

[MS-XJRNL]: Journal Record Message File Format

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Revision Summary

Date	Revision History	Revision Class	Comments
04/04/2008	0.1		Initial Availability.
04/25/2008	0.2		Revised and updated property names and other technical content.
06/27/2008	1.0		Initial Release.
08/06/2008	1.01		Revised and edited technical content.
09/03/2008	1.02		Revised and edited technical content.
12/03/2008	1.03		Updated IP notice.
04/10/2009	2.0		Updated technical content and applicable product releases.
07/15/2009	3.0	Major	Revised and edited for technical content.
11/04/2009	3.1.0	Minor	Updated the technical content.
02/10/2010	3.2.0	Minor	Updated the technical content.
05/05/2010	3.2.1	Editorial	Revised and edited the technical content.
08/04/2010	4.0	Major	Significantly changed the technical content.

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1 Introduction

Journal record **messages** are e-mail messages that are generated by the server to capture and report information about messages sent to and from users of the e-mail system. For background information about how journaling works, see [\[MSFT-WPXTJ\]](#).

This document specifies an extension to [\[RFC2045\]](#) and [\[RFC2046\]](#) to accommodate journal record messages.

1.1 Glossary

The following terms are defined in [\[MS-OXGLOS\]](#):

ASCII
attachment
Augmented Backus-Naur Form (ABNF)
base64 encoding
Bcc recipient
binary large object (BLOB)
body part
Cc recipient
character set
Coordinated Universal Time (UTC)
CRLF
distinguished name (DN)
distribution list
header
journal
Journal-Report
message
MIME
MIME content-type
MIME message
original-message
recipient (1)
Simple Mail Transfer Protocol (SMTP)
To recipient

The following terms are specific to this document:

body: The contents of a **body part** or an entire **message** (containing several **body parts**), as described in [\[RFC2045\]](#) section 2.6.

Content-Transfer-Encoding: A **header** that defines a way of **encoding** non-ASCII character data as **ASCII** data. This is described in [\[RFC2045\]](#) section 6.

encoding: The process of specifying a **Content-Transfer-Encoding** to transform character data from one form to another.

Envelope-Part: The portion of a **Journal-Report** containing metadata about the journaled **message** in machine-readable form.

message/rfc822: The **MIME content-type** of an e-mail **message** that is embedded within another e-mail **message**. The type is expressed via the well-known **MIME content-type header**. The **message/rfc822** type is described in [\[RFC2046\]](#) section 5.2.

MIME attachment: A **body part** within a **MIME message**, for example, an e-mail **message** or file that is attached to an e-mail **message**.

Original-Message-Part: The portion of a **Journal-Report** that captures the contents of the **original-message** that was journaled. The **Original-Message-Part** contains the entire data of the **original-message**. The **Original-Message-Part** is an opaque **binary large object (BLOB)**.

recipient forwarding: A feature provided by many e-mail delivery systems, where a **message** sent to one **recipient** e-mail address is instead redirected to a different e-mail address, called the "forwarded address". E-mail software typically provides methods to configure which specific e-mail addresses are enabled for **recipient forwarding**. Some e-mail systems allow configuring whether the **message** is entirely redirected to the forwarded address with no copy going to the original e-mail address, or whether the original e-mail address receives a copy of the **message** in addition to the forwarded address.

MAY, SHOULD, MUST, SHOULD NOT, MUST NOT: These terms (in all caps) are used as described in [\[RFC2119\]](#). All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

1.2 References

1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information. Please check the archive site, <http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624>, as an additional source.

[MS-OXMSG] Microsoft Corporation, "[.MSG File Format](#)", April 2008.

[MS-OXOABK] Microsoft Corporation, "[Address Book Object Protocol Specification](#)", April 2008.

[RFC2045] Freed, N., and Borenstein, N., "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies", RFC 2045, November 1996, <http://www.ietf.org/rfc/rfc2045.txt>

[RFC2046] Freed, N., and Borenstein, N., "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", RFC 2046, November 1996, <http://www.ietf.org/rfc/rfc2046.txt>

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, <http://www.ietf.org/rfc/rfc2119.txt>

[RFC2821] Klensin, J., Ed., "Simple Mail Transfer Protocol", RFC 2821, April 2001, <http://www.ietf.org/rfc/rfc2821.txt>

[RFC2822] Resnick, P., Ed., "Internet Message Format", RFC 2822, April 2001, <http://www.ietf.org/rfc/rfc2822.txt>

[RFC5234] Crocker, D., Ed., and Overell, P., "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, January 2008, <http://www.ietf.org/rfc/rfc5234.txt>

1.2.2 Informative References

[MS-OXGLOS] Microsoft Corporation, "[Exchange Server Protocols Master Glossary](#)", April 2008.

[MSFT-WPXTJ] Chand, N., "White Paper: Exchange 2007 Transport Journaling", September 2007, [http://technet.microsoft.com/en-us/library/bb738122\(EXCHG.80\).aspx](http://technet.microsoft.com/en-us/library/bb738122(EXCHG.80).aspx)

1.3 Overview

Journal-Reports are **MIME messages** produced by the server that capture information about other ordinary (non-Journal-Report) messages sent through the server. These other messages are referred to here as **original-messages**.

1.3.1 Body Text of the Journal-Report Message

The **body** text of the Journal-Report message lists the e-mail addresses of the sender and **recipients** of the message, the subject, the Internet **Message-ID** field, and certain other metadata about the original-message. The body text is referred to as the **Envelope-Part** of the Journal-Report. This document formally specifies the structure of the Envelope-Part.

1.3.2 original-message

The original-message is attached as a **MIME attachment** to the Envelope-Part. This is referred to as the **Original-Message-Part** of the Journal-Report. How the Original-Message-Part is attached to the Envelope-Part is fully specified in [\[RFC2045\]](#) and [\[RFC2046\]](#).

1.4 Relationship to Protocols and Other Structures

The Envelope-Part that is documented here is a substructure within the larger structure of the Journal-Report MIME message. The Journal-Report structure is a MIME message and conforms to [\[RFC2045\]](#) and [\[RFC2046\]](#).

[\[RFC2045\]](#) specifies how messages with a **MIME content-type** of **message/rfc822** might be nested recursively as **attachments**. The outermost message/rfc822 **body part** of the Journal-Report contains the Envelope-Part as the body.

The Envelope-Part is encoded using the mechanisms prescribed in [\[RFC2045\]](#), such as the **Content-Transfer-Encoding** mechanism, which specifies details such as the **character set** and **encoding** used for the data in the Envelope-Part. This document specifies the syntax of the Envelope-Part prior to any **MIME** encoding being applied.

To illustrate the concept of encoding: The Envelope-Part could contain textual data outside the **ASCII** character set range if the original-message had any non-English text. The MIME message is in many circumstances constrained to contain only data in the ASCII character range, so the MIME standards define methods of encoding non-ASCII data using mechanisms such as **base64 encoding** and quote-printable encoding. Thus, if an encoding mechanism was specified for the Envelope-Part using standardized MIME conventions, decoding would be done before processing the Envelope-Part structure.

The terms Content-Transfer-Encoding, character set, and encoding are specified in [\[RFC2045\]](#). The mechanism for decoding the Envelope-Part is specified in [\[RFC2045\]](#) section 6.

Figure 1 shows how the Envelope-Part substructure is placed in relation to the various other substructures in the Journal-Report MIME message.

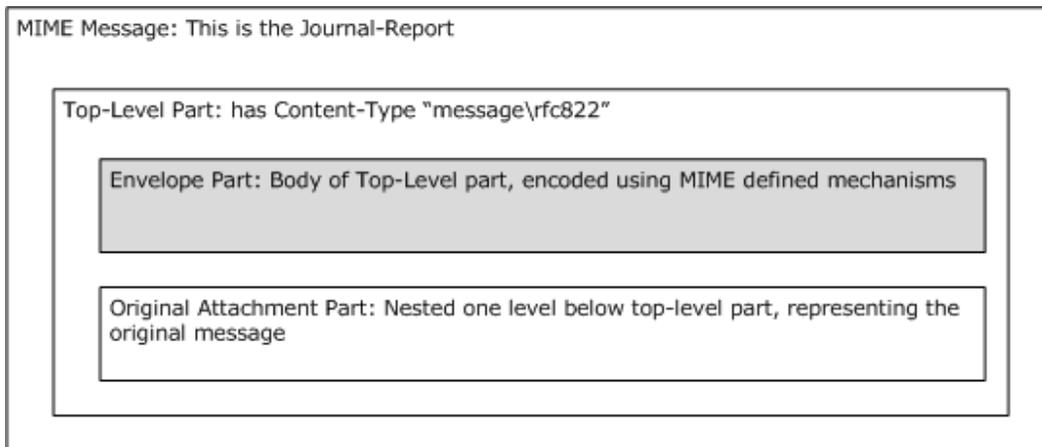


Figure 1: MIME structure of a Journal-Report message

1.5 Applicability Statement

Applications can use this protocol to create and consume **journal** record messages.

1.6 Versioning and Localization

None.

1.7 Vendor-Extensible Fields

None.

2 Structures

Journal-Reports extend the structures defined in [\[RFC2045\]](#) and [\[RFC2046\]](#) by defining a substructure called the Envelope-Part, which is embedded within the MIME message.

2.1 Envelope-Part

The **Augmented Backus-Naur Form (ABNF)** notation [\[RFC5234\]](#) is used to specify the format of the Envelope-Part. The format is a series of field/value pairs on **CRLF** terminated lines.

```
<Envelope-Part>          = <sender> CRLF
                          [<sent-on-behalf> CRLF]
                          (<subject> CRLF <message-id> CRLF) / (<message-id> CRLF <subject>
CRLF)
                          [<label> CRLF]
                          [<mailbox-owner> CRLF]
                          1*<recipient-specification>
                          [<sent-time> CRLF]
                          [<received-time> CRLF]

<sender>                  = "Sender:" SP <reverse-path>
<sent-on-behalf>         = "On-Behalf-Of:" SP <on-behalf-path>
<subject>                 = "Subject:" SP <subject-string>
<message-id>             = "Message-ID:" SP <msg-id>
<label>                   = "Label:" SP 1*255CHAR
<mailbox-owner>          = "Mailbox:" SP <mailbox-owner-address>
<recipient-specification> = <recipient-p2-type> ":" SP <forward-path>
                          ["," SP <redirection-type> ":" SP <original-forward-path>] CRLF
<sent-time>              = "SentUtc:" SP <sent-time-string>
<received-time>          = "ReceivedUtc:" SP <received-time-string>

<recipient-p2-type>      = "Bcc" / "To" / "Cc" / "Recipient"
<redirection-type>      = "Expanded" / "Forwarded"
```

2.1.1 Sender

The **reverse-path** field MUST be set to the e-mail address of the sender of the original-message. This field MUST be formatted as one of the following:

- An **SMTP** e-mail address as specified in [\[RFC2821\]](#).
- A **distinguished name** address formatted according to the following ABNF notation. The format for **x500-dn** is specified in [\[MS-OXOABK\]](#) section 2.2.1.1.

```
<distinguished-name-address> = "[EX:" x500-dn "]"
```

2.1.2 Subject

The **subject-string** field MUST contain the data from the "Subject" **header** of the original-message. This header is specified in [\[RFC2822\]](#).

The **subject-string** can consist of characters outside the ASCII character set range as specified in [\[RFC2045\]](#) and [\[RFC2046\]](#). The MIME content-type header of the respective body part in which

Envelope-Part is embedded MUST specify the character set to use to interpret the **subject-string** in accordance with the MIME specifications [\[RFC2045\]](#) and [\[RFC2046\]](#).

2.1.3 Message-ID

The **msg-id** field MUST contain the value of the **Message-ID** field ([\[RFC2822\]](#) section 3.6.4) of the original-message.

2.1.4 recipient-specification

One or more occurrences of **recipient-specification** give information about the recipients of the original-message that was journaled.

2.1.4.1 recipient-p2-type

This field MUST be set according to the following table.

Value	Meaning
"Bcc"	The recipient listed in forward-path was addressed as a Bcc recipient .
"To"	The recipient listed in forward-path was addressed as a To recipient .
"Cc"	The recipient listed in forward-path was addressed as a Cc recipient .
"Recipient"	The server was unable to determine how the recipient was addressed.

2.1.4.2 forward-path

This field MUST be set to the e-mail address of a recipient of the original-message. This address MUST be formatted in one of the following formats:

- An SMTP e-mail address as specified in [\[RFC2821\]](#).
- A distinguished name address as specified in section [2.1.1](#).

Neither format is preferred over the other. The choice of format is left to the implementation.

2.1.4.3 redirection-type

This field MUST be set to either "Expanded" or "Forwarded."

2.1.4.3.1 Expanded

A message sent to a **distribution list** is redirected instead to the users and distribution lists contained within the distribution list. This process is known as "expansion" and the distribution list is said to have been "expanded." The expansion is repeated for the nested distribution lists until all distribution lists have been expanded to ordinary users. The **redirection-type** field, when set to "Expanded", denotes that the sender of the message sent it originally to **original-forward-path**, which was a distribution list. This distribution list was then expanded to one or more recipients (perhaps expanding nested recipients repeatedly until all recipients were non-distribution list, ordinary recipients). Each of these expanded recipients is listed in the **forward-path** field of a **recipient-specification**.

2.1.4.3.2 Forwarded

A **redirection-type** of "Forwarded" indicates that the recipient indicated by **original-forward-path** was configured for **recipient forwarding**. The message was forwarded to the recipient indicated by **forward-path**.

2.1.4.4 original-forward-path

The **original-forward-path** field is the e-mail address of the recipient that was redirected to **forward-path**. This address MUST be formatted in one of the following formats:

- An SMTP e-mail address as specified in [\[RFC2821\]](#).
- A distinguished name address as specified in section [2.1.1](#).

Neither format is preferred over the other. The choice of format is left to the implementation.

Although syntactically identical to **forward-path**, it has different semantics. The appearance of **redirection-type** and **original-forward-path** in a **recipient-specification** indicates that originally the message that was journaled was sent to the recipient with address **original-forward-path** and the server did one of the following:

1. Changed the recipient address to **forward-path**.
2. Added a new recipient with the address **forward-path** due to the **original-forward-path** recipient being present.

If the **redirection-type** and **original-forward-path** elements are omitted, the server did not have information about what type of forwarding or expansion was done on the recipient when it generated the Journal-Report.

2.1.5 Label

If present, this optional field MUST contain a text value, the contents of which are implementation-specific.

2.1.6 On-Behalf-Of

This field is optional. If present, the **on-behalf-path** field contains the e-mail address of the sending mailbox owner. This e-mail address MUST be different than the address contained in the **reverse-path** field. This address MUST be formatted in one of the following formats:

- An SMTP e-mail address as specified in [\[RFC2821\]](#).
- A distinguished name address as specified in section [2.1.1](#).

Neither format is preferred over the other. The choice of format is left to the implementation.

2.1.7 Mailbox

This field is optional. If present, the **mailbox-owner-address** field contains the SMTP e-mail address of the sending mailbox owner.

2.1.8 SentUtc

This field is optional. If present, the **sent-time-string** field contains a string representing the date and time that the original-message was sent in **Coordinated Universal Time (UTC)**. The exact format of the string contained in the **sent-time-string** field is implementation-dependent.

2.1.9 ReceivedUtc

This field is optional. If present, the **received-time-string** field contains a string representing the date and time that the original-message was received in Coordinated Universal Time (UTC). The exact format of the string contained in the **received-time-string** field is implementation-dependent.

2.2 Original-Message-Part

This data MUST be one of the following:

- A MIME attachment of type message/rfc822.
- A .MSG file as specified in [\[MS-OXMSG\]](#).

Neither format is preferred over the other. The choice of format is left to the implementation.

3 Structure Examples

The following is an example of the Envelope-Part of Journal-Report, followed by an explanation of the various syntax elements (note that the line numbers are not present in the actual Envelope-Part, but are shown here so the structure can be discussed line by line):

```
Sender: sender@contoso.com
Subject: Sample Message
Message-ID: <12345@contoso.com>
To: dl-to-member1@contoso.com, Expanded: dl-to@contoso.com
To: dl-to-member2@contoso.com, Expanded: dl-to@contoso.com
Cc: fwd@contoso.com, Forwarded: user@contoso.com
Bcc: dl-bcc-member@contoso.com, Expanded: dl-bcc@contoso.com
Bcc: fwd2@contoso.com, Forwarded: user2@contoso.com
Recipient: user-unk@contoso.com
```

1. The sender of the original-message was "sender@contoso.com."
2. The subject of the original-message was "Sample Message."
3. The value of the **Message-ID** field ([\[RFC2822\]](#) section 3.6.4) of the original-message was "12345@contoso.com."
4. The original-message was sent to dl-to@contoso.com as a To recipient, which is a distribution list that was expanded to dl-to-member1@contoso.com and dl-to-member2@contoso.com (captured in Line 5) by the server.
5. See (4).
6. The original-message was sent to user@contoso.com as a Cc recipient, which was changed by the e-mail server to fwd@contoso.com because recipient forwarding was configured. User@contoso.com did not receive a copy of the message because there is no **recipient-specification** where user@contoso.com was listed in the **forward-path**.
7. The original-message was sent by the mail client to dl-bcc@contoso.com as a Bcc recipient, which is a distribution list that was expanded to dl-bcc-member@contoso.com.
8. The original-message was sent to user2@contoso.com as a Bcc recipient, which was rewritten by the e-mail server to fwd2@contoso.com because recipient forwarding was configured. User2@contoso.com did not receive a copy of the message because there is no **recipient-specification** where user2@contoso.com was listed in the **forward-path**.
9. Finally, there is no information about whether user-unk@contoso.com was sent the original-message as a To recipient, Cc recipient, or Bcc recipient. It is also not known whether this recipient got the message due to distribution list expansion, recipient forwarding, or was directly addressed by the sender. The "recipient:" element indicates that the server was only able to capture that user-unk@contoso.com was a recipient of the message and no further recipient metadata was available.

4 Security Considerations

This format does not implement or concern itself with security, but relies on the underlying e-mail transport software and e-mail storage software to provide security as applicable.

4.1 Security Considerations for Implementers

None.

4.2 Index of Security Fields

None.

5 Appendix A: Product Behavior

The information in this specification is applicable to the following Microsoft products:

- Microsoft® Office Outlook® 2007
- Microsoft® Exchange Server 2007
- Microsoft® Outlook® 2010
- Microsoft® Exchange Server 2010

Exceptions, if any, are noted below. If a service pack number appears with the product version, behavior changed in that service pack. The new behavior also applies to subsequent service packs of the product unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification prescribed using the terms SHOULD or SHOULD NOT implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that product does not follow the prescription.

6 Change Tracking

This section identifies changes that were made to the [MS-XJRNL] protocol document between the May 2010 and August 2010 releases. Changes are classified as New, Major, Minor, Editorial, or No change.

The revision class **New** means that a new document is being released.

The revision class **Major** means that the technical content in the document was significantly revised. Major changes affect protocol interoperability or implementation. Examples of major changes are:

- A document revision that incorporates changes to interoperability requirements or functionality.
- An extensive rewrite, addition, or deletion of major portions of content.
- The removal of a document from the documentation set.
- Changes made for template compliance.

The revision class **Minor** means that the meaning of the technical content was clarified. Minor changes do not affect protocol interoperability or implementation. Examples of minor changes are updates to clarify ambiguity at the sentence, paragraph, or table level.

The revision class **Editorial** means that the language and formatting in the technical content was changed. Editorial changes apply to grammatical, formatting, and style issues.

The revision class **No change** means that no new technical or language changes were introduced. The technical content of the document is identical to the last released version, but minor editorial and formatting changes, as well as updates to the header and footer information, and to the revision summary, may have been made.

Major and minor changes can be described further using the following change types:

- New content added.
- Content updated.
- Content removed.
- New product behavior note added.
- Product behavior note updated.
- Product behavior note removed.
- New protocol syntax added.
- Protocol syntax updated.
- Protocol syntax removed.
- New content added due to protocol revision.
- Content updated due to protocol revision.
- Content removed due to protocol revision.
- New protocol syntax added due to protocol revision.

- Protocol syntax updated due to protocol revision.
- Protocol syntax removed due to protocol revision.
- New content added for template compliance.
- Content updated for template compliance.
- Content removed for template compliance.
- Obsolete document removed.

Editorial changes are always classified with the change type "Editorially updated."

Some important terms used in the change type descriptions are defined as follows:

- **Protocol syntax** refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.
- **Protocol revision** refers to changes made to a protocol that affect the bits that are sent over the wire.

The changes made to this document are listed in the following table. For more information, please contact protocol@microsoft.com.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
1.1 Glossary	56243 Added "base64 encoding" to the list of terms defined in [MS-OXGLOS].	N	New content added.
1.1 Glossary	56702 Removed normative language from local glossary term definition.	N	Editorially updated.
1.1 Glossary	57240 Removed "message ID (MID)" from list of glossary terms.	N	Content update.
1.1 Glossary	57392 Added "distinguished name (DN)" to list of glossary terms.	N	Content update.
1.1 Glossary	57391 Added "Coordinated Universal Time (UTC)" to list of glossary terms.	N	Content update.
1.2.1 Normative References	55751 Moved [MS-OXGLOS] from Normative References section to Informative References section.	N	Content update.
1.2.1 Normative References	57622 Added [MS-OXOABK] to list of references.	N	Content update.
1.3.1 Body Text of the	57240 Clarified "Message-ID".	N	Content update.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
Journal-Report Message			
2.1 Envelope-Part	57393 Moved <label> field in ABNF to proper place.	N	Content update.
2.1 Envelope-Part	57391 Revised ABNF to add new fields to Envelope-Part.	N	Content update.
2.1.1 Sender	57392 Added information regarding distinguished name format for this field.	N	Content update.
2.1.3 Message-ID	57240 Clarified "Message-ID".	N	Content update.
2.1.4 recipient-specification	57224 Added comma and space to "recipient-specification" ABNF.	N	Content update.
2.1.4 recipient-specification	57391 Moved ABNF to section 2.1.	N	Content update.
2.1.4.2 forward-path	57392 Added information regarding distinguished name format for this field.	N	Content update.
2.1.4.3.1 Expanded	57282 Revised description of "Expanded".	N	Content update.
2.1.4.4 original-forward-path	57237 Revised description for omitted "redirection-type" and "original-forward-path".	N	Content update.
2.1.4.4 original-forward-path	57392 Added information regarding distinguished name format for this field.	N	Content update.
2.1.5 Label	57391 Moved ABNF to section 2.1.	N	Content update.
2.1.6 On-Behalf-Of	57391 Added new section to specify the "On-Behalf-Of" field.	Y	New content added.
2.1.7 Mailbox	57391 Added new section to specify the "Mailbox" field.	Y	New content added.
2.1.8 SentUtc	57391 Added new section to specify the "SentUtc" field.	Y	Content update.
2.1.9 ReceivedUtc	57391 Added new section to specify the "ReceivedUtc" field.	Y	Content update.
3 Structure Examples	57239 Replaced "user@contoso.com" with	N	Content update.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
	"user2@contoso.com" and "fwd@contoso.com" with "fwd2@contoso.com" in description of BCC recipient.		
3 Structure Examples	57240 Clarified "Message-ID".	N	Content update.
4.1 Security Considerations for Implementers	57220 Added new section "Security Considerations for Implementers".	N	New content added.
4.2 Index of Security Fields	57221 Added new section "Index of Security Fields".	N	New content added.

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