

TO:           Distribution

FROM:         Joan Archer Scott

DATE:         24 November 75

RE:           Multics Change Requests

Enclosed are copies of Multics Change Requests which were approved from 16 November 75 through 30 November 75.

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Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>1338</u>
TITLE: Standardize iox_ error codes.		STATUS   DATE
AUTHOR: Larry Johnson		Written   0c/0o/75
		Status   <b>RA 11/18/75</b>
		Expires   02/0o/76
Planned for System: not applicable		CATEGORY (check one)
Fixes Bug Number(s): not applicable		
Documented in MTB: not applicable		
Incompatible Change: yes		
User/Operations-visible Interface Change: yes		
Coded in: ( <input checked="" type="checkbox"/> )PL/I ( <input checked="" type="checkbox"/> )ALM ( )other-see below		
Performance: ( )better ( <input checked="" type="checkbox"/> )same ( )worse		
DOCUMENTATION CHANGES (specify one or more)		
MPM (vol,sect) subr	MPAM (sect)	
MOSN (sect)	MSAM (sect)	
PLMs (AN#)		
Info Segs		
Other		
OBJECTIONS/COMMENTS:		

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

### Summary

A call to an iox\_ entry to read data (get\_chars, get\_line, or read\_record) that returns an error code may also return data. The cases where this can happen should be consistently defined for all I/O modules.

### Reasons

A generalized program which is written to work with any I/O module (such as the io\_call command or PL/I runtime I/O) has no consistent way of determining if it has been returned any good data along with the error code.

### Detailed proposal

Allow only two error codes ever to be returned with data. These would be error\_table\_\$short\_record and error\_table\_\$long\_record. Whenever either of these error codes are returned, the caller should be able to assume that the variable containing the numbers of characters returned (the 4th parameter on input calls) is valid, along with the data in the buffer. If any other error code is returned, the value of this variable would be undefined, and the data in the buffer would be in general unpredicable.

This would affect the various iox\_ input entry points as follows:

get_chars	error_table_\$long_record would never be returned.
	error_table_\$short_record would be returned whenever less bytes than requested are returned. This is how iox_\$get_chars is currently documented, but vfile_

currently returns `error_table_$end_of_info` if more bytes are requested than are left in the file.

`get_line` `error_table_$long_record` would be returned when the line would not fit in the buffer. The data that fits would be returned in this case. `error_table_$short_record` is returned when the remaining data in the file fits in the buffer but does not end in a newline. `get_line` is currently documented to return `end_of_info` in the latter case.

`read_record` `error_table_$long_record` is returned if the record does not fit. The portion that fits is returned. `error_table_$short_record` is never returned. This is not a change.

### Implications

Some I/O modules will have to be modified to conform to these standards.

### Notes

There may be cases where an I/O module may want to return data with an error code. For example, a tape I/O module that has read a record with a parity error may want to do this so that a specialized program could attempt to recover some good data. These cases are beyond the scope of most programs and they should be able to assume there is no data in this case.

An alternate proposal would be to have the number of bytes returned variable always be valid after an `iox_call`. This would involve all I/O modules returning 0 in this variable if there is really no data. This is awkward to do in cases where the I/O module does not support a particular entry point. There would also be no way to handle the tape record error mentioned previously.

### Documentation changes

The description of the `iox_$get_line` entry point must be changed to show the new error code returned.

### Entry: `iox_$get_line`

This entry point reads 9-bit bytes from the unstructured file or device to which an I/O switch is attached. The switch must be open for `stream_input` or `stream_input_output`. Bytes are read until the input buffer is filled, a newline character is read, or end of file is reached, whichever occurs first. A code of 0 is returned if and only if a newline character is read into the buffer (it will be the last character read). If the input buffer is filled without reading a newline character, the code `error_table_$long_record` is returned. The contents of the buffer beyond the last byte read are undefined.

If the switch is attached to a file, bytes are read beginning with the next byte, and the next byte position designator is advanced by the number of bytes read. If the end of file is reached without reading a newline character, the next byte position designator is set to end of file and the code error\_table\_\$short\_record is returned.

### I/O Module changes

The following list shows how some of the existing I/O modules are affected by this MCR.

vfile_	get_chars must be changed to work according to the current standard (it returns end_of_info when it should return short_record). get_line must be changed to return short_record when appropriate.
record_stream_	should be changed to interpret the new meanings of error codes returned by I/O modules to which it is attached. In some of the cases, it may be able to make a reasonable recovery.
rdisk_	should be changed to return buffer_big instead of long_record if given a buffer too large.
tty_	is not affected
tape_mult_	should be changed to return short_record where appropriate at the end of the tape.

### Callers of iox

A survey of currently installed iox\_ callers has not revealed any which will stop working as a result of this change, although it is conceivable that some programs could be affected. The most like area of incompatibility would be in the interpretation of the record length when error\_table\_\$end\_of\_info is returned. Although this MCR proposes that the length in this case be assumed to be zero (no data returned), it would be helpful if existing I/O modules set the value explicitly to zero in case there are programs which check it.

### Info segment

09/29/95 iox\_changes

The error codes returned by iox\_ modules in input operations are being standardized.

get\_chars: Will return the error code error\_table\_\$short record whenever there are fewer bytes than requested available. In particular, an I/O module will never return error\_table\_\$end\_of\_info in this case. This conforms with current iox\_ documentation.

get\_line: Will return error\_table\_\$short\_record when the remaining data in the input stream (or file) does not contain a newline character. Currently, error\_table\_\$end\_of\_info is documented as the error returned in this case.

Effects of change: The result of these changes is that the iox\_input entry points will return consistent error codes. Also, no I/O module will ever return error\_table\_\$end\_on\_info unless there is no data to return. The case of a partial last record in the file will be reported with the code error\_table\_\$short\_record.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1479
TITLE: Install copy_file command		STATUS   DATE
AUTHOR: Ross E. Klinger		Written   10/29/75
		Status   A 11/12/75
		Expires   04/29/76
Planned for System: not applicable		
Fixes Bug Number(s): not applicable		CATEGORY (check one)
Documented in MTB: 222, amended		( ) Lib. Maint. Tools
Incompatible Change: no		( ) Sys. Anal. Tools
User/Operations-visible Interface Change: yes		( ) Sys. Prog. Tools
Coded in: (X) PL/I ( ) ALM ( ) other-see below		( ) 355
Performance: ( ) better (X) same ( ) worse		( ) BOS
		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		( ) Ring Zero
MPM (vol,sect) II, 3	MPAM (sect)	( ) Ring One
MOSN (sect)	MSAM (sect)	( ) SysDaemon/Admin
PLMs (AN#) 57		( ) Runtime
Info Segs copy_file.info		(X) User Command/Subr
Other		
OBJECTIONS/COMMENTS:		
The words "keyed sequential" should replace the words "indexed sequential" throughout the documentation.		

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

SUMMARY: Install the copy\_file command as described in MTB - 222, amended, in the Standard Service System. The command provides a general purpose switch-to-switch copying facility.

REASONS: no such command presently exists, although a clear need for such a facility does exist.

IMPLICATIONS: none.

DETAILED PROPOSAL: see amended MTB-222 MPM documentation, attached.

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copy\_file  
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copy\_file  
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**Names:** copy\_file, cf

This command copies records from an input file to an output file. The input and output file types must be structured. (See Unstructured Files, below, for an explanation of how this type of file may be copied.) The input file may be copied either partially, or in its entirety.

**Usage**

copy\_file input\_spec output\_spec -control\_args-

where:

1. input\_spec specifies the input file from which records are read. It may be either an I/O switch name, or an attach description. (See Notes, below.)

-input\_switch switchname

-isw switchname

specifies the input file by means of an already attached I/O switch name, switchname.

-input\_file "XXX"

-if "XXX"

specifies the input file by means of an attach description, XXX. The attach description string must be enclosed within quotes.

2. output\_spec specifies the output file to which these records are written. It may be either an I/O switch name, or an attach description. (See Notes, below.)

-output\_switch switchname

-osw switchname

specifies the output file by means of an already attached I/O switch name, switchname.

-output\_file "XXX"

-of "XXX"

specifies the output file by means of an attach description, XXX. The attach description string must be enclosed within quotes.

3. control\_args may be one or more of the following optional control arguments. (See Notes, below.)

- keyed** specifies that both records and keys are copied from an indexed sequential input file to an indexed sequential output file. The default is to copy records from an input file (either indexed or not) to a sequential output file. (See Indexed Files, below.)
- from I**  
**-fm I** specifies that records are copied beginning with the Ith record of the input file. I must be a positive integer. The default is to begin copying with the "next record". (See Notes, below.)
- start XXX**  
**-sr XXX** specifies that records are copied beginning with the record whose key is XXX. XXX must be 256 or fewer ASCII characters. The default is to begin copying with the "next record".
- to J** specifies that copying is performed until the Jth record has been copied, or the input file exhausted, whichever occurs first. If this control argument is specified, -from must also be specified. J must be a positive integer, greater than or equal to I. The default is to perform copying until the input file is exhausted.
- stop XXX**  
**-sp XXX** specifies that copying is performed until the record whose key is XXX has been copied, or the input file is exhausted, whichever occurs first. XXX must be 256 or fewer ASCII characters. The default is to perform copying until the input file is exhausted.
- count N**  
**-ct N** specifies that copying is performed until N records have been copied, or the input file exhausted, whichever occurs first. N must be a positive integer. The default is to perform copying until the input file is exhausted.
- all, -a** specifies that copying is performed until the input file is exhausted. This is the default.



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copy\_file  
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copy\_file  
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- brief, -bf specifies that an informative message indicating the number of records actually copied is suppressed.
- long, -lg specifies that an informative message indicating the number of records actually copied is printed. This is the default.

### Unstructured Files

copy\_file operates by performing record I/O on structured files. If it is desired to copy from/to an unstructured file, the record\_stream\_ I/O module may be used, e.g.:

```
cf -if "record_stream_ -target vfile_ pathname" -osw OUT
```

The effect is to take lines from the file specified by pathname via vfile\_, transform them into records via record\_stream\_, and then copy them to the I/O switch named OUT.

### Indexed Files

copy\_file can process an indexed sequential file either as such, or as though it were purely sequential. The former case is specified by the -keyed control argument; the output file is indexed sequential, and both records and keys are copied. The latter case is defaulted to by omitting the -keyed control argument; the output file is sequential, and only records are copied. In either case, the -start and/or -stop control arguments may be used to delimit the range of records copied. Copying is always performed in key order.

The copy command may also be used to copy both the records and keys of an indexed sequential storage system file; however, copy produces an exact duplicate of the input file, whereas copy\_file produces an output file that has been restructured for maximum compactness. (See the MPM write-up of the copy command.)

### Notes

If either the input or output specification is an attach description, it is used to attach a uniquely-named I/O switch to the file. The switch is opened, the copy performed, and then the switch is closed and detached. Alternately, the input or output file may be specified by an I/O switch name. Either the io\_call command or lox\_ subroutine may be used to attach the file prior

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copy\_file  
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copy\_file  
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to the invocation of copy\_file. (See the MPM write-ups of the io\_call command and lox\_ subroutine.)

If the input file is specified by an I/O switch name and the switch is not open, copy\_file opens it for (keyed\_)sequential\_input, performs the copy, and closes it. If the switch is already open when copy\_file is invoked, it is not closed after the copy has been performed; the file is left positioned immediately after the last record copied.

If neither the -start nor -from control argument is used to specify an absolute starting position within the input file, copying begins with the "next record". If the I/O switch is opened by copy\_file, the next record is the first record of the file; otherwise, the next record is that record at which the file is positioned when copy\_file is invoked.

If the output file is specified by an I/O switch name and the switch is not open, copy\_file opens it for (keyed\_)sequential\_output, performs the copy, and closes it. If the switch is already open when copy\_file is invoked, it is not closed after the copy has been performed; the file is left positioned immediately after the last record copied.

The -brief and -long control arguments are mutually exclusive. The informative message appears as follows:

345 records copied.

The -from and -start control arguments are mutually exclusive.

The -to, -stop, -count, and -all control arguments are mutually exclusive.

### **Examples**

1) Copy an entire file from an already attached file to the segment in\_copy:

```
cf -lsw in -of "vfile_in_copy"
```

2) Copy the first 13 records from a tape file to an output file. (This normally would result in their being printed on the user's console.)

```
cf -ct 13 -lf "tape_ansi_887677 -name TEST21 -ret all"  
-of "record_stream_ -target syn_user_output"
```

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copy\_file  
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copy\_file  
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3) Copy 13 records from an already attached file to another already attached file, starting with the 56th record of the input file:

```
cf -isw in -osw out -from 56 -ct 13
```

4) Copy records 43 through 78 from an already attached file to an already attached file:

```
cf -isw in -osw out -from 43 -to 78
```

5) Copy all but the first 7 records from segment testdata.11 to an already attached file:

```
cf -lf "vfile_ testdata.11" -osw out -fm 8
```

6) Copy an entire indexed sequential file with keys:

```
cf -isw in -osw out -all -keyed
```

7) Copy 13 records of an indexed sequential file starting with the record whose key is ASD66 to a sequential output file. No keys are copied.

```
cf -isw in -osw out -sr ASD66 -ct 13
```

7) Copy the records and keys from an indexed sequential file up to and including the record whose key is bb"bb:

```
cf -keyed -isw in -osw out -sp "bb""bb"
```

MULTICS CHANGE REQUEST		MCR <u>1480</u>
TITLE: Changes to disk_control for more meaningful error messages		STATUS   DATE
AUTHOR: Noel I. Morris / James A. Bush		Written   11/02/75
SOURCE: (if external; e.g., "User", "Marketing")		Approved   11/10/75
		Rejected
		Postponed
		Withdrawn
		Expires   06/18/76
CLASSIFICATION	JUSTIFICATION	
<input type="checkbox"/> Incompatible	<input type="checkbox"/> Marketing	<input checked="" type="checkbox"/> Replaced by proposal MCR
<input type="checkbox"/> Change	<input type="checkbox"/> Requirement	<input checked="" type="checkbox"/> Implemented in System
<input checked="" type="checkbox"/> Extension	<input type="checkbox"/> Conformance	Objections/Comments:  The channel and IOM number will be displayed for lost IOM interrupts
<input type="checkbox"/> Restriction	<input type="checkbox"/> to Standard	
<input type="checkbox"/> Performance	<input checked="" type="checkbox"/> Increased	
<input type="checkbox"/> Improvement	<input type="checkbox"/> Consistency	
<input type="checkbox"/> Reliability	<input type="checkbox"/> Simplification	
<input type="checkbox"/> Improvement	<input type="checkbox"/> Generalization	
<input type="checkbox"/>	<input type="checkbox"/> (Unreported)	
<input type="checkbox"/>	<input type="checkbox"/> Bug Fix	

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

REASONS:

1. The channel number on d/e191 error messages is displayed incorrectly.
2. The cylinder and head number in the d/e191 error message is displayed in octal, should be decimal.
3. Not enough information is being displayed by the "Lost IOM interrupt" and the "unexpected IOM status" error messages.

SUMMARY: The changes mentioned above have been installed in Phoenix (unofficially) in order to trap a ds191 error that causes intermittent system crashes.

IMPLICATIONS: syserr messages for disk\_control will display more useful information.

Multics Change Request

TITLE: Changes to BOS		STATUS	DATE	
AUTHOR: Noel I. Morris		Written	11/06/75	
-Coded in: <input type="checkbox"/> PL/I <input checked="" type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____	Category (Check One)		Status	
	Lib. Maint. Tools		Expires	
	Sys. Anal. Tools		DOCUMENTATION CHANGES	
	Sys. Prog. Tools		Document Specify One or More	
	355		MPM (Vol, Sect.)	
X BOS		PLMS (AN #) * 74		
Salvager		MOSN (Sect.)		
Ring Zero		MPAM (Sect.)		
Ring One		MSAM (Sect.)		
SysDaemon/Admin.		Info Segs		
Runtime		Other (Name)		
User Cmnd/Subr.		None (Reason)		
Objections/Comments:				

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

SUMMARY:

Two BOS systems are currently being maintained and developed, one for the current storage system, and one for NSS. The following changes will help to minimize some of the differences between the two BOS system and to thus ease the maintainability problem.

Proposal:

1. NSS BOS required moving the origin of the utility package from 7000 to 10000 to make room for some larger BOS programs. This required the reassembly of all BOS programs and made it impossible to use object for the current BOS, even for programs which did not change. It is proposed to move the origin of the utility package in the current BOS to coincide with that in NSS BOS.
2. NSS BOS requires new entries in the utility package transfer vector. Other transfer vector entries are obsolete in NSS BOS. It is proposed to reorder the transfer vectors of both versions of BOS so that programs which do not differ between NSS BOS and the current BOS can be used by either version.
3. NSS BOS requires new items in BOS common. Other items are obsolete. It is proposed to rearrange both versions of BOS common to allow the sharing of unchanged programs between both versions and to minimize unused space in the BOS common area.

Implication:

All of BOS will have to be reassembled. No operational changes will occur.

Multics Change Request

TITLE: Improve BOS disk error diagnostics		STATUS	DATE
AUTHOR: Noel I. Morris		Written	75.11.06
-Coded in: <input type="checkbox"/> PL/I <input checked="" type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____	Category (Check One)	Status	A 11/18/75
	<input type="checkbox"/> Lib. Maint. Tools	Expires	05/18/76
	<input type="checkbox"/> Sys. Anal. Tools	DOCUMENTATION CHANGES	
	<input type="checkbox"/> Sys. Prog. Tools	Document	Specify One or More
<input checked="" type="checkbox"/> 355	<input type="checkbox"/> BOS	MPM (Vol, Sect.)	
<input type="checkbox"/> Salvager	<input type="checkbox"/> Ring Zero	PLMS (AN #)	
<input type="checkbox"/> Ring One	<input type="checkbox"/> SysDaemon/Admin.	MOSN (Sect.)	
<input type="checkbox"/> Runtime	<input type="checkbox"/> User Cmmnd/Subr.	MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason)	

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

SUMMARY:

Multics was changed some time ago to provide more information on disk errors by printing the detailed status bytes provided by the disk subsystem. Many disk errors occur, however, during BOS operation (such as during a SAVE or RESTOR). BOS currently has no mechanism to retrieve and print the detailed status.

Proposal:

Modify the BOS disk DIM to retrieve and print the detailed disk status. Also, modify the programs NDISK and NCOPY (which perform the SAVE and RESTOR to disk and the SAVE COPY functions) to retrieve and print detailed status.

Implication:

FED will have more information when disk errors occur during BOS operation.

Multics Change Request

TITLE: Change BOS to avoid loading PRU1600 VFC		STATUS	DATE
AUTHOR: Noel I. Morris		Written	75.00.06
-Coded in: <input type="checkbox"/> PL/I <input checked="" type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input checked="" type="checkbox"/> Better <input type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	A 11/18/75
		Expires	05/18/76
Category (Check One) <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input checked="" type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input type="checkbox"/> SysDaemon/Admin. <input type="checkbox"/> Runtime <input type="checkbox"/> User Cmnd/Subr.		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOBN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason) Not required	

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

SUMMARY:

When a PRU 1200/1600 printer is currently used by BOS for dumping, etc., a VFC image is always loaded. In certain cases, this action caused the printer to lose synchronization with the paper, since the Multics VFC image differed from the BOS image. This would occur both in BOS use of the printer and in subsequent Multics use.

Proposal:

1. Modify the VFC image in BOS to contain a two-page long (132 line) image instead of a one-page (66 line) image. Thus, page length will be the same as the Multics VFC image.
2. Modify the BOS printer initialization code to avoid loading the VFC image if one has already been loaded and the paper is synchronized with it.

Implication:

Operations will not have to resynch the paper as often.

TITLE: Modifications to BOS for Unattended Operation		STATUS	DATE
AUTHOR: Noel I. Morris		Written	75.11.06
-Coded in: <input type="checkbox"/> PL/I <input checked="" type="checkbox"/> AIM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____	Category (Check One)		
	<input type="checkbox"/> Lib. Maint. Tools		Status
	<input type="checkbox"/> Sys. Anal. Tools		Expires
	<input type="checkbox"/> Sys. Prog. Tools		DOCUMENTATION CHANGES
<input type="checkbox"/> 355		Document	Specify One or More
<input checked="" type="checkbox"/> BOS		MPM (Vol, Sect.)	
<input type="checkbox"/> Salvager		PLMS (AN #)	
<input type="checkbox"/> Ring Zero		MOSN (Sect.)	5
<input type="checkbox"/> Ring One		MPAM (Sect.)	
<input type="checkbox"/> SysDaemon/Admin.		MSAM (Sect.)	
<input type="checkbox"/> Runtime		Info Segs	
<input type="checkbox"/> User Cmnd/Subr.		Other (Name)	MOH
		None (Reason)	

Objections/Comments:

Notification about runcom file changes should be placed in SRB.

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

SUMMARY:

Certain BOS improvements will ease unattended Multics operation. Some of these changes will provide a smoother BOS interface in general operation.

Proposal:

1. Provide 36 flag bits which can be set and reset under BOS and tested by the IF command. Eventually, Multics will be able to modify these flag bits.
2. Modify the BOS runcom mechanism to perform argument substitution by string insertion instead of converted parameter insertion. This change would allow insertion of arguments of any length. It would eliminate the need to specify conversion type when arguments are to be inserted in a runcom.
3. Modify the WRITE command to print only the characters following the WRITE command instead of the characters following the first 6 characters of the command line.

Implications:

2. Runcom files will have to be changed to drop the conversion type character in argument substitution. Thus, "&nt" (where n is argument number and t is conversion type) will become "&n".
3. This change will remove a BOS kludge. The command line



IF SHUT NEQ 0 WRITE UNSUCCESSFUL SHUTDOWN

used to produce the output

T NEQ 0 WRITE UNSUCCESSFUL SHUTDOWN

if shutdown\_state was nonzero. With the improvement described above, the output produced would be

UNSUCCESSFUL SHUTDOWN

Note:

The BOS mechanism to allow substitutable arguments in runcoms has never been officially documented (except, possibly, in an SRB). A revised MOH section on BOS operation is being prepared, and when ready, will be issued as an MOSN before installation of these changes.

TITLE: Fix bug in reset_disk_meters		STATUS	DATE
AUTHOR: T. Casey		Written	7 November 75
<input checked="" type="checkbox"/> Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL <input type="checkbox"/> Planned for System MR 3.1 <input type="checkbox"/> Fixes Bug Number(s) <u>unreported</u> <input type="checkbox"/> Documented in MTB <input type="checkbox"/> User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no Performance: <input checked="" type="checkbox"/> Better <input type="checkbox"/> Same <input type="checkbox"/> Worse <input type="checkbox"/> Replaces MCR _____		Status	A 11/18/75
		Expires	05/18/76
		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
		Info Segs	
		Other (Name)	
		None (Reason)	no interface change

Objections/Comments:

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

SUMMARY:

Change reset\_disk\_meters to makeunknown directories after resetting their time\_page\_product (tpp).

REASONS:

The tpp of all directories in the hierarchy with nonzero quota are reset during monthly billing. Failing to makeunknown the directories has caused the KST to fill up. With a very large hierarchy, the KST is guaranteed to fill up. When this happens the process faults and the monthly billing is interrupted.

IMPLICATIONS:

KST overflows will be avoided.

DETAILED PROPOSAL:

Since reset\_disk\_meters is driven by a list of directory names prepared by another procedure, it can make no assumptions about the order of the directories in the list, and will therefore simply attempt to makeunknown each directory after resetting its tpp. Some of the directories will be immediately re-initiated, or will remain initiated, because of references to directories inferior to them in the hierarchy, but most of them will be madeunknown, minimizing the possibility of KST overflow.

Multics Change Request

TITLE: Changes to Hardcore Network Environment		STATUS	DATE
AUTHOR: D. M. Wells		Written	1975.11.10
-Coded in: <input checked="" type="checkbox"/> PL/I <input checked="" type="checkbox"/> ALM <input checked="" type="checkbox"/> other <sup>mexp</sup> explain in DETAILED PROPOSAL -Planned for System MR -Fixes Bug Number(s) <u>Unreported</u> -Documented in MTB -User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	A 11/18/75
		Expires	05/18/76
Category (Check One) <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input checked="" type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input type="checkbox"/> SysDaemon/Admin. <input checked="" type="checkbox"/> Runtime <input type="checkbox"/> User Cmmd/Subr.		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MPM (Vol, Sect.)	
		PLMS (AN #) Network	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason)	

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

SUMMARY:

- 1) Fix unwind\_stack\_ to use proper argument list when invoking cleanup handlers.
- 2) Rename hardcore gates into the Network Control Program.
- 3) Fix dstint to use stacq instruction instead of aos.
- 4) Add the neti signal to the list of those with System Condition Indices. (Also change user ring program net\_signal\_handler\_ to use the SCT instead of patching the signal pointer in the per ring data base.)

REASONS:

- 1) The improper call to the IMP DIM cleanup handler has caused several crashes at MIT.
- 2) With the move of much NCP administration into ring 1 (MCR 1211), it appears desirable to provide write-arounds for previously existing (although unreleased to users) interfaces. In order to do this, we will rename the existing gates, add the current names, and later move the name to a new on-line segment.
- 3) With the NCP starting to invoke dstint after system initialization, it should use the stacq to avoid double assignments.
- 4) It has always appeared to be inappropriate for the Network programs to patch the signal procedure pointer, and now that there exists an alternative, it appears desirable to use it.

IMPLICATIONS:

Hopefully, no changes are being made which are bad.

Multics Change Request

TITLE: Alterations to Answering Service portion of Network.		STATUS	DATE
AUTHOR: D. M. Wells		Written	1975.11.10
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-explain in DETAILED PROPOSAL	Category (Check One)	Status	A 11/18/75
	Lib. Maint. Tools	Expires	65/18/76
-Planned for System MR	Sys. Anal. Tools	DOCUMENTATION CHANGES	
-Fixes Bug Number(s) Unreported	Sys. Prog. Tools	Document	Specify One or More
-Documented in MTB	355	MPM (Vol, Sect.)	
-User/Operations-visible	BOS	PLMS (AN #)	Network
Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	Salvager	MOSN (Sect.)	
-Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	Ring Zero	MPAM (Sect.)	
-Performance: <input type="checkbox"/> Better <input type="checkbox"/> Same	Ring One	MSAM (Sect.)	
<input checked="" type="checkbox"/> Worse (very, very slightly)	X SysDaemon/Admin.	Info Segs	
-Replaces MCR	Runtime	Other (Name)	
	User Cmmd/Subr.	None (Reason)	
Objections/Comments:			

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

SUMMARY:

- 1) Actually install changes as described in MCR 962. (This MCR described the recognition of various NO-OPs by the Answering Service.) (FTP only)
- 2) Provide special order calls for use to control use of transmogrification by the FTP dialup module (whether it be a separate module or the current dialup\_.)
- 3) Remove the names logger\_ and net\_tty\_ from the Answering Service Environment. ( These have already been replaced by the Net\_as\_ name.)
- 4) Add support within the Answering Service to provide equivalent (to the TTYDIM) concepts of line type, answerback, etc.
- 5) Cause a special wakeup to the dialup\_ module, if a user has typed ahead one complete line or more.

REASONS:

- 1) These changes were never actually installed and the old MCR has expired.
- 2) Given the desire to experiment with a parallel equivalent to the dialup\_ module (see separately submitted MCR), it seems desirable to be able to turn on and off the (currently automatic) transmogrification of File Transfer Protocol input and output lines.
- 3) Now that all subroutine references to these old names have been removed, it seems desirable to remove them so that they don't become used again.
- 4) To simplify some code in the rest of the AS environment. Also, the line type concept seems, finally, to be the appropriate interface to allow a user to determine if he/she is logged in from the Network. (Though this MCR does not propose to add such concepts to the user environment.)
- 5) Because of coding conventions in dialup\_, if a user ever types ahead a complete line, the AS is not informed of the presense of a line and the use must type an extra blank line. (This only fixes the problem for the Network portion -- where users have long typed ahead their name and password.)

IMPLICATIONS:

- 3) All site administrators will have to check their AS exec\_coms (e.g. admin.ec).

(END)

Multics Change Request

TITLE: Investigation into providing multiple dialup language processors		STATUS	DATE
AUTHOR: D. M. Wells		Written	1975.11.10
-Coded in: <input type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____ (This MCR does not propose installation)	Category (Check One)	DOCUMENTATION CHANGES	
	Lib. Maint. Tools	Document	Specify One or More
	Sys. Anal. Tools	MPM (Vol, Sect.)	
	Sys. Prog. Tools	PLMS (AN #)	
	355	MOSN (Sect.)	
	BOS	MPAM (Sect.)	
	Salvager	MSAM (Sect.)	
	Ring Zero	Info Segs	
	Ring One	Other (Name)	
	SysDaemon/Admin.	None (Reason)	

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

**SUMMARY:** Investigate concept of providing a special Answering Service module to handle Network File Transfer Protocol logins. This probably involves coding a module which is similar to the current dialup, but which understands the USER command rather than the login command, that is should say "300 login incorrect" rather than "login incorrect". It is hoped that this investigation will also show how to provide special processors for other services, such as APL, FAST, etc., which might want to provide a different interface to a user from the initial dialup of the terminal until the close of the session.

**REASONS:** The current login of FTP processes is handled by transmogrification of lines received from dialup. This code has never been quite correct in the handling of error conditions. It also runs the risk of being incompatible with any slight changes made to dialup (or even at other sites due to changes in the local AS error table). It seems to be a simpler task to provide a module at the top level of language interpretation that talks FTP language and knows how to call AS subroutines.

**IMPLICATIONS:** Several problems will be looked at for this study.

- 1) Several of the AS subroutine write directly on the terminal. This will have to be changed in some way.
- 2) During initialization of the AS lines, there will have to be a distinction made between the various flavors of login language.
- 3) The current AS error table provides some mechanism to allow other languages (for example) to be used at other sites. It will be useful to preserve this concept.

Primarily, this MCR is meant to inform other parts of the Multics community that we intend to look at this area.

TITLE: Bug fix to operator command "word"		STATUS	DATE
AUTHOR: T. Casey		Written	10 November 75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 3.1 -Fixes Bug Number(s) <u>unreported</u> -Documented in MTB -User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR		Status	A 11/18/76
		Expires	05/18/76
		DOCUMENTATION CHANGES	
		Category (Check One)	
		<input type="checkbox"/> Lib. Maint. Tools	
		<input type="checkbox"/> Sys. Anal. Tools	
		<input type="checkbox"/> Sys. Prog. Tools	
		<input type="checkbox"/> 355	
		<input type="checkbox"/> BOS	
		<input type="checkbox"/> Salvager	Document Specify One or More
		<input type="checkbox"/> Ring Zero	MPM (Vol, Sect.)
		<input type="checkbox"/> Ring One	PLMS (AN #)
		<input checked="" type="checkbox"/> SysDaemon/Admin.	MOSN (Sect.) 10 (MOH)
		<input type="checkbox"/> Runtime	MPAM (Sect.)
		<input type="checkbox"/> User Cmnd/Subr.	MSAM (Sect.)
Objections/Comments:			Info Segs
			Other (Name)
			None (Reason)

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

SUMMARY:

Change the action taken for the "word" command when a dialup message is given on the command line after the login word. Specifically:

1. Print the message on the Initializer console in all cases, rather than just some cases, as is currently done and,
2. If the message is too long, truncate it, print a message, and complete the operation, rather than aborting the operation in the middle, with the word changed but the message not changed, as is done now.

REASONS:

1. More sensible and useful operator interface.
2. Makes the command work the way the MOH says it does.

IMPLICATIONS:

Less change of operator error or confusion.

Multics Change Request

TITLE: Fix bugs and remove restriction in ed_mgt		STATUS	DATE
AUTHOR: T. Casey		Written	11 November
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> 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? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR		Status	A 11/18/75
		Expires	05/18/76
		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.) AK50, Appendix A	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason)	

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

SUMMARY:

1. Fix bug that prevents setting of the abs\_max parameter to a positive nonzero value.
2. Fix format problem in printing of cross references.
3. Add a delete request to delete a load control group.
4. Add some checks to the verify request, that will print non-fatal warning messages for two suspicious-looking cases:
  - a) a work class with no groups in it, and
  - b) sum of work class percents <100% .

REASONS:

MIT has reported the bugs and requested the new features.

IMPLICATIONS:

The restriction noted in the detailed proposal is not a very clean interface, but the only alternative, in the short term, is refusing to provide the delete request at all.

DETAILED PROPOSAL:

It is not possible to install an mgt that deletes a load control group. Therefore, if a group that exists in the installed mgt is deleted from the administrator's copy, that copy would have to be copied into >sc1 overwriting the installed mgt, during a special session, before the answering service is started. The delete request will print a warning message to that effect.

TITLE: Change printer on/off order calls to return more informative codes.		STATUS	DATE	
AUTHOR: Paul Green and Robert Coren		Written	11/11/75	
<input checked="" type="checkbox"/> Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL <input type="checkbox"/> Planned for System MR <u>3.1</u> <input type="checkbox"/> Fixes Bug Number(s) _____ <input type="checkbox"/> Documented in MTB _____ <input type="checkbox"/> User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Incompatible change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse <input type="checkbox"/> Replaces MCR _____		Category (Check One)	Expires	
		<input type="checkbox"/> Lib. Maint. Tools		DOCUMENTATION CHANGES
		<input type="checkbox"/> Sys. Anal. Tools	Document	
Objections/Comments:		<input type="checkbox"/> Sys. Prog. Tools	MPM (Vol, Sect.)	<u>tty - ; MPM Subr.</u>
		<input type="checkbox"/> 355	PLMS (AN #)	
		<input type="checkbox"/> BOS	MOSN (Sect.)	
		<input type="checkbox"/> Salvager	MPAM (Sect.)	
		<input type="checkbox"/> Ring Zero	MSAM (Sect.)	
		<input type="checkbox"/> Ring One	Info Segs	<u>pending changes</u>
		<input type="checkbox"/> SysDaemon/Admin.	Other (Name)	
<input type="checkbox"/> Runtime	None (Reason)			
<input checked="" type="checkbox"/> User Cmnd/Subr.				

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

SUMMARY:

Change the printer on and printer off order calls in the various IO Modules which implement them, to return the status code error table \$action not performed ("The requested action was not performed") if the conversion tables for the particular terminal indicate that the terminal does not have the printer on/off capability.

REASONS:

Simplify the determination of whether or not a mask is needed for "secret" input (passwords, etc). With user-replaceable conversion tables on the way in the tty DIM (and already in existence in the Network pseudo-tty DIM), this is a useful feature which will greatly simplify and centralize existing code.

IMPLICATIONS:

This is an incompatible change. Users must be notified well in advance. Fortunately, they can begin changing their programs immediately. But the final result is well worth some inconvenience.

DETAILED PROPOSAL:

Track down and check all system commands and tools which use these order calls, and update them for the new convention. These are: admin.pll and dialup.pll in bound\_user\_control, and get\_password.pll in bound\_admin\_tools. Finally, change tty\_index.pll in hardcore to return the new code.



- 6 device similar to IBM Model 2741 with correspondence keyboard and 015 typeball
- 7 device similar to Teletype Models 33 or 35
- 8 device similar to Teletype Model 38
- 9 unused
- 10 unused
- 11 device similar to a Computer Devices Inc. (CDI) Model 1030 or Texas Instruments (TI) Model 725, or a device with an unrecognized answerback, or a device without an answerback (these devices are collectively termed "ASCII" devices)

**read\_status** tells whether or not there is any type-ahead input waiting for a process to read. The `info_ptr` should point to the following structure that is filled in by the call:

```
dcl 1 info_structure      aligned,
    2 ev_chan             fixed bin(71),
    2 input_available     bit(1);
```

where:

1. `ev_chan` is the event channel used to signal the arrival of input.
2. `input_available` indicates whether input is available.
  - "0"b no input
  - "1"b input

**quit\_enable** causes quit signal processing to be enabled for this device. (Quit signal processing is initially disabled.)

**quit\_disable** causes quit signal processing to be disabled for this device.

**start** causes a wakeup to be signalled on the event channel associated with this device. This request is used to restart processing on a device whose wakeup may have been lost or discarded.

**printer\_off** causes the printer mechanism of the terminal to be temporarily disabled if it is physically possible for the terminal to do so. (see Notes)

**printer\_on** causes the printer mechanism of the terminal to be reenabled. (see Notes)

**wru** initiates the transmission of the device's answerback, if it is so equipped. This operation is allowed only for the process that originally attached the device (generally the initializer process). The answerback may subsequently be read by means of the `get_chars` input/output operation.

**store\_id** stores the answerback identifier of the terminal for later use by the process. The `info_ptr` should point to a `char(4)` variable, which contains the identifier.

**set\_type** sets the device type associated with the channel to one of the types described under the info control operation. The `info_ptr` should point to a fixed bin variable, which contains the type.

Notes

The status code error\_table\$action\_not\_performed is returned by the printer\_on and printer\_off control operations if the control tables currently in effect indicate that this terminal cannot perform the printer\_on or printer\_off operation. A code of zero is returned otherwise.

AG93 (MPM Subroutines) DRAFT: SUBJECT TO CHANGE

Nov. 1975

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pending\_changes.info

The hardcore ttydim (and the tty\_ and ntw\_ I/O Modules) will be changed in the future to return the status code error\_table\$action\_not\_performed for the printer\_on and printer\_off control operations if the control tables for the particular terminal indicate that the terminal does not support printer on and printer off. This is an incompatible change; programs which check the code returned by iox\_\$control (or ios\_\$order) must be changed to check for the new code. This change should be made as soon as possible to avoid any problems when the system change is finally installed.

TITLE: Fix many small bugs in Answering Service		STATUS	DATE	
AUTHOR: Paul Green		Written	11/11/75	
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 3.1 -Fixes Bug Number(s) <u>see below</u> -Documented in MTB -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____	Category (Check One)		Status	
	Lib. Maint. Tools		Expires	
	Sys. Anal. Tools		DOCUMENTATION CHANGES	
	Sys. Prog. Tools		Document Specify One or More	
355		MPM (Vol, Sect.) <i>login; MPM com.</i>		
BOS		PLMS (AN #)		
Salvager		MOSN (Sect.)		
Ring Zero		MPAM (Sect.)		
Ring One		MSAM (Sect.)		
<input checked="" type="checkbox"/> SysDaemon/Admin.		Info Segs		
Runtime		Other (Name)		
User Cmnd/Subr.		None (Reason)		

Objections/Comments:

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

SUMMARY:

Fix many minor bugs which have been reported by users and operations in Answering Service 8.2.

1. Fix cv\_cmf to compile last entry in CDT properly.
2. Fix as\_tty\_ to return a special code if the channel hangs up during a changemode or order operation.
3. Fix up\_cdt\_ to use process authorization, not max authorization, when bumping a user whose terminal access class has been reduced.
4. Fix dialup\_ to correctly determine when a password mask is needed, and eliminate sending of black ribbon shift characters. (MPRF 8953)
5. Fix lg\_ctl\_ to handle the -generate\_password control argument in a more sensible manner. (MPRF 8814)

REASONS:

More reliable operation. Bug #1 causes (at sites which have network lines at the end) the Answering Service to get Network and non-Network lines confused. Bug #2 causes the Answering Service to drop lines which hangup during login on a heavily loaded system. Bug #3 causes innocent users to be bumped. Bug #4 causes a password mask to be printed on 2741 terminals which have a printer off capability. Bug #5 is that the system does not check that the new password typed by the user is the same as the generated password supplied by the system; hence, a user can lock him/herself out due to a typing/transmission mistake.

IMPLICATIONS:

Documentation change for #5, but new method is much simpler.

`-generate_password, -gpw`

*Then*

change the user's password to a new password, generated for the user by the system. The login request asks for the old password first. ~~If the old password is correct,~~ a new password is generated and typed on the user's terminal. The user is asked to retype the new password, to verify that he has seen it. If the user types the new password correctly, it replaces the old password for subsequent logins, and the message "password changed" is printed at the user's terminal. If the user mistypes the new password, ~~and he is registered with the generated password attribute,~~ the new password is reprinted on the terminal and the user is asked to retype it. If ~~Person\_id does not~~ have the generated password attribute, the password typed by the user, rather than the generated password, becomes the new password.

*the login and password change is refused.*

`-change_default_project, -cdp`

change the user's default project to be the Project\_id specified in this login request line (see the description of the Project\_id argument above). The default Project\_id is changed for subsequent logins, and the message "default project changed" is printed at the user's terminal. If the `-cdp` control argument is given without a Project\_id argument, an error message is printed.

`-authorization XX, -auth XX`

set the authorization of the process to that specified by XX, where XX is a character string composed of level and category names for the desired authorization, separated by commas. The XX character string may not contain any embedded blank or tab characters. (The short names for each level and category are guaranteed to not contain any blanks or tabs, and can be used whenever the corresponding long names do contain blanks or tabs.) The XX character string must represent an authorization that is less than or equal to the maximum authorization of Person\_id on the project Project\_id. If this control argument is omitted, the user's registered default login authorization is used. (See "Access Control" in the MPM Reference Guide for more information about process authorizations.)

`-change_default_auth, -cda`

change the user's registered default login authorization to the authorization specified by the `-authorization` control argument. If the authorization given by the user is valid, the default authorization is changed for subsequent logins, and the message "default authorization changed" is printed at the terminal. If the `-cda` control argument is given without the `-auth` argument, an error message is printed.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1496
TITLE: Add control arguments to dump_mpc		STATUS DATE Written 11/10/75 Status <u>A 11/18/75</u> Expires 05/10/76
AUTHOR: Larry Johnson		
Planned for System: not applicable Fixes Bug Number(s): not applicable Documented in MTB: not applicable Incompatible Change: no User/Operations-visible Interface Change: no Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-see below Performance: <input type="checkbox"/> better <input checked="" type="checkbox"/> same <input type="checkbox"/> worse		CATEGORY (check one) <input type="checkbox"/> Lib. Maint. Tools <input checked="" type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input type="checkbox"/> SysDaemon/Admin <input type="checkbox"/> Runtime <input type="checkbox"/> User Command/Subr
DOCUMENTATION CHANGES (specify one or more)		
MPM (vol,sect)	MPAM (sect)	
MOSN (sect)	MSAM (sect)	
PLMs (AN#)		
Info Segs		
Other		
None (reason)		
OBJECTIONS/COMMENTS:		

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

### Summary

The dump\_mpc command produces a 3-part MPC dump: a trace table, a memory dump, and a statistical summary. In practice, it has been found that not all portions of the dump are needed all the time. Control arguments should therefore be added to select the portions of the dump that are desired.

### Detailed proposal

See attached command description.

-----  
dump\_mpc  
-----

-----  
dump\_mpc  
-----

Name: dump\_mpc

The dump\_mpc command will perform a dump of the read/write memory of a microprogrammed peripheral controller (MPC) and selectively edit the dump, the trace table, and device statistics.

Usage

dump\_mpc device -path- -control\_args-

where:

1. device is the name of the MPC to dump, or in the case of a unit record MPC, the name of a device connected to it.
2. path is an optional pathname of a segment where the dump is to be stored. The default is mpc-type.list where mpc-type is "tape", "disk", or "urc".
3. control\_args may be selected from the following list:
  - dump causes the memory dump portion of the dump to be placed in the output segment.
  - trace causes the trace table portion of the dump to be placed in the output segment.
  - stat causes the device statistics to be placed in the output segment.

If neither the -stat, -dump, or -trace control arguments are specified, all portions of the dump will be prepared.

In order to dump a tape MPC, the device should be specified as "tape", or "tape\_00". Similarly, for disk, the device should be "disk", or "disk\_00". To dump a disk MPC, however, the system must be configured with an I/O disk connected to the MPC. To dump a unit record MPC, any device connected to the MPC may be specified.

Before using this command, it may be necessary to place switch 4 on the MPC in the up position. This inhibits any further tracing of I/O in the MPC.

The dump produced by this command is in a format similar to the BOS MPCD command.

Access to the gate rcp\_priv\_ is required to use the dump\_mpc command.

TITLE: New login argument and pdt value: subsystem		STATUS	DATE
AUTHOR: T. Casey		Written	6 November 7
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 3.1 -Fixes Bug Number(s) -Documented in MTB -User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR	Category (Check One)		
	<input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input checked="" type="checkbox"/> SysDaemon/Admin. <input type="checkbox"/> Runtime <input type="checkbox"/> User Cmmnd/Subr.		Status P 11/18/75 A 11/25/75 Expires 06/25/76 DOCUMENTATION CHANGES Document Specify One or More MPM (Vol, Sect.) Commands PLMS (AN #) 66 MOSN (Sect.) MPAM (Sect.) MSAM (Sect.)
Objections/Comments:		Info Segs login.info	
		Other (Name)	
		None (Reason)	

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

SUMMARY:

Add -subsystem (-ss) argument to login. Modify answering service to pass subsystem name to act\_proc. Modify administrator tools to allow setting of a default subsystem for a user. The subsystem name is the pathname of a directory containing a prelinked subsystem.

REASONS:

Ability to select a prelinked subsystem, or to get one by default, is needed in order to make use of the pre-linker.

IMPLICATIONS:

Because of lack of space in several tables, the subsystem name will have to be packed into the same string as the process overseer name, and a restriction imposed that the two names total no more than 64 characters.

DETAILED PROPOSAL:

The vinitproc attribute will be required in order to use the -subsystem argument on the login line. If a

subsystem pathname is given, it will be accepted and passed on to `act_proc`. If none is given, then if a default subsystem is defined in the user's PDT entry, it will be passed to `act_proc`. (The implication of "passed to `act_proc`" is that a character string is passed through the answering service without being checked for validity. This is also true for the process overseer.)

The keywords "subsystem: path;" and `Subsystem: path;` will be accepted by `cv_pmf` to define a default subsystem for one user or all users on a project.

If both a subsystem name and a process overseer name are given, and their names add up to more than 64 characters, either in a PMF or on the login line, both will be rejected and translation will fail or login will fail and user will be invited to try again.

However, when only one of these parameters is given on the login line, and the 64 character limit is exceeded only when it is combined with a value from the PDT for the other parameter of the pair, the parameter given on the login line will be rejected, and the value in the PDT, (if any) will be used, and the login will succeed. (For example, giving a long pathname for subsystem will result in getting a non-prelinked process, unless a subsystem is given in the PDT.)

In the cases where the argument on the login line (`-subsystem` or `-po`) must be rejected because the pdt value for the other argument causes the 64 character restriction to be exceeded, the decision to log the user in has already been made. A process will be created using the value(s) from the pdt, and a message to that effect will be printed.

(This is consistent with the action currently taken when the `-po` argument is given but the user does not have the `vinitproc` attribute: a message is printed and a process is created using the process overseer specified in the user's pdt entry.)



The restriction that the subsystem and process overseer name total no more than 64 characters is temporary, to allow implementation within the schedule. It will be removed in the future.

To be added to login MPM writeup

-subsystem path	create the user's process
-ss path	using the prelinked sub-
	system in the directory
	specified by path.

TITLE: Fix access class bug in msf_manager_		STATUS	DATE
AUTHOR: S. Herbst		Written	11 November 75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> AIM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	A 11/26/75
		Expires	05/25/76
		DOCUMENTATION CHANGES	
Category (Check One)		Document	Specify One or More
<input type="checkbox"/> Lib. Maint. Tools		MPM (Vol, Sect.)	
<input type="checkbox"/> Sys. Anal. Tools		PLMS (AN #)	
<input type="checkbox"/> Sys. Prog. Tools		MOSN (Sect.)	
<input type="checkbox"/> 355		MPAM (Sect.)	
<input type="checkbox"/> BOS		MSAM (Sect.)	
<input type="checkbox"/> Salvager		Info Segs	
<input type="checkbox"/> Ring Zero		Other (Name)	
<input type="checkbox"/> Ring One		None (Reason)	doc ok
<input type="checkbox"/> SysDaemon/Admin.			
<input type="checkbox"/> Runtime			
<input checked="" type="checkbox"/> User Cmnd/Subr.			
Objections/Comments:			

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

## SUMMARY:

Fix bug in msf\_manager\_ that stopped APL from working.

## REASONS:

Cannot create a component without s permission on the MSF because call to get access class fails.

## DETAILED PROPOSAL:

Do not attempt to get access class. Instead, use new feature of hcs\_\$create\_branch\_ to use parent's access class.

TITLE: I/O Coordinator improvements and bug fixes		STATUS	DATE
AUTHOR: Jerry A. Stern		Written	11/12/75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR <u>3.1</u> -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	A 11/25/75
		Expires	05/25/76
		DOCUMENTATION CHANGES	
Category (Check One) <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input checked="" type="checkbox"/> SysDaemon/Admin. <input type="checkbox"/> Runtime <input type="checkbox"/> User Cmmnd/Subr.		Document	Specify One or More
Objections/Comments:		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
		Info Segs	
		Other (Name)	
		None (Reason)	<input checked="" type="checkbox"/>

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

Summary: Make a number of changes to the I/O Coordinator that accomplish the following:

1. Fix a bug that can cause requests to be distributed to drivers incorrectly when Access Isolation features are used.
2. Cause a "resetread" order to be issued after a quit.
3. Cause the prompt "Enter Command" to be written on user\_output rather than error\_output.
4. When the coordinator discovers a driver is no longer active and did not finish its request, make the request eligible for another driver. Record how many copies the first driver finished so that the second driver does not have to repeat all copies.

- Reasons:
1. The bug should be fixed.
  2. Any input received before a quit should be flushed.
  3. Writing on error\_output through mrd\_ can cause unnecessary stars and bells to be typed on the initializer console.
  4. Currently, if a driver dies without finishing a request, the request cannot be processed until the coordinator is reinitialized.

TITLE: A modified I/O Coordinator Command Interface		STATUS	DATE
AUTHOR: Jerry A. Stern		Written	11/12/75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> AIM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 3.1 -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	A 11/25/75
		Expires	05/25/76
		DOCUMENTATION CHANGES	
Category (Check One) <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input checked="" type="checkbox"/> SysDaemon/Admin. <input type="checkbox"/> Runtime <input type="checkbox"/> User Cmnd/Subr.		Document	Specify One or More
Objections/Comments:		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	IO Daemon
		MPAM (Sect.)	
		MSAM (Sect.)	
		Info Segs	
		Other (Name)	
		None (Reason)	

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

Summary: Change the I/O Coordinator to accept commands at any time instead of only after a quit.

Reasons: The present requirement to quit the coordinator is inconvenient, especially when attached through mrd\_. Also, quitting the the coordinator completely stops all I/O daemon operations, i.e., drivers cannot proceed. Moreover, the use of certain commands after a quit is dangerous since these commands depend upon the consistency of coordinator data bases. These data bases could be inconsistent if a coordinator operation were interrupted by a quit. The coordinator could inhibit quits during such operations, but this would make it impossible to interrupt the coordinator if it were caught in a loop, etc. The quit mechanism has simply been used for the wrong purpose in the current implementation.

Implications: The Multics Operators' Handbook section on the coordinator would have to be updated to reflect this change. Also, operators familiar with the current interface would have to be re-educated. This is not a serious problem, however, because coordinator commands are rarely used and because the new interface will continue to accept a subset of commands after a quit.

Detailed Proposal: Change the coordinator to block for the input instead of blocking on a dummy channel. This will mean the coordinator is always at command level except when responding to event-call wakeups from drivers. When a quit is received, the coordinator will come to command level. However, certain data base dependent commands will be unavailable.

## EXCERPT from The MULTICS Operators' Handbook

This error message is not fatal and coordinator initialization will continue. However, if any other errors are encountered, the coordinator will print an error message followed by the lines:

Process cannot be initialized.

This indicates a fatal error which should be brought to the attention of the system administrator or other responsible person. When the initialization is finished, the coordinator will type:

I/O Coordinator Initialized

At this point, the coordinator is <sup>at command level</sup> ~~fully operational~~ and ready to accept drivers.

### COORDINATOR COMMANDS

The coordinator performs its job automatically without requiring any instructions from the operator. Therefore, it is rarely necessary for the operator to communicate with the coordinator. Occasionally, however, the operator may wish to issue one of the commands described below. ~~The coordinator will only accept commands after a quit signal has been received.~~ If the coordinator is logged in from an ordinary terminal, the operator should simply press the proper key to issue a quit signal (e.g. ATTN or INTERRUPT). If the coordinator is logged in from the initializer terminal as a consoleless daemon, the operator must type:

quit source\_id

where source\_id is the source name for the coordinator. (See the discussion of consoleless daemons). The coordinator will acknowledge the quit signal by typing:

io\_coordinator: "QUIT" received.

The coordinator will then come to command level and type:

Enter command

At this point, <sup>some</sup> ~~any~~ of the commands described below can be typed by the operator. After each command is processed, the coordinator will return to command level and again type:

Enter command

The operator should not send a second quit signal to the coordinator during this time that it is accepting commands. If a second quit signal is received, the coordinator will ignore it and point out the mistake by typing:

io\_coordinator: QUIT already pending.

The coordinator should not be left in the quit state for an extended period of time since this will effectively halt all active driver processes. The start command, described below, is used to return the coordinator to normal operation.

The following is a list of coordinator commands.

#### 1. logout

This command causes the coordinator to be logged out. Normally, all driver processes should be logged out before the coordinator. If driver processes are not logged out, however, they will automatically detect the fact that the coordinator has been logged out. The drivers will reinitialize and wait for a new coordinator to be logged in.

#### 2. start

move to a new section on how to quit the coordinator

This command causes the coordinator to resume normal operation following a quit signal. ~~The coordinator will cease to accept commands until another quit signal is received.~~

### 3. list

This command causes the coordinator to print a list of active devices, i.e. devices currently assigned to drivers.

### 4. print\_devices

This command causes the coordinator to print a list of all devices managed by the I/O daemon. The devices are grouped according to the request types they service. An asterisk (\*) appearing before a device indicates that the associated request type is the default for the device. The driver access name and the driver authorization (if any) are given for each request type.

### 5. defer\_status

This command causes the coordinator to print a list of device classes for which requests have been deferred. The number of deferred requests for each of these device classes is also printed. At sites having only one device class per request type, no requests will ever be deferred and hence this command will not be of interest. At sites having multiple device classes per request type, requests may be deferred whenever one or more drivers are active for a request type. By examining how many requests have been deferred for various device classes, the operator can judge when it is appropriate to switch a device from one device class to another so that all device classes receive adequate service.

*The remaining commands are not available following a quit signal.*

### 6. term <device\_name>

This command is used to terminate a driver so that the device assigned to it can be assigned to another driver. The <device\_name> for the driver should be specified following the command. Normally, driver termination is performed automatically when a driver logs out. Even if a driver process terminates abnormally, the coordinator will still be able to discover what has occurred and assign the device to a new driver. Therefore, the only time it is necessary to use the "term" command is when one wishes to terminate an active driver which cannot be logged out. This might be necessary, for example, if the driver is logged in from a remote location.

### 7. restart\_status

This command causes the coordinator to print the number of restartable requests for each different request series and to identify those request series for which a restart cycle is in progress. (See "Coordinator Communication Commands" under "Driver Commands" below.)

## LOGIN AND INITIALIZATION OF DEVICE DRIVERS

Device drivers must be logged in after the coordinator. If there is no coordinator logged in, a driver will wait up to 5 minutes for one to log in. Otherwise, it will print an error message and log out.

### Logging in a Driver

At some sites the drivers will be logged in automatically at system start-up time. At other sites, the operator may be required to log in the drivers. The login ID for the drivers is "IO SysDaemon", the same as for the coordinator. The procedure for logging in a driver is the same as that described earlier for the coordinator.

Ver. 3	MULTICS CHANGE REQUEST	MCR 1501
741022		
TITLE: fix minor bugs in tape_ansi_		STATUS DATE
		Written 11/15/75
AUTHOR: Ross E. Klinger		Status 11/25/75
		Expires 05/15/76
Planned for System: MR 3.1		
Fixes Bug Number(s): unreported		CATEGORY (check one)
Documented in MTB: not applicable		( ) Lib. Maint. Tools
Incompatible Change: no		( ) Sys. Anal. Tools
User/Operations-visible Interface Change: no		( ) Sys. Prog. Tools
Coded in: (X)PL/I ( )ALM ( )other-see below		( ) 355
Performance: ( )better (X)same ( )worse		( ) BOS
		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		( ) Ring Zero
MPM (vol,sect) MPAM (sect)		( ) Ring One
MOSN (sect) MSAM (sect)		( ) SysDaemon/Admin
PLMs (AN#)		( ) Runtime
Info Segs		(X) User Command/Subr
Other		
None (reason) conform to documentation		
OBJECTIONS/COMMENTS:		

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

SUMMARY: fix minor bugs in tape\_ansi\_

REASONS: conform to documentation

IMPLICATIONS: elimination of inconsistencies and incorrectness

DETAILED PROPOSAL: 1) make -ring option compatible with output mode options

2) make error reporting of non-existent files more understandable and predictable.

3) make error reporting of incorrect volume id's more understandable and predictable.

TITLE: General IO Daemon Fixes		STATUS	DATE
AUTHOR: Mary Braida		Written	11/17/75
-Coded in: <input type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 3.1 -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	A 11/25/75
		Expires	05/26/76
		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MPM (Vol, Sect.)	
		PLMS (AN #)	IO Daemon (unwritten)
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason)	

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

Summary:

1. Shorten error message on seg\_fault\_error condition.
2. Put header from the -he option on flip cards.
3. Put error messages from normal request processing on log stream rather than on error output.
4. Tell coordinator how many copies of a request were completed, if the driver dies in the middle of a multi-copy request.
5. Change the restart command to complete only the unprocessed copies of a multi-copy request.
6. Make the driver go to command level if an IO error occurs on the device output stream

Reasons:

1. A seg\_fault\_error condition on the user's segment currently being processed does not require multiple lines of explanation with "beeper" activation, but rather a one line message.
2. The header information from the -he option was previously ignored (reference Multics Problem Report Form #008923) preventing any header on punched cards.
3. Since operator intervention is unnecessary in the handling of normal request error messages, the writing of these messages to the operator's console is also unnecessary. Thus, these error messages should be directed only to log stream.



4 and 5. By telling the coordinator how many requests have already been processed, only the remaining number of requests need be processed after a restart. This also avoids extra copies and charges to the user.

6. If an IO error occurs on the device output stream operator attention is required. By returning to command level, further processing of requests is prevented until operator intervention is obtained.

TITLE: Add checks for a null working dir		STATUS	DATE
AUTHOR: Jerold C. Whitmore		Written	11-18-75
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> AIM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 3.1 -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	A 11/25/75
		Expires	05/25/76
		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason)	

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

Summary:

1. Add a new error\_table\_ entry, error\_table\_\$no\_wdir, no\_wdir, no working directory set for this process.
2. Change expand\_path\_ to check for a null string returned from hcs\_\$fs\_search\_get\_wdir and return the new error\_table\_ code.
3. Change cwd entries to check for a null string returned from hcs\_\$fs\_search\_get\_wdir and return the new error\_table\_ code or call com\_err with the new error\_table\_ code as appropriate.

Reasons:

It is possible for a user to login without access to his home directory. Currently, no error message is given to tell the user that relative pathnames will not work until the cwd command is given with a full pathname. It is useful to allow such a process to continue so help can be requested (e.g., to send mail).

TITLE: bk input not to abort on improper_data_format		STATUS	DATE	
AUTHOR: R. Mullen, B. Silver		Written	17 November 75	
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-explain in DETAILED PROPOSAL -Planned for System MR -Fixes Bug Number(s) <u>unreported</u> -Documented in MTB -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR	Category (Check One)	Status	A 11/25/75	
		Lib. Maint. Tools	Expires	05/25/76
		Sys. Anal. Tools	DOCUMENTATION CHANGES	
		Sys. Prog. Tools	Document	Specify One or More
	355			
	BOS	MPM (Vol, Sect.)		
	Salvager	PLMS (AN #)		
	Ring Zero	MOSN (Sect.)		
	X Ring One	MPAM (Sect.)		
	SysDaemon/Admin.	MSAM (Sect.)		
	Runtime			
	User Cmd/Subr.			
Objections/Comments:		Info Segs		
		Other (Name)		
		None (Reason)	invisible bug fix	

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

SUMMARY:

Upon receipt of code = error\_table\_\$improper\_data\_format the reloader will query the user as to whether a new tape should be mounted. The method of query already exists and is used for other "unexplained errors".

REASONS:

Currently the reloader calls for a new tape, although in all cases in living memory the rest of the current tape has been in fact readable.

IMPLICATIONS:

Completeness of reloads is augmented.

DETAILED PROPOSAL:

As above.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1505
TITLE: Create a new hardcore metering gate.		STATUS
AUTHOR: Steve Webber		DATE
Planned for System: not applicable		Written
Fixes Bug Number(s): not applicable		Status
Documented in MTB: not applicable		Expires
Incompatible Change: no		
User/Operations-visible Interface Change: yes		
Coded in: ( )PL/I (X)ALM ( )other-see below		
Performance: ( )better (X)same ( )worse		
DOCUMENTATION CHANGES (specify one or more)		CATEGORY (check one)
MPM (vol,sect)	MPAM (sect)	( )Lib. Maint. Tools
MOSN (sect)	MSAM (sect)	( )Sys. Anal. Tools
PLMs (AN#)	AN60 (to be written)	(X)Sys. Prog. Tools
Info Segs		( )355
Other		( )BOS
		( )Salvager
		( )Ring Zero
		( )Ring One
		( )SysDaemon/Admin
		( )Runtime
		( )User Command/Subr
OBJECTIONS/COMMENTS:		

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

SUMMARY:

Install a new hardcore gate to be used for metering events which are inherently hardcore events. Entries in this gate would allow extraction of information such as page trace statistics, link meters (while they remain in ring 0), and fault meters.

REASONS:

The addition of an alternate gate for such uses allows us more freedom in specifying access to the functions as well as freedom in moving other programs out of ring zero by merely moving names around.

IMPLICATIONS:

Users of any hardcore meters which will eventually be returned through the new gate must change their programs.

DETAILED PROPOSAL:

The initial entries being proposed for the new gate are

hcm\_\$get\_page\_trace  
hcm\_\$get\_fim\_meters  
hcm\_\$get\_link\_meters

The link meters entry might possibly want to be in a user ring gate so that conversion to the user ring linker is easier.

The names of the entrypoints will be put on the gate segment.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>1506</u>
TITLE: Fix bugs in linker introduced in 27-2.		STATUS
AUTHOR: Steve Webber		DATE
Planned for System: MR 3.1		Written
Fixes Bug Number(s): unreported		Status
Documented in MTB: not applicable		Expires
Incompatible Change: no		
User/Operations-visible Interface Change: no		CATEGORY (check one)
Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other-see below		<input type="checkbox"/> Lib. Maint. Tools
Performance: <input checked="" type="checkbox"/> better <input type="checkbox"/> same <input type="checkbox"/> worse		<input type="checkbox"/> Sys. Anal. Tools
DOCUMENTATION CHANGES (specify one or more)		<input type="checkbox"/> Sys. Prog. Tools
MPM (vol,sect)	MPAM (sect)	<input type="checkbox"/> 355
MOSN (sect)	MSAM (sect)	<input type="checkbox"/> BOS
PLMs (AN#)		<input type="checkbox"/> Salvager
Info Segs		<input checked="" type="checkbox"/> Ring Zero
Other		<input type="checkbox"/> Ring One
None (reason) No changes (bug fixes only)		<input type="checkbox"/> SysDaemon/Admin
OBJECTIONS/COMMENTS:		<input type="checkbox"/> Runtime
		<input type="checkbox"/> User Command/Subr

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

SUMMARY:

Fix the following bugs introduced in the 27-2 linker:

1. FORTRAN common stopped working.
2. LISP pl1 subr's stopped working.
3. HPL stopped working (multiple linkage segments).
4. Certain trap-at-first-reference programs stopped working.

REASONS:

To get to the other side.

link\_meters

link\_meters

Item

Meaning

Calls The number of calls to the linker that are completed in each time slot and the total number of calls made to the linker by the process.

avg time The average time (in milliseconds) to completion for a call in each slot and the total average time to completion for a call to the linker made by the process.

avg pf The average number of page faults for a call in that slot and for a call made by the process.

tot time The total virtual time (in seconds) taken by calls in that slot and the total virtual time spent in the linker by the process.

= calls \* avg time

% time Percentage of total linker time for the process that was taken by calls in each slot.

Example

linkage\_meters

Linkage Meters:

slot	calls	avg time	avg pf	tot time	% time
<del>64-25</del>	286	20.014	1.5	5.724	81.1
25-50 <del>64-128</del>	15	77.714	9.5	1.166	16.5
50-75 <del>128-192</del>	1	166.862	32.0	.167	2.4
75 >192	0	0.000	0.0	0.000	0.0
Total	302	23.367	2.0	7.057	

Name: system\_link\_meters, slm

The system\_link\_meters command prints out system-wide statistics regarding usage of the Multics linker. Information is obtained from the data bases: active\_hardcore\_data and tc\_data. Per-process linkage information is available from the link\_meters command.

Usage

system\_link\_meters -control\_arg-

where control\_arg can be selected from the following list:

- reset, -rs            resets the metering interval to begin at the last call with -reset specified. If -reset has never been given in a process, it is equivalent to having been specified at system initialization time.
- report\_reset, -rr    generates a full report and then performs the reset operation.

If no control arguments are given, a full report is generated.

Notes

The following are brief descriptions of the variables printed out by system\_link\_meters. The calls to the linker are broken down into four slots:

1. Calls completed in less than <sup>25</sup>~~64~~ milliseconds
2. Calls completed in between <sup>25</sup>~~64~~ and <sup>50</sup>~~128~~ milliseconds
3. Calls completed in between <sup>50</sup>~~128~~ and <sup>75</sup>~~192~~ milliseconds
4. Calls completed in greater than <sup>75</sup>~~192~~ milliseconds



Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>1507</u>
TITLE: Install system linkage metering tools consistent with 27-2 linker.		STATUS   DATE
AUTHOR: Steve Webber		Written   11/18/75
		Status   <u>11/25/75</u>
		Expires   05/18/76
Planned for System: MR 3-1		CATEGORY (check one)
Fixes Bug Number(s): unreported		( ) Lib. Maint. Tools
Documented in MTB: not applicable		( ) Sys. Anal. Tools
Incompatible Change: no		( <input checked="" type="checkbox"/> ) Sys. Prog. Tools
User/Operations-visible Interface Change: yes		( ) 355
Coded in: ( <input checked="" type="checkbox"/> )PL/I ( )ALM ( )other-see below		( ) BOS
Performance: ( )better ( <input checked="" type="checkbox"/> )same ( )worse		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		( ) Ring Zero
MPM (vol,sect)	MPAM (sect)	( ) Ring One
MOSN (sect)	MSAM (sect)	( ) SysDaemon/Admin
PLMs (AN#)	AN52 (attached)	( ) Runtime
Info Segs		( ) User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

Upgrade the metering tools link\_meters and system\_link\_meters to the 27-2 linker.

REASONS:

The 27-2 linker is sufficiently faster than the previous linker so that changing the width of the buckets in the metering histogram is appropriate. There will now be four buckets of width 25 milliseconds instead of 64 milliseconds.

link\_meters

link\_meters

Name: link\_meters, lkm

The link\_meters command prints out per-process information regarding use of the Multics linker. The statistics are obtained from the Process Data Segment (PDS) of the process. System-wide linkage information can be obtained with the system\_link\_meters command.

### Usage

link\_meters -control\_arg-

where control\_arg can be selected from the following list:

-reset, -rs                resets the metering interval to begin at the last call with -reset specified. If -reset has never been given in a process, it is equivalent to having been specified at process initialization time.

-report\_reset, -rr        generates a report and then performs the reset operation.

If no control argument is given, a full report is generated.

### Notes

The following are brief descriptions of the variables printed by link\_meters. The calls to the linker are broken down into four slots:

1. Calls completed in less than <sup>25</sup>~~64~~ milliseconds
2. Calls completed in between <sup>25</sup>~~64~~ and <sup>50</sup>~~128~~ milliseconds
3. Calls completed in between <sup>50</sup>~~128~~ and <sup>75</sup>~~192~~ milliseconds
4. Calls completed in greater than <sup>75</sup>~~192~~ milliseconds

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR 1508
TITLE: Install new system_link_meters consistent with 27-0.		STATUS
AUTHOR: Steve Webber		DATE
		Written 11/18/75
		Status <u>11/25/75</u>
		Expires 05/18/76
Planned for System: MR 3.1		CATEGORY (check one)
Fixes Bug Number(s): unreported		( ) Lib. Maint. Tools
Documented in MTB: not applicable		( ) Sys. Anal. Tools
Incompatible Change: no		<input checked="" type="checkbox"/> Sys. Prog. Tools
User/Operations-visible Interface Change: no		( ) 355
Coded in: <input checked="" type="checkbox"/> PL/I ( ) ALM ( ) other-see below		( ) BOS
Performance: ( ) better <input checked="" type="checkbox"/> same ( ) worse		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		( ) Ring Zero
MPM (vol,sect)	MPAM (sect)	( ) Ring One
MOSN (sect)	MSAM (sect)	( ) SysDaemon/Admin
PLMs (AN#)		( ) Runtime
Info Segs		( ) User Command/Subr
Other		
None (reason) No change		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

Install new version of system\_link\_meters consistent with 27-0.

REASONS:

The hardcore system 27-0 changed the format of active\_hardcore\_data which system\_link\_meters thought it understood. The program has been changed to use the standard include file for active\_hardcore\_data and hence a simple recompilation is all that is needed.

Ver. 3 741022	MULTICS CHANGE REQUEST	MCR <u>1509</u>
TITLE: Reformat IPC event channel names.		STATUS   DATE
AUTHOR: Steve Webber		Written   11/18/75
		Status   <b>A 11/25/75</b>
		Expires   05/18/76
Planned for System: not applicable		CATEGORY (check one)
Fixes Bug Number(s): unrorted		( ) Lib. Maint. Tools
Documented in MTB: not applicable		( ) Sys. Anal. Tools
Incompatible Change: yes		( ) Sys. Prog. Tools
User/Operations-visible Interface Change: yes		( ) 355
Coded in: (X)PL/I ( )ALM ( )other-see below		( ) BOS
Performance: ( )better (X)same ( )worse		( ) Salvager
DOCUMENTATION CHANGES (specify one or more)		( ) Ring Zero
MPM (vol,sect)                      MPAM (sect)		( ) Ring One
MOSN (sect)                              MSAM (sect)		( ) SysDaemon/Admin
PLMs (AN#)                      AN68 (to be written)		(X) Runtime
Info Segs                      yes (attached)		( ) User Command/Subr
Other		
OBJECTIONS/COMMENTS:		

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

SUMMARY:

Change the format of an IPC event channel name.

REASONS:

The current format contains a relative offset within the process's combined linkage region to the event channel table (ECT) entry for the channel. This format does not work if a process has more than one combined linkage region (as is becoming more and more common) and the ECT needs to be extended after the initial combined linkage region has been filled.

IMPLICATIONS:

Any user program that thinks it understands the format of an ECT and an event channel name must be changed. There are probably no such programs because there is little a user can do by knowing the format and an ECT name. However, there must be adequate warning anyway.

DETAILED PROPOSAL:

The event channel name format will be changed as indicated by the following 2 PL/I declarations describing the old and new formats respectively.

OLD FORMAT

```
dcl 1 event_channel_name based aligned,  
    2 rel_ptr bit (18) unal,  
    2 ring bit (3) unal,  
    2 uid bit (51) unal;
```

NEW FORMAT

```
dcl 1 event_channel_name based aligned,  
    2 ect_ptr ptr unal,  
    2 ring fixed bin (3) unal,  
    2 uid bit (32) unal;
```

Note that the uid field is shrinking from 51 to 32 bits. This is acceptable since the uid must be unique only for the process. The unique ID generator will probably start with a time value and increment this seed when a new event channel is created.

help -pn new\_event\_channel\_names

(8 lines follow)

11/17/75 - new\_ec\_name

The format of an event channel name is being changed. Users were told that these names have internal structure but not what the structure is, to declare the names as fixed bin (71) quantities, and that the IPC primitives would fill in and use the variables so filled in. All of this continues to be true. The only change is in the actual internal format used and its interpretation by the system.

Rest of segment has 10 lines titled "Changed declarations". More help? yes  
Changed declarations: The following PL/I declarations describe the old and new formats.

```
dcl 1 old_event_channel_name based aligned,  
    2 rel_ptr bit (18) unal,  
    2 ring bit (3) unal,  
    2 uid bit (51) unal;  
dcl 1 new_event_channel_name based aligned,  
    2 ecte_ptr ptr unal,  
    2 ring fixed bin (3) unal,  
    2 uid bit (32) unal;
```

TITLE: Implement repeat_query command		STATUS	DATE	
AUTHOR: S. Herbst		Written	18 November	
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR 1475	Category (Check One)		Status	
	Lib. Maint. Tools		Expires	A 11/25/75 05/25/76
	Sys. Anal. Tools		DOCUMENTATION CHANGES	
	Sys. Prog. Tools		Document	Specify One or More
	355		MPM (Vol, Sect.)	Commands
	BOS		PLMS (AN #)	
	Salvager		MOSN (Sect.)	
	Ring Zero		MPAM (Sect.)	
	Ring One		MSAM (Sect.)	
	SysDaemon/Admin.		Info Segs	
Runtime		Other (Name)		
X User Cmnd/Subr.		None (Reason)		
Objections/Comments:				

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

## SUMMARY:

Implement the command repeat\_query (rq), instead of the recently approved reprint\_query, as part of the command\_query\_module. If the last question typed by command\_query has not yet been answered, this command types the question again and returns to the last command\_query stack frame to await a response. Otherwise, it types:

repeat\_query: No pending query.

## REASONS:

This command is less trouble for the user than reprint\_query, which just types the question and forces you to restart before answering.

MPM

MPM

Name: repeat\_query

This command repeats the last query (by the command\_query\_ subroutine) if it has not yet been answered.

It is useful for re-interpreting questions that are garbled.

Usage: repeat\_query

Note: If no question has been asked, or the latest question was answered, the error message "no pending query", is printed.

Example:

Suppose that the console starts to type a question while the user is typing. The query looks like:

```
E@foo.pl1?
```

The user signals QUIT and invokes repeat\_query.  
The console types:

```
Do you want to delete the old segment foo.pl1?
```

The user answers and continues.



TITLE: Fix active functions to work as commands		STATUS	DATE
AUTHOR: S. Herbst		Written	18 November
<input checked="" type="checkbox"/> Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL <input type="checkbox"/> Planned for System MR <input type="checkbox"/> Fixes Bug Number(s) _____ <input type="checkbox"/> Documented in MTB _____ <input type="checkbox"/> User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse <input type="checkbox"/> Replaces MCR _____		Status	A 11/25/75
		Expires	02/26/76
		DOCUMENTATION CHANGES	
		Lib. Maint. Tools	
		Sys. Anal. Tools	
		Sys. Prog. Tools	
		355	Document Specify One or More
		BOS	
		Salvager	MPM (Vol, Sect.)
		Ring Zero	PLMS (AN #)
		Ring One	MOSN (Sect.)
		SysDaemon/Admin.	
		Runtime	MPAM (Sect.)
		X User Cmmd/Subr.	MSAM (Sect.)
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason)	documentation OK

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

SUMMARY:

Fix the active functions listed below to work (print their return values) when called as commands.

REASONS:

Standard behavior for installed active functions.

DETAILED PROPOSAL:

The following active functions are to be fixed:

- |              |          |
|--------------|----------|
| get_pathname | links    |
| home_dir     | nonlinks |
| pd           | nonsegs  |
| wd           | nondirs  |
| segs         |          |
| dirs         |          |
| files        |          |

TITLE: Remove star convention from new send_message		STATUS	DATE
AUTHOR: S. Herbst		Written	18 November 75
<input checked="" type="checkbox"/> Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL <input type="checkbox"/> Planned for System MR <input type="checkbox"/> Fixes Bug Number(s) _____ <input type="checkbox"/> Documented in MTB _____ <input type="checkbox"/> User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Incompatible change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse <input type="checkbox"/> Replaces MCR _____		Status	A 11/25/75
		Expires	05/25/76
		DOCUMENTATION CHANGES	
Category (Check One) <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input type="checkbox"/> SysDaemon/Admin. <input type="checkbox"/> Runtime <input checked="" type="checkbox"/> User Cmmnd/Subr.		Document	Specify One or More
Objections/Comments:		MPM (Vol. Sect.)	AG92
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
		Info Segs	
		Other (Name)	
		None (Reason)	

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

SUMMARY:

Remove star convention (sending to all users on a given project or sending to a given user on all projects) from send\_message.

REASONS:

Use of this feature is discouraged because one invocation of the command annoys many users. In cases where several destinations link to the same mailbox, the star convention puts in multiple copies of the same message. Also, implementation of this feature is complicated and expensive, involving a complete search of the who table, and its removal greatly simplifies send\_message. The user can always build an exec\_com to send to many users at one time if it is necessary to do so.

send\_message

send\_message

sm Person\_id Project\_id so long (for now)

sends two lines:

so long for  
so long now

In both of these examples, the sender's intended message would have been sent if he had enclosed the message in quotes (e.g., "so long (for now)").

When a message appears on the command line, either the Person\_id or the Project\_id (but not both) can be "\*". If the Person\_id is "\*", the line is sent to all users logged in under the given project. If the Project\_id is "\*", the given user receives the message on all projects under which he is logged in.

The user can receive messages while he is in send\_message input mode. He can therefore carry on a conversation with a single invocation of the command.

#### Example

If WJones on the Alpha project sends the following to RTSmith on the Beta project:

sm RTSmith Beta I need access to your listing command

the message would print on RTSmith's terminal (if RTSmith is accepting messages) as follows:

from WJones.Alpha: I need access to your listing command

help -on sm  
(19 lines follow; 39 lines in segment)  
04/11/74

Name: send\_message  
send\_message\_silent  
sms  
send\_message\_acknowledge  
sma  
sm

### Usage

To send a message to another user:

send\_message user\_name project message

(send\_message may be abbreviated as sm)

where:

Rest of segment has 25 lines. More help? yes  
user\_name is the name of the user to whom messages are to be sent.

project The project the user is logged in under.

message The message to be sent. All arguments after the project are concatenated with single intervening spaces to form the message. If this argument is omitted, send\_message types "Input." and sends each line as it is typed, until a line with only "." is typed.

Alternate forms of send\_message:

send\_message\_acknowledge  
sma

causes a reply message to be sent automatically when the message is typed on the receiver's console.

send\_message\_silent  
sms

does not type the "Wakeup not sent", or the "messages have been deferred" warnings.

(End)

TITLE: Implement print_messages -last		STATUS	DATE
AUTHOR: S. Herbst		Written	18 November 6
-Coded in: <input checked="" type="checkbox"/> IPL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR _____ -Fixes Bug Number(s) _____ -Documented in MTB _____ -User/Operations-visible Interface change? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR _____		Status	A 11/25/75
		Expires	06/25/76
		DOCUMENTATION CHANGES	
		Document	Specify One or More
		MPM (Vol, Sect.)	AG92
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
Objections/Comments:		Info Segs	
		Other (Name)	
		None (Reason)	

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

SUMMARY:

Implement "-last" control argument to print\_messages command. When this control argument appears, only the latest message (if there is one) received during this process is printed. The message is not deleted, though it has been read before. pm -last -all is the same as pm -last.

Name: print\_messages, pm

The print\_messages command prints any interprocess messages that were received (and saved in the user's con\_msgs segment) while the user was not accepting messages. (For a description of the con\_msgs segment refer to the accept\_messages command.)

Usage

print\_messages -control\_arg-  
where control\_arg can be: *last*

Notes

The user must issue either the accept\_messages or defer\_messages command before issuing the print\_messages command.

If messages are deferred, it is a good practice to print out pending messages periodically.

→ -last

Print only the latest message received. This feature is useful for repeating a garbled message.

Multics Change Request

TITLE: Make new_user compilable		STATUS	DATE
AUTHOR: T. Casey		Written	18 November
-Coded in: <input checked="" type="checkbox"/> PL/I <input type="checkbox"/> ALM <input type="checkbox"/> other- explain in DETAILED PROPOSAL -Planned for System MR 3.1 -Fixes Bug Number(s) TR 0166 -Documented in MTB -User/Operations-visible Interface change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Incompatible change? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no -Performance: <input type="checkbox"/> Better <input checked="" type="checkbox"/> Same <input type="checkbox"/> Worse -Replaces MCR		Status	A 11/25/75
		Expires	05/25/76
		DOCUMENTATION CHANGES	
Category (Check One) <input type="checkbox"/> Lib. Maint. Tools <input type="checkbox"/> Sys. Anal. Tools <input type="checkbox"/> Sys. Prog. Tools <input type="checkbox"/> 355 <input type="checkbox"/> BOS <input type="checkbox"/> Salvager <input type="checkbox"/> Ring Zero <input type="checkbox"/> Ring One <input type="checkbox"/> SysDaemon/Admin. <input type="checkbox"/> Runtime <input type="checkbox"/> User Cmnd/Subr.		Document	Specify One or More
Objections/Comments:		MPM (Vol, Sect.)	
		PLMS (AN #)	
		MOSN (Sect.)	
		MPAM (Sect.)	
		MSAM (Sect.)	
		Info Segs	
		Other (Name)	
		None (Reason)	

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

SUMMARY:

Fix new\_user so that it will compile with the latest version of pnt.incl.pll.

REASONS:

It will not compile now, because the names of some AIM-related variables got changed in the include file.