X11/96-52

MUMPS Development Committee

Extension to the MDC Standard
Type A Release of the MUMPS Development Committee

ROUTINE Management

October 26, 1995

Produced by the MDC Subcommittee #15
Programming Structures

Ed de Moel, Chairman
MUMPS Development Committee

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The reader is hereby notified that the following MDC specification has been approved by the MUMPS Development Committee but that it may be a partial specification that relies on information appearing in many parts of the MDC Standard. This specification is dynamic in nature, and the changes reflected by this approved change may not correspond to the latest specification available.

Because of the evolutionary nature of MDC specifications, the reader is further reminded that changes are likely to occur in the specification released, herein, prior to a complete republication of the MDC Standard.

ROUTINE Management

1. Identification of the Proposed Change

1.1 Title: ROUTINE Management

1.2 MDC Proposer and Sponsor:

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1.3 Motion:

This document supersedes X11/SC15/95-37. Mo Motion; This is the MDC Type A write-up.

1.4 History:

October 26, 1995	X11/DC15/95-37	Editorial amendmend and accepted as MDC Type A (26:0:3)
June 1995	X11/SC15/TG9/95-1.1	amended (replace R[LOAD] by RL[OAD] and accepted as type A (21:0:3)
January 95	X11/SC15/TG9/95-1	Accepted as type B replacement (9:3:3)
March 95	X11/SC15/TG9/95-1	Discussed by MDCC-E. Unanimous vote for support.
January 28, 95	X11/SC15/TG9/95-1	This document is the result of SC15/TG9 meetings at January 28 and 29 passed as type B
January 28, 95	see also section 7 of this document	
January 28, 95	X11/SC15/94-31	This document produced as a result of SC15/TG9 discussions
November 7 94	X11/SC15/94-19	MDCC-E discussed the minutes of SC15 and SC15/TG10; MDCC-E wondered that the straw poll of SC15 showed 18 votes for ROUTINE and 7 for the FILE command, while SC15/TG10 voted to reconfirm the FILE command as type B and not to recommend the ROUTINE command as type B. Vote by MDCC-E to resubmit passed unanimously.
June 94 RENO	X11/SC15/94-19	SC15 conducted a straw poll with FILE(7), ROUTINE(18), and remanded to TG10;
21 April 93	X11/SC15/94-xx	This document proposed as type C
April 93		Discussion at MDCC-E meeting in Nüremberg.

1.5 Dependencies

This proposal modifies canvass document version 1.1.
There is a concurrently submitted proposal for standard routineparameters which depends on this proposal.

2. Justification of Proposed Change

2.1 Needs

M is more than a programming language, however, M does not provide any standard means to create or modify routines. Since M is frequently used by program generators a standardized way of creating and modifying routines is needed. Also, modern editors supported by third parties need to be able to load and save routines.
This proposal attempts to standardize the minimum functionality needed and leaves room for further extensions.

2.2 Existing Practice in the Area of the Proposed Change

Most implementations use a non-standard command to load a routine into a partition (which is in itself not a standard entity) and a command to save a routine. Some implementors are able to save pre-compiled code only. However this means that the $TEXT function will not always return the correct result.

3. Description of Proposed Change

3.1 General description of the Proposed Change

This proposal will add two new commands to the M language which allow one to load routines into a glvn or to save routines from a glvn.

3.2 Annotated Examples of Use

RLOAD test:^EDIT("copy 3")
Loads routine 'test' into global ^EDIT("copy 3",i) where i is a numeric subscript value

RSAVE test:^EDIT("File 1"):(ZEXECUTE="SYSTEM,USER,WORLD":ZFORMAT="PCODE")
Saves the M code lines from global ^EDIT("File 1",i) where i is a numeric subscript value, as routine test. The routine parameters in this example illustrate a possible use of routine parameters and are no part of this proposal.

3.3 Formalization

Add a new section after 8.2.17 the READ command

8.2.18 RLOAD

RL[OAD] postcond SP L routineargument

routineargument ::= | routineref : glvn [: routineparameters] |
| @ expratom V L routineargument |

routineparameters ::= | routineparam |
| |
| ([[routineparam] :] ... routineparam) |

routineparam ::= | routinekeyword |
| routineattribute = expr |

routinekeyword ::= name

routineattribute ::= name

Spellings of routinekeyword and routineattribute differing only in the use of lowercase and uppercase letters are equivalent.

All values of routinekeyword and routineattribute not starting with the character 'Z' are reserved for the MDC.

Assume that glvn is represented as $A(i_1,i_2,...,i_x)$ (x'<0).
Then the lines of the routine denoted by routineref are stored in nodes $A(i_1,i_2,...,i_x,i_{x+1})$. i_{x+1} has a value of n for the n'th line of the routine for all lines of the routine and no other nodes of A within the subscript range $i_1 \ldots i_{x+1}$ will be affected.

The naked indicator is modified by the reference to glvn if it is a gvn, but not by the implicit reference to the immediate descendants of glvn.

If the routineref denotes a non-existent routine an error condition occurs with an ecode="M88"

8.2.19 RSAVE

RS[AVE] postcond SP L routineargument

Assume that glvn is represented as $A(i_1,i_2,...,i_x)$ (x'<0)
Then the data values of all nodes $A(i_1,i_2,...,i_x,i_{x+1})$ for which the value of $DATA is either 1 or 11 are stored as lines of the routine denoted by routineref. The lines are taken in the subscript ordering for i_{x+1} as specified in the definition of $ORDER (7.1.5.11)

If glvn is undefined or if no node $A(i_1,i_2,...,i_x,i_{x+1})$ with a $DATA value of 1 or 11 exists the routine denoted by routineref is deleted.

If any one of the lines denoted by $A(i_1,i_2,...,i_x,i_{x+1})$ does not conform to the definition of a line the effect of executing the RSAVE command is unspecified.

At no point during the execution of the RSAVE command will any process be able to see a partially-filed routine.

Execution of a RSAVE command where routineref names the currently-executing routine causes an error with ecode="M25", and the routine is not modified.

The naked indicator is modified by the reference to glvn if it is a gvn, but not by the implicit reference to the immediate descendants of glvn.

Add to the end of step f in the description of the QUIT command (section 8.2.16):

> However, if this location is in a routine which has been modified or made inaccessible by the execution of a RSAVE command (subsequent to the placing of the frame on the PROCESS-

STACK), unspecified behavior may result.

4. Implementation Effects

4.1 Effect on Existing User Practices and Investments

The functionality introduced by this change to the language was already present in most implementations in a slightly different way. Adapting to the new commands, and making thereby the applications portable will not be too difficult.

4.2 Effect of Existing Vendor Practices and Investment

The functionality introduced is available in most systems in a slightly different way. It should not be too difficult for most vendors to use the RLOAD and RSAVE commands.

4.3 Techniques and Costs for Compliance Verification

4.4 Legal Considerations

No legal considerations.

5. Closely Related Standards Activities

5.1 Other X11 Proposals Under Consideration

X11/SC15/TG9/94-9 Routine editing (superseded by this document)
X11/SC15/TG9/94-8 Standard Routineparameters

5.2 Other Related Standards Efforts

None

5.3 Recommendations for Coordinating Liaison

None

6. Associated Documents

None

7. Issues, Pros and Cons, and Discussion

This proposal specifies only a mechanism to load and save a routine into and from a glvn
Other functionality regarding protection, save formats etc. can be added later on using the routineparameters.
The current proposal "merges routines into glvn", it does not kill the references at the beginning of the operation.

For the information of the reader the history section of document X11/SC15/TG9/94-9, ROUTINE Editing sponsored by Alan Frank, is given.

December, 1994	Document X11/SC15/TG9/94-9 as submitted for the January 1995 meeting
June, 1994	X11/SC15/TG10/94-5 adds atomicity; amended to replace "File" by "Routine" [16-2]; passed as subcommittee type B, 16-3-6. There was much discussion of an alternative proposal. Tg10 considered the various differences one by one and reaffirmed the approach taken in this proposal.
February, 1994	Task group discussion; recommended standardizing fileparameters
October, 1994	Subcommittee placed this functionality on calendar with an expected date of June, 1995.
June, 1993	Discussed in task group; voted 13-0 that atomicity should be explicit.
February, 1993	X11/SC15/TG10/93-2 (corrected example line CS2+1); failed as MDC type A, 10-20
January, 1993	Mail ballot submission for SC15 type A; approved
October, 1992	Approved as type B, 13-7-6 (X11/SC15/TG10/92-1)
September, 1992	Approved unanimously by TG10. Improved routine deletion text; changed fileparameters
April, 1992	Changes in examples and proposal format (X11/SC15/92-6)
February, 1992	Not addressed due to lack of time (X11/SC15/91-2)
October, 1991	Required editorial changes noted in X11/SC1/91-70
June, 1991	Demoted to type B and amended (X11/SC1/91-50)
April, 1991	"Minimal Routine Editing" passed by MDCC-E (X11/SC1/91-50)
January, 1991	Passed as Subcommittee type A (X11/SC1/90-106)
October, 1990	Failed to receive 2/3 majority (X11/SC1/90-85)
June, 1990	Revised type B (X11/SC1/90-36)
January, 1990	Revised type B with more optional parameters (X11/SC1/90-10)
May, 1989	FILE command reproposed to Sub 1; passed as type B
February, 1989	Structured system variable approach proposed to Sub 1
October, 1988	FILE command proposed to MDC Subcommittee #1 (X11/SC1/88-54)
April, 1988	ZSave-style proposal distributed (X11/SC1/88-17); task group formed
, 1980	FILE proposal from George Timson

8. Glossary