X11/96-70

MUMPS Development Committee

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

OMI International

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Produced by the MDC Subcommittee #14
Networking and Communications

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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.

1. Identification of the Proposed Change

1.1 Title

OMI International

1.2 MDC Proposer and Sponsor

Proposer
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1.3 Motion

None. Final version approved by MDC on September 29, 1996. This document supersedes X11/SC14/96–2.

1.4 History

13 Oct 1996	X11/96-70	Final document.
29 Sep 1996	X11/SC14/96–2	MDC accepted as Type A, 26:0:2.
22 Mar 1996	X11/SC14/TG4/95-13	SC14 accepted as Type A, 7:0:0.
25 Oct 1995	X11/SC14/TG4/95-10	Original proposal by Frederick Hiltz accepted by SC14 as Type B, 4:0:3.

1.5 Dependencies

This proposal is dependent upon:
ANSI/MDC X11.2-1995, OMI;
X11/95-93, OMI WRITE;
X11/96-30, OMI JOB.

Proposals depending on this proposal: none.

2. Justification of the Proposed Change

2.1 Needs

OMI should support the character set profiles of X11.1.

2.2 Existing Practice in Area of the Proposed Change

None.

3. Description of the Proposed Change

3.1 General Description of the Proposed Change

A client process that could use the character set profile of a global or a device on its own node can use the same global or device on a server node. OMI continues to transport data in the server's form — the client or agent performs all translations and interpretations.

The global reference is extended to refer to ssvns, giving the client or agent access to the server's character set profile for a global or device. A new *character translation* field in the global reference

governs whether the subscripts and data values of its transaction use the OMI standard character set profile or the server's character set profile. String write arguments send data to a device in the device's character set profile. The *character translation* field of the *connect* transaction governs all other strings.

The OMI major version number changes from 1 to 2.

3.2 Annotated Examples of Use

None. The OMI protocol is invisible to application routines.

3.3 Formalization

Amend ANSI/MDC X11.2-1995, OMI as shown in Appendix 9.

Amend X11/95-93, OMI WRITE as shown in appendix 10.

Amend X11/96-30, OMI JOB as shown in Appendix 11.

4. Implementation Effects

4.1 Effect on Existing User Practices and Investments

None. Existing routines need not be changed.

4.2 Effect on Existing Vendor Practices and Investments

The extension from OMI version 1 to version 2 requires minor changes to OMI version negotiation. The handling of global references requires minor change. Implementations that offer character set profiles for their own globals and devices can easily apply them to data transported by OMI.

4.3 Techniques and Costs for Compliance Verification

A verification facility for OMI compliance must be extended to verify correct use of character set profiles. This may require two man-weeks of software development.

4.4 Legal Considerations

None.

5. Closely Related Standards Activities

5.1 Other X11 Proposals Under Consideration

None.

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

7.1 Compression Techniques

In October 1995 the subcommittee asked what happens with multi-byte character sets when all sorts of compression techniques can be used to specify a sequence of multi-byte characters as in the Russian set and in JIS. Two features of OMI pertain. Both are found in 4.1:

1. OMI messages shall use the server's character set profile for a device and (when the *character translation* field of the global reference = 1) for a global. If that character set profile specifies a compression technique, then both the agent and server know it and use it. OMI neither requires nor permits the transmission of decompressed characters.

However, when the character set profile does not specify a compression technique but the implementation uses one internally, then OMI messages must contain the decompressed characters. In short, the character set profile determines the form of the OMI messages, regardless of the implementation's internal storage.

2. The *character translation* flag of the *connect* transaction governs the coding of other strings. When the flag = 0, the coding is ISO 8859-1 Latin alphabet No. 1. When the flag = 1, both agent and server use a shared non-standard character set, which could include compression because OMI says nothing about the properties of the non-standard character set.

7.2 Multiple Character Sets

In October 1995 the subcommittee noted that multi-character set handling is not specified. X11.1 clauses 7.1.3.2 and 7.1.3.3 specify one character set profile per device and per global respectively, and OMI does the same. However, one must consider the effect of changing that character set profile during a sequence of OMI transactions.

Implementers will not likely permit a global's character set to change while the global exists, since that would invalidate the stored data. Changing a device's character set while the device is open is more likely, but ill-advised. Neither standard — M nor OMI — addresses the semantics of such a change, and users must expect unspecified behavior.

7.3 October 1995 MDC Meeting

Pro	Con
1 Supports character set profiles using the network (1)	1 Multi-character set handling is not specified (5)

(Number of citations in the vote.)

7.4 March 1996 MDC Meeting

Pro	Con
1 Adds functionality (1)	
2 Adds international capability (1)	

(Number of citations in the vote.)

7.5 September 1996 MDC Meeting

Pro	Con
1 Transports charset profiles (10)	
	(Number of citations in the vote.)

8. Glossary

None.

9. Appendix

4.1 OMI and MUMPS

[Insert the following paragraphs in alphabetic order of the terms that they describe.]

- *character set profile:* Annex A. A character set profile defines 5 attributes of a global or a device: the names of the characters in its character set, the internal codes that represent them, which characters match which pattern codes, which characters may appear in the global name and subscripts, and the collation scheme.

- *ssvn:* 7.1.3 A structured system variable begins with "^$" but otherwise has the form of a gvn, for example:

```
^$GLOBAL("INV","CHARACTER")="ASCII"
```

states that ^INV uses the ASCII character set profile.

4.4 National character sets

[Replace the entire text of this clause with the following.]

4.4.1 Database

Most MUMPS databases use the character set profile M, defined in ANSI/MDC X11.1 Annex A. Some retain the collating sequence, pattern matching, and name characters of the M profile, but use different national character sets. And some use other character set profiles that cannot be translated to and from the M profile.

Many OMI transactions contain a global reference in the request, the response, or both. OMI defines the contents and collating sequence of subscripts and data values in these transactions in two ways, selected by the *character translation* field of the global reference:

- *character translation = 0:* Subscripts and data values shall use the M character set profile extended by the characters and codes 128 through 255 of the ISO 8859–1 Latin alphabet No. 1, which are common European symbols. Both agents and servers shall send this extended character set profile on output and shall accept it as input.

- *character translation = 1:* Subscripts and data values shall use the character set profile of the server. The agent shall refer to the server's ssvns if necessary for the definition of the character set profile.

The *connect* transaction contains a *character translation* field that governs the content of all strings not governed by the global reference nor by explicit specifications of this standard:

- *character translation = 0:* Strings shall use the M character set profile extended by the characters and codes 128 through 255 of the ISO 8859–1 Latin alphabet No. 1. Both

agents and servers shall send this extended character set profile on output and shall accept it as input.

- *character translation = 1:* Strings shall use the un-translated character set of the server.

An agent and a server that share a non-standard character set internally may set *character translation* = 1 throughout to avoid the burden of reciprocal translations to and from the M character set.

4.4.2 Device

The agent shall send data in *string write arguments* to a device using the device's character set profile. The agent shall refer to the server's ssvns if necessary for the definition of the device's character set profile. All other strings in device-related transactions shall be governed by the *character translation* field of the *connect* transaction as defined in 4.1.1.

Table 2 Error conditions

Type	Name	Description
		Database errors
70	Incompatible character set profile	The server is unable to translate subscripts or data between its character set profile and the M character set profile selected by the agent.

5.3.3 Global reference

[Replace the first paragraph and the first sentence of the second paragraph with:]

4.1 describes the environment, the global variable name (gvn), the structured system variable name (ssvn) and the lock argument (nref) that appear in many OMI messages, where they have the following form, called a global reference.

A global reference shall be a long string <LS>. Its fields shall be a character translation flag and strings containing the environment, name, and subscripts.

[Replace Figure 4 - Form of global reference with:]

<SI>	<LS>		<SS>		<SS>		<SS>		
Char Trans	<LI>	Environment	<SI>	Name	<SI>	Sub 1	<SI>	Sub 2	...

Figure 1 - Form of global reference

[Replace the list of fields in the global reference with the following:]

a *Character translation:* <SI> governs whether the transaction in which the global reference appears shall use the extended M character set profile or the server's character set profile for the global, ssvn or nref. The selection shall govern the characters and the collating sequence of subscripts and data values appearing in the transaction. See 4.4.

0 selects the extended M character set profile. 1 selects the server's character set profile. All other values are reserved.

NOTE - Other strings in the transaction, for example a global name, are governed by the character translation selected during the *connect* transaction.

b *Environment:* <LS> denotes the server's environment for this global reference. See 4.1 and 4.7.

c *Name:* <SS> The name of a gvn or an nref shall contain a leading caret, and the name of an ssvn shall contain a leading caret and dollar sign as shown in 4.1.

d *Subscript(s):* <SS> 0 or more subscripts. Each shall be a short string, thus limited to 255 characters. Numeric subscripts shall appear as decimal characters, not as binary numbers or other internal representation.

NOTE - The number of subscripts is implied by the length of the entire global reference, a long string <LS>.

5.4.1 Connect

[Replace the *character translation* field description of the *connect* request with the following:]

e *Character translation:* <SI> governs the character set that the agent proposes for all strings except those governed by the *character translation* flag in the global reference and those explicitly specified in this standard. See 4.4 and 5.3.3. 0 selects the extended M character set profile. 1 selects the untranslated character set of the server. All other values are reserved.

[Replace the *character translation* field description of the *connect* response with the following:]

e *Character translation:* <SI> indicates the server's selection of the character set to be used during the session for all strings except those governed by the character translation flag in the global reference and those explicitly specified in this standard. See 4.4 and 5.3.3. 0 selects the extended M character set profile. 1 selects the untranslated character set of the server. All other values are reserved.

10. Appendix: Amendments to OMI WRITE

Clause numbers refer to clauses of ANSI/MDC X11.2-1995, OMI as given in Appendix 9 of X11/95-93, OMI WRITE.

5.3.4 Mnemonic spaces

[Insert the following paragraph at the end of this clause:]

Some devices support a device parameter that sets the character set profile of the device. Agents may refer to the server's ssvns for the availability and definitions of character set profiles.

5.3.7 Write arguments

5.3.7.1 String

[Insert the following paragraph at the end of this clause:]

The agent shall send this field in the character set profile of the device.

11. Appendix: Amendments to OMI JOB

Clause numbers refer to clauses of ANSI/MDC X11.2-1995, OMI as given in Appendix 9 of X11/96-30, OMI JOB.

5.3.x Routine reference

[Append the following paragraph to the definition of the *arguments* field:]

When the job request in which the routine reference appears includes a process parameter that sets a character set profile, the agent shall send the arguments using that character set profile. Otherwise, the agent shall use the character set profile of the client.

5.4.26 Job

[Append the following paragraph to the definition of the *label* field:]

The agent shall send the label using the server's character set profile for the routine named in the routine reference.