To: Distribution

From: Betsy

Date: April 5, 1976

Subject: MCR's 3/16 - 31/76

Attached are the approved MCR's from March 16 - 31, 1976

Ver. 4
750508

Multics Change Request

MCR 1688
Page 1 of 1

TITLE: Improve Prelinker's user interface

AUTHOR: Richard Bratt RAB

STATUS	DATE
Written	2/27/76
Status	P 03/09/76 A 3/30/76
Expires	9/30/76

-Coded in: [X] PL/I [ ] ALM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-Fixes Bug Number(s)
-Documented in MTB
-User/Operations-visible Interface change? [X] yes [ ] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [X] Same [ ] Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
X	User Cmnd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	No plm yet written

Objections/Comments:

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

SUMMARY:

1. Allow the directory to be prelinked to be specified by relative pathname.

2. If no pathname is given, have the prelink command prelink the subsystem defined by the pldt in the working directory.

3. Implement a new option to the prelinker, "-delete" or"-dl", which specifies that the prelinked system contained in the specified directory is to be deleted rather than recreated

REASONS: Make prelinker easier to use.

Multics Change Request

MCR 1693
Page 1 of 1

TITLE: Fix several Answering Service bugs and problems

AUTHOR: Paul Green TVV

STATUS	DATE
Written	02-25-76
Status	P 3/9/76 A 3/30/76
Expires	9/30/76

-Coded in: ☑ PL/I ☐ ALM ☐ other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-Fixes Bug Number(s) MRF 9150
-Documented in MTB
-User/Operations-visible Interface change? ☐ yes ☑ no
-Incompatible change? ☐ yes ☑ no
-Performance: ☐ Better ☑ Same ☐ Worse
-Replaces MCR

Category (Check One)

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

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	AN66
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY: 1) Do a resetread before reading login line.
2) Do a resetread after bad login words.
3) Fix DETACH to not fault.
4) Fix test mode to work.
5) Fix fault recovery problems in as_dump_.
6) Fix answering service to change terminal modes (and line length) to defaults after logout or a fatal process error, and not after new_proc.

Reasons: 1) GM has reported problems with terminals that have multi-line answerbacks. The resetread is necessary to discard any "left-over" answerback characters.

2) It is possible, by fast typing, to get the answering service to print your password if you misspell login.

3) Bug.

4) Bug.

5) as_dump_ shouldn't invoke the message coordinator when it is called by the message coordinator.

6) Modes are advertised as per-session, not per-process. They should be reset after a fatal process error in case the process was in raw input or raw output mode.

Implications:
1) Will not be able to type ahead login line (and password).

2-6) None.

Ver. 3
741022 MULTICS CHANGE REQUEST

MCR 1699

TITLE: Temporary emergency fix to tty_read

AUTHOR: Robert S. Coren JWG

STATUS	DATE
Written	03/03/76
Status	A 3/16/76
Expires	03/03/76

Planned for System: 3.1
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

DOCUMENTATION CHANGES (specify one or more)
MPM (vol,sect) MPAM (sect)
MDSM (sect) MSAM (sect)
PLMS (AM#)
Info Segs
Other
None (reason) bug fix

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

OBJECTIONS/COMMENTS:

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

SUMMARY: Fix bug whereby faulty prescan in tty_read was causing confusion in tty_write, which has caused at least two crashes at MIT.

REASONS: Crashes are undesirable.

IMPLICATIONS: None.

DETAILED PROPOSAL: Remove update of column position from tty_read prescan procedure.

NOTE: The new version of the TTY DIM planned for AM4.0 will eliminate this problem since prescan will be removed. This MCR proposes a quick and dirty interim fix.

Ver. 4
750508

Multics Change Request

MCR 1700
Page 1 of 1

TITLE: Install prelink driver tables for FAST and DFAST

AUTHOR: S. Barr TVV

STATUS	DATE
Written	3/9/76
Status	A 3/16/76
Expires	9/16/76

DOCUMENTATION CHANGES

-Coded in: [X] PL/I [ ] ALM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR 3.1
-Fixes Bug Number(s)
-Documented in MTB
-User/Operations-visible Interface change? [ ] yes [ ] no
-Incompatible change? [ ] yes [ ] no
-Performance: [ ] Better [ ] Same [ ] Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmmd/Subr.
x	Subsystem

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

Objections/Comments:

SRB doc required

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

Summary:

Install the prelinked driver tables in >tools in an analogous manner to the administration exec_coms.

Reasons:

Prelinked subsystems must be prelinked at each boot of the system. A call to do this must be added to the system_start_up.ec and a directory for each subsystem to be prelinked must be created to hold the pldt and the associated segments.

Detailed Proposal:

Install fast.pldt and dfast.pldt in >tools.

Implications:

A site that wishes to run a prelinked version of FAST or DFAST subsystems will follow these steps:

1) Create a directory for the subsystem.
2) Create a link in that directory to the proper pldt with the name "pldt". (If the site wished to modify the driver table, it would copy the original segment from >tools.)
3) Add a line to part 2 of the system_start_up.ec of the form:

   prelink path

   where path is the abolute pathname of the directory to be prelinked.

Multics Change Request

TITLE: Fix Bugs in cv_cmf

AUTHOR: T. Casey JWG

STATUS	DATE
Written	March 4, 1976
Status	A 3/16/76
Expires	9/16/76

-Coded in: ☐ PL/I ☐ ALM ☒ other- explain in DETAILED PROPOSAL
-Planned for System MR 3.1
-Fixes Bug Number(s) unreported
-Documented in MTB
-User/Operations-visible Interface change? ☐ yes ☒ no
-Incompatible change? ☐ yes ☒ no
-Performance: ☐ Better ☒ Same ☐ Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
X	SysDaemon/Admin.
	Runtime
	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	No interface change

Objections/Comments:

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

SUMMARY:

Change error checking in cv_cmf so that:

1) The check for printable ascii characters in comment statements allows all printable characters, including tabs and other special characters;

2) Brief error messages (printed at the second and subsequent occurrences of the same error) will contain some part of the offending statement, where appropriate, rather than just the error number.

REASONS :

The current cv_cmf will not compile the cmf that is generated by the create_cmf command, and the error messages produceed by the attempt to compile it consist of nothing but the error number and severity, with no indication of which statement is in error.

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750508

Multics Change Request

MCR 1702
Page 1 of 1

TITLE: Allow ntape_ to handle multifile tapes

AUTHOR: Richard Bratt JWG

STATUS	DATE
Written	3/3/76
Status	A 3/16/76
Expires	9/16/76

-Coded in: [X] PL/I [ ] AIM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-Fixes Bug Number(s)
-Documented in MTB
-User/Operations-visible Interface change? [X] yes [ ] no
-Incompatible change? [X] yes [ ] no
-Performance: [ ] Better [X] Same [ ] Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
X	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	AG93
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:
Pending changes notice, clarify user doc on passing end of real information

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

SUMMARY: Currently ntape_ refuses to read or skip past a tape mark. This renders it useless in reading multi file tapes.

PROPOSAL: allow ntape_ to read or skip past a tape mark.

IMPLICATIONS:

1. Many more tapes will be readable by ntape_
2. Current programs which depend upon read returning error_table_$end_of_info repeatedly when a tape mark is encountered may stop working.

However, since ntape_ fails to detect end_of_information (sec MCR 1678), the number of programs in this class most be zero.

Ver. 4
750508

Multics Change Request

JWG

MCR 1703
Page 1 of 1

TITLE: Install new command compare_command_output

AUTHOR: Steve Herbst

STATUS	DATE
Written	3/3/76
Status	P 3/16/76 A 03/29/76
Expires	09/23/76

DOCUMENTATION CHANGES

-Coded in: [X] PL/I [ ] ALM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-Fixes Bug Number(s) X
-Documented in MTB
-User/Operations-visible Interface change? [ ] yes [ ] no
-Incompatible change? [ ] yes [ ] no
-Performance: [ ] Better [ ] Same [ ] Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
X	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	AN51
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:
explain how it affects environment in user doc.

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

SUMMARY:

Install the new command compare_command_output, used to compare the operation of two different versions of the same command.

For MCR 1703 (1)

Name: compare_command_output

This command executes two versions of another command and compares their output.

Usage:

```
compare_command_output pathA pathB
                       -control_args- --ag args-
```

where:

1. pathA is the pathname of a command.

2. pathB is the pathname of a different version of the same command.

3. control_args can be:

   -after LINE Execute the command line LINE (in quotes) after executing each version of the command being tested.

   -before LINE Execute the command line LINE (in quotes) before executing each version of the command being tested.

   -brief Direct both user_output and error_output to temporary segments in the process directory, and print only the discrepancies. The default is to leave user_output and error_output attached as they are.

4. -ag args specifies the arguments to be passed to the two commands pathA and pathB. All arguments to compare_command_output following -ag are interpreted as such.

Notes:

The compare_command_output command executes the following in order:

1. The -before command line, if present.
2. The version specified by pathA.
3. The -after command line, if present.
4. The -before command line again.
5. The version specified by pathB.
6. The -after command line again.

If the -brief control argument is specified, user_output and error_output are both attached to a temporary segment for A's output, steps 1, 2, and 3 are executed, user_output and error_output are re-attached to another temporary segment for B's

For MCR 1703 (2)

output, and steps 4, 5, and 6 are executed. The compare_ascii command is invoked then to compare the contents of the two temporary segments.

To compare the same two commands with a variety of arguments, it is convenient to define an abbreviation for the beginning of the compare_command_output command line through -ag.

Example:

To compare the operation of two versions of the archive command on the same archive, keep a permanent archive somewhere and use a -before command line to make a temporary copy. Use an -after command line to print the contents of the archive after each execution.

```
compare_command_output >sss>ac ac -brief
     -before "copy real.archive temp.archive"
     -after "pr temp.archive 1;dl temp.archive"
```

Because of the -brief control argument, the user sees only the discrepancies in the printed output, labelled A and B.

Name: ntape_

This I/O module supports I/O from/to files on magnetic tape.

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

Attach Description

The attach description has the following form:

```
ntape_ reel_num -control_arg -optional_args-
```

where:

1. reel_num — is the tape reel number. If the tape is 7-track, reel_num must contain ",7track". If the tape is 9-track, reel_num may contain ",9track" (if it contains neither, 9-track is assumed).

2. control_arg — must be -raw to indicate that each physical record (block) on the tape represents one logical record.

3. optional_args — may be one of the following arguments:

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

   -extend — specifies extension of the file if it already exists on the tape.

Opening

The opening modes supported are sequential_input, sequential_output, and sequential_input_output. If an I/O switch attached via the ntape_ I/O module is to be opened for output or input_output, the -write argument must occur in the attach description.

Control Operation

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

Modes Operation

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

Notes

A.) Using the -raw control argument, the relation between logical and physical record is as follows:

1. On input, the logical record contains m=4*ceil(n/36) bytes, where n is the number of data bits in the physical record. The first n bits of the input record are the data bits, the last (9+m-n) bits are 0's.

2. On output, the physical record contains n=k*ceil((36*ceil(m/4))/k) data bits, where k+1 is the number of tracks on the tape, and m is the length of the logical record in characters. The first 9+m data bits of the physical record contain the bits of the logical record (i.e., the output buffer). The last (n-9+m) bits of the physical record are 0's.

B.) ntape_ allows a user to read and skip past ~~tape~~ marks. It is thus the user's responsibility to detect the logical end of tape.

That is, ~~end of~~ error_table_$ end_of_info is returned when a tape mark is ~~read~~ detected but subsequent ~~read or skip~~ operations ~~will be~~ are allowed.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1704
TITLE: read parity error recovery for tape_ansi_		STATUS / DATE
AUTHOR: Ross E. Klinser MDM		Written: 03/01/76 Status: A 3/16/76
Planned for System: 4.0 Fixes Bug Number(s): not applicable Documented in MTB: not applicable Incompatible Change: yes User/Operations-visible Interface Change: yes Coded in: (X)PL/I ( )ALM ( )other-see below Performance: ( )better (X)same ( )worse		Expires: 09/01/76 CATEGORY (check one) ( )Lib. Maint. Tools ( )Sys. Anal. Tools ( )Sys. Prog. Tools ( )355 ( )BOS ( )Salvager ( )Ring Zero ( )Ring One ( )SysDaemon/Admin ( )Runtime (X)User Command/Subr
DOCUMENTATION CHANGES (specify one or more) MPM (vol,sect) AG93 MPAM (sect) MOSN (sect) MSAM (sect) PLMs (AN#) 57 Info Segs tape_ansi_change.info Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

1) modify tape_ansi_ and tape_ibm_ to return a data record even though that record was read with a parity-type error. Currently no data record is returned.

2) Provide a new control operation, "reset_error_lock", that resets the logical record I/O lock only if its value is error_table_$tape_error (indicating a parity-type error), and only if the I/O switch is open for sequential_input. Currently, the I/O switch is permanently inhibited from further reading once a parity-type error occurs.

REASONS:

1) It is desirable to have access to the bad record, either to print it, attempt to use it, etc.

2) many users have expressed the desire to be able to continue processing once such a bad record has been read. The specific mechanism of a one-time-only unlocking operation is proposed because continuing to process can have non-trivial results. If records are blocked, there is no way of determining which of the n records in a block actually contains the bad data. The record for which the tape error is returned may in fact be completely valid. If the record format is spanned, SCW's (segment control words) may have been insidiously modified so as to invalidate subsequent blocks, etc. Nevertheless, some mechanism that is not amenable to careless use should be provided.

IMPLICATIONS:

1) iox_$read_record calls which return error_table_$tape_error will no longer necessarily also return non-zero record lengths.

2) iox_ level users will be able to recover from parity-type errors, completely reliably in U, F, D, and V formats, less so in FB, VB, DB, S, SB, VVS, and VBS.

DETAILED PROPOSAL: see attached

Error Processing (See reset_error_lock OPERATION, below.)

If an error occurs while reading, the I/O module makes 25 attempts to backspace and reread. If an error occurs while writing, the I/O module makes 10 attempts to backspace, erase, and rewrite. Should an unrecoverable error occur while reading or writing, the I/O module "locks" the file so that no further I/O is possible. If an unrecoverable error occurs while writing file labels or tapemarks, the user is queried about preserving the defective file versus file set consistency. (See "Queries" above.) If an unrecoverable error occurs during certain phases of volume switching or label reading, the I/O switch may be closed. The overriding concern of the error recovery strategy is:

1. to maintain a consistent file set structure
2. to ensure the validity of data read or written

Close Operation

The I/O switch must be open.

Control Operation

The I/O module supports nine control operations.

reset_error_lock
hardware_status feov
status close_rewind
volume_status retain_all
file_status retain_none

In the descriptions below, info_ptr is the information pointer specified in an iox_$control entry point call.

(See file_status OPERATION, below.)

reset_error_lock OPERATION

This operation "unlocks" the file so that further I/O is possible subsequent to a parity-type I/O error while reading. Such an error is indicated by a previous iox_$read_record or iox_$position call having returned the status code error_table_$tape_error. In this case, the value of tape_file_status.event_lock is error_table_$tape_error. The I/O switch must be open for sequential_input. The info_ptr should be a null pointer.

ANY NOTE: IF RECORDS ARE BLOCKED AND/OR SPANNED, THE VALIDITY OF ~~THOSE~~ RECORDS READ SUBSEQUENT TO A PARITY-TYPE I/O ERROR IS NOT GUARANTEED. (The parity error is reported for the first logical record in the block; the actual location of the error in the block is unknown.)

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750508

Multics Change Request

MCR 1705
Page 1 of 1

TITLE: Solve MCS input interruption problems

AUTHOR: Grady JWG

STATUS	DATE
Written	3/7/76
Status	A 3/16/76
Expires	9/16/76

DOCUMENTATION CHANGES

-Coded in: ☐ PL/I ☐ ALM ☒ other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-Fixes Bug Number(s)
-Documented in MTB 259
-User/Operations-visible Interface change? ☒ yes ☐ no
-Incompatible change? ☐ yes ☒ no
-Performance: ☐ Better ☒ Same ☐ Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
X	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

Document	Specify One or More
MPM (Vol, Sect.)	subroutines
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	TTY-changes-info
Other (Name)	
None (Reason)	

Objections/Comments:
Pending changes, notification of incompatible change

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

SUMMARY: Implement the solutions to the input interruption problems described in MTB-259

REASONS: These problems are annoying and have been the subject of many MPRF'S

DETAILED Proposal:
Coded in 355 map

IMPLICATIONS: command_query and accept_message can be changed to not issue extra new line

Ver. 3
74 1022 MULTICS CHANGE REQUEST

MCR 1706

TITLE: Fix gen_sst_card for new storage system.

AUTHOR: VanVleck

STATUS	DATE
Written	03/03/76
Status	A 3/16/76
Expires	09/03/76

Planned for System: MR 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

CATEGORY (check one)
( )Lib. Maint. Tools
( )Sys. Anal. Tools
(X)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#) tools
Info Segs
Other

OBJECTIONS/COMMENTS:

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

SUMMARY: Change gen_sst_card to work for the new storage system.

REASONS: The size of the ASTE and the layout of the SST changed with system 28-0.

IMPLICATIONS: none

Ver. 3
74 1022 MULTICS CHANGE REQUEST

MCR 1707

TITLE: Reload logical volume ID

AUTHOR: VanVleck

STATUS	DATE
Written	03/03/76
Status	A 3/16/76
Expires	09/03/76

Planned for System: MR 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect) MPAM (sect)
MCSN (sect) a)01 MSAM (sect)
PLMs (AN#)
Info Segs
Other

CATEGORY (check one)

( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
( )Ring Zero
( )Ring One
(X)SysDaemon/Admin
( )Runtime
( )User Command/Subr

OBJECTIONS/COMMENTS:

SRB explanation needed

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

SUMMARY: Modify the reloader to reload the sons_lvid attribute of a directory. Add a new argument, "-no_lv" to the reloader to indicate that the logical volume ID should be ignored while reloading. Verify that all logical volume ID's used are valid before inserting them into the hardcore.

REASONS: When an installation does a complete reload, the result of the reload should be the same as the hierarchy when it was dumped, as far as logical volume membership. The "-no_lv" argument is necessary because otherwise attempts to reload a dump tape made at one installation onto another installation would incorrectly attempt to put the logical volume unique ID into the hardcore. When this action is done as part of a cross-system reload, the unique ID is invalid and the contents of the tape cannot be loaded.

IMPLICATIONS: An extra call to the hardcore and a call to mdc_ will be made for each directory reloaded in the regular case; in the cross-site case an additional argument must be specified.

Since hphcs_$set_sons_lvid doesn't set the sons_lvid if there are already segments in the directory, in order to avoid creating invalid directories with sons on more than one volume, an installation may over-ride the LVIDs on a reload tape by creating directories in advance, setting the sons_lvid as desired, creating a segment in them, and reloading with "-notrim".

Ver. 3
741022 MULTICS CHANGE REQUEST

MCR 1708

TITLE: Make I/O priority depend on scheduling priority.

AUTHOR: VanVleck

STATUS	DATE
Written	03/03/76
Status	A 3/16/76
Expires	09/03/76

Planned for System: MR 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )AIM ( )other-see below
Performance: ( )better (X)same ( )worse

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect) MPAM (sect)
MOSN (sect) MSAM (sect)
PLMs (AN#) an61
Info Segs
Other

CATEGORY (check one)

( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
(X)Ring Zero
( )Ring One
( )SysDaemon/Admin
( )Runtime
( )User Command/Subr

OBJECTIONS/COMMENTS:

Observe performance at MIT when installed.

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

SUMMARY: The disk DIM gives priority to some I/O requests and not to others. Currently all page and VTOCE reads have priority and no writes have priority. Change the disk DIM so that page reads and VTOCE reads and writes have priority if issued by a process which has its prds$level (depth in the traffic controller eligibility queue) less than the number of CPU's on the system.

REASONS: Performance experimentation indicates that this change allows the processes with the highest dispatching priority to complete their I/O faster, and so improves system throughput and response. More complicated optimizations have been proposed, such as sorting the requests according to multiprogramming depth, and these will be evaluated and considered for later installation. This change is easy and should provide much of the expected benefit.

IMPLICATIONS: In tests on the CISL machine, an improvement of about 3 to 5 percent was noticed.

Ver. 3
741022 MULTICS CHANGE REQUEST

MCR 1709

TITLE: Per-drive metering in disk DIM

AUTHOR: VanVleck

STATUS	DATE
Written	03/03/76
Status	A 3/16/76
Expires	09/03/76

Planned for System: MR 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X) PL/I ( ) ALM ( ) other-see below
Performance: ( ) better (X) same ( ) worse

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

DOCUMENTATION CHANGES (specify one or more)
MPM (vol,sect) MPAM (sect)
MCSN (sect) MSAM (sect)
PLMs (AN#) AN61
Info Segs
Other

OBJECTIONS/COMMENTS:

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

SUMMARY: Add metering to the hardcore disk DIM to measure the number of VTOC and page reads and writes and the total seek distance on a per-drive basis. A command to print meters will be made available.

REASONS: When attempting to analyze the performance of the system we need to be able to confirm or deny the existence of an I/O bottleneck on a particular drive.

IMPLICATIONS: More wired-down storage is required; 192 words per disk subsystem.

Ver. 4
750508

Multics Change Request

MCR 1710
Page ____ of ____

TITLE: Install FAST run unit manager

AUTHOR: M. Weaver MDM

STATUS	DATE
Written	3/10/76
Status	A 3/16/76
Expires	9/16/76

DOCUMENTATION CHANGES

-Coded in: [XX] PL/I [ ] ALM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR 3.1
-Fixes Bug Number(s) ____
-Documented in MTB ____
-User/Operations-visible Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [ ] Same [ ] Worse
-Replaces MCR ____

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
X	Runtime
	User Cmnd/Subr.

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	User interface covered in language and FAST manual

Objections/Comments:

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

Summary: Install the run unit manager for FAST.

Reasons: Needed to run user programs in FAST. A general Multics run command would take too long to implement for 3.1 and may not be ideal for FAST anyway.

Detailed Proposal: The run unit manager implements most of the FAST run command (any compilation is done beforehand). In FAST, all user programs are executed within a run unit so that each program's storage can be isolated. The run unit's search rules are the main program* and working directory only. Fortran and basic programs may not be mixed within a run unit. pl1 and alm programs may be called but they do not run in the run unit in that any static or links are handled by the system linker and remain after the run unit terminates. A single temporary scratch segment is used to store name lists, linkage sections, etc. and for language runtime use; this is truncated at the end of the run unit.

The run unit manager's steps are as follows:

1) Identify all subprograms in main program if it was compiled or part of the run.

2) Allocate all common blocks and snap all links. This step applies only to fortran programs.

3) Execute programs.

4) Recover all storage, terminating basic/fortran segments.

*If the program was compiled by the run command.

The run unit manager will be called by the FAST command processor as follows:

```
declare fast_run_unit_manager_ entry(ptr, fixed bin(24),
   1 aligned,
   2 bit(1) unal,
   2 bit(1) unal,
   2 bit(1) unal, char(32) varying, fixed bin(35));

call fast_run_unit_manager_ (object_ptr, object_bc, flags,
main_ename, code);
```

where:

1. object_ptr — points to the main program to be executed. (Input)

2. object_bc — is the bit count of the main program. (Input)

3. flags — is a structure of control info declared as follows:

```
dcl 1 flags aligned,
    2 just_compiled bit(1) unal,
    2 brief bit(1) unal,
    2 probe bit(1) unal,
    2 mbz bit(33) unal;
```

and

   a. just_compiled — is ON if the object segment was just compiled as a result of this run command and its entry names should be used as the "artificial" reference names. Also its static and linkage will not be copied.

   b. brief — is ON if warning messages such as unresolved links are to be inhibited. This may somehow be associated with ready_on / ready_off.

   c. probe — is ON if the program is to be run under control of the debugger. (not initially implemented.)

4. main_ename is the name of the main entry point. (Input)

5. code is a returned status code. (Output).

The following entry is called by the basic linker:

```
declare fast_run_unit_manager_$find_entry_value entry (char(32),
    ptr, fixed bin (35));

call fast_run_unit_manager_$find_entry_value (entname, entptr, code);
```

where:

1) entname is the name of the entrypoint to find.(Input)

2) entptr points to the specified entrypoint. (Output)

3) code is nonzero if entname is not found in the run unit's name space.

Ver. 3
741022 MULTICS CHANGE REQUEST

MCR 1711

TITLE: Improvement to indent

AUTHOR: Larry Johnson NIM

STATUS	DATE
Written	03/01/76
Status	A 3/16/76
Expires	09/01/76

Planned for System: 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: yes
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect) MPAM (sect)
MOSN (sect) MSAM (sect)
PLMs (AN#)
Info Segs
Other
None (reason)

CATEGORY (check one)

( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
( )Ring Zero
( )Ring One
( )SysDaemon/Admin
( )Runtime
(X)User Command/Subr

OBJECTIONS/COMMENTS:

Pending changes

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

Summary

The indent command currently will indent the line:

<NP>

to

<TAB><NP>

where <TAB> is a tab to the current indent level. Also, the line is considered non-blank, so that a comment on the next line (actually the top of the next page) is indented to column 60.

A more reasonable way to handle this case would be not to indent the <NP>, and consider the line blank so that the following comment would not be indented.

Detailed Proposal

The indent command will change every line consisting of white space and a new-page character to the sequence <NP> , which will be considered a blank line. Lines inside of quoted strings, of course, would not be affected.

Ver. 3
741022 MULTICS CHANGE REQUEST

MCR 1712

TITLE: Implement iox_ control operations from command level

AUTHOR: Larry Johnson JWG

STATUS	DATE
Written	03/05/76
Status	A 3/16/76
Expires	09/05/76

Planned for System: 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: yes
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse
Replaces MCR: 1497

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect) CMD, SUBR MPAM (sect)
MOSN (sect) MSAM (sect)
PLMs (AN#)
Info Segs
Other SWG

CATEGORY (check one)

( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
( )Ring Zero
( )Ring One
( )SysDaemon/Admin
( )Runtime
(X)User Command/Subr

OBJECTIONS/COMMENTS:

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

Summary

Implement a new order call for the io_call command to use to perform control operations. Ultimately, all I/O modules should support this new order.

Reasons

The current io_call command is unable to implement many of the control operations provided by the I/O modules because it does not attempt to provide the info structure they require. The pointer to this structure is always set to null(). It is not feasable for io_call to construct and/or interpret these structures because there are so many different formats (at least 12 in the currently installed I/O modules, with more planned in the future).

Detailed proposal

This proposal calls for I/O modules to optionally implement an additional order call to be used by the io_call command to perform these control operations. How this order will work is explained in the documentation to be added to the SWG (See page 3, Support for the io_call control command).

Documentation changes

Since the format of the io_call command control operation will differ according to the I/O module and the specific order call, it would not be appropriate to include all the different command formats in the io_call command description. Therefore, each I/O module should include a section entitled "Implementation of the control operation of the io_call command", or something similar. The explanation of the control operation in the io_call command should be changed to direct the reader to this section of the I/O module description. Finally, an explanation of the io_call order should be added to the SWG under "Writing an I/O module".

--- MPM SUBROUTINES ---

The following is a sample showing how the tty_ I/O module order calls would be performed. Similiar sections should be added to the other I/O module descriptions.

Implementation of the control operation of the io call command

All control orders can be performed using the io_call command. The general format is:

io_call control switchname order -optional_arg-

where:

1. order is any of the control operations previously listed.
2. optional_arg is required only for the control operations shown below.

io_call control switchname store_id new_id

where new_id is the 4-character string to be stored as the terminal answer-back.

io_call control switchname set_type new_type

where new_type is a decimal number representing the type number of the terminal.

--- MPM COMMANDS ---

The following should replace the section of io_call describing the control operation.

Operation: control

io_call control switchname order -optional_args-

where:

1. order is the control order to be performed.

2. optional_args are additional arguments required by some I/O modules for certain control orders.

This command applies only when the I/O switch is attached via an I/O module that supports the control I/O operation. The exact format of the command depends on which I/O module is being used, and which control order is being performed. Consult the I/O module description in the MPM Subroutines for more details.

--- SWG ---

The following should be added to the section on "Writing an I/O module".

Support for the io call control command

To facilitate control operations from command level (via the io_call command), an I/O module that implements the control operation should also implement the "io_call" control order. Briefly, this order works as follows: whenever the io_call command must perform a control operation, it will call iox_$control to perform the "io_call" order with a pointer to the structure described below. It is the job of the I/O module to interpret the structure and execute the real order call that was to be performed.

The format of the info structure on the io_call order is as follows (This structure will be contained in io_call_info.incl.pl1):

```
dcl 1 io_call_info aligned,
    2 caller_name char(32),
    2 order_name char(32),
    2 nargs fixed bin,
    2 max_arglen fixed bin,
    2 args (0 refer (io_call_info.nargs))
      char (0 refer (io_call_info.max_arglen)) varying;
```

where:

1. caller_name is the name of the caller to be used in com_err_ calls.

2. order_name is the name or the order from the callers command line.

3. nargs is the number of arguments in the arg array.

4. max_arglen is the length of the longest argument.

5. args are the arguments from the command line.

The following steps describe how an I/O module could implement the io_call order. Other ways, of course, are possible.

1. Check to see if the order is one that requires an info structure. If not, just return error_table_$no_operation. The io_call command will recall iox_$control with the **original** order and a null info pointer.

2. If an info structure is required, it should be constructed. This may involve the interpretation of the arg array.

3. Call iox_$control recursively, using the info structure just constructed.

4. Finally, if the structure contains output values, these may be printed, if this is useful. For large structures, it is conceivable that the arg array could contain control arguments to select what is being printed.

The procedure has two alternatives to choose from to report an error. First, it may simply return a non-zero status code to io_call, in which case the following standard error would be printed:

io_call: Text of error. switchname

If this is not sufficient, the subroutine can **call sub_err_ directly,** passing it the caller name from the info structure. In this case, a zero status code should be returned.

Ver. 3
741022 MULTICS CHANGE REQUEST

MCR 1713

TITLE: Fix bug in quota $move_quota

AUTHOR: VanVleck

STATUS	DATE
Written	03/08/76
Status	A 3/16/76
Expires	09/08/76

Planned for System: 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect) MPAM (sect)
MOSN (sect) MSAM (sect)
PLMs (AN#) an61
Info Segs
Other

CATEGORY (check one)

( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
(X)Ring Zero
( )Ring One
( )SysDaemon/Admin
( )Runtime
( )User Command/Subr

OBJECTIONS/COMMENTS:

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

SUMMARY:

Change quota$move_quota to return the error code $invalid_move_quota if the parent directory does not have a terminal quota.

REASONS:

The current code prints a nonfatal syserr message and proceeds; as long as the (uninitialized) quota in the directory happens to contain zero the system will produce an error code later after locking and unlocking the page table lock unneccessarily. This expense is needless and if the cell ever contained garbage quota could be generated illegally.

IMPLICATIONS:

Eliminates peculiar syserr message.

Ver. 3
741022 MULTICS CHANGE REQUEST

MCR 1714

TITLE: Allow delentry to delete bad directroy

AUTHOR: VanVleck

STATUS | DATE
Written | 03/08/76
Status | A 3/16/76
Expires | 09/08/76

Planned for System: 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

DOCUMENTATION CHANGES (specify one or more)
MPM (vol,sect) MPAM (sect)
MOSN (sect) MSAM (sect)
PLMs (AN#) an61
Info Segs
Other

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

OBJECTIONS/COMMENTS:

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

SUMMARY:

Change delentry to be able to delete a directory whose UID in the directory header is zero (say, due to a reused address).

REASONS:

Lock fails to lock such a directory. This causes delentry to fail, and the directory cannot be deleted.

DETAILED PROPOSAL:

If the directory UID is zero, treat it as if it were a segment and delete it anyway. Log a syserr message giving the pathname.

IMPLICATIONS:

Users no longer have to wait for the salvager to run to get rid of bad ex-directories.

ver. 4
750508

Multics Change Request

MCR 1715
Page 1 of 1

TITLE: Install a FAST/DFAST version of fortran_io_

AUTHOR: G. Chang MDM

STATUS	DATE
Written	3/10/76
Status	A 3/16/76
Expires	9/16/76

-Coded in: [X] PL/I [ ] ALM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR 3.1
-Fixes Bug Number(s)
-Documented in MTB
-User/Operations-visible Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [XX] Same [ ] Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
X	Runtime
	User Cmmd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

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

SUMMARY:

To install a fortran_io_ that supports FAST/DFAST fortran io.

IMPLICATIONS:

The fortran_io_ to be installed will only be used by FAST/DFAST users. This is a temporary arrangement. Eventually, this fortran_io_ will be merged with the current fortran_io_. Distinctions between FAST, DFAST, and Multics will be made by switches in fast_related_data_.

DETAILED PROPOSAL:

The differences between this fortran_io_ and the system version is mentioned in MCR-1589 (fortran for DFAST), and will not be repeated here. This version will also contain the segments fortran_stop_ and fortran_pause_. Names will be renamed fast_fortran_io_, fast_fortran_stop_, and fast_fortran_pause_ temporarily for this MR3.1 release.

50508

Multics Change Request

MCR 1716
Page 1 of 1

TITLE: COBOL Maintenance Release

AUTHOR: William K. O'Neill (CEO-B) CC2

STATUS	DATE
Written	March 2, 1976
Status	A 03/22/76
Expires	September 2, 1976

DOCUMENTATION CHANGES

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

-Coded in: [X] PL/I [X] AIM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR 3.1
-Fixes Bug Number(s) Attached
-Documented in MTB
-User/Operations-visible - Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [X] Same [ ] Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
X	User Cmnd/Subr.

Objections/Comments:
Need to know what is the "standard prefix"

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

Summary

A. The compiler does not generate the proper code to handle unsigned data, that is described as signed. Similarily, signed data, that is described as unsigned is not handled properly. The University of Southwestern Louisianna has requested fixes for these problems.

B. Many other difficulties have been fixed. A copy of the bug file will be available from C. Zethraeus or from me. *

Implications

In addition to fixing difficulties the compiler has been modified to use a standard prefix on external procedure names, include file names and external data names. Thus all components of the compiler have changed.

* Bug list attached.
Bugs marked as being in (Cobol Release) 1.5 will be fixed.

02/17/75

The following is a list of outstanding bugs in Release 1.4

021 DATE**** uns For relative or indexed files having dynamic access mode, the REWRITE verb causes the "current record pointer" to be set to the record just rewritten rather than leaving it undisturbed. Thus, a READ NEXT RECORD following a REWRITE causes the rewritten record to be accessed rather than the next record as determined by a previous READ RECORD (or START). The same problem will occur with DELETE or WRITE.

026 DATE**** uns Errors occur if the data-name specified with the RELATIVE KEY or RECORD KEY clause is qualified.

031 DATE**** 1.5 An attempt to specify a data-item declared in the CONSTANT SECTION as the receiving field of the MOVE verb is not diagnosed. This will normally result in run-time failure. Also, inconsistent and misleading diagnostics are given for other verbs for which a CONSTANT SECTION item is specified as the receiving field. The diag 5-248 (produced now for the ACCEPT verb) should be produced in all cases.

032 DATE**** The run-time symbol table is currently not created properly to handle identical paragraph names in different sections. NOTE: This will be specified in the users guide.

053 DATE**** uns The SEARCH verb causes an entire table to be searched, even when the table contains a variable occurrance item whose length-determining field contains a less than maximum value.

059 DATE**** 1.5 The identifier used with the CALL statement is not allowed to be subscripted.

063 DATE**** 1.5 More than one contiguous receiving operands of the ADD, SUBTRACT, DIVIDE, and MULTIPLY statements cannot be subscripted. The compiler will abort with an out of segment bounds in the PD syntax phase.

061 DATE**** uns No warning is given when the same IFN is used for more than one EXTERNAL file in a COBOL program.

062 DATE**** uns No diagnostic is issued when TALLY is illegally used as an operand of a statement.

063 DATE**** During execution of the OPEN statement, it is possible that the attachment has been accomplished, but that the actual opening fails. In this case, if the user retries the OPEN and (a) the CATALOGUE-NAME is variable and (b) it is different than it was for the original OPEN, the user must detach the io_switch (via io_call) before retrying. NOTE: This will be specified

in the users guide.

096 DATE**** Internal files (i.e. files not with EXTERNAL specified in their SELECT clause) must not have ATTACH-OPTION "syn_ (user_input | user_output)".. This will cause the user_input or user_output io_switch to be closed when the CLOSE statement is executed which is not conducive for the continued life of the process. NOTE: This will be specified in the user guide.

173 DATE**** Lower case alphabetic literals (e.g. "a", "b", ...) are not allowed to be used in the CURRENCY SIGN IS literal clause. Use of the corresponding character in a picture description is not recognized and diagnosed as a fatal error. NOTE: Upper case must be used. This will be specified in the reference manual.

182 DATE**** 1.5 A program containing the statement INITIALIZE X where X contains an array, and also has a performable paragraph or section physically located AFTER this statement causes a severity 4 error in the generator:

mc_fixup: An inconsistency exists in the fixup table ... This can be avoided by placing all such INITIALIZE statements at the end of the program.

184 DATE**** 1.5 An attempt to SET a group index data name is not diagnosed as an error. Also, no code is generated.

188 DATE**** 1.5 The subject of REDEFINES must not be separated from the object by a condition name (i.e. level 88 entry). This causes an erroneous fatal diagnostic indicating unequal size redefines. For example, the following will fail:

```
1 a.
  2 b pic 99.
  88 c value is 0.
  2 d pic xx redefines b.
```

190 DATE**** uns In a complex condition, the combination of words AND IS NOT is not accepted. For example:

```
if a = b and is not > c ...
```

For identical functionality use:

```
if a = b and not > c ...
```

193 DATE**** uns The factoring if the NOT logical operator in a complex condition causes compile failure in the fixup phase of generation. For example:

```
if not ( a = b or c = d ) ...
```

For identical functionality use:

```
if not a = b or not c = d ...
```

195 DATE**** A MOVE CORRESPONDING resulting in a null match causes a fatal diagnostic. ANSI is not clear on what action should be taken in such a case. However, it would seem more useful to issue only a warning and merely generate no moves. NOTE: This will be clarified in the reference manual.

096 DATE**** 1.5 An item subordinate to an item containing the OCCURS clause will not be a candidate for a MOVE CORRESPONDING match. ANSI states that only the item actually containing the OCCURS is not to be a candidate (i.e. not the items subordinate to it.

097 DATE**** 1.5 Any "corresponding" in which the referenced level is separated from the elementary level by 2 or more levels will not process elementary levels correctly after a mismatch is found on the level immediately above the elementary level. For example:

```
  1 a.                                  1 aa.
    2 b.                                  2 b.
      3 c.                                  3 c.
        4  d  pic x.                          4 d
pic x.
      3     e.                                  3
e-false.
        4  f  pic x.                          4 f
pic x.
      3 g.                                  3 g.
        4 h pic x.                            4  h
```

pic x. "move corr a to aa" will correctly move d, not move f, and incorrectly not move h.

100 35332*** uns If the DEPENDING ON identifier-1,clause is used in an "sd" entry, the record size is not stored in identifier-1 when the sd file is read.

101 35252*** 1.5 If DECIMAL POINT IS COMMA is specified then OBJECT IS COMMA must be specified.

107 DATE**** uns The COPY...REPLACING structure causes unspecified results, such as an abort during compilation(_EX phase).

110 DATE**** The CLOSE...REEL clause incorrectly closes the file. NOTE: This will be clarified in the reference manual.

111 DATE**** uns COPY of an include file which contains a continued statement is not parsed correctly.

115 DATE**** uns ADVANCING clause in the WRITE statement sends improper linefeeds to the printer a) AFTER ADVANCING 0 advances 1 line. b) BEFORE ADVANCING incorrectly advances line afterwhich specified number of lines are advanced.

116 DATE**** uns COPY...REPLACING does not replace a numeric paragraph name.

117 DATE**** uns DELETE of records on indexed data file does not delete the records correctly. NOTE: Duplicate of difficulty number 21.

118 DATE**** uns Read pointer is not incremented properly when a READ is done after a DELETE. Problem can be reduced by inserting an extra READ immediately following the DELETE. NOTE* Duplicate of difficulty number 21.

120 DATE**** uns Read pointer is not properly incremented when a

READ is executed after a REWRITE. Problem can be circumvented by inserting an extra read immediately following the REWRITE. NOTE: Duplicate of Difficulty number 21.

124 35314*** 1.5 Compiler aborts in clist. The ddalloc phase calls clist to put out diagnostic 150 (unequal redefines), and gives a bad token size. The temporary solution is to fix the error in the source program so the diag is not issued.

125 35316*** 1.5 If the procedure division contains more than about 1500 source lines the compiler will abort in the replacement phase, with an out of segment bounds in mc_io_$swf_put.

127 35317*** 1.5 The compiler aborts in mc_addr due to a perform varying, when the item varied is subscripted. We do not know if all such subscripts will fail, or only more complex ones.

128 35318*** 1.5 Extraneous diag (possible left truncation) in the file section. The appear to be related to a move corresponding.

129 35294*** uns The message "cross reference listing not produced - source program contains too many data-names" may appear. If so the compilation will be correct, except for a cross reference listing.

130 35322*** uns The compiler will abort if the ENVIRONMENT DIVISION header is not present.

132 35286*** 1.5 A SIGN CLAUSE should not be used on a group item, or unspecified results will occur at object time.

140 35344*** 1.5 It is not possible to list source lines when using debug with COBOL object programs. Debug will ignore the request.

141 35293*** 1.5 A STRING statement where the pointer variable is overpunch sign will generate bad code (results are unpredictable) at execution time. At compile time the message "mc_register$get unable to get pointer register" will occur, compilation will continue.

142 26958*** uns An UNSTRING of an alphanumeric into a numeric may produce invalid code if the length of the numeric is less than the length of the alphanumeric.

143 27004*** uns A READ into a file that has an occurs may store the data in the wrong location. NOTE: This is patched at USL in data division allocation.

144 27006*** uns A WRITE AFTER ADVANCING PAGE, followed by a WRITE BEFORE ADVANCING n LINES does not overprint. The second line is appended to the first.

145 26985*** uns MOVE of a scaled integer item to an alphanumeric item fails. Example: move a to b; a pic 99PP value 3000; b pic XXXX; gives 30bb; should be 3000.

146 26986*** uns MOVE of a scaled integer item to an alpanumeric edited item fails. Example: move a to b; a pic 99PP value 3700; b pic XBXX; gives 3b7b; should be 3b70.

147 27016*** uns Data which is described with an overpunch sign (S in picture), but is actually unsigned may produce incorrect results at execution time. Similarily data described as unsigned but which has an overpunch sign may produce incorrect results.

148 27043*** uns MOVE of a COMP-7 data item to a COMP-6 data item will fail at execution time.

149 27018*** uns The key of an indexed file must be within the record. If not, a fatal diagnostic (rather than an observation) will occur.

150 27001*** 1.5 A compiler abort will occur if the number of data definitions, plus paragraph definitions, plus procedure definitions exceeds about 800. The abort is an out of bounds at mc_io_$swf_put in the replacement phase. This has been patched in the compiler driver at USL.

151 27002*** 1.5 MULTIPLY anything by data-name(x) may abort in mc_addr at compile time. Works correctly if the occurs is on the data-name. The failure will be either "attempt to referencce thru null pointer" or "subscript or index error encountered". One temporary solution is to put a "giving" in the statement.

152 27003*** 1.5 A format 1 divide (no giving) with subscripting may abort in mc_addr. See difficulty 151 for details.

153 27007*** 1.5 MULTIPLY a by b, c, d will abort in mc_addr at compile time. Similarily DIVIDE a into b, c, d. The temporary solution is to remove the multiple receiving fields.

154 27008*** 1.5 If a SORT is executed and no records have been released, a loop will occur at object time.

155 26984*** 1.5 In an edited move, if the receiving item has DB, or CR in the picture clause and the sending item is zero, two zeros are generated, instead of two spaces.

156 27014*** 1.5 A move corresponding will not move some of the data items if the items are out of order.

157 36492*** 1.5 The INITIALIZE statement should not be used. It's use will result in either compiler aborts, or erronneous diagnostics.

158 27015*** 1.5 An ambiguous data name in an occurs depending on will not cause a diagnostic message to be issued. But the count of fatal diagnostics will include this.

159 27017*** 1.5 Warning diagnostic 3--181 (second value not greater than first) will be issued on 88 cond-1 value "a" thru "e". This diagnostic is extraneous and should be ignored.

160 27013*** 1.5 The compiler will abort in the data division allocation phase if a reserved word is used as the variable in an occurs depending on.

161 27042*** 1.5 An add or subtract corresponding will produce a fatal diagnostic if the data items correspond, but are not numeric.

162 27012*** 1.5 If bad syntax is encountered in an organization clause in the environment division, the compiler will abort with "illegal machine operation" in the id/ed syntax phase.

163 33325*** 1.5 A "go to" from a declatative to a non declarative, or to another declarative will result in a fatal diagnostic (rather than an observation).

164 27031*** 1.5 A level 88 associated with a group item will cause a "storage condition" in the generator phase of the compiler.

(END)

Ver. 3
741022 MULTICS CHANGE REQUEST CC2

MCR 1717

TITLE: Multics HEALS

AUTHOR: RH MORRISON/AR DOWNING

STATUS DATE
Written 03/03/76
Status R 03/22/76
Expires 09/03/76

Planned for System: MR 3.1
Fixes Bug Number(s): not applicable
Documented in MTB: 265
Incompatible Change: no
User/Operations-visible Interface Change: yes
Coded in: (■)PL/I ( )ALM ( )other-see below
Performance: ( )better (■)same ( )worse

DOCUMENTATION CHANGES (specify one or more)
MPM (vol,sect) MPAM (sect)
MOSN (sect) MSAM (sect)
PLMs (AN#)
Info Segs
Other Hardware Diagnostic Aids

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

OBJECTIONS/COMMENTS:

Installed unapproved software

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

SUMMARY: Install procedures to implement Multics HEALS.
Draft documentation is attached.

REASON: HEALS is a new facility not previously installed.
See:

1. Multics HEALS II Product Functional Specification, #58004068 (Rev. A), J.L. Gildersleeve, June 19, 1975.

2. Multics HEALS II Project Summary and Authorization, PSA 225AD

3. Product Calendar Item 2C0102

4. Multics HEALS II, Phase 2, MTB-265

IMPLICATIONS: HEALS reports on CPU errors and tape I/O errors will be available to site support and FED personnel.

DETAILED PROPOSAL: Install the following procedures:
heals_report.pl1
heals_io_reports_.pl1
heals_cpu_reports_.pl1
heals_collect_data_.pl1
heals_hran_.pl1
heals_arg_info.incl.pl1

SUMMARY OF HEALS FACILITIES

This section provides a brief description of the HEALS facilities on the Multics system.

HEALS is an acronym for "Honeywell Error Analysis and Logging System". It provides facilities for:

1. capturing and logging hardware error data,
2. sorting and analyzing the data,
3. presenting the analyzed data in a series of reports.

The purpose of Heals is to assist central site personnel in monitoring performance of the hardware and predicting maintenance schedules. It is also useful in diagnosing transient malfunctions. HEALS facilities, therefore, are not of interest to the average user of Multics.

Multics HEALS reports are a subset of GCOS HEALS reports. The set includes those of most interest to Honeywell Field Engineering Division personnel and excludes those peculiar to GCOS systems or of interest primarily to GCOS users. The list of planned Multics HEALS reports is:

I/O Error Report
Tape Reel Error Statistics Report
Tape Errors by Handler and Command Report
Tape Errors by Reel-number/Unit Report
Tape Errors by Unit/Reel-number Report
Tape Unit Error Variance Report
Disk Error Statistics Report
CPU Error Report
MOS Memory EDAC Report
MPC Statistics Report

In release MR3.1, only the CPU Error Report and the I/O Error Report for tapes are supported.

HEALS IMPLEMENTATION

Hardware error data for HEALS is logged by the syserr mechanism to the syserr log. Logging of the data is independent of other HEALS facilities.

The HEALS facilities are invoked by the command "heals_report". Arguments to this command specify the desired reports and the from/to time of the report data (see below).

The heals_report command causes the ring 4 copy of syserr_log to be updated.

SUMMARY DESCRIPTION OF HEALS REPORTS

A detailed description of the reports is contained in the manual "HEALS II Manual", Field Engineering Division, May,1975. Although this manual describes the GCOS HEALS reports, the Multics HEALS reports have the same format and content with minor exceptions (eg, the reports do not report by GCOS job and activity number). A brief summary of each report follows.

The first seven reports are concerned with I/O errors. The I/O Error report lists all I/O errors that were logged, while the other six reports select and sort the same data for convenience and emphasis. The three remaining reports deal with the processor, memory, and peripheral controller subsystems.

The I/O Error report summarizes all I/O error records found on the syserr_log for the specified time interval and details the data found on those records. It many times will be used as a final reference when more specific data is needed after first analyzing other HEALS reports. For each error, the report line contains the date/time the error was logged, the device name, the major and substatus of the status return words, the iom status, the type of interrupt, the device command, the device address, the binary seek address for disk entries or the tape reel serial number for tape entries, the number of records for a multiple record command and the record residue, and the number of connects on this device from the time of the last system boot load.

The Tape Reel Error Statistics report lists the reel numbers of the first 512 tapes reporting errors for this reporting period. They are sorted by descending order of the total number of data alerts logged against those reel numbers. This report will indicate tape reels that may need maintenance by the tape librarian.

The Tape Errors by Handler and Command report tallies all tape errors by handler device number and tape subsystem command. This report will indicate which tape device may need additional diagnosis.

The Tape Errors by Reel-number/Unit report will indicate whether a tape reel is failing on multiple devices. This will assist in the determination of media versus device problems.

The Tape Errors by Unit/Reel-number will indicate device errors that are occurring when different tape reels are mounted on the same tape device.

The Tape Unit Error Variance report indicates which device is experiencing the most data alerts with respect to connects for the entire tape subsystem.

The Disk Error Statistics report summarizes the records for system mass storage errors that have occurred during the reporting period. The continuous binary seek address is converted to its device specific decimal equivalent in order to relate the failure to a specific physical characteristic of the device. All read, write, or seek errors will be reported.

The CPU Error report formats and prints history register dumps.

The MOS Memory EDAC report summarizes the MOS and Core storage error or error correction information.

The MPC Statistics report displays the statistical counters for Tape and Disk MPC subsystems. The display represents valuable statistics including accurate counts of device usage and certain abnormal conditions. Statistics of particular interest are counts of marginal conditions and errors successfully recovered by the firmware. Each channel and device address is displayed on this report.

HEALS USAGE

It is expected that HEALS will be used for both routine reporting of hardware errors and for specific reports on demand.

It is recommended that all HEALS reports be generated on a daily basis (or at most a weekly basis) to maintain a continuous record of hardware errors and malfunctions. This HEALS activity can be a scheduled absentee job.

At any time that specific reports are wanted for monitoring or diagnostic purposes, HEALS can be invoked by terminal command.

The ring 4 copy of syserr_log should save at least the data subsequent to the previous run of all HEALS reports. Preferably it should also save the data for the previous full report run.

HEALS INSTALLATION REQUIREMENTS

The HEALS procedures have no special requirements.

The user of HEALS must have "re" access on >system_control_1>audit_gate_ and must have "r" access to >system_control_1>perm_syserr_log in order to have the ring 4 copy of syserr_log updated.

Name: heals_report, hr

The heals_report command produces specified reports of interest to site support and Field Engineering personnel. The reports are placed in the current working directory for subsequent perusal or dprinting. A report file is given a name formed from the report_name argument (see below) by appending a suffix of _report.

Usage

heals_report report_name -control_args-

where:

1. report_name — is selected from the following:

   io_error — selects the I/O Error Report,

   cpu_error — selects the CPU Error Report,

2. control_args — are selected from the following:

   -from date, -fm date — specifies the date and time after which errors will be reported. If this argument is not given, the default value will be the value of -to time minus 24 hours.

   -to date — specifies the date and time to which errors will be reported. If this argument is not given, the default value will be the current date and time.

Notes

The dates specified after the -fm, -from, and -to control_args must be acceptible to the convert_date_to_binary_ subroutine.

The various reports are described in detail in the section "Multics HEALS" above.

heals_report

Example

If the command line

```
heals_report io_error -from 03/01/76 -to 03/02/76
```

is issued at 2:00 PM, a file named io_error_report and suitable for printing will be created in the current working directory, containing the I/O Error Report for the period from 2:00 PM, March 1, 1976 to 2:00 PM, March 2, 1976.

Ver. 3
741022 MULTICS CHANGE REQUEST

MCR 1718

TITLE: Fix 28.0 NSS bugs, Round 1

AUTHOR: Bernard Greenberg TVV

STATUS	DATE
Written	03/11/76
Status	~~A~~ 3 23 ~~76~~
Expires	09/11/76

Planned for System: MR 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (■)PL/I ( )ALM ( )other-see below
Performance: ( )better (■)same ( )worse

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect) MPAM (sect)
MOSN (sect) MSAM (sect)
PLMs (AN#) 61
Info Segs
Other

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

OBJECTIONS/COMMENTS:

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

SUMMARY: Fix bugs in New Storage System affecting segment moving and handling of MSU451 disks.

REASONS: Current software causes shutdown failure and system crashes in certain cases.

IMPLICATIONS: Better reliability.

DETAILED PROPOSAL: Change fsout_vol to correctly output volume maps larger than 1K. Change segment_mover to correctly rethread the ASTE of a segment being moved.

Ver. 4
750508

Multics Change Request

MCR 1719
Page 1 of

TITLE: Change BOS Firmware Loader to Print Revision Number of Firmware

AUTHOR: Noel I. Morris

STATUS	DATE
Written	3/15/76
Status	A 3/23/76
Expires	9/23/76

DOCUMENTATION CHANGES

-Coded in: ☐ PL/I ☒ ALM ☐ other- explain in DETAILED PROPOSAL
-Planned for System MR 3.1
-Fixes Bug Number(s)
-Documented in MTB
-User/Operations-visible Interface change? ☐ yes ☒ no
-Incompatible change? ☐ yes ☒ no
-Performance: ☐ Better ☒ Same ☐ Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
X	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

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

Objections/Comments:

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

Proposal:

Modify the BOS FWLOAD command to print the revision number of the firmware module being loaded. This will enable FED and operations to know what versions of firmware are in use at any given time. The message

LOADED M500

will be changed to

LOADED M500 REV.LA

Multics Change Request

MCR 1720
Page I of I

TITLE: Fix Bug in Append

AUTHOR: A. A. Kobziar TVV

STATUS	DATE
Written	3/12/76
Status	A 3/23/76
Expires	9/23/76

DOCUMENTATION CHANGES

-Coded in: XX PL/I ☐ ALM ☐ other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-Fixes Bug Number(s) unreported
-Documented in MTB
-User/Operations-visible Interface change? ☐ yes X no
-Incompatible change? ☐ yes X no
-Performance: ☐ Better XX Same ☐ Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
x	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

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

Objections/Comments:

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

SUMMARY:

In creating a directory, append gets a vtoce for the new branch. If append is unable to initialize the new directory's header (makeknown fails because kst full), append deletes the branch but doesn't free the vtoce. A call to delete_vtoce will be added to deal with such failures.

IMPLICATIONS:

The reload's running out of kst will no longer leave unconnected vtoces.

Ver. 4
750508

Multics Change Request

MCR 1721
Page I of I

TITLE: Redefine Recovery Mode Directory Salvaging

AUTHOR: A. Kobziar TVV

STATUS	DATE
Written	3/12/76
Status	A 3/23/76
Expires	9/23/76

-Coded in: [X] PL/I [ ] ALM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-Fixes Bug Number(s)
-Documented in MTB
-User/Operations-visible Interface change? [X] yes [ ] no
-Incompatible change? [ ] yes [X] no
-Performance: [X] Better [ ] Same [ ] Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
X	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	9.2
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

SUMMARY:

Define two recovery modes of directory salvaging rpv and rlv.

REASONS:

The automatic salvaging of the hierarchy is a necessary component in making crash recovery foolproof (and unattended).

IMPLICATIONS:

A shutdown failure on the root physical pack (rpv) will automatically envoke a rpv salvage, which should take about 3 min. at MIT, while a shutdown failure on any pack belonging to the root logical volume (rlv) will automatically envoke an rlv salvage, which should take about 10 min at MIT.

DETAILED PROPOSAL:

An rpv salvage will salvage all directories up to level 2 that are hierarchically accessible on the rpv, and check rpv vtoce connections (i.e. >udd>m will be salvaged). An rlv salvage will salvage all directories up to level 3 (i.e. >udd>m>amk will be salvaged) but will not check any vtoce connections. (level 3 reaches about ½ of all MIT directories).

er. 4
50508

Multics Change Request

MCR 1722
Page 1 of 1

TITLE: Fix bug restricting absentee arg lengths

AUTHOR: Steve Herbst JWG

STATUS	DATE
Written	3/15/76
Status	A 3/23/76
Expires	9/23/76

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

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
X	User Cmnd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

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

SUMMARY:

Remove 168 character restriction on lengths of absentee arguments.

Ver. 4
750508

Multics Change Request

MCR 1723
Page 1 of

TITLE: Fix bugs in BOS device address interpretation

AUTHOR: Noel I. Morris

STATUS	DATE
Written	3/10/76
Status	A 3/23/76
Expires	9/23/76

-Coded in: ☐ PL/I ☒ AIM ☐ other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-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)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
X	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmmd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

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

Summary:
Several bugs have been found in the BOS utility subroutines cvadd and argmul. In certain cases, these bugs cause device addresses to be interpreted incorrectly. Problems have been found when using the dump command and when using the test command to test or clear the bulk store.

Proposal:
Analyze and fix the bugs.

er. 4
50508

Multics Change Request

MCR 1724
Page 1 of

TITLE: Fix Bug in BOS RESTOR Command

AUTHOR: Noel I. Morris

STATUS	DATE
Written	3/10/76
Status	A 2 | 23 | 76
Expires	9 | 23 | 76

-Coded in: ☐ PL/I ☒ AIM ☐ other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-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)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
X	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmmd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

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

Summary:
A coding bug in the RESTOR command causes it to print incorrect information about tape contents and target disk under certain conditions.

Proposal:
Fix the bug.

Ver. 4
750508

Multics Change Request

MCR 1725
Page 1 of

TITLE: Fix Bugs in BOS DUMP Command

AUTHOR: Noel I. Morris

STATUS	DATE
Written	3/12/76
Status	A 3/23/76
Expires	9/23/76

-Coded in: ☐ PL/I ☒ ALM ☐ other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-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)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
X	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

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

Summary:

Several problems have been found in the BOS DUMP command:

1. Attempting to dump 256K segments causes an infinite loop.
2. Certain dumping functions do not initialize the online printer package.
3. If the DBR has the unpaged bit turned on, it appears as the character "J" in the REGS printout.

Proposal:

Fix the problems.

Multics Change Request

MCR 1726
Page 1 of

TITLE: Fix bug in the BOS IF command

AUTHOR: Noel I. Morris

STATUS	DATE
Written	3/12/76
Status	A 3/23/76
Expires	9/23/76

DOCUMENTATION CHANGES

-Coded in: ☐ PL/I ☒ ALM ☐ other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-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)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
X	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmmd/Subr.

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

Objections/Comments:

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

Summary:
A bug in the SHUT test of the IF command causes it to get an error.

Proposal:
Fix the bug.

Ver. 4
750508

Multics Change Request

MCR 1727
Page 1 of

TITLE: Move the "flagbox" segment

AUTHOR: Noel I. Morris

STATUS	DATE
Written	3/12/76
Status	A 3/23/76
Expires	9/23/76

DOCUMENTATION CHANGES

-Coded in: [X] PL/I [X] ALM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-Fixes Bug Number(s)
-Documented in MTB
-User/Operations-visible Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [X] Same [ ] Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
X	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmmd/Subr.
X	Initialization

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

Objections/Comments:

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

Summary:
Multics currently sets up a flagbox segment during system initialization. This segment is used to contain various datta needed by BOS in order to access Multics main memory when dumping, etc. It also contains a word of 36 flag bits which can be used for communications between Multics and BOS for smooth unattended operation.

Unfortunately, the flagbox segment is placed in memory such that it is overlayed by BOS main control when BOS is entered. This requires the flag bits to be copied into the BOS toehold when BOS is entered from Multics. But, these bits will also be copied when BOS is entered from BOS --- causing them to be destroyed.

It is obvious that the flagbox segment should be part of the BOS toehold, itself. Then, no copying of data would be required. Such a mechanism was considered at one time, but it was discarded since write permission would have to be given to the BOS toehold in Multics. This was (rightly) thought to be dangerous.

Detailed Proposal:
Move the flagbox segment so that it resides in the second 16 word block of the BOS toehold. Make it an unpaged segment only 16 words long. Modify the BOS toehold to move all other data used by BOS out of the second 16 words of the toehold.

Modify the BOS appending package to pick up the SST SDW and hardcore DBR out of the toehold instead of from the saved Multics main memory image. Make the code compatible for a while so that this information will be looked for in both places.

er. 4
50508

Multics Change Request

MCR 1729
Page 1 of 1

TITLE: Remove general_format_parse_ from bound_fortran_

AUTHOR: D. S. Levin RAB

STATUS	DATE
Written	3/18/1976
Status	A 3/23/76
Expires	9/23/76

-Coded in: [X] PL/I [ ] AIM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR 3.1
-Fixes Bug Number(s)
-Documented in MTB
-User/Operations-visible Interface change? [X] yes [ ] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [X] Same [ ] Worse
-Replaces MCR

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.
X	Unbundled

DOCUMENTATION CHANGES

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

Objections/Comments:

This segment must be shipped with Fortran, FAST or DFAST.

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

SUMMARY:

The procedure general_format_parse_ must be available to both Fortran compilers and both Fortran I/O packages. All four bound segments are, or will be, installed in >unbundled. If the binding arrangements are not changed, a prelinked version of dfast/fast will have to include bound_fortran_.

REASONS;

One of the designed goals for dfast/fast is that it have low resource usage. bound_fortran_ would add a 51K segment, in order to use a 1K object segment.

IMPLICATIONS:

The old compiler would have to snap a link to general_format_parse_ instead of having the link satisfied by the binder. The old Fortran I/O package will continue to snap a link.

DETAILED PROPOSAL:

Make general_format_parse_ a standalone segment.

Ver. 3
741022 MULTICS CHANGE REQUEST

MCR 1730

TITLE: Recompile several hardcore programs

AUTHOR: VanVleck

STATUS | DATE
Written | 03/18/76
Status | A 03/30/76
Expires | 09/18/76

Planned for System: 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

CATEGORY (check one)
( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
(X)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#) an61
Info Segs
Other

OBJECTIONS/COMMENTS:

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

SUMMARY:

Recompile 40 programs on the system tape which were last compiled by the non-EIS version of PL/I. Minor changes are necessary to a few of the programs to make them compile. One program, timer_manager_, requires a minor bug fix.

REASONS:

This change reduces the number of compilers which needs to be shipped with each system release.

IMPLICATIONS:

none

Ver. 3
741022 MULTICS CHANGE REQUEST

MCR 1731

TITLE: Fix bug in terminate_proc

AUTHOR: VanVleck

STATUS | DATE
Written | 03/16/76
Status | A03/30/76
Expires | 09/16/76

Planned for System: 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

DOCUMENTATION CHANGES (specify one or more)

MPM (vol,sect) MPAM (sect)
MOSN (sect) MSAM (sect)
PLMs (AN#) an61
Info Segs
Other

CATEGORY (check one)

( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
(X)Ring Zero
( )Ring One
( )SysDaemon/Admin
( )Runtime
( )User Command/Subr

OBJECTIONS/COMMENTS:

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

SUMMARY:

Change terminate_proc to call verify_lock unconditionally instead of only calling if pds$block_lock_count is nonzero.

REASONS:

The new version of lock does not record locks in pds$block_lock_count for "fast" locks. A process can lock such a lock and terminate, and hang the system.

IMPLICATIONS:

Fix bug.

Ver. 4
750508

Multics Change Request

MCR 1733
Page 1 of

TITLE: Fix Card Reader Hangup Problem in BOS

AUTHOR: Noel I. Morris

STATUS	DATE
Written	3/19/76
Status	A 03/30/76
Expires	09/30/76

-Coded in: ☐ PL/I ☒ AIM ☐ other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-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)	
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

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

Summary:
When BOS detects an I/O error when reading cards, it attempts to wait for the card reader to become ready again. In certain cases, the special interrupt indicating that the reader is ready will be lost, and BOS will appear to hang.

Proposal:
Fix the card reading and special interrupt detecting mechanism in BOS.

Ver. 3
741022 MULTICS CHANGE REQUEST

MCR 1734

TITLE: Fix set_tty for network problems

AUTHOR: Robert S. Coren TVV

STATUS	DATE
Written	03/16/76
Status	A 03/30/76
Expires	09/16/76

Planned for System: MR 4.0
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

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

DOCUMENTATION CHANGES (specify one or more)
MPM (vol,sect) MPAM (sect)
MOSN (sect) MSAM (sect)
PLMs (AN#)
Info Segs pending_changes
Other
None (reason) ~~no change required~~

OBJECTIONS/COMMENTS:

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

SUMMARY: Make set_tty command recognize network line type, and not perform certain functions for network lines.

REASONS: Default modes for certain terminal types are invalid for the Network.

IMPLICATIONS: No unexpected error messages for set_tty used over the network; inability to set tabs over the network using set_tty.

DETAILED PROPOSAL: If set_tty identifies the line type of the caller as being "network" (i.e., it is not any line type known to the tty_ DIM), it will not set default modes when the "-terminal_type" control argument is given, nor will it perform the functions implied by the "-reset" and "-tabs" control arguments.

Ver. 4
750508

Multics Change Request

MCR 1735
Page 1 of 1

TITLE: Accept options (variable) and options (non_quick) on procedure statements

AUTHOR: R. Barnes

STATUS	DATE
Written	03/24/76
Status	A 03/30/76
Expires	09/30/76

DOCUMENTATION CHANGES

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

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

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
X	User Cmmd/Subr.

Objections/Comments:

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

SUMMARY: Change the PL/I compiler to accept options (variable) and options (non_quick) on procedure statements.

PROPOSAL:

1. Allowing a user to put options (variable) on an internal procedure statement, will allow him /her to call an internal procedure with a variable number of arguments just like ioa_. Since cu_$arg_ptr and friends will have to be used in accessing the parameters of such a procedure, the compiler will make it non-quick.

2. Options (non_quick) allows a user to specify that a particular block must be non_quick. Options (no_quick_blocks) actually does that today ... but mistakenly implies that all contained blocks are also non_quick.

er. 4
50508

Multics Change Request

MCR 1737
Page 1 of 1

TITLE: Reorganize info segment directories

AUTHOR: John Gintell

STATUS	DATE
Written	03/24/76
Status	A 03/30/76
Expires	09/30/76

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

Category (Check One)	
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

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

Summary:

Create a separate directory for the info segments corresponding & each "logical" library. Reorganize the info segments accordingly.

>doc>info contains standard system
>doc>tools contains tools
>doc>unbundled contains unbundled software
>doc>ils is installation maintained

change check_info_segs and help to search >doc>info, doc>unbundled and >doc>ils in that order. doc>tools will not be searched since it does not contain info segments of interest to ordinary users.

Reasons:

The contents of the unbundled library should be synchronized with the its info segments. Info_segments for tools should not be on the "search path" of ordinary users.

Ver. 4
750508

Multics Change Request

MCR 1738
Page 1 of 1

TITLE: Replace all info segments in >doc>info

AUTHOR: John Gintell

STATUS	DATE
Written	03/24/76
Status	A 03/30/76
Expires	09/30/76

DOCUMENTATION CHANGES

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

-Coded in: ☐ PL/I ☐ ALM ☒ other- explain in DETAILED PROPOSAL
-Planned for System MR 4.0
-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)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
X	User Cmnd/Subr.

Objections/Comments:

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

Summary:

Replace all of the info segments in >doc>info to conform to new into segment conventions (new help command) and remove obsolete segments. Info segments fall in four categories:

1) commands in AG02 and AK 92
2) Some subroutines in AG 93
3) Changes in the latest release
4) General topics

Reasons:

The new help command expects a new format of info segment. The directory >doc>info had many obsolete info segments.

Implications:

Procedures to keep these info segments up-to-date must be established.

DETAILED PROPOSAL:

Phase 1: Remove obsolete info segments. Install info segments for all commands in AG92. (This was done for MR 3.1)

Phase 2. For 4.0 complete the rest of 1) and 4), update 3), do 2).

Ver. 4
750508

Multics Change Request

MCR 1739
Page 1 of 1

TITLE: Emergency fixes for modules used by FAST/DFAST

AUTHOR: M. Weaver RAB

STATUS	DATE
Written	03/24/76
Status	A 03/30/76
Expires	09/30/76

-Coded in: [X] PL/I [x] ALM [x] other- explain in DETAILED PROPOSAL
-Planned for System MR 3.1
-Fixes Bug Number(s)
-Documented in MTB
-User/Operations-visible Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [X] Same [ ] Worse
-Replaces MCR

Category (Check One)	
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
X	Runtime
X	User Cmmd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

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

SUMMARY:

1) Retain the new basic compiler entries in bound_ep_basic_.bind,

2) Correct basic object segment generation in FAST/DFAST.

3) Add two more segdefs to fast related_data_.

REASONS: Changes needed for fortran and basic to be usable in FAST/DFAST.

DETAILED PROPOSAL :

The basic compiler sets the segname definition incorrectly. If it is entered at one of the new FAST entry points, often causing faults. The new segdefs in fast_related_data_ are:

1) dcl fast_related_data_ $terminate_run entry ext variable; /*entry to call to terminate run_unit*/ Used by fortran stop procedure; set by FAST and DFAST run unit managers to appropriate internal procedures.

2) dcl fast_related_data_ $fortran_io_initiated bit (1) aligned ext; if the value is "1"b, fortran I/O has been initialized for the run unit and set to "0"b by each invocation of the run unit manager before program execution.

er. 4
50508

Multics Change Request

MCR 1740
Page 1 of 1

TITLE: Fix bugs in write_user_usage_report

AUTHOR: T. Casey JWC

STATUS	DATE
Written	March 17, 1976
Status	A 03/30/76
Expires	09/30/76

-Coded in: [X] PL/I [ ] ALM [ ] other- explain in DETAILED PROPOSAL
-Planned for System MR 3.1
-Fixes Bug Number(s) see below
-Documented in MTB
-User/Operations-visible Interface change? [ ] yes [X] no
-Incompatible change? [ ] yes [X] no
-Performance: [ ] Better [ ] Same [X] Worse
-Replaces MCR

bugs 9037 and others (reported)

Category (Check One)	
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
X	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	no interface change

Objections/Comments:

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

SUMMARY: Fix the following bugs:

1) Billing blows up on a project with more than 256 users;
2) in the message:
"*** usage for the period from_date to to_date"
from_date is the later of the last time billing was run or the last time a new user was registered on the project;
3) in the message warning of inconsistent misc charge figures between projfile and miscfile, the figures are reversed (each figure is identified as coming from the other file).

REASONS:

1) Projects with more than 256 users exist;
2&3) Incorrect messages confuse recipients of bills.

IMPLICATIONS: Fix for 1) decreases performance by eliminating quick blocks.

DETAILED PROPOSAL:

1) Declare arrays inside begin blocks, after number of projects in the sat and number of users on project are known; instead of using fixed length arrays of arbitrary size.

2) Change date-finding algorithm to use the earlier of the two dates; this chooses a date later than the last billing date only for a project newly-created during the month.

3) Reverse the figures, leaving the text of the error message unchanged.

Ver. 4
750508

Multics Change Request

MCR 1742.
Page 1 of 1

TITLE: Add &q and &r to exec_com

AUTHOR: Steve Herbst JWG

STATUS	DATE
Written	3/23/76
Status	A 03/30/76
Expires	09/30/76

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

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
X	User Cmmd/Subr.

DOCUMENTATION CHANGES

Document	Specify One or More
MPM (Vol, Sect.)	AG92
PLMS (AN #)	
MOSN (Sect.)	
MPAM (Sect.)	
MSAM (Sect.)	
Info Segs	
Other (Name)	
None (Reason)	

Objections/Comments:

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

Summary: Add &q, &r, &qf and &rf features to exec_com. They work the same as in the do command.

Reason:

Do and exec_com implement essentially the same language with respect to parameter substitution.

Implication:

Incompatible change. These newly defined strings currently represent themselves.

Argument Substitution

Strings of the form &i in the exec_com segment are interpreted as dummy arguments and are replaced by the corresponding argument to the exec_com command. For instance, optional_arg1 is substituted for the string &1 and optional_arg10 is substituted for &10.

see following page.

replace

The character & should be followed by a number, i, or by the string ec_name. If no corresponding optional_arg is provided, &i is replaced by the null string. The string &ec_name is replaced by the entryname portion of the exec_com pathname without the ec suffix. The string &0 is replaced by the pathname argument to exec_com, just as it was given to the command.

Argument substitution can take place in command lines, input lines or in control statements, since the replacement of arguments is done before the check for a control statement.

Control Statements

Control statements permit more variety and control in the execution of the command sequences. Currently the control statements are: &label, &goto, &attach, &detach, &input_line, &command_line, &ready, &print, &quit, &if, &then, and &else.

Control statements generally must start at the beginning of a line with no leading blanks. Exceptions to this rule are the &then and &else statements, that can appear elsewhere. Also when a control statement is part of a THEN_CLAUSE or an ELSE_CLAUSE, it does not have to start at the beginning of a line.

1. &label and &goto

These statements permit the transfer of control within an exec_com segment.

&label location	identifies the place to which a goto control statement transfers control. location is any string of 32 or fewer characters identifying the label.
&goto location	causes control to be transferred to the place in the exec_com segment specified by the label location. Execution then continues at the line immediately following the label.

The strings &qi, &ri, &fi, &qfi, and &rfi also indicate argument substitution. The string &qi is replaced by the ith argument to the exec_com command with quotes doubled. The string &ri is replaced by the ith argument, requoted. Refer to the do command for a description of quote doubling and requoting. The string &fi is replaced by a string of the ith through last arguments to exec_com, separated by blanks. Likewise, &qfi is replaced by a string of the ith through last arguments with quotes doubled and &rfi is replaced by a string of the ith through last arguments, requoted.

The string &n is replaced by the number of arguments to the exec_com command. The string &ec_name is replaced by the entryname portion of the exec_com pathname without the ec suffix. The string &0 is replaced by the pathname argument to exec_com just as it was typed.

Ver. 4
750508

Multics Change Request

MCR 1743
Page 1 of 1

TITLE: Fix bug in hcs_$initiate_search_rules
AUTHOR: Steve Herbst

STATUS	DATE
Written	3/23/76
Status	A 03/30/76
Expires	09/30/76

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

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
X	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
	User Cmnd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

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

Summary: Fix bug in hcs_$initiate_search_rules preventing the root from being added to the search rules.

Reason: The root is a valid place to search for object segments.

Ver. 4
750508

Multics Change Request

MCR 1744
Page 1 of 1

TITLE: Fix bug in add_name

AUTHOR: Steve Herbst

STATUS	DATE
Written	3/23/76
Status	A 03/30/76
Expires	09/30/76

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

	Category (Check One)
	Lib. Maint. Tools
	Sys. Anal. Tools
	Sys. Prog. Tools
	355
	BOS
	Salvager
	Ring Zero
	Ring One
	SysDaemon/Admin.
	Runtime
X	User Cmmd/Subr.

DOCUMENTATION CHANGES

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

Objections/Comments:

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

Summary : Fix bug causing the add_name command to go into a loop when a pathname argument has bad syntax.

Ver. 3
741022

MULTICS CHANGE REQUEST

MCR 1745

TITLE: Convert several hardcore data bases to be `cds` segments.

AUTHOR: Steve Webber

STATUS	DATE
Written	03/23/76
Status	03/30/76
Expires	09/23/76

Planned for System: MR 4.1
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: ( )better (X)same ( )worse

CATEGORY (check one)
( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
(X)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#) several
Info Segs
Other

OBJECTIONS/COMMENTS:

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

SUMMARY:

Convert the following hardcore data bases to be cds segments, i.e., the source changes from alm to cds.

1. pds
2. prds
3. scs
4. sys_info
5. tc_data
6. oc_data
7. syserr_data

REASONS:

The cds language is much better suited for generating data bases than alm. Also, by creating include files, which the cds source can reference, it is much easier to generate metering and debugging tools in the user ring since we can easily know the offset of particular items in hardcore data bases.

IMPLICATIONS:

It may become tempting to use the pl1 include file representation in hardcore code rather than the external reference method invoking the linkage mechanism. If this becomes extensive, more and more of the system will have to be recompiled when a data base changes in such a way that offsets of items change. The pl1 include file method is almost always more efficient.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1746

TITLE: Add get_main, a procedure for getting storage during initialization.

AUTHOR: Steve Webber

STATUS	DATE
Written	03/23/76
Status	A 03/30/76
Expires	09/23/76

Planned for System: MR 4.1
Fixes Bug Number(s): not applicable
Documented in MTB: not applicable
Incompatible Change: no
User/Operations-visible Interface Change: no
Coded in: (X)PL/I ( )ALM ( )other-see below
Performance: (X)better ( )same ( )worse

CATEGORY (check one)
( )Lib. Maint. Tools
( )Sys. Anal. Tools
( )Sys. Prog. Tools
( )355
( )BOS
( )Salvager
(X)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#) AN70
Info Segs
Other

OBJECTIONS/COMMENTS:

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

SUMMARY:

Add the procedure "get_main" to the system. It is to be called during initialization (usually during collection 1 initialization, but not restricted to it) to get contiguous main storage for a segment. It allows for the creation of segments such as "sst" and "tc_data" as a function of useful parameters rather than having to calculate how many pages of core are required.

REASONS:

1. Makes for a better system administrator interface since commands such as gen_sst_card and get_tcd_card are no longer needed.

2. Makes better use of wired down core by minimizing breakage and allowing the system to have table sizes which are not arbitrarily a multiple of 1K.

3. Eases the high water mark.

IMPLICATIONS:

Several programs have to be converted and configuration cards changed. MOSN must be updated.

DETAILED PROPOSAL:

The get_main procedure will be called with a pointer to a segment for which storage is desired. If the segment is wired, as determined by the SLT entry for the segment, get_main acquires storage at the "perm-wired" end of the

collection 1 main-memory "window" (see AN70). If the segment is not wired, the storage is taken from the "paged-segs" end. get_main returns an SDW for the segment, that is generated from the address (as it determines), from the bound (as input), and with access set to read, write.

If get_main is called after init_sst has run (during collection 1), the "window" no longer exists, so get_main calls pc_contig to acquire contiguous (wired-down) core. In this case, the segment will use up integral pages from the paging pool.