)
None (Reason)

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

SUMMARY:

Implement the new entry point mailbox_\$open_if_full, used to cheaply find out if there are any messages in a mailbox or if the mailbox has been salvaged.

REASON:

The simple sequence:

mail
No mail.

can be much cheaper than it is today.

Entry: mailbox_\$open_if_full

This entry point opens a specified mailbox only if it contains messages or has been salvaged. This is an inexpensive way to find out if a mailbox is empty.

Usage:

```
dcl mailbox_$open_if_full entry.  
  (char(*),char(*),fixed bin,bit(1),fixed bin,fixed bin(35));
```

```
call mailbox_$open_if_full  
  (dn,en,count,salv_bit,mseg_index,code);
```

where:

1. dn is the mailbox directory name. (Input)
2. en is the mailbox entryname. (Input)
3. count is the number of messages. (Output)
4. salv_bit is "1"b if the mailbox has been salvaged. (Output)
5. mseg_index is an index for the mailbox if count[^]0 or salv_bit="1"b, zero otherwise. If mseg_index[^]0 the mailbox is open and should later be closed. (Output)
6. code is an error code returned by mailbox_\$open. (Output)

TITLE: Fix bug in quota		STATUS	DATE
AUTHOR: S. Herbst		TVV	
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL		Category (Check One)	Written 07/27/76
-Planned for System MR		Lib. Maint. Tools	Status A 09/18/76 (0)
-Fixes Bug Number(s)		Sys. Anal. Tools	Expires 01/27/77
-Documented in MTB		Sys. Prog. Tools	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		X Ring Zero	PLMS (AN #)
-Replaces MCR		Ring One	MOSN (Sect.)
		SysDaemon/Admin.	MPAM (Sect.)
		Runtime	MSAM (Sect.)
		User Cmmnd/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 bug in quota\$move that can cause the working directory pathname stored for the process to be set to null.

DETAILED PROPOSAL:

Remove the call to makeunknown that was added recently immediately before the return statement. In some cases, the directory in question has not been made known and its reference count is decremented once more than it should be.

TITLE: Implement mail -acknowledge		STATUS	DATE
AUTHOR: S. Herbst TVV		Written	07/27/76
<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 5.0 <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 type="checkbox"/> no <input type="checkbox"/> Incompatible change? <input type="checkbox"/> yes <input type="checkbox"/> no Performance: <input type="checkbox"/> Better <input type="checkbox"/> Same <input type="checkbox"/> Worse <input type="checkbox"/> Replaces MCR		Status	A 08/08/76
		Expires	01/27/77
		Category (Check One) <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input type="checkbox"/> SysDaemon/Admin. <input type="checkbox"/> Runtime <input checked="" type="checkbox"/> User Cmnd/Subr.	
Objections/Comments:		Document	Specify One or More
		MPM (Vol, Sect.)	AG92
		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:

Implement the -acknowledge control argument to mail, used to send a mail message with the acknowledge bit on. The acknowledgement is sent an an interactive message. If mail cannot be acknowledged for access reasons, the sender is issued a warning message similar to that printed by send_message_acknowledge.

REASONS:

Useful for people sending important long messages.

mail

mail

Name: mail, ml

The mail command allows the user to send a message to another user or to print messages sent to him. Mail sent to a user is placed in the segment named mailbox in his home directory. The mailbox is provided with a lock so that two users cannot write into it at the same time.

Usage

mail -path- -Person_id1- -Project_id1- ... -Person_idn- -Project_idn-

- control_arg -

where:

1. path is the pathname of a mailbox segment whose contents are to be output (when no Person_idi Project_idi pairs are specified) or of a segment to be sent (when one or more Person_idi Project_idi pairs are specified). A value of "*" for path indicates that the user wishes to input a message to be sent (see "Composing Mail" below).
2. Person_idi is the name of a person to whom mail is to be sent.
3. Project_idi is the name of a Project_id on which Person_idi is registered.

4.

Printing Mail

The contents of the mailbox segment named by path is printed, preceded by a line of the form:

x messages, y lines (where x and y are decimal integers greater than zero)

If path is omitted, the contents of the mailbox segment in the user's home directory is printed. After printing, the mail command asks whether it should delete the messages. If the answer is no, the messages are saved. If the answer is yes, mail truncates the mailbox to zero length. In either case, the user returns to command level.

→ *control_arg* can be *-acknowledge* or *-ack* to request acknowledgement of the piece of mail. The acknowledgement reads: "Acknowledge message of <date-time sent>" or is sent as an interactive message by the mail command when used to read the message.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 2078
TITLE: Fix ring zero meter limit initializer.		STATUS DATE
AUTHOR: Bernard Greenberg		Written 07/27/76
Planned for System: MR 5.0 Fixes Bug Number(s): 359 Documented in MTB: not applicable Incompatible Change: no User/Operations-visible Interface Change: no Coded in: (<input checked="" type="checkbox"/>)PL/I (<input type="checkbox"/>)ALM (<input type="checkbox"/>)other-see below Performance: (<input type="checkbox"/>)better (<input checked="" type="checkbox"/>)same (<input type="checkbox"/>)worse		Status POB 08/06/76
		Expires 01/27/77
		CATEGORY (check one)
DOCUMENTATION CHANGES (specify one or more)		() Lib. Maint. Tools
MPI (vol,sect)	MPAM (sect)	() Sys. Anal. Tools
MOSN (sect)	MSAM (sect)	() Sys. Prog. Tools
plms (AN#) Tools		() 355
Info Segs		() BOS
Other		() Salvager
		() Ring Zero
		(<input checked="" type="checkbox"/>) Ring One
		() SysDaemon/Admin
		() Runtime
		() User Command/Subr
OBJECTIONS/COMMENTS:		

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

SUMMARY: There are two outstanding inadequacies in the current ring_zero_meter_limits mechanism:

- 1) Any error in processing the ASCII segment leaves the old binary segment in effect, perpetrating possibly dangerous windows upon the hardcore.
- 2) Deletion of segments which had been visible causes table conversion to fail.

Change initialize_peek_limits to do the following:

- 1) Before beginning table conversion, truncate the old binary segment, ensuring no metering access if conversion fails.
- 2) If a segment name is not found in the SLT, print a message to that effect, giving the name (as opposed to "Syntax Error in ASCII segment"), and go on processing. This gives no information away, and is a conservative action.

REASONS: Security, reliability.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCP 2079
TITLE: Fix bugs/misfeatures in handling of Master directories by hierarchy Salvager	AUTHOR: Bernard Greenberg	STATUS: Written DATE: 07/27/76 TVV: Status: A 08/03/76 Expires: 01/27/77
Planned for System: MP 5.0	Fixes Bug Number(s): not applicable	CATEGORY (check one)
Documented in MTB: not applicable	Incompatible Change: no	() Lib. Maint. Tools
User/Operations-visible Interface Change: no	Coded in: (X) PL/I () ALM () other-see below	() Sys. Anal. Tools
Performance: () better (X) same () worse		() Sys. Prog. Tools
		() 355
		() BOS
		(X) 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#) 61		
Info Segs		
Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY: The hierarchy salvager is not particularly cognizant of Master Directories. The following bugs exist:

1) Quota received is subtotalled recursively, even below a Master Directory. Not only does this cause incorrect accumulation of quota received, but gives 0-quota terminal status to all non-quota-bearing parents of a Master Directory. Quota received subtotalling should be cut off at a Master Directory (segment quota only).

2) Inconsistencies between Master Directory status in the directory header and the branch are neither detected nor corrected.

3) The Master Directory UID in the Directory header is not checked/corrected by the Salvager.

Fix these bugs and add the following feature:

1) Directories whose sons_lvid is different from their father's should be marked as Master Directories. This assists the register_mdir command in rectifying such situations.

REASONS: More correct operation, more reliable salvaging.

IMPLICATIONS: none.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 2080
TITLE: Print warning message when shutdown with Unflushed Paging Device occurs.		STATUS DATE
AUTHOR: Bernard Greenberg		Written 07/27/76
TVV		Status Acsh 07/76
		Expires 01/27/77
		CATEGORY (check one)
Planned for System: MR 5.0	Fixes Bug Number(s): not applicable	() Lib. Maint. Tools
Documented in MTB: not applicable	Incompatible Change: no	() Sys. Anal. Tools
User/Operations-visible Interface Change: no	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
NPM (vol,sect)	MPAM (sect)	() Salvager
NOSH (sect)	MSAM (sect)	(X) Ring Zero
PLMs (AN#) 70		() Ring One
Info Segs		() SysDaemon/Admin
Other		() Runtime
OBJECTIONS/COMMENTS:		() User Command/Subr

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

SUMMARY: Have the system print a warning message when a shutdown or emergency shutdown completes with an unflushed paging device.

REASONS: The system having shut down successfully is a false indication that "all is well". In such a case, which always follows an unsuccessful emergency shutdown, the operator must be aware that the content of the Bulk Store is not to be destroyed.

IMPLICATIONS: Reliability. The content of the Bulk Store was almost lost in this fashion at MIT.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 2081
TITLE: Fix bad syserr messages		STATUS DATE
AUTHOR: Bernard Greenberg		Written 07/27/76
Planned for System: MR 5.0 Fixes Bug Number(s): not applicable Documented in MTB: not applicable Incompatible Change: no User/Operations-visible Interface Change: no Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-see below Performance: <input type="checkbox"/> better <input checked="" type="checkbox"/> same <input type="checkbox"/> worse		Status A08 12/76
		Expires 01/27/77
DOCUMENTATION CHANGES (specify one or more)		CATEGORY (check one)
NPM (vol,sect)	NPAM (sect)	<input type="checkbox"/> Lib. Maint. Tools
MUSN (sect)	MSAM (sect)	<input type="checkbox"/> Sys. Anal. Tools
PLNs (AN#)		<input type="checkbox"/> Sys. Prog. Tools
Info Segs		<input type="checkbox"/> 355
Other	n/a	<input type="checkbox"/> BOS
		<input type="checkbox"/> Salvager
		<input checked="" type="checkbox"/> Ring Zero
		<input type="checkbox"/> Ring One
		<input type="checkbox"/> SysDaemon/Admin
		<input type="checkbox"/> Runtime
		<input type="checkbox"/> User Command/Subr
OBJECTIONS/COMMENTS:		

TW

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

SUMMARY: Repair a few bad syserr calls in verify_lock and page_error which say things like "Error tw verifying AST lock" and print negative addresses at page control device error time.

REASONS: Multics should convey an impression of coherence, not chaos.

Ver. 3 .741022	MULTICS CHANGE REQUEST	MCR <u>2082</u>
TITLE: Fix online salvager process terminations.		STATUS: <u>Written</u> DATE: <u>07/28/76</u>
AUTHOR: Bernard Greenberg	TW	Status: <u>Revised</u> Expires: <u>01/28/77</u>
Planned for System: MR 5.0		
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: 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)		(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 buafix		
OBJECTIONS/COMMENTS:		

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

SUMMARY: The online salvager has traditionally terminated processes when it has been invoked on the process directory of some unfortunate process via automatic call. However, several changes in release 4.0, notably MCR's 1799 and 1731 have caused such invocation more often, and caused it to fail. This is because the on_line_salvager leaves the directory it had intended to salvage out of service, for it is presumedly bad in some way, and calls to terminate the process. This call causes the online salvager to be invoked recursively, as the process still has the original directory locked. What is more, it is out of service, so the online salvager cannot access the branch and crashes the system observing an internal error.

PROPOSAL: 1) Let the online salvager salvage such directories to completion. They're going to have to be deleted consistently anyway. 2) Let the online salvager not terminate processes, but rather indicate to verify_lock, his caller, that the process ought be terminated. Verify_lock can call to terminate the process once the directory has been unlocked. 3) MCR 1799 invokes the online salvager in the case where a directory is not locked for modification, on the reasonable probability that the directory has become bad and is causing a crawlout. For an in-use process directory, created during this bootload, this cannot be the case without someone having detected and repaired it earlier. So do not indicate process termination in this case of process directory lock crawlout.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2083</u>
TITLE: Make system maintain master_dir uid.		STATUS : DATE
AUTHOR: Bernard Greenberg	TVV	Written : 07/28/76
		Status : <u>A08/28/76</u>
		Expires : 01/28/77
Planned for System: MR 5.0		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
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: Release 5.0 needs the Master Directory identifier field in directories. It is now allocated, but not set. Set this field at master directory creation time, and at the time sons_lvid is externally set.

REASONS: More correct operation as per design.

Ver. 3
741022

MULTICS CHANGE REQUEST

MCR 2084

TITLE: Fix salvager to set access_name type and owner.
AUTHOR: Bernard Greenberg

TW

STATUS	DATE
Written	07/28/76
Status	08/03/76
Expires	01/28/77

Planned for System: MR 5.0
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#) 61
Info Seas
Other

OBJECTIONS/COMMENTS:

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

SUMMARY: The salvager directory rebuilder does not set the access_name.type and access_name.owner fields in the access names it rebuilds. Change it to do so.

REASONS: Operation according to design. The system now sets and maintains these fields, but the salvager does not. These fields will be used by the new salvager, covered under separate MCR. However, MCR 1649 covers the setting of these fields at this time, independent of such other MCR.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2085</u>
TITLE: Add interface for interrogating hardcore definitions segment.		STATUS: DATE
AUTHOR: Bernard Greenberg	SHW	Written: 07/28/76
		Status: <u>08/18/76</u>
		Expires: 01/28/77
Planned for System: MR 5.0		CATEGORY (check one)
Fixes Bug Number(s): not applicable		() Lib. Maint. Tools
Documented in MTB: not applicable		(<input checked="" type="checkbox"/>) Sys. Anal. Tools
Incompatible Change: no		() Sys. Prog. Tools
User/Operations-visible Interface Change: 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) MPAM (sect)		() Ring One
MOSN (sect) MSAM (sect)		() SysDaemon/Admin
PLMs (AN#) 72		() Runtime
Info Seas		() User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY: MCR 1786 provides for "a fabricated segment to contain all loaded definitions" on a Multics System Tape. This segment is made deciduous so that tools can be constructed to determine offsets of symbols in the hardcore. Here is such an interface.

REASONS: Ability to utilize this new information from tools such as ol_dump.

IMPLICATIONS: Increased debuggability of the hardcore.

DETAILED PROPOSAL: See attached documentation.

NOTES: The expression of the proposed interfaces is in a style similar to other entries of ring0_get_.

(ring0_get_ . . .)

⋮

ring0_get_\$definition

This entry point is used to ascertain the offset of a symbol in a hardcore segment in the running Multics Supervisor.

Usage: declare ring0_get_\$definition entry (ptr, char (*), char (*),
fixed bin (18), fixed bin, fixed bin (35));

call ring0_get_\$definition (segptr, componentname, symname,
offset, type, code);

where

segptr is a pointer to the base of the segment in which it is desired to obtain a symbol offset. If supplied as null, the segment which bears the name componentname in the SLT will be used, and segptr will be returned as output as a pointer to the base of this segment. (Input/Output)

componentname is the name of the segment or segment bound component in which the symbol symname is to be found. If the symbol symname is an unambiguous reference in the segment defined by segptr, this parameter may be given as a null string. If segptr is given as null, this parameter must be supplied, and specifies the segment name as well. (Input)

symname is the name of the external symbol in the segment specified by segptr or componentname. If more than one external symbol of this name appears in this segment, componentname is used to select the correct component. (Input)

offset is the offset of this definition, if found, into the section of the specified segment as specified by type. (Output)

type is the definition type of this definition, as specified in the MPM Subsystem Writer's Guide (Order #AXXX), detailing in which section of the segment specified this definition resides. (Output)

code is a standard status code. error_table_\$no_defs is returned if the segment specified has no definitions. (Output)

ring0_get_\$definition_given_slts

This entry point is used to ascertain the offset of a symbol in a hardcore segment in other than the running Multics Supervisor. Copies of the SLT, SLT Name Table and Hardcore definitions segment are supplied.

Usage:

```
declare ring0_get_$definition_given_slrt entry (ptr, char (*), char (*),
        fixed bin (18), fixed bin, fixed bin (35),
        ptr, ptr, ptr);
```

```
call ring0_get_$definition_given_slrt (segptr, componentname, symname,
        offset, type, code,
        sltp, nametblp, deftblp);
```

where

segptr, componentname, symname, offset, type, and code are as in the writeup of ring0_get_\$definition, and

sltp is a pointer to the copy of the Segment Loading Table (SLT) to be used. (Input)

nametblp is a pointer to the corresponding copy of the SLT Name Table. (Input)

deftblp is a pointer to the corresponding copy of the Hardcore Definitions Segment (definitions_). (Input)

Ver. 3
741022

MULTICS CHANGE REQUEST

MCR 2086

TITLE: Fix bug in [format_line]

STATUS	DATE
Written	07/28/76
Status	<u>9 02/10/76</u>
Expires	01/28/77

AUTHOR: Larry Johnson

MJG

Planned for System: ~~not applicable~~ 5.0
 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#)
 Info Segs
 Other
 None (reason)

OBJECTIONS/COMMENTS:

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

Summary

The format_line active function returns its result as a quoted string. It herefore doubles any quotes found in the string. The quote doubling algorithm is incorrect, because it does not compute the length of the returned string correctly.

Detailed Proposal

Fix this calculation so that the returned strings length will be set correctly.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2087</u>
TITLE: Fix truncate to not audit truncations of copy-on-write segments		STATUS: <u>Written</u> DATE: <u>06/30/76</u>
AUTHOR: L. Scheffler		Status: <u>AOS/10/76</u>
		Expires: <u>12/30/76</u>
Planned for System: MR4.0 bug fix		CATEGORY (check one)
Fixes Bug Number(s): unreported		() Lib. Maint. Tools
Documented in MFB: 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		() BUS
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
PL's (AN#)		() Runtime
Info Segs		() User Command/Subr
Other		
None (reason) none needed		
OBJECTIONS/COMMENTS:		

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

SUMMARY: Fix truncate to not audit attempts to truncate a segment with its copy switch on to which the user is missing "w" access.

REASONS: This is not an auditable protection event, since the intent is to truncate a new copy. This would not normally be worth fixing, since the copy should be created first. However, the current PL/I compiler truncates xeq_tree_ (a copy-on-write segment) before writing it. This produces an erroneous auditing message for the first use of the PL/I compiler in a process. This unfortunately visible bug should be fixed in MR4.0 so that the Air Force will accept auditing.

IMPLICATIONS: This auditing message will not appear.

DETAILED PROPOSAL: In truncate, change the line of code

```
call dir_control_errors$contentts (ep, code);
```

that computes the error code when the caller does not have "w" access to the segment to

```
if ep -> entry.copysw
then call dir_control_errors$contentts_info (ep, code);
else call dir_control_error$contentts (ep, code);
```

This code computes the same error code in all cases, but the contentts_info entry does not cause an auditing message.

COMMENT: This is a quick fix so that a customer will be happy with MR4.0. The proper, long-range fix involves cleaning up the meaning and use of copy-on-write segments.

TITLE: Fix bug in format_word_list		STATUS	DATE
AUTHOR: Jerry Stern		Written	08/02/76
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	A 08/10/76
		Expires	02/16/77
		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 type="checkbox"/> Runtime <input type="checkbox"/> User Cmnd/Subr.		Document	Specify One or More
Objections/Comments:		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MFAM (Sect.)	
		MSAM (Sect.)	
		Info Segs	
		Other (Name)	
		None (Reason) X	

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

Summary: Fix a bug in format_word_list that causes an incorrect calculation of the actual printing length of words containing backspaces in non-canonical form.

Reasons: Word lists containing such words are incorrectly formatted by format_word_list.

Implications: None.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2089</u>
TITLE: Sort segdef names in print_link_info's output	AUTHOR: Steve Webber (TVV)	STATUS DATE Written 07/30/76 Status <u>A 08/10/76</u> Expires 01/30/77
Planned for System: not applicable Fixes Bug Number(s): not applicable Documented in MTB: not applicable Incompatible Change: yes User/Operations-visible Interface Change: yes Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-see below Performance: <input type="checkbox"/> better <input type="checkbox"/> same <input checked="" type="checkbox"/> worse		CATEGORY (check one) <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input type="checkbox"/> SysDaemon/Admin <input type="checkbox"/> Runtime <input checked="" type="checkbox"/> User Command/Subr
DOCUMENTATION CHANGES (specify one or more) MPM (vol,sect) Commands MPAM (sect) MOSN (sect) MSAM (sect) PLMs (AN#) Info Segs pending_changes Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

Change the format of the print_link_info command (and other callers of form_link_info_) to list the entypoint names within a single class-3 definition list in alphabetical order. They are currently listed in the order generated by the translator which is not necessarily predictable.

REASONS:

It makes it easier to use print_link_info output -- particularly as seen in the cds listing segment.

IMPLICATIONS:

Since the order of entries listed is different, users depending on the order may have problems. This is not expected to be a problem.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2092</u>
TITLE: Fix bug in quota		STATUS DATE
AUTHOR: VanVleck		Written 07/29/76
SHW		Status A 08/10/76
		Expires 01/29/77
Planned for System: not applicable	Fixes Bug Number(s): not applicable	CATEGORY (check one)
Documented in MTB: not applicable	Incompatible Change: no	() Lib. Maint. Tools
User/Operations-visible Interface Change: no	Coded in: (<input checked="" type="checkbox"/>) PL/I () ALM () other-see below	() Sys. Anal. Tools
Performance: () better (<input checked="" type="checkbox"/>) same () worse		() Sys. Prog. Tools
		() 355
		() 80S
		() Salvager
DOCUMENTATION CHANGES (specify one or more)		(<input checked="" type="checkbox"/>) 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:

Change activate to set the terminal quota switch ON if vtoce.received is nonzero.

REASONS:

The system sometimes gets confused about whether a directory has a terminal quota or not, and refuses valid requests or accepts invalid requests for quota operations. This behavior occurs when the "quota received" field for becomes larger than 131071, since the system discovers terminal accounts by discovering that the received field is greater than 0.

The correct solution to this problem requires expanding the quota received field. To obtain the space to expand the field requires some modifications to the structure of a VTOC entry, and should be done when directory quota is reimplemented.

An interim fix to the problem is to assume that the directory is terminal when the received field is nonzero (instead of positive).

IMPLICATIONS:

This is a kludge but will make the system behave more reasonably until the real fix is designed.

director

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2093</u>
TITLE: Correct fs_alloc so it doesn't destroy the last specified area size		STATUS DATE
AUTHOR: Susan Barr	TVV	Written 07/29/76
		Status <u>08/10/76</u>
		Expires 01/29/77
Planned for System: MR 5.0		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
DOCUMENTATION CHANGES (specify one or more)		() Ring Zero
MPM (vol,sect) MPAM (sect)		() Ring One
MOSN (sect) MSAM (sect)		() SysDaemon/Admin
PLMs (AN#)		() Runtime
Info Segs		() User Command/Subr
Other		(X) Ring Zero
None (reason) bug fix		
REJECTION/COMMENTS:		
Long salvage required to make fix work. (Put this on yellow form and SRB).		

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

SUMMARY:

The installed version of fs_alloc sets up a block of information at the start of an area. The end of this block contains a table of permitted allocation sizes. The procedure sets the first available area to start at the same location as the last entry in the allocation size table.

PROPOSAL:

This requires a one line fix to the initial area calculation.

IMPLICATIONS: none

Ver. 3	MULTICS CHANGE REQUEST	MJG	MCR <u>2094</u>
741022			
TITLE: Detect Invalid Segment Number Arguments To display_kst_entry.			STATUS DATE
AUTHOR: Richard Bratt			Written 07/27/76
			Status <u>A09/10/76</u>
			Expires 01/27/77
Planned for System:	not applicable		CATEGORY (check one)
Fixes Bug Number(s):	not applicable		() Lib. Maint. Tools
Documented in MTB:	not applicable		(<input checked="" type="checkbox"/>) Sys. Anal. Tools
Incompatible Change:	no		() Sys. Prog. Tools
User/Operations-visible Interface Change:	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)	MPAM (sect)		() Ring One
MOSN (sect)	MSAM (sect)		() SysDaemon/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: If display_kst_entry is given a bad segment number it faults. Fix it.

Ver. 3 741022	MULTICS CHANGE REQUEST	MJG	MCR <u>2095</u>
TITLE: New Teco.			STATUS
AUTHOR: Richard Bratt			DATE
Planned for System: not applicable			Written
Fixes Bug Number(s): not applicable			Status
Documented in MTB: not applicable			Expires
Incompatible Change: no			
User/Operations-visible Interface Change: yes			
Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-see below			
Performance: <input checked="" type="checkbox"/> better <input type="checkbox"/> same <input type="checkbox"/> worse			
DOCUMENTATION CHANGES (specify one or more)			CATEGORY (check one)
MPM (vol,sect)	MPAM (sect)		<input type="checkbox"/> Lib. Maint. Tools
MOSN (sect)	MSAM (sect)		<input type="checkbox"/> Sys. Anal. Tools
PLMs (AN#) Tools			<input checked="" type="checkbox"/> Sys. Prog. Tools
Info Segs			<input type="checkbox"/> 355
Other			<input type="checkbox"/> BOS
			<input type="checkbox"/> Salvager
			<input type="checkbox"/> Ring Zero
			<input type="checkbox"/> Ring One
			<input type="checkbox"/> SysDaemon/Admin
			<input type="checkbox"/> Runtime
			<input type="checkbox"/> User Command/Subr
OBJECTIONS/COMMENTS:			

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

SUMMARY: I have a private improved teco which I would like to offer for installation.

REASON: My teco is superior to the installed teco, from which it was derived, in many ways.

- * It is better structured, containing about 70 fewer labels.
- * It treats tabs between commands as white space rather than illegal commands.
- * It is 8% faster.
- * It contains many new commands:
 - * P, (written by Mike Grady) which allows one to append to a Q register.
 - * :EI, (written by Mike Grady) which is like EI but returns success or failure as value.
 - * :=, which is like = but prints in octal.
 - * :\, which is like \ but deals in octal.
 - * EA, which allows active functions to be invoked and their value returned into Q registers.
 - * "M, which allows one to match a string with the characters to the

right of the dot.

- * :M, which acts like "M with the sense of the test inverted.
- * :M, which acts like M except it jumps rather than calls the macro.
- * ;;, which is like ; with the sense of the test inverted.
- * :<, which is like < except that all errors are caught and success or failure is returned as value (i.e. lisp errset).
- * F<, which is like < except that it returns a success value and the iteration is labeled (as we will soon see this is like the lisp catch).
- * :F<, which is like both F< and :< (i.e. it is both a catch and errset).
- * F;;, which takes a numeric value and a quoted string. The value is thrown out to the enclosing F< (or :F<) whose label matches the string (i.e. lisp throw).
- * :C, :R, and :J, which act like their uncoloned counterparts but absorb errors. If a move is before B, it is equivalent to BJ. If a move is after Z, it is equivalent to ZJ.

Note: :R, :C, :J, F<, :F<, F;;, :M, and ;; are compatible with ITS teco.

BASIC TECO COMMANDS

The most general form of a TECO command is:

m,nX/string/

where m and n are optional numeric arguments, X is the command to be executed, and /string/ is a quoted string. In most cases, the command is just one character, though in some cases, it may be two characters. Not all of the commands take arguments. Those that do generally have default values for missing arguments. Only a few commands expect quoted strings. The string must not be omitted if the command expects one. Some commands also return values; this is discussed later in "Advanced TECO Commands."

The letters chosen for commands generally have some mnemonic meanings, which are indicated in the description of each command. Unfortunately, TECO has a fairly long history, having originally been developed for editing paper tapes, and so some of the mnemonic meanings are almost lost now. As many commands as one wishes can be typed at a time. Execution of the commands does not start until after the "\$" followed by a newline character is typed. Spaces can be inserted anywhere (except in the middle of numbers) and newline characters can be inserted anywhere except between a command and its arguments.

Remember that uppercase and lowercase letters can be used interchangeably as commands.

Reading a File - EI (External Input)

EI/pathname/ reads in the file specified by pathname, which is assumed to be a standard Multics pathname. The contents of the file are inserted in the buffer at the current pointer position and then the pointer is moved to the right of the text just inserted.

Writing a File: - EO (External Output)

EO/pathname/ writes the contents of the buffer to the file specified by pathname. This command takes arguments similar to the T command; it writes out that part of the buffer which would be

Author: Richard Bratt

Date: 07/30/76

Subject: A New Teco.

I have created a new teco which may be of general interest. This document contains the prototype documentation for each command introduced. In addition to command changes, I have made teco ignore tab characters between commands. This teco, whose structure is far superior to the installed teco, is about 8% faster. This teco lives in >udd>m>rgb>s.

EXECUTING A MACRO IN A Q-REGISTER

:Mq is like Mq except that if issued within a macro, return from Mq causes the invoking macro to immediately return.

APPENDING TEXT TO A Q-REGISTER - P (aPpend)

Pq takes arguments like the X command, but appends the text that X would extract to Q-register q. The text is not deleted from the buffer and the current pointer is not moved.

READING A FILE

:EI acts like EI except that it returns a value and cannot cause an error. If the command succeeds the value returned is -1. If the command fails the value returned is 0.

TYPING OUT VALUES

:= acts like = but prints in octal.

CONVERTING NUMBERS

: acts like \ except that it deals in octal representations.

STRING COMPARISON - "M (Match)

"M/string/ If the specified string appears to the right of the pointer, then execution continues; otherwise execution skips to just after the corresponding '.

:"M/string/

acts like "M except that the sense of the test is inverted.

INVOKING AN ACTIVE FUNCTION - EA

EAq/string/

passes the specified string to the command processor's active function application entry. The result of the active function application is returned in Q-register q. The specified string should not be enclosed in square brackets.

MOVING THE POINTER

:J

acts like J except that errors cannot occur. If the pointer would be moved before B, it is moved to B. If the pointer would be moved beyond Z, it is moved to Z.

:R

acts like R except that errors cannot occur. If the pointer would be moved before B, it is moved to B. If the pointer would be moved beyond Z, it is moved to Z.

:C

acts like C except that errors cannot occur. If the pointer would be moved before B, it is moved to B. If the pointer would be moved beyond Z, it is moved to Z.

ITERATION

:<

acts like < except that it catches errors which occur within the iteration group and it returns a value. If no errors occur, the iteration group returns -1. If an error occurs, the command environment is unwound and the iteration group returns 0. The error is not printed.

F<!label!

acts like < except that it returns a value. If a F;/label/ command is executed within the iteration group, the execution environment is unwound to the innermost F<!label! iteration group and that group returns the argument of the F; command as value. If no F;/label/ command is executed then the iteration group returns -1.

:F<label! acts like both F< and :<. If an error is encountered the iteration group immediately returns 0. If a F;/label/ command is executed, the iteration group immediately returns the argument of the F; command. Finally, if the iteration group completes normally, it returns -1 as value.

TERMINATING A LOOP

:: acts like ; except that the sense of the test is inverted. If ::'s argument is negative, the innermost loop is terminated.

nF;/string/ causes the execution environment to be unwound to the innermost iteration group labeled with the given string. If no such iteration group is found, an error is reported. When the appropriate iteration group is reached, it immediately returns n as value. It should be noted that a F; command whose target does not exist causes an error even if the F; command is enclosed in an enclosed iteration group.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2096</u>
TITLE: Install status tables for disk and ope		STATUS DATE Written 08/02/76 Status <u>A 08/10/76</u> Expires 02/02/77
AUTHOR: Larry Johnson	NIM	
Planned for System: MR 5.0 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 (<input checked="" type="checkbox"/>)other-see below Performance: ()better (<input checked="" type="checkbox"/>)same ()worse		CATEGORY (check one) ()Lib. Maint. Tools (<input checked="" type="checkbox"/>)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#)		
Info Segs		
Other		
None (reason)		
OBJECTIONS/COMMENTS:		

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

Summary

Install status tables as used by analyze_device_stat_ for disks and the operator's console.

Reason

These additional tables are the only uninstalled status tables for peripheral devices. The io_error_summary command can use these tables to report disk and ope errors.

Detailed Proposal

Status tables are coded in mexp.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2097</u>								
TITLE: Fix addressing problem in patch_firmware command	AUTHOR: Larry Johnson	NIM								
Planned for System: MR 5.0	Fixes Eug Number(s): not applicable	Documented in MTB: not applicable								
Incompatible Change: no	User/Operations-visible Interface Change: no	Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-see below								
Performance: <input type="checkbox"/> better <input checked="" type="checkbox"/> same <input type="checkbox"/> worse	<table border="1"> <tr> <td>STATUS</td> <td>DATE</td> </tr> <tr> <td>Written</td> <td>08/02/76</td> </tr> <tr> <td>Status</td> <td>78/10 02/10/76</td> </tr> <tr> <td>Expires</td> <td>02/02/77</td> </tr> </table>		STATUS	DATE	Written	08/02/76	Status	78/10 02/10/76	Expires	02/02/77
STATUS	DATE									
Written	08/02/76									
Status	78/10 02/10/76									
Expires	02/02/77									
DOCUMENTATION CHANGES (specify one or more)		CATEGORY (check one)								
MPM (vol,sect)	MPAM (sect)	<input type="checkbox"/> Lib. Maint. Tools								
MOSN (sect)	MSAM (sect)	<input type="checkbox"/> Sys. Anal. Tools								
PLMs (AN#)		<input checked="" type="checkbox"/> Sys. Prog. Tools								
Info Segs		<input type="checkbox"/> 355								
Other	Hardware Diagnostic Aids	<input type="checkbox"/> BOS								
		<input type="checkbox"/> Salvager								
		<input type="checkbox"/> Ring Zero								
		<input type="checkbox"/> Ring One								
		<input type="checkbox"/> SysDaemon/Admin								
		<input type="checkbox"/> Runtime								
		<input type="checkbox"/> User Command/Subr								
OBJECTIONS/COMMENTS:										

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

Summary

Change the patch_firmware command (and dump_firmware command) to deal in absolute MPC addresses.

Reason

The patch_firmware command as originally proposed (MCR 1977), made patches by using the relative address in the firmware module. For some firmware modules, this corresponds to the absolute address, and for some it does not. Since firmware patches are generally given in terms of absolute MPC addresses, it is often necessary to relocate them manually to use the command.

Detailed Proposal

Add tests to the patch_firmware command to determine the type of firmware module being patched, and relocate the patches accordingly.

patch_firmware

patch_firmware

Name: patch_firmware

The patch_firmware command is used to patch a segment containing an image of a firmware module for an MPC.

Usage

patch_firmware path mem addr word₁ ... word_n

where:

1. path is the path name of the segment containing the firmware.
2. mem is the memory overlay to patch. This argument may be "cs" to patch the control store overlay, or "rw" to patch the read/write memory overlay.
3. addr is the starting address to patch, in hexadecimal.
4. word_i are new MPC words, in hexadecimal. All word_i must be in the range 0-FFFF. Up to 16 words can be patched with one patch_firmware command.

Notes

The patch_firmware command will display the old and new contents of each firmware word patched, as well as the checksum, before the patch is made. The user is then asked whether the patch is correct. The patch will not be made unless the user answers yes.

Firmware modules may be retrieved from the firmware tape using the load_firmware_file command. Normally, firmware modules are kept in the archive >ldd>firmware>firmware.archive.

Firmware patches are usually given as absolute memory addresses in the MPC. Since the first 512 words (200 hex) are not supplied in the distributed firmware modules (they are hard-wired in the MPC), it may be necessary to relocate patches by subtracting 200 hex from the address given.

Ver. 3	MULTICS CHANGE REQUEST	MCR <u>2099</u>
741022		
TITLE: Change combined linkage regions into areas.		STATUS DATE
AUTHOR: M. Weaver		Written 08/03/76
		Status <u>A08/10/76</u>
		Expires 02/03/77
Planned for System: MR 5.0		
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: no		() Sys. Prog. Tools
Coded in: (X)PL/I (X)ALM ()other-see below		() 355
Performance: ()better ()same (X)worse		() 80S
		() Salvager
DOCUMENTATION CHANGES (specify one or more)		() Ring Zero
MPM (vol,sect) SWG MPAM (sect)		() Ring One
MOSN (sect) MSAM (sect)		() SysDaemon/Admin
PLMs (AN#)		(X) Runtime
Info Segs		() User Command/Subr
Other		
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_\$assign_linkage, into an area. Also use the area for allocating user storage, e.g., PL/I allocations where the area isn't specified.

REASONS:

- To be able to reclaim storage used by the linkage and static sections of terminated segments.
- To simplify management of the linkage region by using the standard system area package.
- To have, in most cases, a single area replacing the combined linkage region, system_free_n and free_. This simplifies get_system_free_area_ and the PL/I compiler as well.

IMPLICATIONS:

Any user programs which think they understand the format of a combined linkage region or the system free area will probably have to be changed. This is not much of a problem since such uses are rare.

DETAILED PROPOSAL:

- The system area will have the default attributes zero_on_alloc and extend.

2. Delete some items from the lot header and combine its declaration with that of the stack header (see attached include files).

3. Add the following new pointers to the stack header:

- o a pointer to the system storage area
- o a pointer to the user storage area
- o a pointer to the area containing linkage sections (formerly the pointer to the current combined linkage region).
- o a pointer to the area containing static sections
- o a pointer to the control information for *system links (so that commands can access it).

Although all the above area pointers will normally be the same, referencing them separately will allow users to have more control over their processes.

4. Change link_man\$get_initial_linkage to initialize the linkage region as an area and to set the area pointers in the stack header.

5. Change get_system_free_area_ to return a pointer to the user storage area.

6. Install commands to change the user and system area pointers. Also install a command to create an area (see attached writeups).

7. Change link_man to allocate storage for linkage and static sections in the appropriate areas.

8. Combine lot_maintainer (now in alm) with link_man and update unsnap_service.

9. Change term_ to free linkage and static sections.

10. Change the prelinker to set/use new include files and to initialize areas.

11. Change get_next_area_ptr_ to not call get_temp_segments_ if in ring 0 or for a system area. get_temp_segments_ is not in ring 0 and system area segments normally would not be released.

12. Change print_linkage_usage to not list holes and to ignore lot/isot entries with the high order 2 bits on.

```

/* BEGIN INCLUDE FILE ... stack_header.incl v1 .. 3/72 Bill Silver */
/* modified 7/76 by M. Weaver for *system links and more system use of areas */

```

```

dcl sb ptr; /* the main pointer to the stack header */

dcl 1 stack_header based (sb) aligned,

  2 pad1 (4) fixed bin, /* (0) */
  * 2 system_free_ptr ptr, /* (4) pointer to system storage area */
  * 2 user_free_ptr ptr, /* (6) pointer to user storage area */

  2 clr_ptr ptr, /* (8) pointer to area containing linkage sections */
  2 max_lot_size fixed bin(17) unal, /* (10) number of words allowed in lot */
  2 pad2 bit (18) unal,
  2 cur_lot_size fixed bin(17) unal, /* (11) number of words (entries) in lot */

  * 2 combined_static_ptr ptr, /* (12) pointer to area containing separate static */
  * 2 sys_link_info_ptr ptr, /* (14) pointer to *system link name table */

  2 parent_ptr ptr, /* (16) pointer to parent stack or null */
  2 stack_begin_ptr ptr, /* (18) pointer to first stack frame on the stack */
  2 stack_end_ptr ptr, /* (20) pointer to next useable stack frame */
  2 lot_ptr ptr, /* (22) pointer to the lot for the current ring */

  2 signal_ptr ptr, /* (24) pointer to signal procedure for current ring
  2 bar_mode_sp ptr, /* (26) value of sp before entering bar mode */
  2 pl1_operators_ptr ptr, /* (28) pointer to pl1_operators_$operator_table */
  2 call_op_ptr ptr, /* (30) pointer to standard call operator */

  2 push_op_ptr ptr, /* (32) pointer to standard push operator */
  2 return_op_ptr ptr, /* (34) pointer to standard return operator */
  2 return_no_pop_op_ptr ptr, /* (36) pointer to standard return / no pop operator
  2 entry_op_ptr ptr, /* (38) pointer to standard entry operator */

  2 trans_op_tv_ptr ptr, /* (40) pointer to translator operator ptrs */
  2 isot_ptr ptr, /* (42) pointer to ISOT */
  2 sct_ptr ptr, /* (44) pointer to System Condition Table */
  2 unwinder_ptr ptr; /* (46) pointer to unwinder for current ring */

```

```

/* The following offset refers to a table within the pl1 operator table. */

```

```

dcl tv_offset fixed bin init(361) internal static; /* (551) octal */

```

```

/* The following constants are offsets within this transfer vector table. */

```

```
dcl tv_offset fixed bin init(361) internal static; /* (551) octal */
```

```
/* The following constants are offsets within this transfer vector table. */
```

```
dcl (call_offset fixed bin init(271),  
push_offset fixed bin init(272),  
return_offset fixed bin init(273),  
return_no_pop_offset fixed bin init(274),  
entry_offset fixed bin init(275)) internal static;
```

```
/* The following declaration is an overlay of the whole stack header. Procedures which  
move the whole stack header should use this overlay.
```

```
*/
```

```
dcl stack_header_overlay (size(stack_header)) fixed bin based (sb);
```

```
/* END INCLUDE FILE ... stack_header.incl.pl1 */
```

BEGIN INCLUDE FILE ... stack_header.lr)alm 3/72 Bill Silver

modified 7/76 by M. Weaver for *system links, tasking and more system use of areas */

equ	stack_header.system_free_ptr,4	ptr to system storage area
equ	stack_header.user_free_ptr,6	ptr to user storage area
equ	stack_header.clr_ptr,8	ptr to area containing linkage sections
equ	stack_header.max_lot_size,10	number of words allowed in lot
equ	stack_header.cur_lot_size,11	number of words (entries) in lot
equ	stack_header.combined_static_ptr,12	ptr to area containing separate static
equ	stack_header.sys_link_info_ptr,14	ptr to *system link name table
equ	stack_header.parent_ptr,16	ptr to parent stack or null
equ	stack_header.stack_begin_ptr,18	ptr to first stack frame
equ	stack_header.stack_end_ptr,20	ptr to next useable stack frame
equ	stack_header.lot_ptr,22	ptr to the lot for the current ring
equ	stack_header.signal_ptr,24	ptr to signal proc for current ring
equ	stack_header.bar_mode_sp,26	value of sp before entering bar mode
equ	stack_header.pl1_operators_ptr,28	ptr: pl1_operators_\$operator_table
equ	stack_header.call_op_ptr,30	ptr to standard call operator
equ	stack_header.push_op_ptr,32	ptr to standard push operator
equ	stack_header.return_op_ptr,34	ptr to standard return operator
equ	stack_header.ret_no_pop_op_ptr,36	ptr: stand. return/ no pop operator
equ	stack_header.entry_op_ptr,38	ptr to standard entry operator
equ	stack_header.trans_op_tv_ptr,40	ptr to table of translator operator ptrs
equ	stack_header.isot_ptr,42	pointer to ISOT
equ	stack_header.sct_ptr,44	pointer to System Condition Table
equ	stack_header.unwinder_ptr,46	pointer to unwinder for current ring
equ	stack_header_end,48	length of stack header

The following constant is an offset within the pl1 operators table.
It references a transfer vector table.

bool tv_offset,551

The following constants are offsets within this transfer vector table.

equ call_offset,tv_offset+271

equ push_offset,tv_offset+272

```
* BEGIN INCLUDE FILE -- lot.incl.pl1 S.Hebber 9/74, Modified by R. Bratt 04/76, modified by M. Weaver 7.
```

```
cl .lotp ptr;
```

```
cl 1 lot based (lotp) aligned,  
2 lp (0:9999) ptr unaligned;
```

```
/* array of packed pointers to linkage sections
```

```
cl .lotp ptr;
```

```
cl 1 .lot based (lotp) aligned,  
2 .lotp (0:9999) ptr unaligned;
```

```
cl 1 .lot1 (0:9999) aligned based,  
2 flags unaligned,  
3 fault bit (2) unaligned,  
3 system bit (1) unaligned,  
3 mbz bit (6) unaligned,  
2 fault_code fixed bin (8) unaligned,  
2 static_offset bit (18) unaligned;
```

```
END INCLUDE FILE lot.incl.pl1 */
```


set_user_storage

set_user_storage

Name: set_user_storage

The set_user_storage command establishes an area as the storage region in which normal user allocations are performed. These allocations include:

- o variables allocated by PL/I programs using an allocate statement not including an "in clause",
- o FORTRAN common blocks, and
- o PL/I external variables whose names do not contain dollar signs.

Usage

set_user_storage virtual_address

where:

1. virtual_address is the address of an initialized area. It may be either a pathname, segment number-offset combination, or reference name-entrypoint name combination.

Notes

Refer to the write-up of the create_area command.

It is recommended that the area specified be extensible.

A virtual address can assume one of the following six formats:

- o <pathname>
- o <pathname>|<octal offset>
- o <reference name>\$
- o <reference name>\$<entrypoint name>
- o <octal segment number>

set_user_storage

set_user_storage

o <octal segment number>|<octal offset>

Examples

set_user_storage free_\$free_

causes objects to be placed in the segment whose reference name is "free_" at the offset whose entrypoint name is "free_".

set_user_storage my_seg\$

causes the segment whose reference name is "my_seg" to be used. The area is assumed to be at an offset of 0 in the segment. The segment must already exist with the reference name my_seg.

set_user_storage my_seg

causes the segment whose (relative) pathname is my_seg to be used. The segment must already exist.

set_system_storage

set_system_storage

Name: set_system_storage

The set_system_storage command establishes an area as the storage region in which normal system allocations are performed.

Usage

set_system_storage virtual_address

where:

1. virtual_address is the address of an initialized area. It may be either a pathname, segment number-offset combination, or reference name-entrypoint name combination.

Notes

Refer to the write-up of the create_area command.

It is recommended that the area specified be extensible.

A virtual address can assume one of the following six formats:

- o <pathname>
- o <pathname>|<octal offset>
- o <reference name>\$
- o <reference name>\$<entrypoint name>
- o <octal segment number>
- o <octal segment number>|<octal offset>

set_system_storage

set_system_storage

Examples

set_system_storage free_\$free_

causes objects to be placed in the segment whose reference name is "free_" at the offset whose entrypoint name is "free_".

set_system_storage my_seg\$

causes the segment whose reference name is "my_seg" to be used. The area is assumed to be at an offset of 0 in the segment. The segment must already exist with the reference name my_seg.

set_system_storage my_seg

causes the segment whose (relative) pathname is my_seg to be used. The segment must already exist.

create_area

create_area

Name: create_area

The create_area command creates an area and initializes it with user specified area management control information.

Usage

create_area virtual_address -control_args-

where:

1. virtual_address is the address of the area to be created. If the segment already exists, the specified portion will still be initialized as an area.
2. control_args are optional and can be selected from the following:
 - no_freeing allows the area management mechanism to use a faster allocation strategy that never frees.
 - dont_free is used during debugging to disable the free mechanism. This does not affect the allocation strategy.
 - zero_on_alloc instructs the area management mechanism to clear blocks at allocation time.
 - zero_on_free instructs the area management mechanism to clear blocks at free time.
 - extend causes the area to be extensible, i.e., span more than one segment. This feature should be used only for perprocess, temporary areas.
 - no_temp_segs causes any extended components to be created with unique names (derived from the given name or the -ld control argument) in the same directory as the specified initial component. The default is for additional components to be placed in the process directory.
 - size n specifies the octal size, in words, of the area being created, or of the first

create_area

create_area

component if extensible.

-id string

specifies a string to be used in constructing the names of the components of extensible areas.

Note

A virtual address can assume one of the following two formats:

- o <pathname>
- o <pathname>|<octal offset>

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2100</u>
TITLE: Handle *system links		STATUS: DATE
AUTHOR: M. Heaver		Written: 08/03/76
Planned for System: MR 5.0		Status: <u>A08/10/76</u>
Fixes Bug Number(s): not applicable		Expires: 02/03/77
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: <input checked="" type="checkbox"/> PL/I () ALM () other-see below		() Sys. Prog. Tools
Performance: <input checked="" type="checkbox"/> better () same () worse		() 355
DOCUMENTATION CHANGES (specify one or more)		() BOS
MPM (vol,sect) AG92A,AK92 MPAM (sect)		() Salvager
MOSN (sect) MSAM (sect)		() Ring Zero
PLMs (AN#)		() Ring One
Info Segs		() SysDaemon/Admin
Other		<input checked="" type="checkbox"/> Runtime
		<input checked="" type="checkbox"/> User Command/Subr
OBJECTIONS/COMMENTS:		

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

SUMMARY:

Change the system to handle *system links. Call the targets of these links system managed variables or external variables; provide commands to manipulate them. Treat some type 6 links as if they were *system links.

REASONS:

*system links provide a more efficient, general and flexible method of handling language-defined external storage.

IMPLICATIONS:

PL/I external static variables and fortran labelled common with the same names will be mapped into the same storage. The length of all variables with the same name must be the same; this is not currently enforced. Variables (including common) will be accessible from command level.

DETAILED PROPOSAL:

1. Change link_snap to allocate storage for *system links in the user area, maintaining a control list in the system area (see attached documentation of control list). Put a pointer to the control list in the stack header so that commands can access it.

Make the following mappings:

- o type 6 links to stat_\$ename into *systemlename
- o type 6 links to segname.com\$null_ename into *systemisegname
- o type 6 links to b_.com\$null_ename into *systemiblink*.com
- o type 4 links to stat_\$ename with traps-before-link to datmk_ into *systemlename

systemiblink.com goes to blank common, which must be special cased; a separate segment is obtained for it and the length is not checked.

2. Change the binder to recognize and regenerate *system links. Do not change it at this time to combine type 6 and *system links. However, this means that in some cases more links will be regenerated than are really necessary.

3. Change term_ to null any init_ptrs in the control list that point to the segment being terminated. This should avoid in most cases the problem of getting garbage or a fault when trying to reinitialize variables.

4. Install the following commands for manipulating system managed variables (see attached write-ups):

```
list_external_variables
delete_external_variables
reset_external_variables
```

These commands update only the total_allocated_size and cur_num_of_variables meters (kept in the control list header).

5. Change the link_meters command to print information from the *system link meters.


```
/* BEGIN INCLUDE FILE ... system_link_names.incl.pl1 */  
/* created by M. Weaber 7/28/76 */
```

```
dc1 1 variable_table_header aligned based,          /* header for name table */  
    2 hash_table (0:63) ptr unaligned,             /* hash table for variable nodes */  
    2 total_search_time fixed bin(71),             /* total time to search for variables */  
    2 total_allocation_time fixed bin(71),         /* total time spent allocating and initializing nodes a  
    2 number_of_searches fixed bin,                 /* number of times names were looked up */  
    2 number_of_variables fixed bin,                /* number of variables allocated by the linker, incl de  
    2 cur_num_of_variables fixed bin,               /* current number of variables allocated */  
    2 number_of_steps fixed bin,                    /* total number of nodes looked at */  
    2 total_allocated_size fixed bin(35);          /* current amount of storage in user area */
```

```
dc1 1 variable_node aligned based,                  /* individual variable information */  
    2 forward_thread ptr unaligned,                 /* thread to next node off same hash bucket */  
    2 name char(32),                                 /* name of variable */  
    2 vbl_size fixed bin(19) unaligned,            /* length in words of variable */  
    2 init_type fixed bin(15) unaligned,           /* 0=not init; 3=init template; 4=area */  
    2 vbl_ptr ptr,                                  /* pointer to variable's storage */  
    2 init_ptr ptr;                                  /* pointer to original init info in object seg */
```

```
/* END INCLUDE FILE ... system_link_names.incl.pl1 */
```

The targets of *system links are created and managed by the linker. The storage for these system managed variables is allocated in the user storage area, but the control information used by the linker is allocated in the system storage area. The control information consists of a header containing a hash table and metering information and a threaded list of nodes off each hash bucket.

The header structure is declared as follows:

```
dcl 1 variable_table_header          aligned based,
    2 hash_table                      (0:63) ptr unaligned,
    2 total_search_time               fixed bin (71),
    2 total_allocation_time           fixed bin (71),
    2 number_of_searches               fixed bin,
    2 number_of_variables              fixed bin,
    2 cur_num_of_variables              fixed bin,
    2 number_of_steps                  fixed bin,
    2 total_allocated_size             fixed bin (35);
```

where:

1. hash_table is the hash table for known *system link targets. Each bucket potentially points to a threaded list of variable nodes.
2. total_search_time is the total time spent searching for a name.
3. total_allocation_time is the total time spent allocating and initializing nodes and variables.
4. number_of_searches is the number of times a search was made for a name.
5. number_of_variables is the number of variables allocated by the linker, including those deleted.
6. cur_num_of_variables is the current number of variables allocated.
7. number_of_steps is the total number of nodes inspected.
8. total_allocated_size is the current amount of storage allocated for these variables in the user storage area.

The structure describing a variable node is as follows:

```
dcl 1 variable_node      aligned based,
    2 forward_thread    ptr  unaligned,
    2 name               char(32),
    2 vbl_size           fixed bin (19) unaligned,
    2 init_type          fixed bin (15) unaligned,
    2 vbl_ptr            ptr,
    2 init_ptr           ptr;
```

where:

1. forward_thread points to the next node off the same hash bucket.
2. name is the name of the variable.
3. vbl_size is the length in words of the variable.
4. init_type indicates how the variable was initialized:
0 = initialized to zeroes;
3 = initialized with a template value;
4 = initialized as an empty area.
5. vbl_ptr points to the variable's storage.
6. init_ptr points to the original initialization information in the object segment. It is valid only if init_type = 3 and if the object segment has not been made unknown.

list_external_variables

list_external_variables

Name: list_external_variables, lxv

The list_external_variables command prints information about variables managed by the system for the user, including fortran common and PL/I external static variables whose names do not contain "\$". The default information is the location and size of each specified variable.

Usage

list_external_variables names -control_args-

where:

1. names are names of system managed variables.
2. control_args are optional and can be selected from the following:
 - unlabelled_common, -uc is the name for blank common.
 - long, -lg also prints how and when the variables were allocated.
 - all prints information for each variable the system is managing.

get_external_variable

get_external_variable

Name: get_external_variable, gxv

The get_external_variable active function returns the value (or, if desired, the location) of a variable managed by the system for the user. Such variables include fortran common and PL/I external static variables whose names do not contain "\$".

Usage

[get_external_variable name --location-]

where:

1. name Is the name of a system managed variable. The name -unlabelled_common (or -uc) represents blank common.
2. -location, -lc Is optional; if given, the output is a string of three octal numbers suitable as input to the dump_segment command.

`delete_external_variables`

`delete_external_variables`

Name: `delete_external_variables`, dxv

The `delete_external_variables` command deletes from the user's name space specified variables managed by the system for the user. All links to those variables are unsnapped and their storage is freed.

Usage

`delete_external_variables names -control_args-`

where:

1. `names` are names of system managed variables.
2. `control_args` are optional and can be selected from the following:
 - `-unlabelled_common, -uc` is the name for blank common.
 - `-all` deletes all system managed variables.

Warning: Use of this command violates PL/I environment assumptions.

reset_external_variables

reset_external_variables

Name: reset_external_variables, rev

The reset_external_variables command reinitializes system managed variables to the values they had when they were allocated.

Usage

reset_external_variables names

where:

1. names are the names of the system managed variables to be reinitialized. The name -unlabelled_common (or -uc) represents blank common.

Ver. 3	MULTICS CHANGE REQUEST	MCR_ <u>2102</u>
741022		
TITLE: Make string active function work as command		STATUS DATE
AUTHOR: Gary C. Dixon	TW	Written 07/27/76
		Status <u>A08/10/76</u>
		Expires 01/27/77
Planned for System: MR 5.0		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: yes		() 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) Commands MPAM (sect)		() Ring One
MOSN (sect) MSAM (sect)		() SysDaemon/Admin
PLMs (AN#)		() Runtime
Info Segs		<input checked="" type="checkbox"/> User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY: Make the string active function work as a command.

REASONS: Provide a simple facility for outputting all results of an active function to test its operation; provide a replacement for the AML command print_string by extending this SSS active function in a natural way.

IMPLICATIONS: Non-MIT users will have this facility.

Ver. 3
741022

MULTICS CHANGE REQUEST

MCR 2103

TITLE: Meter directory activations.

AUTHOR: Bernard Greenberg

STATUS	DATE
written	08/04/76
Status	<i>TVV</i> 08/10/76
Expires	02/04/77

Planned for System: MR 5.0
 Fixes Bug Number(s): not applicable
 Documented in MTE: 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
- BCS
- Salvager
- Ring Zero
- Ring One
- SysDaemon/Admin
- Runtime
- User Command/Subr

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect) MPAM (sect)
 MCSM (sect) MSAM (sect)
 FLMS (AN#) 61
 Info Segs
 Other

OBJECTIONS/COMMENTS:

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

SUMMARY: Some schemes under consideration for validating quota used after a crash involve an overhead per directory activation. In order to ascertain the tradeoffs of such schemes, the number of directory activations per activation must be known. Meter them.

REASONS: More knowledge about behavior of system.

IMPLICATIONS: One instruction extra per directory activation.

Change file system meters to report the number of all activation and directory activations.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2104</u>
TITLE: Fix CDS bugs.		STATUS DATE
AUTHOR: Leonard Greenberg		Written 08/04/76
		Status <u>AOB/10/76</u>
		Expires 02/04/77
Planned for System: MR 5.0		CATEGORY (check one)
Fixes Bug Number(s): not applicable		() Lib. Maint. Tools
Documented in MTB: not applicable		() Sys. Anal. Tools
Incompatible Change: no		(<input checked="" type="checkbox"/>) Sys. Prog. Tools
User/Operations-visible Interface Change: no		() 355
Coded in: (<input checked="" type="checkbox"/>) FL/I () ALM () other-see below		() BOS
Performance: () better (<input checked="" type="checkbox"/>) same () worse		() Salvager
DOCUMENTATION CHANGES (specify one or more)		() Ring Zero
MFM (vol,sect) MPAM (sect)		() Ring One
MOSM (sect) MSAM (sect)		() SysDaemon/Admin
FLMs (AN#) 51		() Runtime
Info Segs		() User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

SHW

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

SUMMARY: Fix the following bugs in create_data_segment and create_data_segment_:

- 1) The source map is not forced to an even boundary. This causes date-times to be stored incorrectly.
- 2) Odd text/static section lengths, when supplied, cause a random pad word to be copied into the object segment. This pad should be zero to make compare_object output concur when appropriate.
- 3) The create_data_segment command does not properly handle input arguments of the form x.cds, as opposed to x. Ead listing segment names are created.

HICPCSAL: Fix these bugs.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>2105</u>
TITLE: Clean up disk rebuilder interface, integrate with disk initializer.		STATUS
AUTHOR: Bernard Greenberg		Written 08/04/76
Planned for System: MR 5.0 Fixes Bug Number(s): not applicable Documented in MTE: not applicable Incompatible Change: yes User/Operations-visible Interface Change: no Coded in: (<input checked="" type="checkbox"/>)PL/I (<input type="checkbox"/>)ALM (<input type="checkbox"/>)other-see below Performance: (<input type="checkbox"/>)better (<input checked="" type="checkbox"/>)same (<input type="checkbox"/>)worse		Status <u>A 08/10/76</u>
		Expires 02/04/77
		CATEGORY (check one)
DOCUMENTATION CHANGES (specify one or more)		() Lib. Maint. Tools
MPN (vol,sect)	MPAM (sect)	() Sys. Anal. Tools
MCSN (sect) moh	MSAM (sect)	() Sys. Prog. Tools
PLMs (AN#)		() 355
Info Segs		() EOS
Other		() Salvager
OBJECTIONS/COMMENTS:		() Ring Zero
		(<input checked="" type="checkbox"/>) Ring One
		() SysDaemon/Admin
		() Runtime
		() User Command/Subr

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

SUMMARY: Change some messages printed out by the disk rebuilder (a ring e initializer tool) to print out drive names instead of PVT indices. Integrate the disk rebuilder control language with that of the volume initializer by commoning the [now duplicated] interaction code into a separate program. Add the "nvtoce" request to augment the "vtoc" request to specify VTOC size.

REASONS: Messages printed by the disk rebuild program do not discuss drives in the standard fashion. Much code is duplicated between the disk pack initializer and the disk rebuilder, interpreting two control languages that are essentially the same. The "nvtoce" request, specifying a number of VTOC entries to be created on the disk, will be needed by the new Reloader.

IMPLICATIONS: Documentation change; see attached.

(description of init_vol initializer command)

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vtoc nnn specifies the number of records to be dedicated to the Volume Table of Contents and Volume Header.

nvtoce nnn specifies the number of Volume Table of Contents (VTOC) entries to be allocated on the new volume.

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And the same shall be placed in the writeup of rebuild_disk;

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The following bit of disk_rebuild, a useful item, comes over to init_vol:

startover causes all information input from requests to be scrapped, and the request loop to be started over.

(END)