

# [MS-OXCMSG]: Message and Attachment Object Protocol Specification

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## Revision Summary

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# Table of Contents

<b>1 Introduction</b>	<b>9</b>
1.1 Glossary	9
1.2 References	10
1.2.1 Normative References	11
1.2.2 Informative References	12
1.3 Overview	12
1.3.1 Message Objects	12
1.3.2 FAI Messages	12
1.3.3 Message Recipients	13
1.3.4 Message Attachments	13
1.4 Relationship to Other Protocols	13
1.5 Prerequisites/Preconditions	13
1.6 Applicability Statement	14
1.7 Versioning and Capability Negotiation	14
1.8 Vendor-Extensible Fields	14
1.9 Standards Assignments	14
<b>2 Messages</b>	<b>15</b>
2.1 Transport	15
2.2 Message Syntax	15
2.2.1 Message Object Properties	15
2.2.1.1 General Properties	15
2.2.1.2 PidTagHasAttachments Property	15
2.2.1.3 PidTagMessageClass Property	16
2.2.1.4 PidTagMessageCodepage Property	16
2.2.1.5 PidTagMessageLocaleId Property	16
2.2.1.6 PidTagMessageFlags Property	16
2.2.1.7 PidTagMessageSize Property	17
2.2.1.8 PidTagMessageStatus Property	18
2.2.1.9 PidTagSubjectPrefix Property	18
2.2.1.10 PidTagNormalizedSubject Property	18
2.2.1.11 PidTagImportance Property	18
2.2.1.12 PidTagPriority Property	19
2.2.1.13 PidTagSensitivity Property	19
2.2.1.14 PidLidSmartNoAttach Property	19
2.2.1.15 PidLidPrivate Property	19
2.2.1.16 PidLidSideEffects Property	20
2.2.1.17 PidNameKeywords Property	20
2.2.1.18 PidLidCommonStart Property	20
2.2.1.19 PidLidCommonEnd Property	21
2.2.1.20 PidTagAutoForwarded Property	21
2.2.1.21 PidTagAutoForwardComment Property	21
2.2.1.22 PidLidCategories Property	21
2.2.1.23 PidLidClassification	21
2.2.1.24 PidLidClassificationDescription Property	21
2.2.1.25 PidLidClassified Property	21
2.2.1.26 PidTagInternetReferences Property	22
2.2.1.27 PidLidInfoPathFormName Property	22
2.2.1.28 PidTagMimeSkeleton Property	22
2.2.1.29 PidTagTnefCorrelationKey Property	22

2.2.1.30	PidTagAddressBookDisplayNamePrintable Property .....	22
2.2.1.31	PidTagCreatorEntryId Property .....	22
2.2.1.32	PidTagLastModifierEntryId Property .....	22
2.2.1.33	PidLidAgingDontAgeMe Property .....	23
2.2.1.34	PidLidCurrentVersion Property .....	23
2.2.1.35	PidLidCurrentVersionName Property .....	23
2.2.1.36	PidTagAlternateRecipientAllowed Property .....	23
2.2.1.37	PidTagResponsibility Property .....	23
2.2.1.38	PidTagRowid Property .....	23
2.2.1.39	PidTagHasNamedProperties Property .....	23
2.2.1.40	PidTagRecipientOrder Property .....	24
2.2.1.41	PidNameContentBase Property .....	24
2.2.1.42	PidNameAcceptLanguage Property .....	24
2.2.1.43	PidTagPurportedSenderDomain Property .....	24
2.2.1.44	PidTagStoreEntryId Property .....	24
2.2.1.45	PidTagTrustSender .....	24
2.2.1.46	PidTagSubject Property .....	25
2.2.1.47	PidTagMessageRecipients Property .....	25
2.2.1.48	PidNameContentClass Property .....	25
2.2.1.49	Body Properties .....	25
2.2.1.49.1	PidTagBody Property .....	25
2.2.1.49.2	PidTagNativeBody Property .....	26
2.2.1.49.3	PidTagBodyHtml Property .....	26
2.2.1.49.4	PidTagRtfCompressed Property .....	26
2.2.1.49.5	PidTagRtfInSync Property .....	26
2.2.1.49.6	PidTagInternetCodepage Property .....	26
2.2.1.49.7	PidTagBodyContentId Property .....	26
2.2.1.49.8	PidTagBodyContentLocation Property .....	27
2.2.1.49.9	PidTagHtml Property .....	27
2.2.1.50	Contact Linking Properties .....	27
2.2.1.50.1	PidLidContactLinkEntry Property .....	27
2.2.1.50.2	PidLidContacts Property .....	28
2.2.1.50.3	PidLidContactLinkName Property .....	28
2.2.1.50.4	PidLidContactLinkSearchKey Property .....	28
2.2.1.51	Retention and Archive Properties .....	28
2.2.1.51.1	PidTagArchiveTag Property .....	29
2.2.1.51.2	PidTagPolicyTag Property .....	29
2.2.1.51.3	PidTagRetentionPeriod Property .....	29
2.2.1.51.4	PidTagStartDateEtc Property .....	29
2.2.1.51.5	PidTagRetentionDate Property .....	29
2.2.1.51.6	PidTagRetentionFlags Property .....	30
2.2.1.51.7	PidTagArchivePeriod Property .....	30
2.2.1.51.8	PidTagArchiveDate Property .....	31
2.2.2	Attachment Object Properties .....	31
2.2.2.1	General Properties .....	31
2.2.2.2	PidTagLastModificationTime Property .....	31
2.2.2.3	PidTagCreationTime Property .....	31
2.2.2.4	PidTagDisplayName Property .....	31
2.2.2.5	PidTagAttachSize Property .....	32
2.2.2.6	PidTagAttachNumber Property .....	32
2.2.2.7	PidTagAttachDataBinary Property .....	32
2.2.2.8	PidTagAttachDataObject Property .....	32
2.2.2.9	PidTagAttachMethod Property .....	32

2.2.2.10	PidTagAttachLongFilename Property .....	33
2.2.2.11	PidTagAttachFilename Property.....	33
2.2.2.12	PidTagAttachExtension Property.....	33
2.2.2.13	PidTagAttachLongPathname Property .....	33
2.2.2.14	PidTagAttachPathname Property .....	33
2.2.2.15	PidTagAttachTag Property .....	33
2.2.2.16	PidTagRenderingPosition Property .....	34
2.2.2.17	PidTagAttachRendering Property .....	34
2.2.2.18	PidTagAttachFlags Property .....	34
2.2.2.19	PidTagAttachTransportName Property.....	34
2.2.2.20	PidTagAttachEncoding Property .....	34
2.2.2.21	PidTagAttachAdditionalInformation Property .....	35
2.2.2.22	PidTagAttachmentLinkId Property .....	35
2.2.2.23	PidTagAttachmentFlags Property.....	35
2.2.2.24	PidTagAttachmentHidden Property .....	35
2.2.2.25	PidTagTextAttachmentCharset Property .....	35
2.2.2.26	MIME Properties.....	35
2.2.3	Message Object ROPs .....	36
2.2.3.1	RopOpenMessage ROP.....	36
2.2.3.1.1	RopOpenMessage ROP Request Buffer .....	37
2.2.3.1.2	RopOpenMessage ROP Response Buffer .....	37
2.2.3.2	RopCreateMessage ROP.....	38
2.2.3.2.1	RopCreateMessage ROP Request Buffer.....	38
2.2.3.2.2	RopCreateMessage ROP Response Buffer.....	39
2.2.3.3	RopSaveChangesMessage ROP .....	39
2.2.3.3.1	RopSaveChangesMessage ROP Request Buffer .....	39
2.2.3.3.2	RopSaveChangesMessage ROP Response Buffer .....	40
2.2.3.4	RopRemoveAllRecipients ROP .....	40
2.2.3.4.1	RopRemoveAllRecipients ROP Request Buffer .....	40
2.2.3.4.2	RopRemoveAllRecipients ROP Response Buffer .....	40
2.2.3.5	RopModifyRecipients ROP .....	40
2.2.3.5.1	RopModifyRecipients ROP Request Buffer .....	41
2.2.3.5.2	RopModifyRecipients ROP Response Buffer .....	41
2.2.3.6	RopReadRecipients ROP.....	41
2.2.3.6.1	RopReadRecipients ROP Request Buffer .....	42
2.2.3.6.2	RopReadRecipients ROP Response Buffer .....	42
2.2.3.7	RopReloadCachedInformation ROP.....	42
2.2.3.7.1	RopReloadCachedInformation ROP Request Buffer.....	42
2.2.3.7.2	RopReloadCachedInformation ROP Response Buffer.....	42
2.2.3.8	RopSetMessageStatus ROP .....	42
2.2.3.8.1	RopSetMessageStatus ROP Request Buffer .....	43
2.2.3.8.2	RopSetMessageStatus ROP Response Buffer .....	43
2.2.3.9	RopGetMessageStatus ROP .....	43
2.2.3.9.1	RopGetMessageStatus ROP Request Buffer .....	43
2.2.3.9.2	RopGetMessageStatus ROP Response Buffer .....	43
2.2.3.10	RopSetReadFlags ROP .....	44
2.2.3.10.1	RopSetReadFlags ROP Request Buffer .....	44
2.2.3.10.2	RopSetReadFlags ROP Response Buffer .....	44
2.2.3.11	RopSetMessageReadFlag ROP.....	45
2.2.3.11.1	RopSetMessageReadFlag ROP Request Buffer.....	45
2.2.3.11.2	RopSetMessageReadFlag ROP Response Buffer.....	45
2.2.3.12	RopOpenAttachment ROP.....	45
2.2.3.12.1	RopOpenAttachment ROP Request Buffer .....	46

2.2.3.12.2	RopOpenAttachment ROP Response Buffer .....	46
2.2.3.13	RopCreateAttachment ROP .....	46
2.2.3.13.1	RopCreateAttachment ROP Request Buffer .....	46
2.2.3.13.2	RopCreateAttachment ROP Response Buffer .....	46
2.2.3.14	RopDeleteAttachment ROP .....	47
2.2.3.14.1	RopDeleteAttachment ROP Request Buffer .....	47
2.2.3.14.2	RopDeleteAttachment ROP Response Buffer .....	47
2.2.3.15	RopSaveChangesAttachment ROP .....	47
2.2.3.15.1	RopSaveChangesAttachment ROP Request Buffer .....	47
2.2.3.15.2	RopSaveChangesAttachment ROP Response Buffer .....	47
2.2.3.16	RopOpenEmbeddedMessage ROP .....	48
2.2.3.16.1	RopOpenEmbeddedMessage ROP Request Buffer .....	48
2.2.3.16.2	RopOpenEmbeddedMessage ROP Response Buffer .....	48
2.2.3.17	RopGetAttachmentTable ROP .....	48
2.2.3.17.1	RopGetAttachmentTable ROP Request Buffer .....	49
2.2.3.17.2	RopGetAttachmentTable ROP Response Buffer .....	49
2.2.3.18	RopGetValidAttachments ROP .....	49
2.2.3.18.1	RopGetValidAttachments ROP Request Buffer .....	49
2.2.3.18.2	RopGetValidAttachments ROP Response Buffer .....	49
<b>3</b>	<b>Protocol Details .....</b>	<b>50</b>
3.1	Client Details .....	50
3.1.1	Abstract Data Model .....	50
3.1.1.1	Per Global .....	50
3.1.1.2	Per Mailbox .....	50
3.1.1.3	Per Message Object .....	50
3.1.2	Timers .....	50
3.1.3	Initialization .....	50
3.1.4	Higher-Layer Triggered Events .....	51
3.1.4.1	Opening a Message Object .....	51
3.1.4.2	Creating a Message Object .....	51
3.1.4.3	Saving Changes on a Message Object .....	51
3.1.4.4	Removing All Recipients .....	51
3.1.4.5	Adding, Deleting, or Modifying a Recipient .....	51
3.1.4.6	Reading Recipients .....	51
3.1.4.7	Reload Message Object Header Info .....	51
3.1.4.8	Setting Message Status .....	51
3.1.4.9	Getting Message Status .....	51
3.1.4.10	Setting Message Object Read State .....	51
3.1.4.11	Opening an Attachment .....	52
3.1.4.12	Creating an Attachment .....	52
3.1.4.13	Deleting an Attachment .....	52
3.1.4.14	Setting Attachment Object Content .....	52
3.1.4.15	Saving Changes on an Attachment Object .....	52
3.1.4.16	Opening an Embedded Message Object .....	52
3.1.4.17	Accessing the Attachments Table .....	52
3.1.4.18	Creating an Embedded Message .....	52
3.1.4.19	Saving an Embedded Message .....	52
3.1.4.20	Linking a Contact Object .....	53
3.1.5	Message Processing Events and Sequencing Rules .....	53
3.1.5.1	Sending a RopOpenMessage ROP Request .....	53
3.1.5.2	Sending a RopSaveChangesMessage ROP Request .....	53
3.1.5.3	Sending a RopCreateMessage ROP Request .....	53

3.1.5.4	Sending a RopRemoveAllRecipients ROP Request.....	54
3.1.5.5	Sending a RopModifyRecipients ROP Request .....	54
3.1.5.6	Sending a RopReadRecipients ROP Request .....	54
3.1.5.7	Sending a RopSetMessageStatus ROP Request .....	54
3.1.5.8	Sending a RopGetMessageStatus ROP Request.....	55
3.1.5.9	Sending a RopSetReadFlags ROP Request.....	55
3.1.5.10	Sending a RopOpenAttachment ROP Request .....	55
3.1.5.11	Sending a RopCreateAttachment ROP Request.....	55
3.1.5.12	Sending a RopSetProperties ROP Request .....	55
3.1.5.13	Sending a RopGetPropertiesSpecific ROP Request .....	56
3.1.5.14	Sending a RopSaveChangesAttachment ROP Request .....	56
3.1.5.15	Sending a RopOpenEmbeddedMessage ROP Request .....	56
3.1.5.16	Sending a RopGetAttachmentTable ROP Request .....	56
3.1.6	Timer Events .....	56
3.1.7	Other Local Events .....	56
3.2	Server Details .....	57
3.2.1	Abstract Data Model .....	57
3.2.1.1	Per Global.....	57
3.2.1.2	Per Mailbox.....	57
3.2.1.3	Per Message Object .....	57
3.2.2	Timers .....	57
3.2.3	Initialization .....	57
3.2.4	Higher-Layer Triggered Events.....	57
3.2.4.1	Requesting Body Properties .....	58
3.2.5	Message Processing Events and Sequencing Rules.....	58
3.2.5.1	Receiving a RopOpenMessage ROP Request .....	58
3.2.5.2	Receiving a RopCreateMessage ROP Request .....	59
3.2.5.3	Receiving a RopSaveChangesMessage ROP Request.....	60
3.2.5.4	Receiving a RopRemoveAllRecipients ROP Request.....	61
3.2.5.5	Receiving a RopModifyRecipients ROP Request .....	61
3.2.5.6	Receiving a RopReadRecipients ROP Request .....	62
3.2.5.7	Receiving a RopReloadCachedInformation ROP Request.....	62
3.2.5.8	Receiving a RopSetMessageStatus ROP Request .....	63
3.2.5.9	Receiving a RopGetMessageStatus ROP Request.....	63
3.2.5.10	Receiving a RopSetReadFlags ROP Request .....	63
3.2.5.11	Receiving a RopSetMessageReadFlag ROP Request.....	64
3.2.5.12	Receiving a RopOpenAttachment ROP Request .....	64
3.2.5.13	Receiving a RopCreateAttachment ROP Request .....	65
3.2.5.14	Receiving a RopSaveChangesAttachment ROP Request .....	66
3.2.5.15	Receiving a RopDeleteAttachment ROP Request.....	66
3.2.5.16	Receiving a RopOpenEmbeddedMessage ROP Request .....	66
3.2.5.17	Receiving a RopGetAttachmentTable ROP Request .....	67
3.2.6	Timer Events .....	67
3.2.7	Other Local Events .....	67
<b>4</b>	<b>Protocol Examples.....</b>	<b>68</b>
4.1	Create Message .....	68
4.1.1	RopCreateMessage Request Buffer .....	68
4.1.2	RopCreateMessage Response Buffer .....	68
4.2	Name to Id Mapping.....	68
4.3	Get Attachment Table .....	68
4.3.1	RopGetAttachmentTable Request Buffer .....	69
4.3.2	RopGetAttachmentTable Response Buffer .....	69

4.4	Insert HTML Embedded Image .....	69
4.4.1	RopCreateAttachment Request Buffer .....	69
4.4.2	RopCreateAttachment Response Buffer .....	69
4.4.3	Setting Properties.....	70
4.4.4	RopSaveChangesAttachment Request Buffer.....	70
4.4.5	RopSaveChangesAttachment Response Buffer.....	71
4.4.6	Releasing Attachment Object .....	71
4.5	Attach Text File .....	71
4.5.1	RopCreateAttachment Request Buffer .....	71
4.5.2	RopCreateAttachment Response Buffer .....	71
4.5.3	Setting Properties.....	71
4.5.4	RopSaveChangesAttachment Request Buffer.....	72
4.5.5	RopSaveChangesAttachment Response Buffer.....	73
4.5.6	Releasing Attachment Object .....	73
4.6	Setting Message Properties .....	73
4.7	Adding Recipients .....	73
4.7.1	RopModifyRecipients Request Buffer .....	73
4.7.2	RopModifyRecipients Response Buffer .....	75
4.8	Save Message .....	75
4.8.1	RopSaveChangesMessage Request Buffer.....	76
4.8.2	RopSaveChangesMessage Response Buffer.....	76
4.9	Releasing Message Object.....	76
<b>5</b>	<b>Security.....</b>	<b>77</b>
5.1	Security Considerations for Implementers.....	77
5.2	Index of Security Parameters .....	77
<b>6</b>	<b>Appendix A: Product Behavior.....</b>	<b>78</b>
<b>7</b>	<b>Change Tracking.....</b>	<b>80</b>
<b>8</b>	<b>Index .....</b>	<b>83</b>



# 1 Introduction

The Message and Attachment Object Protocol provides the methods used within the server for manipulating **Message objects**.

Sections 1.8, 2, and 3 of this specification are normative and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in RFC 2119. Sections 1.5 and 1.9 are also normative but cannot contain those terms. All other sections and examples in this specification are informative.

## 1.1 Glossary

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

- 8.3 name**
- ASCII**
- code page**
- Coordinated Universal Time (UTC)**
- flags**
- GUID**
- handle**
- language code identifier (LCID)**
- remote procedure call (RPC)**
- Unicode**

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

- address book**
- Archive Policy**
- Attachment object**
- attachments table**
- blind carbon copy (Bcc) recipient**
- body part**
- carbon copy (Cc) recipient**
- category**
- character set**
- contact**
- Contact object**
- contents table**
- E-mail object**
- Embedded Message object**
- EntryID**
- folder associated information (FAI)**
- Folder object**
- header**
- Hypertext Markup Language (HTML)**
- Inbox folder**
- Logon object**
- mailbox**
- message body**
- message class**
- Message object**
- metafile**
- Multipurpose Internet Mail Extensions (MIME)**
- named property**

**non-Unicode  
Object Linking and Embedding (OLE)  
permission  
plain text  
primary recipient  
property tag  
public folder  
read receipt  
recipient  
recipient table  
remote operation (ROP)  
restriction  
Retention Policy  
retention tag  
Rich Text Format (RTF)  
ROP request  
ROP request buffer  
ROP response  
ROP response buffer  
search key  
soft delete  
store  
Store object  
Table object  
To recipient  
transaction  
Transport Neutral Encapsulation Format (TNEF)  
Uniform Resource Identifier (URI)  
Web Distributed Authoring and Versioning Protocol (WebDAV)  
Windows Metafile Format (WMF)**

The following terms are specific to this document:

**archive tag:** An element that contains information about the Archive Policy of a Message object or folder.

**clear-signed body:** A message body that was promoted from a clear-signed S/MIME message, as described in [MS-OXOSMIME].

**header message object:** A Message object that contains partial information about a message on a server, such as an identifier for the message, the display names of the recipients and the sender, the subject of the message, and the delivery time of the message. It allows a client to display enough information about a message to let a user choose whether to download the message.

**undefined body:** A body with no defined content.

**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

References to Microsoft Open Specifications documentation do not include a publishing year because links are to the latest version of the technical documents, which are updated frequently. References to other documents include a publishing year when one is available.

## 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](mailto: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-LCID] Microsoft Corporation, "[Windows Language Code Identifier \(LCID\) Reference](#)".
- [MS-OXBBODY] Microsoft Corporation, "[Best Body Retrieval Algorithm](#)".
- [MS-OXCDATA] Microsoft Corporation, "[Data Structures](#)".
- [MS-OXCFCICS] Microsoft Corporation, "[Bulk Data Transfer Protocol Specification](#)".
- [MS-OXCMAIL] Microsoft Corporation, "[RFC2822 and MIME to E-Mail Object Conversion Algorithm](#)".
- [MS-OXCPerm] Microsoft Corporation, "[Exchange Access and Operation Permissions Protocol Specification](#)".
- [MS-OXCPRPT] Microsoft Corporation, "[Property and Stream Object Protocol Specification](#)".
- [MS-OXCROPS] Microsoft Corporation, "[Remote Operations \(ROP\) List and Encoding Protocol Specification](#)".
- [MS-OXCRPC] Microsoft Corporation, "[Wire Format Protocol Specification](#)".
- [MS-OXCSTOR] Microsoft Corporation, "[Store Object Protocol Specification](#)".
- [MS-OXCTABL] Microsoft Corporation, "[Table Object Protocol Specification](#)".
- [MS-OXOABK] Microsoft Corporation, "[Address Book Object Protocol Specification](#)".
- [MS-OXOCAL] Microsoft Corporation, "[Appointment and Meeting Object Protocol Specification](#)".
- [MS-OXOCFG] Microsoft Corporation, "[Configuration Information Protocol Specification](#)".
- [MS-OXOMSG] Microsoft Corporation, "[E-Mail Object Protocol Specification](#)".
- [MS-OXOSFLD] Microsoft Corporation, "[Special Folders Protocol Specification](#)".
- [MS-OXPROPS] Microsoft Corporation, "[Exchange Server Protocols Master Property List](#)".
- [MS-OXRTFCP] Microsoft Corporation, "[Rich Text Format \(RTF\) Compression Algorithm](#)".
- [MS-OXRTFEX] Microsoft Corporation, "[Rich Text Format \(RTF\) Extensions Algorithm](#)".
- [MS-OXTNEF] Microsoft Corporation, "[Transport Neutral Encapsulation Format \(TNEF\) Data Algorithm](#)".
- [MS-WMF] Microsoft Corporation, "[Windows Metafile Format](#)".
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[RFC3282] Alvestrand, H., "Content Language Headers", RFC 3282, May 2002, <http://www.rfc-editor.org/rfc/rfc3282.txt>

## 1.2.2 Informative References

[MS-GLOS] Microsoft Corporation, "[Windows Protocols Master Glossary](#)".

[MS-OXCFOLD] Microsoft Corporation, "[Folder Object Protocol Specification](#)".

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

[MS-OXOCNTC] Microsoft Corporation, "[Contact Object Protocol Specification](#)".

[MS-OXODOC] Microsoft Corporation, "[Document Object Protocol Specification](#)".

[MS-OXOJRN] Microsoft Corporation, "[Journal Object Protocol Specification](#)".

[MS-OXONOTE] Microsoft Corporation, "[Note Object Protocol Specification](#)".

[MS-OXOPOST] Microsoft Corporation, "[Post Object Protocol Specification](#)".

[MS-OXORSS] Microsoft Corporation, "[RSS Object Protocol Specification](#)".

[MS-OXOSMIME] Microsoft Corporation, "[S/MIME E-Mail Object Algorithm](#)".

[MS-OXOSMMS] Microsoft Corporation, "[Short Message Service \(SMS\) and Multimedia Messaging Service \(MMS\) Object Protocol Specification](#)".

[MS-OXOTASK] Microsoft Corporation, "[Task-Related Objects Protocol Specification](#)".

[MS-OXOUM] Microsoft Corporation, "[Voice Mail and Fax Objects Protocol Specification](#)".

## 1.3 Overview

The Message and Attachment Object Protocol consists of a set of properties and **remote operation (ROP)** procedure calls for adding, modifying, and deleting Message objects, **folder associated information (FAI)** messages, and **Attachment objects** associated with messages.

### 1.3.1 Message Objects

Message objects are representations of end-users' data that store properties and are persisted in a folder hierarchy within a message **store**.

### 1.3.2 FAI Messages

FAI messages contain auxiliary data needed by the client or server. FAI messages are persisted in the same way as Message objects, but cannot be sent.

### 1.3.3 Message Recipients

Message objects allow clients to associate one or more **recipients (2)** to a message.

### 1.3.4 Message Attachments

An Attachment object is used by a client to associate files, **Object Linking and Embedding (OLE)** objects, other messages, or binary data with a particular Message object. Because Attachment objects are created, maintained, and accessed only in the context of a message, they are considered subobjects. Operations that affect the location of a Message object also apply to its attachments. Clients retrieve information about attachments in a message via an **attachments table**, which is a **Table object**, as described in [\[MS-OXCTABL\]](#).

## 1.4 Relationship to Other Protocols

The Message and Attachment Object Protocol relies on folders, tables, and properties, as described in [\[MS-OXCFCOLD\]](#), [\[MS-OXOSFLD\]](#), [\[MS-OXCTABL\]](#), and [\[MS-OXCPRPT\]](#), as well as the underlying ROPs transport, described in [\[MS-OXCROPS\]](#).

At the time of this publication, the following protocols are known to extend the Message and Attachment Object Protocol.

- Appointment and Meeting Object Protocol, as described in [\[MS-OXOCAL\]](#)
- Contact Object Protocol, as described in [\[MS-OXOCNTC\]](#)
- E-Mail Object Protocol, as described in [\[MS-OXOMSG\]](#)
- Task-Related Objects Protocol, as described in [\[MS-OXOTASK\]](#)
- Note Object Protocol, as described in [\[MS-OXONOTE\]](#)
- Journal Object Protocol, as described in [\[MS-OXOJRNL\]](#)
- RSS Object Protocol, as described in [\[MS-OXORSS\]](#)
- Post Object Protocol, as described in [\[MS-OXOPOST\]](#)
- Short Message Service (SMS) and Multimedia Messaging Service (MMS) Object Protocol, as described in [\[MS-OXOSMMS\]](#)
- Document Object Protocol, as described in [\[MS-OXODOC\]](#)
- S/MIME E-Mail Object Protocol, as described in [\[MS-OXOSMIME\]](#)
- Voice Mail and Fax Objects Protocol, as described in [\[MS-OXOUM\]](#)

## 1.5 Prerequisites/Preconditions

The Message and Attachment Object Protocol assumes the client has previously logged on to the server and has acquired a **handle** to the **Folder object** upon which it needs to operate. For more information on Folder objects, see [\[MS-OXCFCOLD\]](#). For more information on folder storage and organization, see [\[MS-OXCSTOR\]](#).

## 1.6 Applicability Statement

The Message and Attachment Object Protocol can be used as the basis for different types of personal information messages, such as E-mail, **Contacts**, Appointments, or Notes.

## 1.7 Versioning and Capability Negotiation

None.

## 1.8 Vendor-Extensible Fields

A third-party application can create its own set of **named properties** on a Message object as described in [\[MS-OXCPRPT\]](#). A third-party application can also extend the Message and Attachment Object Protocol to implement its own object type by changing the **PidTagMessageClass** property (section [2.2.1.3](#)). For a simple example that extends this protocol to implement an electronic representation of a "Sticky Note", see [\[MS-OXONOTE\]](#).

## 1.9 Standards Assignments

None.

## 2 Messages

### 2.1 Transport

The **ROP request buffers** and **ROP response buffers** specified by this protocol are sent to and respectively are received from the server using the underlying remote operations transport as specified in [\[MS-OXCROPS\]](#).

### 2.2 Message Syntax

Message objects can be created and modified by clients and servers. Except where noted, this section defines constraints to which both clients and servers adhere when operating on Message objects.

Clients operate on Message objects using the ROPs as specified in section [2.2.3](#), and the Property and Stream Object Protocol, as specified in [\[MS-OXCPRPT\]](#) section 2.2.

Unless otherwise specified, all property constraints specified in [\[MS-OXPROPS\]](#) apply to Message objects. A Message object can also contain other properties defined in [\[MS-OXPROPS\]](#), but these properties have no impact on this protocol.

When a property is referred to as "read-only for the client", the server can return an error and ignore any request to change the value of that property, or the server can return Success but not persist any changes to read-only properties. [<1>](#) Read-only properties that could not be saved are enumerated in the **PropertyProblems** field of the **PropSetProperties ROP response**, as specified in [\[MS-OXCROPS\]](#) section 2.2.8.6.2.

#### 2.2.1 Message Object Properties

##### 2.2.1.1 General Properties

The following properties exist on all Message objects. These properties are read-only for the client.

**PidTagAccess** ([\[MS-OXCPRPT\]](#) section 2.2.1.1)

**PidTagAccessLevel** ([\[MS-OXCPRPT\]](#) section 2.2.1.2)

**PidTagChangeKey** ([\[MS-OXCFXICS\]](#) section 2.2.1.2.7)

**PidTagCreationTime** (section [2.2.2.3](#))

**PidTagLastModificationTime** (section [2.2.2.2](#))

**PidTagLastModifierName** ([\[MS-OXCPRPT\]](#) section 2.2.1.5)

**PidTagObjectType** ([\[MS-OXCPRPT\]](#) section 2.2.1.7)

**PidTagRecordKey** ([\[MS-OXCPRPT\]](#) section 2.2.1.8)

**PidTagSearchKey** ([\[MS-OXCPRPT\]](#) section 2.2.1.9)

##### 2.2.1.2 PidTagHasAttachments Property

Type: **PtypBoolean** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagHasAttachments** property ([\[MS-OXPROPS\]](#) section 2.784) indicates whether the Message object contains at least one attachment. This property is read-only for the client.

The server computes this property from the **mfHasAttach** flag of the **PidTagMessageFlags** property ([\[MS-OXPROPS\]](#) section 2.858).

### 2.2.1.3 PidTagMessageClass Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagMessageClass** property ([\[MS-OXPROPS\]](#) section 2.854) denotes the specific type of the Message object. It determines the set of properties defined for the message, the kind of information the message conveys, and how to handle the message.

All characters in this property MUST be from the **ASCII** characters 0x20 through 0x7F. It MUST NOT end with a period (ASCII character 0x2E), and its length MUST be greater than zero and less than 256 characters. Furthermore, its length SHOULD be fewer than 128 characters because some operations require extending the value of the **PidTagMessageClass** property.

Any equality or matching operations performed against the value of this property MUST be case-insensitive.

The value of this property is interpreted in groups of characters separated by periods ("."). Each group specifies a type of object. A **message class** of "IPM.Note" denotes a standard Message object, and a message class of "Remote.IPM.Note" indicates a **header message object**.

### 2.2.1.4 PidTagMessageCodepage Property

Type: **PtypInteger32**, unsigned

The **PidTagMessageCodepage** property ([\[MS-OXPROPS\]](#) section 2.855) specifies the **code page** used to encode the **non-Unicode** string properties on this Message object. The Folder object code page is used if this property is set to 0x0000.

### 2.2.1.5 PidTagMessageLocaleId Property

Type: **PtypInteger32**, unsigned

Contains the **language code identifier (LCID)** of the end-user who created this message. For more details see [\[MS-LCID\]](#).

### 2.2.1.6 PidTagMessageFlags Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagMessageFlags** property ([\[MS-OXPROPS\]](#) section 2.858) specifies the status of the Message object. Set to zero or to a bitwise OR of one or more of the values from the following tables.

After the first successful call to the **RopSaveChangesMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.3), as described in section [2.2.3.3](#), these **flags** are read-only for the client.

Flag name	Value	Description
<b>mfRead</b>	0x00000001	The message is marked as having been read.



Flag name	Value	Description
<b>mfUnsent</b>	0x00000008	The message is still being composed. This bit is cleared by the server when responding to the <b>RopSubmitMessage</b> ROP ( <a href="#">[MS-OXCROPS]</a> section 2.2.7.1) with a success code.
<b>mfResend</b>	0x00000080	The message includes a request for a resend operation with a non-delivery report. For more details, see <a href="#">[MS-OXOMSG]</a> section 3.2.4.5.

These flags are always read-only for the client.

Flag name	Value	Description
<b>mfUnmodified</b>	0x00000002	The message has not been modified since it was first saved (if unsent) or it was delivered (if sent).
<b>mfSubmitted</b>	0x00000004	The message is marked for sending as a result of a call to the <b>RopSubmitMessage</b> ROP
<b>mfHasAttach</b>	0x00000010	The message has at least one attachment. This flag corresponds to the message's <b>PidTagHasAttachments</b> property (section <a href="#">2.2.1.2</a> ).
<b>mfFromMe</b>	0x00000020	The user receiving the message was also the user who sent the message.
<b>mfFAI</b>	0x00000040	The message is an FAI message.
<b>mfNotifyRead</b>	0x00000100	The user who sent the message has requested notification when a recipient (1) first reads it.
<b>mfNotifyUnread</b>	0x00000200	The user who sent the message has requested notification when a recipient (1) deletes it before reading or the Message object expires.
<b>mfEverRead</b>	0x00000400	The message has been read at least once. This flag is set or cleared by the server whenever the <b>mfRead</b> flag is set or cleared. Clients MAY ignore this flag. <a href="#">&lt;2&gt;</a>
<b>mfInternet</b>	0x00002000	The incoming message arrived over the Internet and originated either outside the organization or from a source the gateway does not consider trusted.
<b>mfUntrusted</b>	0x00008000	The incoming message arrived over an external link other than X.400 or the Internet. It originated either outside the organization or from a source the gateway does not consider trusted.

The **PidTagMessageFlags** property is also modified using the **RopSetMessageReadFlag** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.11), as described in section [2.2.3.11](#), or the **RopSetReadFlags** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.10), as described in section [2.2.3.10](#).

### 2.2.1.7 PidTagMessageSize Property

Type: **PtypInteger32**, unsigned

Contains the size in bytes consumed by the Message object on the server. This property is read-only for the client.

### 2.2.1.8 PidTagMessageStatus Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

Specifies the status of a message in a **contents table**. Contains a bitwise OR of zero or more of the following values.

Flag name	Value	Description
<b>msRemoteDownload</b>	0x00001000	The message has been marked for downloading from the remote message store to the local client.
<b>msInConflict</b>	0x00000800	This is a conflict resolve message as specified in <a href="#">[MS-OXCFXICS]</a> section 3.1.5.6.2.1. This is a read-only value for the client.
<b>msRemoteDelete</b>	0x00002000	The message has been marked for deletion at the remote message store without downloading to the local client.

More details about setting and obtaining the value of this property are specified in section [3.1.5.7](#) and section [3.1.5.8](#).

### 2.2.1.9 PidTagSubjectPrefix Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagSubjectPrefix** property ([\[MS-OXPROPS\]](#) section 2.1095) contains the prefix for the subject of the message. This property is set by the client but can be an empty string if there is no subject. The sum of the lengths of the **PidTagNormalizedSubject** property (section [2.2.1.10](#)) and the **PidTagSubjectPrefix** property MUST be less than 254 characters.

More details about the processing of this property are specified in section [3.1.5.13](#).

### 2.2.1.10 PidTagNormalizedSubject Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagNormalizedSubject** property ([\[MS-OXPROPS\]](#) section 2.876) contains the normalized subject of the message, as specified in [\[MS-OXCMAIL\]](#) section 2.2.3.2.6.1. This property is set by the client but can be an empty string if there is no subject. The sum of the lengths of the **PidTagNormalizedSubject** property and the **PidTagSubjectPrefix** property (section [2.2.1.9](#)) MUST be less than 254 characters.

More details about obtaining the value of this property are specified in section [3.1.5.13](#).

### 2.2.1.11 PidTagImportance Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagImportance** property ([\[MS-OXPROPS\]](#) section 2.805) indicates the level of importance assigned by the end user to the Message object. This property MUST be set to one of the following values.

Value	Meaning
0x00000000	Low importance.

Value	Meaning
0x00000001	Normal importance.
0x00000002	High importance.

### 2.2.1.12 PidTagPriority Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagPriority** property ([\[MS-OXPROPS\]](#) section 2.936) indicates the client's request for the priority at which the message is to be sent by the messaging system. This property is set to one of the following values.

Value	Description
0x00000001	Urgent
0x00000000	Normal
0xFFFFFFFF	Not urgent

### 2.2.1.13 PidTagSensitivity Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagSensitivity** property ([\[MS-OXPROPS\]](#) section 2.1073) indicates the sender's assessment of the sensitivity of the Message object. The value of this property is one of the following.

Value	Meaning
0x00000000	Normal
0x00000001	Personal
0x00000002	Private
0x00000003	Confidential

### 2.2.1.14 PidLidSmartNoAttach Property

Type: **PtypBoolean** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidSmartNoAttach** property ([\[MS-OXPROPS\]](#) section 2.302) is set to TRUE (0x01) if the Message object has no attachments that are visible to the end user. If this property is unset, a default value of FALSE (0x00) is used.

### 2.2.1.15 PidLidPrivate Property

Type: **PtypBoolean** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidPrivate** property ([\[MS-OXPROPS\]](#) section 2.211) is set to TRUE (0x01) if the end user wants this Message object to be hidden from other users who have access to the Message object.

### 2.2.1.16 PidLidSideEffects Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidSideEffects** property ([\[MS-OXPROPS\]](#) section 2.300) controls how a Message object is handled by the client in relation to certain user interface actions by the user, such as deleting a message. This property is set to a bitwise OR of zero or more of the following flags.

Flag name	Value	Description
<b>seOpenToDelete</b>	0x00000001	The client opens the Message object when deleting.
<b>seNoFrame</b>	0x00000008	No UI is associated with the Message object.
<b>seCoerceToInbox</b>	0x00000010	The client moves the Message object to the <b>Inbox folder</b> when moving or copying to a Folder object with the <b>PidTagContainerClass</b> property ( <a href="#">[MS-OXOCAL]</a> section 2.2.11.1) set to "IPF.Note". For more details about the <b>PidTagContainerClass</b> property, see <a href="#">[MS-OXOSFLD]</a> section 2.2.8.
<b>seOpenToCopy</b>	0x00000020	The client opens the Message object when copying to another folder.
<b>seOpenToMove</b>	0x00000040	The client opens the Message object when moving to another folder.
<b>seOpenForCtxMenu</b>	0x00000100	The client opens the Message object when displaying context-sensitive commands, such as a context menu, to the end user.
<b>seCannotUndoDelete</b>	0x00000400	The client cannot undo a delete operation; this flag MUST NOT be set unless the <b>seOpenToDelete</b> flag is set.
<b>seCannotUndoCopy</b>	0x00000800	The client cannot undo a copy operation; this flag MUST NOT be set unless the <b>seOpenToCopy</b> flag is set.
<b>seCannotUndoMove</b>	0x00001000	The client cannot undo a move operation; this flag MUST NOT be set unless the <b>seOpenToMove</b> flag is set.
<b>seHasScript</b>	0x00002000	The Message object contains end-user script.
<b>seOpenToPermDelete</b>	0x00004000	The client opens the Message object to permanently delete it.

### 2.2.1.17 PidNameKeywords Property

Type: **PtypMultipleString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidNameKeywords** property ([\[MS-OXPROPS\]](#) section 2.495) contains keywords or **categories (3)** for the Message object. The length of each string within the multivalued string is less than 256 characters.

### 2.2.1.18 PidLidCommonStart Property

Type: **PtypTime** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidCommonStart** property ([\[MS-OXPROPS\]](#) section 2.63) indicates the start time for the Message object. The value of this property is less than or equal to the value of the

**PidLidCommonEnd** property (section [2.2.1.19](#)). This time is interpreted as **Coordinated Universal Time (UTC)**.

### 2.2.1.19 PidLidCommonEnd Property

Type: **PtypTime** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidCommonEnd** property ([\[MS-OXPROPS\]](#) section 2.62) indicates the end time for the Message object. The value of this property MUST be greater than or equal to the value of the **PidLidCommonStart** property (section [2.2.1.18](#)). This time is interpreted as **UTC**.

### 2.2.1.20 PidTagAutoForwarded Property

Type: **PtypBoolean** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAutoForwarded** property ([\[MS-OXPROPS\]](#) section 2.683) indicates that this message has been automatically generated or automatically forwarded. If this property is unset, a default value of 0x00 is assumed.

### 2.2.1.21 PidTagAutoForwardComment Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAutoForwardComment** property ([\[MS-OXPROPS\]](#) section 2.684) contains a comment added by the autoforwarding agent.

### 2.2.1.22 PidLidCategories Property

Type: **PtypMultipleString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidCategories** property ([\[MS-OXPROPS\]](#) section 2.49) contains the array of text labels assigned to this Message object.

### 2.2.1.23 PidLidClassification

Type: **PtypMultipleString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidClassification** property ([\[MS-OXPROPS\]](#) section 2.52) contains a list of the classification categories (3) to which this Message object has been assigned.

### 2.2.1.24 PidLidClassificationDescription Property

Type: **PtypMultipleString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidClassificationDescription** property ([\[MS-OXPROPS\]](#) section 2.53) contains a human-readable summary of each of the classification categories (3) included in the **PidLidClassification** property (section [2.2.1.23](#)).

### 2.2.1.25 PidLidClassified Property

Type: **PtypBoolean** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidClassified** property ([\[MS-OXPROPS\]](#) section 2.56) indicates whether the contents of a message are regarded as classified information.

### 2.2.1.26 PidTagInternetReferences Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagInternetReferences** property ([\[MS-OXPROPS\]](#) section 2.817) contains a list of message IDs (MIDs), as specified in [\[MS-OXCDATA\]](#) section 2.2.1.2, that specify the messages to which this reply is related. The format of this property is specified in [\[RFC2822\]](#).

### 2.2.1.27 PidLidInfoPathFormName Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidInfoPathFormName** property ([\[MS-OXPROPS\]](#) section 2.149) contains the name of the form associated with this message, if one exists. The relationship between this property and the **Content-Class MIME header (2)** is specified in [\[MS-OXCMAIL\]](#) sections [2.1.3.2.2](#) and [2.2.3.2.15](#).

### 2.2.1.28 PidTagMimeSkeleton Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagMimeSkeleton** property ([\[MS-OXPROPS\]](#) section 2.870) contains all the top level MIME message headers (2), all MIME message **body part** headers (2), and body part content that is not already converted to Message object properties, including attachments.

The use of the **PidTagMimeSkeleton** property for converting between MIME messages and Message object format is specified in [\[MS-OXCMAIL\]](#) section 2.4.3.1.

### 2.2.1.29 PidTagTnefCorrelationKey Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagTnefCorrelationKey** property ([\[MS-OXPROPS\]](#) section 2.1109) contains a value that correlates a **Transport Neutral Encapsulation Format (TNEF)** attachment with a message. This property determines whether or not an inbound TNEF file belongs to the message it is attached to. It is used primarily by transport providers and gateways.

### 2.2.1.30 PidTagAddressBookDisplayNamePrintable Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAddressBookDisplayNamePrintable** property ([\[MS-OXPROPS\]](#) section 2.584) contains the printable string version of the display name.

### 2.2.1.31 PidTagCreatorEntryId Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagCreatorEntryId** property ([\[MS-OXPROPS\]](#) section 2.725) specifies the original author of the message according to their **address book EntryID**. The format of an address book EntryID data type is specified in [\[MS-OXCDATA\]](#) section 2.2.5.2.

### 2.2.1.32 PidTagLastModifierEntryId Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagLastModifierEntryId** property ([\[MS-OXPROPS\]](#) section 2.833) specifies the last user to modify the contents of the message according to their address book EntryID. The format of an address book EntryID data type is specified in [\[MS-OXCDATA\]](#) section 2.2.5.2.

### 2.2.1.33 PidLidAgingDontAgeMe Property

Type: **PtypBoolean** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidAgingDontAgeMe** property ([\[MS-OXPROPS\]](#) section 2.4) specifies whether the message should be automatically archived. This property is set to "TRUE" if the message will not be automatically archived; otherwise, "FALSE".

### 2.2.1.34 PidLidCurrentVersion Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidCurrentVersion** property ([\[MS-OXPROPS\]](#) section 2.88) specifies the build number of the client application that sent the message.

### 2.2.1.35 PidLidCurrentVersionName Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidCurrentVersionName** property ([\[MS-OXPROPS\]](#) section 2.89) specifies the name of the client application that sent the message.

### 2.2.1.36 PidTagAlternateRecipientAllowed Property

Type: **PtypBoolean** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAlternateRecipientAllowed** property ([\[MS-OXPROPS\]](#) section 2.647) specifies whether the sender permits the message to be autoforwarded. This property is set to "TRUE" if autoforwarding is allowed.

### 2.2.1.37 PidTagResponsibility Property

Type: **PtypBoolean** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagResponsibility** property ([\[MS-OXPROPS\]](#) section 2.994) specifies whether another mail agent has ensured that the message will be delivered. This property is set to "TRUE" if another agent has accepted responsibility; otherwise, "FALSE".

### 2.2.1.38 PidTagRowid Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagRowid** property ([\[MS-OXPROPS\]](#) section 2.1002) contains a unique identifier for a recipient (2) in the message's **recipient table**. This is a temporary identifier that is valid only for the life of the Table object.

### 2.2.1.39 PidTagHasNamedProperties Property

Type: **PtypBoolean** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagHasNamedProperties** property ([\[MS-OXPROPS\]](#) section 2.786) specifies whether this Message object supports named properties.

#### 2.2.1.40 PidTagRecipientOrder Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagRecipientOrder** property ([\[MS-OXPROPS\]](#) section 2.966) specifies the location of the current recipient (2) in the recipient table.

#### 2.2.1.41 PidNameContentBase Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidNameContentBase** property ([\[MS-OXPROPS\]](#) section 2.428) specifies the value of the **Content-Base** header (2), which defines the base **Uniform Resource Identifier (URI)** for resolving relative URLs contained within the **message body**.

#### 2.2.1.42 PidNameAcceptLanguage Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidNameAcceptLanguage** property ([\[MS-OXPROPS\]](#) section 2.368) contains the value of the **Accept-Language** header (2), which defines the natural languages in which the sender prefers to receive a response. The format of this property is specified in [\[RFC3282\]](#) section 3. The relationship between this property and the **Accept-Language** header (2) is specified in [\[MS-OXCMAIL\]](#) sections [2.1.3.2.16](#) and [2.2.3.2.11](#).

#### 2.2.1.43 PidTagPurportedSenderDomain Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagPurportedSenderDomain** property ([\[MS-OXPROPS\]](#) section 2.944) contains the domain name of the last sender responsible for transmitting the current message.

#### 2.2.1.44 PidTagStoreEntryId Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagStoreEntryId** property ([\[MS-OXPROPS\]](#) section 2.1089) contains the unique EntryID of the message store where an object resides. The format of this property is specified in [\[MS-OXCDATA\]](#) section 2.2.4.

#### 2.2.1.45 PidTagTrustSender

**Note** *Some of the information in this section is subject to change because it applies to a preliminary implementation of the protocol or structure. For information about specific differences between versions, see the behavior notes that are provided in the Product Behavior appendix.*

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagTrustSender** property ([\[MS-OXPROPS\]](#) section 2.1113) specifies whether the message was delivered through a trusted transport channel. <3> This property is a Boolean integer. Valid values are given in the following table.

Value	Meaning
0x00000000	Message was not delivered through a trusted transport channel.



Value	Meaning
0x00000001	Message was delivered through a trusted transport channel.

### 2.2.1.46 PidTagSubject Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagSubject** property ([\[MS-OXPROPS\]](#) section 2.1095) contains the full subject of an e-mail message. The full subject is a concatenation of the subject prefix, as identified by the **PidTagSubjectPrefix** property (section [2.2.1.9](#)), and the normalized subject, as identified by the **PidTagNormalizedSubject** property (section [2.2.1.10](#)). If the **PidTagSubjectPrefix** property is not set or is set to an empty string, then the values of the **PidTagSubject** and **PidTagNormalizedSubject** properties are equal.

### 2.2.1.47 PidTagMessageRecipients Property

Type: **PtypObject** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagMessageRecipients** property ([\[MS-OXPROPS\]](#) section 2.862) contains a **restriction (2)** table that can be used to find all messages containing the recipients (2) in a contents table. The restriction (2) is a **SubObjectRestriction** structure, as specified in [\[MS-OXCDATA\]](#) section 2.12.10. Messages can be searched with this restriction (2) using the **RopSetSearchCriteria** ROP ([\[MS-OXCROPS\]](#) section 2.2.4.4) and the **RopRestrict** ROP ([\[MS-OXCROPS\]](#) section 2.2.5.3).

### 2.2.1.48 PidNameContentClass Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidNameContentClass** property ([\[MS-OXPROPS\]](#) section 2.429) contains a string that identifies the type of content of a Message object. The value of this property is as follows:

- For an **E-mail object**, the value is as specified in [\[MS-OXCMAIL\]](#) section 2.2.3.2.15.
- For other Message objects, the value is as specified in the technical document that defines the particular Message object.
- For the **Web Distributed Authoring and Versioning Protocol (WebDAV)**, the value is as specified in the technical document that specifies the particular WebDAV extension.

### 2.2.1.49 Body Properties

Body properties are a group of related properties that specify the body text format and contents and conform to the specification in [\[MS-OXBBODY\]](#). The body properties are valid on any Message object.

#### 2.2.1.49.1 PidTagBody Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagBody** property ([\[MS-OXPROPS\]](#) section 2.688) contains unformatted text, which is the text/plain MIME format as specified in [\[RFC1521\]](#) section 7.1.2. Processing of the **plain text** body from the MIME message format is specified in [\[MS-OXCMAIL\]](#) section 2.1.3.3.1.

### 2.2.1.49.2 PidTagNativeBody Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagNativeBody** property ([\[MS-OXPROPS\]](#) section 2.872) indicates the best available format for storing the message body <4>. The value of this property is limited to one of the property values shown in the following table.

Value	Meaning
0x00000000	<b>Undefined body</b>
0x00000001	Plain text body
0x00000002	<b>Rich Text Format (RTF)</b> compressed body
0x00000003	<b>HTML</b> body
0x00000004	<b>Clear-signed body</b>

### 2.2.1.49.3 PidTagBodyHtml Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagBodyHtml** property ([\[MS-OXPROPS\]](#) section 2.691) contains the HTML body as specified in [\[RFC2822\]](#) section 2.3.

### 2.2.1.49.4 PidTagRtfCompressed Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagRtfCompressed** property ([\[MS-OXPROPS\]](#) section 2.1004) contains an RTF body compressed as specified in [\[MS-OXRTFCP\]](#).

### 2.2.1.49.5 PidTagRtfInSync Property

Type: **PtypBoolean** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagRtfInSync** property ([\[MS-OXPROPS\]](#) section 2.1005) is set to "TRUE" (0x01) if the RTF body has been synchronized with the contents in the **PidTagBody** property (section [2.2.1.49.1](#)).

### 2.2.1.49.6 PidTagInternetCodepage Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagInternetCodepage** property ([\[MS-OXPROPS\]](#) section 2.814) indicates the code page used for the **PidTagBody** property (section [2.2.1.49.1](#)) or the **PidTagBodyHtml** property (section [2.2.1.49.3](#)).

### 2.2.1.49.7 PidTagBodyContentId Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagBodyContentId** property ([\[MS-OXPROPS\]](#) section 2.689) contains a **GUID** corresponding to the current message body.

This property corresponds to the **Content-ID** header (2). The relationship between this property and the **Content-ID** header (2) is further specified in [\[MS-OXCMAIL\]](#) sections [2.1.3.4.2.3](#) and [2.2.3.2.24](#).

### 2.2.1.49.8 PidTagBodyContentLocation Property

Type: PtypString ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagBodyContentLocation** property ([\[MS-OXPROPS\]](#) section 2.690) contains a globally unique URI that serves as a label for the current message body. The URI can be either absolute or relative.

This property corresponds to the **Content-Location** header (2). The relationship between this property and the **Content-Location** header (2) is further specified in [\[MS-OXCMAIL\]](#) sections [2.1.3.4.2.3](#) and [2.2.3.2.26](#). The format of this property is further specified in [\[RFC2110\]](#).

### 2.2.1.49.9 PidTagHtml Property

Type: PtypBinary ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagHtml** property ([\[MS-OXPROPS\]](#) section 2.800) contains the message body text in HTML format.

### 2.2.1.50 Contact Linking Properties

Contact linking properties are a group of related properties that are valid on any Message object containing information about the linked **Contact objects**.

#### 2.2.1.50.1 PidLidContactLinkEntry Property

Type: PtypBinary ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidContactLinkEntry** property ([\[MS-OXPROPS\]](#) section 2.70) contains the list of address book EntryIDs linked to by this Message object.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
AddrBookEntryIdCount																															
FieldSize																															
AddrBookEntryIdData (variable)																															
...																															
Padding																															

**AddrBookEntryIdCount (4 bytes):** The number of address book EntryIDs included in this property.

**FieldSize (4 bytes):** The size of the **AddrBookEntryIdCount** field, minus 4.

**AddrBookEntryIdData (variable):** The EntryID data. Repeated the number of times specified by the **AddrBookEntryIdCount** field. Address book EntryIDs are specified in [\[MS-OXCDATA\]](#) section 2.2.5.2.

**Padding (3 bytes):** Between 0 and 3 bytes of padding, up to the amount required to make the **FieldSize** field a multiple of 4. The value of each padded byte MUST be 0x0000.

### 2.2.1.50.2 PidLidContacts Property

Type: **PtypMultipleString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidContacts** property ([\[MS-OXPROPS\]](#) section 2.77) contains the **PidTagDisplayName** property ([\[MS-OXOABK\]](#) section 2.2.3.1) of each address book EntryID referenced in the value of the **PidLidContactLinkEntry** property (section [2.2.1.50.1](#)). This property can also include names not referenced in the **PidLidContactLinkEntry** property.

### 2.2.1.50.3 PidLidContactLinkName Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidContactLinkName** property ([\[MS-OXPROPS\]](#) section 2.74) contains the elements of the **PidLidContacts** property (section [2.2.1.50.2](#)), separated by a semicolon and a space ("; ").

### 2.2.1.50.4 PidLidContactLinkSearchKey Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidLidContactLinkSearchKey** property ([\[MS-OXPROPS\]](#) section 2.75) contains the list of **search keys** for the Contact object linked to by this Message object. Search keys are used to find related objects. Search keys for address book data are further specified by the **PidTagSearchKey** property ([\[MS-OXCPRPT\]](#) section 2.2.1.9).

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1		
SearchKeyCount										SearchKeyData (variable)																							
...																																	

**SearchKeyCount (2 bytes):** The number of search keys included in this property.

**SearchKeyData (variable):** The search keys, up to the number indicated by the **ContactEntryCount** field. Search keys may be a variable size and are null-terminated, as specified in [\[MS-OXOABK\]](#) section 2.2.3.5.

### 2.2.1.51 Retention and Archive Properties

Retention and archive properties specify information about the **Retention Policy** or **Archive Policy**. These properties are valid on e-mail Message objects. Some of these properties are also valid on folders. The Retention Policy and the Archive Policy are independent features. The server can enable one of these policies, both of these policies, or neither of them. For details about how the Retention Policy and Archive Policy settings are communicated between client and server, see [\[MS-OXOCFG\]](#) section 2.2.5.2.3.

### 2.2.1.51.1 PidTagArchiveTag Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagArchiveTag** property ([\[MS-OXPROPS\]](#) section 2.928) specifies the GUID of an **archive tag**. The **PidTagArchiveTag** property can be present on both Message objects and folders and can be set by both client and server.

### 2.2.1.51.2 PidTagPolicyTag Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagPolicyTag** property ([\[MS-OXPROPS\]](#) section 2.928) specifies the GUID of a **retention tag**. The **PidTagPolicyTag** property can be present on both Message objects and folders and can be set by both client and server.

### 2.2.1.51.3 PidTagRetentionPeriod Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagRetentionPeriod** property ([\[MS-OXPROPS\]](#) section 2.997) specifies the number of days that a Message object can be retained. The **PidTagRetentionPeriod** property can be present on both Message objects and folders and can be set by both client and server.

The presence of the **PidTagRetentionPeriod** property on a Message object indicates that the retention tag on that Message object was explicitly applied by the end user. If the value of the **PidTagRetentionPeriod** property is 0, the Message object never expires.

When the **PidTagRetentionPeriod** property is present on a folder, it has no special significance; it simply specifies the retention period that corresponds to the retention tag on that folder.

### 2.2.1.51.4 PidTagStartDateEtc Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagStartDateEtc** property ([\[MS-OXPROPS\]](#) section 2.1087) has the following structure.

Length in bytes	Meaning	Notes
4	<b>Default retention period</b>	A default retention tag is applied to a Message object when a regular retention tag is not present on the Message object. The absence of a regular retention tag indicates that the Message object does not have a specific Retention Policy. The application of the default tag is based on the Message object's message class.)
8	<b>Start date</b>	The date, in UTC, from which the age of the Message object is calculated.

The **PidTagStartDateEtc** property can be present only on Message objects.

### 2.2.1.51.5 PidTagRetentionDate Property

Type: **PtypTime** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagRetentionDate** property ([\[MS-OXPROPS\]](#) section 2.995) specifies the date, in UTC, after which a Message object is expired by the server. The **PidTagRetentionDate** property can be

present only on Message objects, not on folders. If the property is not present, the Message object never expires. The **PidTagRetentionDate** property can be set by both client and server.

The value of the **PidTagRetentionDate** property is calculated from the values of other properties. The values used in the calculation depend on whether the Message object has a specific Retention Policy. (A Message object will have the default Retention Policy in the absence of a specific Retention Policy.) The explicit method of calculation is as follows:

- When the Message object has a specific Retention Policy:

**PidTagRetentionDate** = **PidTagMessageDeliveryTime** ([MS-OXOMSG] section 2.2.3.9) + **PidTagRetentionPeriod** (section 2.2.1.51.3). If the **PidTagMessageDeliveryTime** property does not exist, the **PidTagCreationTime** property (section 2.2.2.3) is used.

- When the Message object has the default Retention Policy:

**PidTagRetentionDate** = **PidTagMessageDeliveryTime** + default retention period. If the **PidTagMessageDeliveryTime** property does not exist, the **PidTagCreationTime** property is used.

### 2.2.1.51.6 PidTagRetentionFlags Property

Type: **PtypInteger32** ([MS-OXCDATA] section 2.11.1)

The **PidTagRetentionFlags** property ([MS-OXPROPS] section 2.996) contains flags that specify the status or nature of an item's retention tag or archive tag. The **PidTagRetentionFlags** property can be present on both Message objects and folders and can be set by both client and server.

The value of the **PidTagRetentionFlags** property is a bitwise OR of zero or more of the values from the following table.

Flag name	Value	Description
<b>ExplicitTag</b>	0x00000001	The retention tag on the folder is explicitly set.
<b>UserOverride</b>	0x00000002	The retention tag was not changed by the end user.
<b>AutoTag</b>	0x00000004	The retention tag on the Message object is an autotag, which is predicted by the system.
<b>PersonalTag</b>	0x00000008	The retention tag on the folder is of a personal type and can be made available to the end user.
<b>ExplicitArchiveTag</b>	0x00000010	The archive tag on the folder is explicitly set.
<b>KeepInPlace</b>	0x00000020	The Message object remains in place and is not archived.
<b>SystemData</b>	0x00000040	The Message object or folder is system data.

### 2.2.1.51.7 PidTagArchivePeriod Property

Type: **PtypInteger32** ([MS-OXCDATA] section 2.11.1)

The **PidTagArchivePeriod** property ([MS-OXPROPS] section 2.650) specifies the number of days that a Message object can remain unarchived. The **PidTagArchivePeriod** property can be present on both Message objects and folders and can be set by both client and server.

The presence of the **PidTagArchivePeriod** property on a Message object indicates that the archive tag on that Message object was explicitly applied by the end user. If the value of **PidTagArchivePeriod** is 0, the Message object is never archived by the server.

When the **PidTagArchivePeriod** property is present on a folder, it has no special significance; it simply specifies the archive period that corresponds to the archive tag on that folder.

### 2.2.1.51.8 PidTagArchiveDate Property

Type: **PtypTime** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagArchiveDate** property ([\[MS-OXPROPS\]](#) section 2.649) specifies the date, in UTC, after which a Message object is archived by the server. The **PidTagArchiveDate** property can be present on only Message objects, not on folders, and can be set by both client and server. If the **PidTagArchiveDate** property is not present, the Message object is never archived by the server.

The value of the **PidTagArchiveDate** property is calculated from the values of other properties as follows:

**PidTagArchiveDate** = start date + **PidTagArchivePeriod** (section [2.2.1.51.7](#))

The start date is obtained from the last eight bytes of the **PidTagStartDateEtc** property (section [2.2.1.51.4](#)).

## 2.2.2 Attachment Object Properties

### 2.2.2.1 General Properties

The following properties exist on any Attachment object. These properties are set by the server and are read-only for the client.

**PidTagAccessLevel** ([\[MS-OXCPRPT\]](#) section 2.2.1.2)

**PidTagObjectType** ([\[MS-OXCPRPT\]](#) section 2.2.1.7)

**PidTagRecordKey** ([\[MS-OXCPRPT\]](#) section 2.2.1.8)

### 2.2.2.2 PidTagLastModificationTime Property

Type: **PtypTime**, in UTC ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagLastModificationTime** property ([\[MS-OXPROPS\]](#) section 2.832) indicates the last time the file referenced by the Attachment object was modified, or the last time the Attachment object itself was modified.

### 2.2.2.3 PidTagCreationTime Property

Type: **PtypTime**, in UTC ([\[MS-OXCDATA\]](#) section 2.11.1)

Indicates the time the file referenced by the Attachment object was created, or the time the Attachment object itself was created.

### 2.2.2.4 PidTagDisplayName Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagDisplayName** property ([\[MS-OXPROPS\]](#) section 2.745) contains the name of the attachment as input by the end user. This property is set to the same value as the **PidTagAttachLongFilename** property (section [2.2.2.13](#)).

### 2.2.2.5 PidTagAttachSize Property

Type: **PtypInteger32**, unsigned ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachSize** property ([\[MS-OXPROPS\]](#) section 2.678) contains the size in bytes consumed by the Attachment object on the server. This property is read-only for the client.

### 2.2.2.6 PidTagAttachNumber Property

Type: **PtypInteger32**, unsigned ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachNumber** property ([\[MS-OXPROPS\]](#) section 2.673) identifies the Attachment object within its Message object. The value of this property MUST be unique among the Attachment objects in a message.

### 2.2.2.7 PidTagAttachDataBinary Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachDataBinary** property ([\[MS-OXPROPS\]](#) section 2.659) contains the contents of the file to be attached.

### 2.2.2.8 PidTagAttachDataObject Property

Type: **PtypObject** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachDataObject** property ([\[MS-OXPROPS\]](#) section 2.660) contains the binary representation of the Attachment object in an application-specific format.

### 2.2.2.9 PidTagAttachMethod Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachMethod** property ([\[MS-OXPROPS\]](#) section 2.671) represents the way the contents of an attachment are accessed. This property is set to one of the following values.

Flag name	Value	Description
<b>afNone</b>	0x00000000	The attachment has just been created.
<b>afByValue</b>	0x00000001	The <b>PidTagAttachDataBinary</b> property (section <a href="#">2.2.2.7</a> ) contains the attachment data.
<b>afByReference</b>	0x00000002	The <b>PidTagAttachLongPathname</b> property (section <a href="#">2.2.2.13</a> ) contains a fully qualified path identifying the attachment <b>To recipients</b> with access to a common file server.
<b>afByReferenceOnly</b>	0x00000004	The <b>PidTagAttachLongPathname</b> property contains a fully qualified path identifying the attachment.
<b>afEmbeddedMessage</b>	0x00000005	The attachment is an embedded message that is accessed via the <b>RopOpenEmbeddedMessage</b> ROP ( <a href="#">[MS-OXCROPS]</a> section 2.2.6.16).



Flag name	Value	Description
<b>afStorage</b>	0x00000006	The <b>PidTagAttachDataObject</b> property (section <a href="#">2.2.2.8</a> ) contains data in an application-specific format.

### 2.2.2.10 PidTagAttachLongFilename Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachLongFilename** property ([\[MS-OXPROPS\]](#) section 2.665) contains the full file name and extension of the Attachment object.

### 2.2.2.11 PidTagAttachFilename Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachFilename** property ([\[MS-OXPROPS\]](#) section 2.663) contains the **8.3 name** of the value of the **PidTagAttachLongFilename** property (section [2.2.2.10](#)).

### 2.2.2.12 PidTagAttachExtension Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachExtension** property ([\[MS-OXPROPS\]](#) section 2.662) contains a file name extension that indicates the document type of an attachment.

### 2.2.2.13 PidTagAttachLongPathname Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachLongPathname** property ([\[MS-OXPROPS\]](#) section 2.666) contains the fully qualified path and file name with extension.

### 2.2.2.14 PidTagAttachPathname Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachPathname** property ([\[MS-OXPROPS\]](#) section 2.674) contains the 8.3 name of the value of the **PidTagAttachLongPathname** property (section [2.2.2.13](#)).

### 2.2.2.15 PidTagAttachTag Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachTag** property ([\[MS-OXPROPS\]](#) section 2.679) contains the identifier information for the application that supplied the Attachment object's data. This property can be left unset; if set, it MUST be one of the following.

Definition	Data	Comments
TNEF	{0x2A,86,48,86,F7,14,03,0A,01}	The TNEF format is specified in <a href="#">[MS-OXTNEF]</a> .
<b>afStorage</b>	{0x2A,86,48,86,F7,14,03,0A,03,02,01}	Data is in an application-specific format.
MIME	{0x2A,86,48,86,F7,14,03,0A,04}	Conversion between Message object and MIME

Definition	Data	Comments
		formats is specified in <a href="#">[MS-OXCMAIL]</a> .

### 2.2.2.16 PidTagRenderingPosition Property

Type: **PtypInteger32**, unsigned ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagRenderingPosition** property ([\[MS-OXPROPS\]](#) section 2.978) represents an offset, in rendered characters, to use when rendering an attachment within the main message text.

The values specify a relative ordering of the rendered attachment in the text. If a message has three **attachments** with values of 200, 100, and 500 for the **PidTagRenderingPosition** property, these will be rendered in the same order as if the attachments had the values 2, 1, and 5. A detailed example of this property is provided in [\[MS-OXRTFEX\]](#) section 3.2.

The value 0xFFFFFFFF indicates a hidden attachment that is not to be rendered in the main text.

### 2.2.2.17 PidTagAttachRendering Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachRendering** property ([\[MS-OXPROPS\]](#) section 2.677) contains a Windows metafile format (WMF) **metafile** as specified in [\[MS-WMF\]](#) for the Attachment object.

### 2.2.2.18 PidTagAttachFlags Property

Type: **PtypInteger32**, as a bit field ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachFlags** property ([\[MS-OXPROPS\]](#) section 2.664) indicates which body formats might reference this attachment when rendering data. This property contains a bitwise OR of zero or more of the following flags. If this property is absent or its value is 0x00000000, the attachment is available to be rendered in any format.

Flag name	Value	Description
<b>attInvisibleInHtml</b>	0x00000001	The Attachment object is not available to be rendered in HTML.
<b>attInvisibleInRtf</b>	0x00000002	The Attachment object is not available to be rendered in RTF.
<b>attRenderedInBody</b>	0x00000004	The Attachment object is referenced and rendered within the HTML body of the associated Message object. More details are specified in the <b>PidTagBodyHtml</b> property (section <a href="#">2.2.1.49.3</a> ).

### 2.2.2.19 PidTagAttachTransportName Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachTransportName** property ([\[MS-OXPROPS\]](#) section 2.680) contains the name of an attachment file, modified so that it can be correlated with TNEF messages, as specified in [\[MS-OXTNEF\]](#).

### 2.2.2.20 PidTagAttachEncoding Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachEncoding** property ([\[MS-OXPROPS\]](#) section 2.661) contains encoding information about the Attachment object. If the attachment is in MacBinary format, this property is set to "{0x2A,86,48,86,F7,14,03,0B,01}"; otherwise, it is unset. This property is used to indicate that the attachment content, which is the value of the **PidTagAttachDataBinary** property (section [2.2.2.7](#)), MUST be encoded in the MacBinary format, as specified in [\[MS-OXCMAIL\]](#). Clients SHOULD [<5>](#) correctly detect MacBinary I, MacBinaryII, and MacBinary III formats.

#### 2.2.2.21 PidTagAttachAdditionalInformation Property

Type: **PtypBinary** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachAdditionalInformation** property ([\[MS-OXPROPS\]](#) section 2.655) MUST be set to an empty string if the **PidTagAttachEncoding** property (section [2.2.2.20](#)) is unset. If the **PidTagAttachEncoding** property is set, the **PidTagAttachAdditionalInformation** property MUST be set to a string of the format ":CREA:TYPE", where ":CREA" is the four-letter Macintosh file creator code, and ":TYPE" is a four-letter Macintosh type code.

#### 2.2.2.22 PidTagAttachmentLinkId Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachmentLinkId** property ([\[MS-OXPROPS\]](#) section 2.670) is the type of Message object to which this attachment is linked. This property MUST be set to 0x00000000 unless overridden by other protocols that extend the Message and Attachment Object Protocol as noted in section [1.4](#).

#### 2.2.2.23 PidTagAttachmentFlags Property

Type: **PtypInteger32** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachmentFlags** property ([\[MS-OXPROPS\]](#) section 2.668) indicates special handling for this Attachment object. This property MUST be set to 0x00000000 unless overridden by other protocols that extend the Message and Attachment Object Protocol as noted in section [1.4](#)

#### 2.2.2.24 PidTagAttachmentHidden Property

Type: **PtypBoolean** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagAttachmentHidden** property ([\[MS-OXPROPS\]](#) section 2.669) is set to **TRUE** (0x01) if this Attachment object is hidden from the end user.

#### 2.2.2.25 PidTagTextAttachmentCharset Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The **PidTagTextAttachmentCharset** property ([\[MS-OXPROPS\]](#) section 2.1106) specifies the **character set (2)** of messages for messages with a text body. This property corresponds to the *charset* parameter of the **Content-Type** header (2), as specified in [\[MS-OXCMAIL\]](#) section 2.2.3.4.1.2.

#### 2.2.2.26 MIME Properties

The following properties contain MIME information and can be left unset. For details about MIME specifications, see [\[RFC2045\]](#). For the specification on mapping these properties, see [\[MS-OXCMAIL\]](#). The types in the following table are specified in [\[MS-OXCDATA\]](#) section 2.11.1.

Type	Property name	Content
PtypString	<b>PidTagAttachMimeTag</b> ([MS-OXPROPS] section 2.672)	The <b>Content-Type</b> header (2).
PtypString	<b>PidTagAttachContentId</b> ([MS-OXPROPS] section 2.657)	A content identifier unique to this Message object that matches a corresponding "cid:" URI scheme reference in the HTML body of the Message object.
PtypString	<b>PidTagAttachContentLocation</b> ([MS-OXPROPS] section 2.658)	A relative or full URI that matches a corresponding reference in the HTML body of the Message object.
PtypString	<b>PidTagAttachContentBase</b> ([MS-OXPROPS] section 2.656)	The base of a relative URI. MUST be set if the <b>PidTagAttachContentLocation</b> property contains a relative URI.
PtypString	<b>PidTagAttachPayloadClass</b> ([MS-OXPROPS] section 2.675)	The class name of an object that can display the contents of the message.
PtypString	<b>PidTagAttachPayloadProviderGuidIdString</b> ([MS-OXPROPS] section 2.676)	The GUID of the software application that can display the contents of the message.
PtypString	<b>PidNameAttachmentMacContentType</b> ([MS-OXPROPS] section 2.371)	The <b>Content-Type</b> header (2) of the Macintosh attachment.
PtypBinary	<b>PidNameAttachmentMacInfo</b> ([MS-OXPROPS] section 2.372)	The headers (2) and resource fork data associated with the Macintosh attachment.

### 2.2.3 Message Object ROPs

The following sections specify the format of the ROP request buffers and ROP response buffers specific to the Message and Attachment Object Protocol. Before sending these requests to the server, the client has logged on to the server and acquired a handle to the Message object or Folder object used in the **ROP request**.

#### 2.2.3.1 RopOpenMessage ROP

The **RopOpenMessage** ROP ([MS-OXCROPS] section 2.2.6.1) provides access to an existing Message object, which is identified by the message ID (MID), whose structure is specified in [MS-OXCADATA] section 2.2.1.2.<6> The folder containing the Message object is identified by the folder ID (FID), whose structure is specified in [MS-OXCADATA] section 2.2.1.1.

For this ROP, the value of the **InputHandleIndex** field references either a **Store object** or a Folder object. If a folder is used, it is not necessary that it is the parent folder, only that it is a folder within the same store. The value of the **OutputHandleIndex** field references a Message object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [MS-OXCROPS]. This section specifies the syntax and semantics of various fields that are not fully specified in [MS-OXCROPS].

### 2.2.3.1.1 RopOpenMessage ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopOpenMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.1).

**CodePageId:** 2 bytes specifying the code page in which the non-Unicode representation of the strings on this Message object are encoded. A value of 0x0FFF means that the code page of the **Logon object** is used.

**FolderID:** 8 bytes containing the FID ([\[MS-OXCADATA\]](#) section 2.2.1.1) of the folder from which the message is to be opened.

**OpenModeFlags:** 1 byte. The values given in the following table are valid; if other bits are set, they are ignored.

Flag name	Value	Description
<b>ReadOnly</b>	0x00	Message will be opened as read-only.
<b>ReadWrite</b>	0x01	Message will be opened for both reading and writing.
<b>BestAccess</b>	0x03	Open for read/write if the user has write <b>permissions</b> for the folder, read-only if not.
<b>OpenSoftDeleted</b>	0x04	Open a <b>soft deleted</b> Message object if available.

### 2.2.3.1.2 RopOpenMessage ROP Response Buffer

The following descriptions define valid fields for the response buffer of the **RopOpenMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.1).

**HasNamedProperties:** 1 byte.

Value	Meaning
0x00	No named properties are defined for this Message object.
Nonzero	Named properties are defined for this Message object and can be obtained through a <b>RopGetPropertiesAll</b> ROP request ( <a href="#">[MS-OXCROPS]</a> section 2.2.8.4). Named properties can consist of custom properties added and maintained by third-party applications.

**SubjectPrefix:** A **TypedString** structure ([\[MS-OXCADATA\]](#) section 2.11.7) specifying the prefix for the subject of the Message object. The **SubjectPrefix** field contains the value of the **PidTagSubjectPrefix** property (section [2.2.1.9](#)).

**NormalizedSubject:** A **TypedString** structure specifying the normalized subject of the Message object. The **NormalizedSubject** field contains the value of the **PidTagNormalizedSubject** property (section [2.2.1.10](#)).

**RecipientCount:** A 2-byte unsigned integer containing the number of recipients (2) associated with the Message object.

**ColumnCount:** A 2-byte unsigned integer containing the number of elements in the **RecipientColumns** field.

**RecipientColumns:** An array of **PropertyTag** structures ([\[MS-OXCDATA\]](#) section 2.9) with the number of elements specified in the **ColumnCount** field. Each **PropertyTag** value is valid for a recipient (2) as specified in [\[MS-OXPROPS\]](#).

**RowCount:** A 1-byte unsigned **integer** containing the number of rows in the **RecipientRows** field. The value MUST be less than or equal to the **RecipientCount** field.

**RecipientRows:** An array of **OpenRecipientRow** structures whose number is equal to the value of the **RowCount** field.

The value of the **RecipientType** field specified in [\[MS-OXCROPS\]](#) section 2.2.6.1.2.1 is a bitwise OR of one value from the Types table with zero or more values from the flags table. Valid values for the **RecipientType** field are given in the following table.

Value	Meaning
0x01	<b>Primary recipient</b>
0x02	<b>Carbon copy (Cc) recipient</b>
0x03	<b>Blind carbon copy (Bcc) recipient</b>

Valid flags are as follows.

Value	Meaning
0x10	When resending a previous failure, this flag indicates that this recipient (1) did not successfully receive the message on the previous attempt.
0x80	When resending a previous failure, this flag indicates that this recipient (1) did successfully receive the message on the previous attempt.

### 2.2.3.2 RopCreateMessage ROP

The **RopCreateMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.2) is used to create a new Message object.

For this ROP, the value of the **InputHandleIndex** field references a folder or Logon object and the value of the **OutputHandleIndex** field references a Message object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [\[MS-OXCROPS\]](#). This section specifies the syntax and semantics of various fields that are not fully specified in [\[MS-OXCROPS\]](#).

#### 2.2.3.2.1 RopCreateMessage ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopCreateMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.2).

**CodePageId:** 2 bytes specifying the code page with which the non-Unicode representation of the strings on this Message object are to be encoded; a value of 0x0FFF means that the code page of the Logon object is used.

**FolderId:** 8 bytes containing the FID ([\[MS-OXCADATA\]](#) section 2.2.1.1) for the Folder object in which the Message object is to be created.

**AssociatedFlag:** 1 byte Boolean value.

Value	Meaning
0x00	Is not an FAI message.
Nonzero	Is an FAI message.

### 2.2.3.2.2 RopCreateMessage ROP Response Buffer

The following descriptions define valid fields for the response buffer of the **RopCreateMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.2).

**HasMessageId:** 1 byte.

Value	Meaning
0x00	This is the last byte in the buffer.
Nonzero	The <b>MessageId</b> field follows beginning with the next byte in the buffer.

**MessageId:** 8 bytes containing the MID ([\[MS-OXCDATA\]](#) section 2.2.1.2) for the newly created Message object.

### 2.2.3.3 RopSaveChangesMessage ROP

The **RopSaveChangesMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.3) commits the changes made to the Message object.

For this ROP, the value of the **ResponseHandleIndex** field references the containing Folder object or, for an embedded message, the **Embedded Message object**. The value of the **InputHandleIndex** field references a Message object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [\[MS-OXCROPS\]](#). This section specifies the syntax and semantics of various fields that are not fully specified in [\[MS-OXCROPS\]](#).

#### 2.2.3.3.1 RopSaveChangesMessage ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopSaveChangesMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.3).

**SaveFlags:** 1 byte indicating the server save behavior; MUST be one value from the following table.

Flag name	Value	Description
<b>KeepOpenReadOnly</b>	0x09	The client requests that the server commit the changes. The server either returns an error and leaves the Message object open with unchanged access level or returns a success code and keeps the Message object open with read-only access. More details about access levels are specified in <a href="#">[MS-OXCPRPT]</a> section 2.2.1.2.
<b>KeepOpenReadWrite</b>	0x0A	The client requests that the server commit the changes. The server either returns an error and leaves the Message object

Flag name	Value	Description
		open with unchanged access level or returns a success code and keeps the Message object open with read/write access.
<b>ForceSave</b>	0x0C	The client requests that the server commit the changes. The server either returns an error and leaves the Message object open with unchanged access level or returns a success code and keeps the Message object open with read/write access. The <b>ecObjectModified</b> error code is not valid when this flag is set; the server overwrites any changes instead.

### 2.2.3.3.2 RopSaveChangesMessage ROP Response Buffer

The following descriptions define valid fields for the response buffer of the **RopSaveChangesMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.3).

**MessageId:** 8 bytes containing the MID ([\[MS-OXCDATA\]](#) section 2.2.1.2) for the saved Message object.

### 2.2.3.3.4 RopRemoveAllRecipients ROP

The client sends the **RopRemoveAllRecipients** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.4) to delete all recipients (2) from a message.

For this ROP, the value of the **InputHandleIndex** field references a Message object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [\[MS-OXCROPS\]](#). This section specifies the syntax and semantics of various fields that are not fully specified in [\[MS-OXCROPS\]](#).

#### 2.2.3.4.1 RopRemoveAllRecipients ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopRemoveAllRecipients** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.4).

**Reserved:** 4 bytes; unspecified value.

#### 2.2.3.4.2 RopRemoveAllRecipients ROP Response Buffer

The syntax of the **RopRemoveAllRecipients** ROP response buffer is specified in [\[MS-OXCROPS\]](#) section 2.2.6.4.

This protocol adds no additional field information to the **RopRemoveAllRecipients** ROP response buffer.

### 2.2.3.5 RopModifyRecipients ROP

The **RopModifyRecipients** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.5) modifies recipients (2) associated with the Message object.

For this ROP, the value of the **InputHandleIndex** field references a Message object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [\[MS-OXCROPS\]](#). This section specifies the syntax and semantics of various fields that are not fully specified in [\[MS-OXCROPS\]](#).



### 2.2.3.5.1 RopModifyRecipients ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopModifyRecipients** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.5).

**ColumnCount:** 2 bytes containing the number of elements in the **RecipientColumns** field. Is greater than or equal to 0x0000 and less than 0x7FEF.

**RecipientColumns:** An array of **PropertyTag** structures whose number is equal to the value of the **ColumnCount** field. Each element is valid for a recipient (2) as specified in [\[MS-OXPROPS\]](#). The client MUST NOT include **property tags** for any properties that are part of standard property values of the **RecipientRow** field, as specified in [\[MS-OXCADATA\]](#) section 2.8.3:

**PidTagAddressType** ([\[MS-OXOABK\]](#) section 2.2.3.13)

**PidTagDisplayName** (section [2.2.2.4](#))

**PidTagEmailAddress** ([\[MS-OXOABK\]](#) section 2.2.3.14)

**PidTagEntryId** ([\[MS-OXCPRM\]](#) section 2.2.4)

**PidTagInstanceKey** ([\[MS-OXOABK\]](#) section 2.2.3.6)

**PidTagRecipientType** ([\[MS-OXOMSG\]](#) section 2.2.3.1)

**PidTagSearchKey** ([\[MS-OXCPRPT\]](#) section 2.2.1.9 )

**PidTagSendRichInfo** ([\[MS-OXOABK\]](#) section 2.2.3.18)

**PidTagTransmittableDisplayName** ([\[MS-OXOABK\]](#) section 2.2.3.8)

**RowCount:** 2 bytes containing the number of elements in the **RecipientRows** field. The value of this field is greater than or equal to 0x0000 and less than 0x7FEF.

**RecipientRow:** An array of **ModifyRecipientRow** structures ([\[MS-OXCROPS\]](#) section 2.2.6.5.1.1) whose length equals the value of the **RowCount** field.

### 2.2.3.5.2 RopModifyRecipients ROP Response Buffer

The syntax of the **RopModifyRecipients** ROP response buffer is specified in [\[MS-OXCROPS\]](#) section 2.2.6.5.

This protocol adds no additional field information to the **RopModifyRecipients** ROP response buffer.

### 2.2.3.6 RopReadRecipients ROP

The **RopReadRecipients** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.6) retrieves the recipients (2) associated with the Message object.

For this ROP, the value of the **InputHandleIndex** field references a Message object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [\[MS-OXCROPS\]](#). This section specifies the syntax and semantics of various fields that are not fully specified in [\[MS-OXCROPS\]](#).

### 2.2.3.6.1 RopReadRecipients ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopReadRecipients** ROP ([MS-OXCROPS] section 2.2.6.6).

**RowId:** 4 bytes containing the starting index for the recipients (2) to be retrieved.

**Reserved:** 2 bytes; MUST be 0x0000.

### 2.2.3.6.2 RopReadRecipients ROP Response Buffer

The following descriptions define valid fields for the response buffer of the **RopReadRecipients** ROP ([MS-OXCROPS] section 2.2.6.6).

**RowCount:** 1 byte containing the number of elements in the **RecipientRows** field. Is greater than or equal to 0x00 and less than 0xFF.

**RecipientRows:** An array of **ReadRecipientRow** structures whose number of elements equals the **RowCount** field. The **ReadRecipientRow** structure is specified in [MS-OXCROPS] section 2.2.6.6.2.1.

### 2.2.3.7 RopReloadCachedInformation ROP

The **RopReloadCachedInformation** ROP ([MS-OXCROPS] section 2.2.6.7) retrieves the same information as **RopOpenMessage** ROP ([MS-OXCROPS] section 2.2.6.1) but operates on an already opened Message object.

For this ROP, the value of the **InputHandleIndex** field references a Message object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [MS-OXCROPS]. This section specifies the syntax and semantics of various fields that are not fully specified in [MS-OXCROPS].

#### 2.2.3.7.1 RopReloadCachedInformation ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopReloadCachedInformation** ROP ([MS-OXCROPS] section 2.2.6.7).

**Reserved:** 2 bytes; MUST be 0x0000.

#### 2.2.3.7.2 RopReloadCachedInformation ROP Response Buffer

The syntax of the **RopReloadCachedInformation** ROP response buffer ([MS-OXCROPS] section 2.2.6.7) is identical to the syntax of the **RopOpenMessage** ROP response buffer ([MS-OXCROPS] section 2.2.6.1).

### 2.2.3.8 RopSetMessageStatus ROP

The **RopSetMessageStatus** ROP ([MS-OXCROPS] section 2.2.6.8) sets the **PidTagMessageStatus** property ([MS-OXPROPS] section 2.865) on a message in a folder without the need to open or save the Message object.

For this ROP, the value of the **InputHandleIndex** field references a Folder object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [MS-OXCROPS]. This section specifies the syntax and semantics of various fields that are not fully specified in [MS-OXCROPS].

#### 2.2.3.8.1 RopSetMessageStatus ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopSetMessageStatus** ROP ([MS-OXCROPS] section 2.2.6.8).

**MessageId:** 8 bytes containing the MID ([MS-OXCADATA] section 2.2.1.2) for the Message object to modify.

**MessageStatusFlags:** 4 bytes containing the **PidTagMessageStatus** property ((section 2.2.1.8), which defines the status of the message in a contents table. Valid values are specified in section 2.2.1.8. This value of this field is combined with the value of the **MessageStatusMask** field to yield the new message status.

**MessageStatusMask:** 4 bytes indicating which status flags are to be set and which are to be cleared. This field contains a bitwise OR of zero or more values from the table in section 2.2.1.8. Processing information for this field is specified in section 3.2.5.8.

#### 2.2.3.8.2 RopSetMessageStatus ROP Response Buffer

The following descriptions define valid fields for the response buffer of the **RopSetMessageStatus** ROP ([MS-OXCROPS] section 2.2.6.8).

**MessageStatusFlags:** 4 bytes indicating the status flags that were set on the Message object before processing this request. This field MUST contain a bitwise OR of zero or more values from the table in section 2.2.1.8.

#### 2.2.3.9 RopGetMessageStatus ROP

The **RopGetMessageStatus** ROP ([MS-OXCROPS] section 2.2.6.9) gets the message status of a message in a folder.

For this ROP, the value of the **InputHandleIndex** field references a Folder object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [MS-OXCROPS]. This section specifies the syntax and semantics of various fields that are not fully specified in [MS-OXCROPS].

#### 2.2.3.9.1 RopGetMessageStatus ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopGetMessageStatus** ROP ([MS-OXCROPS] section 2.2.6.9).

**MessageId:** 8 bytes containing the MID ([MS-OXCADATA] section 2.2.1.2) for the Message object in which to operate.

#### 2.2.3.9.2 RopGetMessageStatus ROP Response Buffer

The following descriptions define valid fields for the request buffer of the **RopGetMessageStatus** ROP ([MS-OXCROPS] section 2.2.6.9).

**MessageStatusFlags:** 4 bytes indicating the status of the Message object. This field contains a bitwise OR of zero or more values from the table in section 2.2.1.8.

### 2.2.3.10 RopSetReadFlags ROP

The **RopSetReadFlags** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.10) changes the state of the **PidTagMessageFlags** property (section [2.2.1.6](#)) on one or more Message objects within a Folder object. It also triggers the sending of **read receipts**, as specified in [\[MS-OXOMSG\]](#).

For this ROP, the value of the **InputHandleIndex** field references a Folder object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [\[MS-OXCROPS\]](#). This section specifies the syntax and semantics of various fields that are not fully specified in [\[MS-OXCROPS\]](#).

#### 2.2.3.10.1 RopSetReadFlags ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopSetReadFlags** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.10).

**WantAsynchronous:** 1 byte indicating whether client is prepared for the **RopSetReadFlags** ROP request to be processed asynchronously with status reported via the **RopProgress** ROP ([\[MS-OXCROPS\]](#) section 2.2.8.13).

**ReadFlags:** 1 byte containing a bitwise OR of zero or more values from the following table. The server modifies bits on the **PidTagMessageFlags** property (section [2.2.1.6](#)). The flags, **rfGenerateReceiptOnly**, **rfsuppressReceipt**, and **rfClearReadFlag**, (**rfClearNotifyRead** or **rfClearNotifyUnread**), are mutually exclusive.

Flag name	Value	Description
<b>rfDefault</b>	0x00	The server sets the read flag and sends the receipt.
<b>rfSuppressReceipt</b>	0x01	The user requests that any pending read receipt be canceled; the server sets the <b>mfRead</b> bit.
<b>rfReserved</b>	0x0A	Ignored by the server.
<b>rfClearReadFlag</b>	0x04	Server clears the <b>mfRead</b> bit; the client MUST include the <b>rfSuppressReceipt</b> bit with this flag.
<b>rfGenerateReceiptOnly</b>	0x10	The server sends a read receipt if one is pending, but does not change the <b>mfRead</b> bit.
<b>rfClearNotifyRead</b>	0x20	The server clears the <b>mfNotifyRead</b> bit but does not send a read receipt.
<b>rfClearNotifyUnread</b>	0x40	The server clears the <b>mfNotifyUnread</b> bit but does not send a nonread receipt.

**MessageIdCount:** 2 bytes containing the number of elements in the **MessageIds** field.

**MessageIds:** An array of MIDs ([\[MS-OXCADATA\]](#) section 2.2.1.2) whose length is equal to the value of the **MessageIdCount** field.

#### 2.2.3.10.2 RopSetReadFlags ROP Response Buffer

The following descriptions define valid fields for the response buffer of the **RopSetReadFlags** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.10).

**PartialCompletion:** 1 byte boolean flag. A nonzero value indicates the server was unable to modify one or more of the Message objects represented in the **MessageIds** field.

### 2.2.3.11 RopSetMessageReadFlag ROP

The **RopSetMessageReadFlag** ROP ([MS-OXCROPS] section 2.2.6.11) changes the state of the **PidTagMessageFlags** property (section 2.2.1.6) for the Message object. It also triggers the sending of read receipts, as specified in [MS-OXOMSG].

In this section, "in **public folder** mode" means that the logon associated with the value of the **LogonID** field from the request was created with the **Private** flag unset.

For this ROP, the value of the **ResponseHandleIndex** field references a Folder object, and the value of the **InputHandleIndex** field references a Message object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [MS-OXCROPS]. This section specifies the syntax and semantics of various fields that are not fully specified in [MS-OXCROPS].

#### 2.2.3.11.1 RopSetMessageReadFlag ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopSetMessageReadFlag** ROP ([MS-OXCROPS] section 2.2.6.11).

**ReadFlags:** 1 byte containing a bitwise OR of one or more values from the **ReadFlags** field table in section 2.2.3.10.1.

**ClientData:** A 24 byte LongTermID, as specified in [MS-OXCDATA] section 2.2.1.3.1, that represents the message read when in public folder mode; 0 bytes otherwise.

#### 2.2.3.11.2 RopSetMessageReadFlag ROP Response Buffer

The following descriptions define valid fields for the response buffer of the **RopSetMessageReadFlag** ROP ([MS-OXCROPS] section 2.2.6.11).

**ReadStatusChanged:** 1 byte containing one of the following values.

Value	Meaning
0x00	The read status on the Message object was unchanged, or the logon is not in public folder mode.
Nonzero	The read status on the Message object changed, and the logon is in public folder mode.

**LogonId:** 1 byte containing the LogonID from the request when the value in the **ReadStatusChanged** field is nonzero; 0 bytes otherwise.

**ClientData:** 24 bytes containing the **ClientData** field from the request when the value in the **ReadStatusChanged** field is nonzero; 0 bytes otherwise.

### 2.2.3.12 RopOpenAttachment ROP

The **RopOpenAttachment** ROP ([MS-OXCROPS] section 2.2.6.12) opens an Attachment object stored on the Message object.

For this ROP, the value of the **InputHandleIndex** field references a Message object, and the value of the **OutputHandleIndex** field references an Attachment object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [MS-OXCROPS]. This section specifies the syntax and semantics of various fields that are not fully specified in [MS-OXCROPS].

### 2.2.3.12.1 RopOpenAttachment ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopOpenAttachment** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.12).

**OpenAttachmentFlags:** 1 byte containing one of the following values.

Value name	Value	Description
ReadOnly	0x00	Message will be opened as read-only.
ReadWrite	0x01	Message will be opened for both reading and writing.
BestAccess	0x03	Open for read/write if possible, read-only if not.

**AttachmentID:** 4 bytes containing the ID of the Attachment object to be opened, as specified by the **PidTagAttachNumber** property (section [2.2.2.6](#)).

### 2.2.3.12.2 RopOpenAttachment ROP Response Buffer

The syntax of the **RopOpenAttachment** ROP response buffer is specified in [\[MS-OXCROPS\]](#) section 2.2.6.12.

This protocol adds no additional field information to the **RopOpenAttachment** ROP response buffer.

### 2.2.3.13 RopCreateAttachment ROP

The **RopCreateAttachment** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.13) creates a new Attachment object on the Message object.

For this ROP, the value of the **InputHandleIndex** field references a Message object, and the value of the **OutputHandleIndex** field references an Attachment object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [MS-OXCROPS]. This section specifies the syntax and semantics of various fields that are not fully specified in [MS-OXCROPS].

#### 2.2.3.13.1 RopCreateAttachment ROP Request Buffer

The syntax of the **RopCreateAttachment** ROP request buffer is specified in [\[MS-OXCROPS\]](#) section 2.2.6.13.

This protocol adds no additional field information to the **RopCreateAttachment** ROP request buffer.

#### 2.2.3.13.2 RopCreateAttachment ROP Response Buffer

The syntax of the **RopCreateAttachment** ROP response buffer is specified in [\[MS-OXCROPS\]](#) section 2.2.6.13.

The field specified in this section is part of the **RopCreateAttachment** ROP response buffer.

**AttachmentID:** 4 bytes containing the ID for the Attachment object that was created.

### 2.2.3.14 RopDeleteAttachment ROP

The **RopDeleteAttachment** ROP ([MS-OXCROPS] section 2.2.6.14) deletes an existing Attachment object from the Message object.

For this ROP, the value of the **InputHandleIndex** field references a Message object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [MS-OXCROPS]. This section specifies the syntax and semantics of various fields that are not fully specified in [MS-OXCROPS].

#### 2.2.3.14.1 RopDeleteAttachment ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopDeleteAttachment** ROP [MS-OXCROPS] section 2.2.6.14.

**AttachmentID:** 4 bytes containing the ID of the Attachment object to be deleted.

#### 2.2.3.14.2 RopDeleteAttachment ROP Response Buffer

The syntax of the **RopDeleteAttachment** ROP response buffer is specified in [MS-OXCROPS] section 2.2.6.14.

This protocol adds no additional field information to the **RopDeleteAttachment** ROP response buffer.

### 2.2.3.15 RopSaveChangesAttachment ROP

The **RopSaveChangesAttachment** ROP ([MS-OXCROPS] section 2.2.6.15) commits the changes made to the Attachment object.

For this ROP, the value of the **ResponseHandleIndex** field references the containing Message object, and the value of the **InputHandleIndex** field references an Attachment object.

If pending changes include changes to read-only properties, the server MAY<7> return an error.

The complete syntax of the ROP request and response buffers for this ROP is specified in [MS-OXCROPS]. This section specifies the syntax and semantics of various fields that are not fully specified in [MS-OXCROPS].

#### 2.2.3.15.1 RopSaveChangesAttachment ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopSaveChangesAttachment** ROP ([MS-OXCROPS] section 2.2.6.15).

**SaveFlags:** As specified in section [2.2.3.3.1](#).

#### 2.2.3.15.2 RopSaveChangesAttachment ROP Response Buffer

The syntax of the **RopSaveChangesAttachment** ROP response buffer is specified in [MS-OXCROPS] section 2.2.6.15.

This protocol adds no additional field information to the **RopSaveChangesAttachment** ROP response buffer.

### 2.2.3.16 RopOpenEmbeddedMessage ROP

The **RopOpenEmbeddedMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.16) retrieves a handle to a Message object from the given Attachment object.

For this ROP, the value of the **InputHandleIndex** field references an Attachment object and the value of the **OutputHandleIndex** field references a Message object.

The complete syntax of the ROP request and response buffers for this ROP is specified in [\[MS-OXCROPS\]](#). This section specifies the syntax and semantics of various fields that are not fully specified in [\[MS-OXCROPS\]](#).

#### 2.2.3.16.1 RopOpenEmbeddedMessage ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopOpenEmbeddedMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.16).

**CodePageId**: 2 bytes specifying the code page in which the non-Unicode representation of the strings on this Message object MUST be encoded.

**OpenModeFlags**: 1 byte. The following values are valid for this flag.

Value name	Value	Description
ReadOnly	0x00	Open the message as read-only.
ReadWrite	0x01	Open the message for both reading and writing.
Create	0x02	Create the attachment if it does not already exist and open the message for both reading and writing.

#### 2.2.3.16.2 RopOpenEmbeddedMessage ROP Response Buffer

The following descriptions define valid fields for the response buffer of the **RopOpenEmbeddedMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.16).

**MessageId**: 8 bytes containing the MID ([\[MS-OXCADATA\]](#) section 2.2.1.2) for the Message object.

**HasNamedProperties**, **SubjectPrefix**, **NormalizedSubject**, **RecipientCount**, **ColumnCount**, **RecipientColumns**, **RowCount**, **RecipientRows**: These fields are as specified in section [2.2.3.1.2](#). For the **RecipientRows** field, the presence of data in these fields is indeterminate, even when the embedded message exists.

### 2.2.3.17 RopGetAttachmentTable ROP

The **RopGetAttachmentTable** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.17) retrieves a handle to a Table object that represents the attachments stored on the Message object. For more details on Table objects, see [\[MS-OXCTABL\]](#).

For this ROP, the value of the **InputHandleIndex** field references a Message object, and the value of the **OutputHandleIndex** field references a Table object.



The complete syntax of the ROP request and response buffers for this ROP is specified in [MS-OXCROPS]. This section specifies the syntax and semantics of various fields that are not fully specified in [MS-OXCROPS].

### 2.2.3.17.1 RopGetAttachmentTable ROP Request Buffer

The following descriptions define valid fields for the request buffer of the **RopGetAttachmentTable** ROP ([MS-OXCROPS] section 2.2.6.17).

**TableFlags:** 1 byte. The following values are valid for this flag.

Value name	Value	Description
Standard	0x00	Open the table.
Unicode	0x40	Open the table. Also requests that the columns containing string data be returned in Unicode format.

### 2.2.3.17.2 RopGetAttachmentTable ROP Response Buffer

The syntax of the **RopGetAttachmentTable** ROP response buffer is specified in [MS-OXCROPS] section 2.2.6.17.

This protocol adds no additional field information to the **RopGetAttachmentTable** ROP response buffer.

### 2.2.3.18 RopGetValidAttachments ROP

The **RopGetValidAttachments** ROP ([MS-OXCROPS] section 2.2.6.18) gets the attachment IDs for all attachments that have previously been saved and have been assigned a valid numeric identifier. <8>

The complete syntax of the ROP request and response buffers for this ROP is specified in [MS-OXCROPS]. This section specifies the syntax and semantics of various fields that are not fully specified in [MS-OXCROPS].

#### 2.2.3.18.1 RopGetValidAttachments ROP Request Buffer

The syntax of the **RopGetValidAttachments** ROP request buffer is specified in [MS-OXCROPS] section 2.2.6.18.1.

This protocol adds no additional field information to the **RopGetAttachmentTable** ROP request buffer.

#### 2.2.3.18.2 RopGetValidAttachments ROP Response Buffer

The syntax of the **RopGetValidAttachments** ROP request buffer is specified in [MS-OXCROPS] section 2.2.6.18.2.

This protocol adds no additional field information to the **RopGetValidAttachments** ROP response buffer.

## 3 Protocol Details

### 3.1 Client Details

#### 3.1.1 Abstract Data Model

This section describes a conceptual model of possible data organization that an implementation maintains to participate in this protocol. The described organization is provided to facilitate the explanation of how the protocol behaves. This document does not mandate that implementations adhere to this model as long as their external behavior is consistent with that described in this document.

The following abstract data model (ADM) data types are defined in this section:

##### **Global**

##### **Mailbox**

##### **Message Object**

##### 3.1.1.1 Per Global

The following ADM element is common to both client and server:

**Global.Handle:** Represents an open connection by a client to a server object, as specified in [\[MS-OXCRPC\]](#) section 3.1.1.1.

##### 3.1.1.2 Per Mailbox

**Mailboxes** are represented by the **Mailbox** ADM object type. The following ADM objects are maintained for each **Mailbox**:

**Mailbox.MessageObject:** An abstract representation of a Message object.

##### 3.1.1.3 Per Message Object

A Message object is represented by the **MessageObject** ADM data type. The following ADM elements are maintained for each **MessageObject**:

**MessageObject.ReadState:** A state specifying whether the message has been read by a user, as specified in section [3.1.4.10](#). The possible state values are as follows:

- **Unsent:** The message has not been sent.
- **Read:** The message has been read.
- **Resend:** The message has been marked for resending.

### 3.1.2 Timers

None.

### 3.1.3 Initialization

None.

## 3.1.4 Higher-Layer Triggered Events

### 3.1.4.1 Opening a Message Object

A client obtains a handle to an existing Message object by sending a **RopOpenMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.1).

### 3.1.4.2 Creating a Message Object

A client creates a new Message object by sending a **RopCreateMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.2).

### 3.1.4.3 Saving Changes on a Message Object

A client saves all the changes to a Message object by sending a **RopSaveChangesMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.3).

### 3.1.4.4 Removing All Recipients

A client clears all recipients (2) from a Message object by sending a **RopRemoveAllRecipients** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.4).

### 3.1.4.5 Adding, Deleting, or Modifying a Recipient

A client modifies recipients (2) of the Message object by sending a **RopModifyRecipients** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.5).

### 3.1.4.6 Reading Recipients

A client retrieves a list of all recipients (2) on the Message object by sending a **RopReadRecipients** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.6).

### 3.1.4.7 Reload Message Object Header Info

A client retrieves the current state of the data returned in a **RopOpenMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.1) by sending a **RopReloadCachedInformation** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.7).

### 3.1.4.8 Setting Message Status

A client changes the status on a header message object (that is, marks or unmarks it for download or delete) by sending a **RopSetMessageStatus** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.8).

### 3.1.4.9 Getting Message Status

A client checks the status of a header message object by sending a **RopGetMessageStatus** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.9).

### 3.1.4.10 Setting Message Object Read State

A client marks one or more Message objects as read or unread without opening the Message objects by sending a **RopSetReadFlags** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.10).

When a user marks or unmarks a single opened Message object as read, the client sends a **RopSetMessageReadFlag** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.11).

#### 3.1.4.11 Opening an Attachment

A client opens and manipulates an existing Attachment object to a Message object by sending a **RopOpenAttachment** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.12).

#### 3.1.4.12 Creating an Attachment

A client adds a new Attachment object to a Message object by sending a **RopCreateAttachment** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.13).

#### 3.1.4.13 Deleting an Attachment

A client deletes an attachment from a Message object by sending a **RopDeleteAttachment** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.14).

#### 3.1.4.14 Setting Attachment Object Content

A client adds the contents of a file to an Attachment object by sending a **RopSetProperties** ROP request ([\[MS-OXCROPS\]](#) section 2.2.8.6) as specified in [\[MS-OXCPRPT\]](#) section 2.2.5.

#### 3.1.4.15 Saving Changes on an Attachment Object

A client saves changes to an Attachment object by sending a **RopSaveChangesAttachment** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.15).

#### 3.1.4.16 Opening an Embedded Message Object

A client opens an existing Attachment object and manipulates it as if it were a Message object by sending a **RopOpenEmbeddedMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.16).

#### 3.1.4.17 Accessing the Attachments Table

A client retrieves information about all Attachment objects associated with a Message object without opening each Attachment object by sending a **RopGetAttachmentTable** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.17).

#### 3.1.4.18 Creating an Embedded Message

A client creates an embedded message by sending a **RopCreateAttachment** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.13) to create an attachment on a message.

#### 3.1.4.19 Saving an Embedded Message

A client saves an embedded message by sending a **RopSaveChangesMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.3) on the embedded message. Then the client sends a **RopSaveChangesAttachment** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.15) on the attachment from which the embedded message was opened. Finally, the client sends a **RopSaveChangesMessage** ROP on the enclosing message.

### 3.1.4.20 Linking a Contact Object

To link a Contact object with another Message object, the client sets the following properties. Additional details are specified in section [2.2.1.50](#).

- **PidLidContactLinkEntry** (section [2.2.1.50.1](#))
- **PidLidContactLinkName** (section [2.2.1.50.3](#))
- **PidLidContactLinkSearchKey** (section [2.2.1.50.4](#))
- **PidLidContacts** (section [2.2.1.50.2](#))

### 3.1.5 Message Processing Events and Sequencing Rules

#### 3.1.5.1 Sending a RopOpenMessage ROP Request

To send the **RopOpenMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.1), the client first obtains the MID ([\[MS-OXCDATA\]](#) section 2.2.1.2) for the Message object to be opened, and either the FID ([\[MS-OXCDATA\]](#) section 2.2.1.1) or the LogonID. The MID is accessible from the contents table of the Folder object that contains the Message object by including the **PidTagMid** property ([\[MS-OXCFCICS\]](#) section 2.2.1.2.1) in a **RopSetColumns** ROP request ([\[MS-OXCROPS\]](#) section 2.2.5.1), as specified in [\[MS-OXCTABL\]](#) section 2.2.2.2.

To open a soft deleted Message object, the client MUST include the **OpenSoftDeleted** flag in the **OpenModeFlag** field.

When the client receives the response buffer, it can cache the data from the **NormalizedSubject** and **SubjectPrefix** fields to minimize further calls to the server; it then updates the cache when issuing a **RopSetProperties** ROP request ([\[MS-OXCROPS\]](#) section 2.2.8.6) for the **PidTagNormalizedSubject** property (section [2.2.1.10](#)) and the **PidTagSubjectPrefix** property (section [2.2.1.9](#)) and uses the cached values.

The client uses the opened Message object in subsequent ROPs; it MUST eventually send a **RopRelease** ROP request ([\[MS-OXCROPS\]](#) section 2.2.15.3) on the Message object and, after doing so, MUST NOT use the Message object for any subsequent ROPs.

The client is responsible for maintaining the privacy of the properties on the Message object when the **PidLidPrivate** property (section [2.2.1.15](#)) is set to 0x01.

If a client does not recognize a message class, it reverts to acting on all but the last group, recursively, until a recognized form remains.

#### 3.1.5.2 Sending a RopSaveChangesMessage ROP Request

The client controls the access level of the Message object after saving changes by calling the **RopSaveChangesMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.3) by setting the proper flags as specified in section [2.2.3.3.1](#).

#### 3.1.5.3 Sending a RopCreateMessage ROP Request

After calling the **RopCreateMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.2), the client sends a **RopSaveChangesMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.3) to commit the new Message object and uses the opened Message object in subsequent ROPs. It MUST eventually send a **RopRelease** ROP request ([\[MS-OXCROPS\]](#) section 2.2.15.3) on the Message object and, after doing so, MUST NOT use the Message object for any subsequent ROPs.

### 3.1.5.4 Sending a RopRemoveAllRecipients ROP Request

After calling the **RopRemoveAllRecipients** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.4), the client commits the changes by sending a **RopSaveChangesMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.3) for the Message object associated with the removed recipients (2).

### 3.1.5.5 Sending a RopModifyRecipients ROP Request

To modify an existing recipient (2) using the **RopModifyRecipients** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.5), the client sets the **RowId** field of the **RecipientRows** field to the row ID of the recipient (2) to be modified and sets all of the **ModifyRecipientRow** data to the desired values for that recipient (2), including any additional property information for the recipients (2). Additional property information is set by adding values for the **PropertyTag** field to the **RecipientColumns** field and including the property values in the **RecipientRows** field.

To delete an existing recipient (2), the client sets the **RowId** field to the row ID of the recipient (2) to be deleted and sets the **RecipientRowSize** field to 0x0000.

To add a new recipient (2), the client sets the **RowId** field to a value greater than the largest row ID for any recipient (2) that already exists on the Message object. The client sets all of the data in the **ModifyRecipientRow** field to the desired values for that recipient (2), including any additional property information.

To commit the changes, the client sends a **RopSaveChangesMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.3) for the Message object associated with the added recipients (2).

### 3.1.5.6 Sending a RopReadRecipients ROP Request

If the count of recipients and the count of recipient rows in the **RopOpenMessage** ROP response buffer ([\[MS-OXCROPS\]](#) section 2.2.6.1) are the same, then the client can use the information in the **RecipientRow** field from the **RopOpenMessage** ROP instead of sending a **RopReadRecipients** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.6). If the counts are not equal, the client MUST issue a series of **RopReadRecipients** ROP requests to retrieve all the recipients associated with the Message object.

A client accesses the information for all recipients in the message by setting the **RowId** field to 0x00000000, and then iteratively sending **RopReadRecipients** ROP requests with an increasing row ID value to obtain the recipients that did not fit in the previous request.

### 3.1.5.7 Sending a RopSetMessageStatus ROP Request

The client uses the **RopSetMessageStatus** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.8) to set the value of the **PidTagMessageStatus** property (section [2.2.1.8](#)). Additionally, the **PidTagMessageStatus** property can be set as a column on a contents table, as specified in [\[MS-OXCTABL\]](#) section 2.2.2.2.

To modify the status of a header message object, clients:

1. Obtain the message's MID ([\[MS-OXCADATA\]](#) section 2.2.1.2), as specified in section [3.1.5.1](#).
2. Send the **RopSetMessageStatus** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.8), setting the mask and status appropriately.

### 3.1.5.8 Sending a RopGetMessageStatus ROP Request

The client uses the **RopGetMessageStatus** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.9) to obtain the value of the **PidTagMessageStatus** property (section [2.2.1.8](#)).

To retrieve the status of a header message object, clients:

1. Obtain the message's MID ([\[MS-OXCADATA\]](#) section 2.2.1.2), as specified in section [3.1.5.1](#).
2. Send the **RopGetMessageStatus** ROP request; if the request succeeds, the value of the header message object's **PidTagMessageStatus** property ([\[MS-OXPROPS\]](#) section 2.865) is returned in the response buffer.

### 3.1.5.9 Sending a RopSetReadFlags ROP Request

The client obtains a list of MIDs ([\[MS-OXCADATA\]](#) section 2.2.1.2) using a contents table, as specified in section [3.1.4.1](#), and uses the list of MIDs in the **RopSetReadFlags** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.10).

The client controls whether the Message object is marked as read or unread, as well as the sending of read receipts, by setting the appropriate flags as specified in section [2.2.3.10.1](#).

### 3.1.5.10 Sending a RopOpenAttachment ROP Request

When sending a **RopOpenAttachment** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.12) to open an attachment, the client MUST use a valid value for the **AttachmentID** field. For more information about opening an Embedded Message object, see section [3.1.4.17](#).

The client uses the opened Attachment object in subsequent ROPs. It eventually sends a **RopRelease** ROP request ([\[MS-OXCROPS\]](#) section 2.2.15.3) on the Attachment object and, after doing so, MUST NOT use the Attachment object for any subsequent ROPs.

### 3.1.5.11 Sending a RopCreateAttachment ROP Request

After creating a new attachment with a call to the **RopCreateAttachment** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.13), the client sends a **RopSaveChangesAttachment** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.15) to commit the new Attachment object and uses the newly created Attachment object in subsequent ROPs. The client eventually sends a **RopRelease** ROP request ([\[MS-OXCROPS\]](#) section 2.2.15.3) on the Attachment object and, after doing so, MUST NOT use the Attachment object for any subsequent ROPs.

To create an Embedded Message object, the client uses the **RopSetProperties** ROP ([\[MS-OXCROPS\]](#) section 2.2.8.6) to set the **afEmbeddedMessage** flag on the **PidTagAttachMethod** property (section [2.2.2.9](#)). Finally the client sends a **RopOpenEmbeddedMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.16) on the attachment to get a Message object handle.

The client sends a **RopSaveChangesMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.3) to commit the Attachment object change to the Message object.

### 3.1.5.12 Sending a RopSetProperties ROP Request

Depending on the type of Attachment object being created by sending the **RopSetProperties** ROP request ([\[MS-OXCROPS\]](#) section 2.2.8.6), the client sets the appropriate value for the **PidTagAttachMethod** property, as specified in section [2.2.2.9](#).

The client sends a **RopSaveChangesAttachment** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.15) to commit the change to the Attachment object and a **RopSaveChangesMessage** ROP request to commit the Attachment object change to the Message object.

To set the **PidTagMessageStatus** property (section [2.2.1.8](#)), the client does not include it in a **RopSetProperties** ROP request ([\[MS-OXCROPS\]](#) section 2.2.8.6), as specified in [\[MS-OXCPRPT\]](#) section 2.2.5. Instead, the client calls the **RopGetMessageStatus** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.9), as specified in section [2.2.3.9](#).

### 3.1.5.13 Sending a RopGetPropertiesSpecific ROP Request

To get the **PidTagMessageStatus** property (section [2.2.1.8](#)), the client does not include it in a **RopGetPropertiesSpecific** ROP request ([\[MS-OXCROPS\]](#) section 2.2.8.3). Instead, the client calls the **RopSetMessageStatus** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.8), as specified in section [2.2.3.8](#).

The client does not include the **PidTagSubjectPrefix** property (section [2.2.1.9](#)) in a **RopGetPropertiesSpecific** ROP request ([\[MS-OXCROPS\]](#) section 2.2.8.3). Instead, the client uses the **SubjectPrefix** field from the **RopOpenMessage** ROP response buffer ([\[MS-OXCROPS\]](#) section 2.2.6.1).

The client does not include the **PidTagNormalizedSubject** property (section [2.2.1.10](#)) in a **RopGetPropertiesSpecific** ROP request ([\[MS-OXCROPS\]](#) section 2.2.8.3). Instead, the client uses the **NormalizedSubject** field from the **RopOpenMessage** ROP response buffer ([\[MS-OXCROPS\]](#) section 2.2.6.1).

### 3.1.5.14 Sending a RopSaveChangesAttachment ROP Request

After saving changes to an attachment with a call to the **RopSaveChangesAttachment** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.15), the client sends a **RopSaveChangesMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.3) to commit the Attachment object changes to the Message object.

### 3.1.5.15 Sending a RopOpenEmbeddedMessage ROP Request

The client uses the Message object opened by the **RopOpenEmbeddedMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.16) in subsequent ROPs; it eventually sends a **RopRelease** ROP request ([\[MS-OXCROPS\]](#) section 2.2.15.3) on the Message object and, after doing so, MUST NOT use the Message object for any subsequent ROPs.

### 3.1.5.16 Sending a RopGetAttachmentTable ROP Request

When a client calls the **RopGetAttachmentTable** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.17), the server returns a table of properties for each Attachment object associated with the Message object, as specified in [\[MS-OXCTABL\]](#). To retrieve the attachment ID, the client includes the **PidTagAttachNumber** property (section [2.2.2.6](#)) when sending a **RopSetColumns** ROP request ([\[MS-OXCROPS\]](#) section 2.2.5.1).

## 3.1.6 Timer Events

None.

## 3.1.7 Other Local Events

None.



## 3.2 Server Details

### 3.2.1 Abstract Data Model

This section describes a conceptual model of possible data organization that an implementation maintains to participate in this protocol. The described organization is provided to facilitate the explanation of how the protocol behaves. This document does not mandate that implementations adhere to this model as long as their external behavior is consistent with that described in this document.

The following ADM data types are defined in this section.

**Global**

**Mailbox**

**MessageObject**

#### 3.2.1.1 Per Global

The following ADM element is common to both client and server:

**Global.Handle:** Represents an open connection by a client to a server object, as specified in [\[MS-OXCRPC\]](#) section 3.1.1.1.

#### 3.2.1.2 Per Mailbox

Mailboxes are represented by the **Mailbox** ADM data type. The following ADM elements are maintained for each **Mailbox**.

**Mailbox.MessageObject:** An abstract representation of a Message object.

#### 3.2.1.3 Per Message Object

A Message object is represented by the **MessageObject** ADM data type. The following ADM elements are maintained for each **MessageObject**.

**MessageObject.AttachmentTable:** The set of attachments associated with a message.

**MessageObject.Transactions:** A record of the open **Global.Handle** ADM elements (section [3.2.1.1](#)) against a **MessageObject**. Each **Global.Handle** ADM element is given its own **transaction (3)**. If a change to a **MessageObject** is committed on one **Global.Handle** ADM element, the server prevents changes from being saved against other open **Global.Handle** ADM elements on the same **MessageObject**, as specified in section [3.2.5.3](#).

### 3.2.2 Timers

None.

### 3.2.3 Initialization

None.

### 3.2.4 Higher-Layer Triggered Events

None.

### 3.2.4.1 Requesting Body Properties

When a client requests the Message body, it can either use the best body algorithm as specified in [\[MS-OXBBODY\]](#) or directly request one of the body properties specified in section [2.2.1.49](#). In the second case, the server SHOULD convert whatever body property it has for the message into the requested format. For example, if the message contains the body in the **PidTagBodyHtml** property (section [2.2.1.49.3](#)) and the client requests the **PidTagBody** property (section [2.2.1.49.1](#)), the server SHOULD convert the **PidTagBodyHtml** property to a plain text representation and return this converted value.

The semantics for converting from one body format to another are implementation-dependent.

## 3.2.5 Message Processing Events and Sequencing Rules

### 3.2.5.1 Receiving a RopOpenMessage ROP Request

The Message object returned by the **RopOpenMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.1) is used in subsequent ROPs, such as a **RopGetPropertiesSpecific** ROP request ([\[MS-OXCROPS\]](#) section 2.2.8.3). For information about which ROPs operate on Message objects, see the specific ROPs in [\[MS-OXCROPS\]](#).

When the server receives multiple requests to open the same Message object, it returns a different handle and maintains a separate transaction (3) for each.

A **RopOpenMessage** ROP MUST NOT succeed if a Message object with the specified ID does not exist or if the client has insufficient access rights to the folder in which the Message object is stored.

If the **OpenModeFlag** field includes the **OpenSoftDeleted** flag, the **RopOpenMessage** ROP provides access to all Message objects, including soft deleted Message objects. If the **OpenSoftDeleted** flag is not included, the server MUST NOT provide access to soft deleted Message objects.

The response field **RecipientCount** indicates the current number of recipients (2) in the message. In addition, the server returns data for as many recipients (2) as will fit in the response buffer, in the order of the value of the **RowId** field. The data for each recipient (2) is encoded as an **OpenRecipientRow** structure in the **RecipientRows** field. The response field **RowCount** indicates how many recipients (2) are present in the **RecipientRows** field.

If a server does not recognize a message class, it reverts to acting on all but the last group, recursively, until a recognized form remains.

The following specific error code applies to this ROP.

Error code name	Value	Meaning
ecNotFound	0x8004010F	The MID ( <a href="#">[MS-OXCADATA]</a> section 2.2.1.2) does not correspond to a message in the database. The user does not have rights to the message. The folder corresponding to the FID ( <a href="#">[MS-OXCADATA]</a> section 2.2.1.1) entered in the ROP request buffer does not contain a message with the entered MID. The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to a Folder object or a Store object. The message is soft deleted and the client has not specified the

Error code name	Value	Meaning
		<b>OpenSoftDeleted</b> flag as part of the <b>OpenModeFlag</b> field.

### 3.2.5.2 Receiving a RopCreateMessage ROP Request

**Note** Some of the information in this section is subject to change because it applies to a preliminary implementation of the protocol or structure. For information about specific differences between versions, see the behavior notes that are provided in the Product Behavior appendix.

When processing the **RopCreateMessage** ROP ([MS-OXCROPS] section 2.2.6.2), the server MUST NOT commit the new Message object until it receives a **RopSaveChangesMessage** ROP request ([MS-OXCROPS] section 2.2.6.3).

The server SHOULD [<9>](#) initialize the following properties before responding.

Property name	Initial data
<b>PidTagImportance</b> (section <a href="#">2.2.1.11</a> )	0x00000001
<b>PidTagMessageClass</b> (section <a href="#">2.2.1.3</a> )	IPM.Note
<b>PidTagSensitivity</b> (section <a href="#">2.2.1.13</a> )	0x00000000
<b>PidTagDisplayBcc</b> ([MS-OXOMSG] section 2.2.1.7)	""
<b>PidTagDisplayCc</b> ([MS-OXOMSG] section 2.2.1.8)	""
<b>PidTagDisplayTo</b> ([MS-OXOMSG] section 2.2.1.9)	""
<b>PidTagMessageFlags</b> (section <a href="#">2.2.1.6</a> )	0x00000009; will be 0x00000409 (the <b>mfEverRead</b> flag combined by using the bitwise OR operation with the value 0x00000009) if the client does not explicitly set the read state
<b>PidTagMessageSize</b> (section <a href="#">2.2.1.7</a> )	See the <b>PidTagMessageSize</b> property in section <a href="#">2.2.1.7</a>
<b>PidTagHasAttachments</b> (section <a href="#">2.2.1.2</a> )	0x00
<b>PidTagTrustSender</b> (section <a href="#">2.2.1.45</a> )	0x00000001
<b>PidTagAccess</b> ([MS-OXCPRPT] section 2.2.1.1)	0x00000003
<b>PidTagAccessLevel</b> ([MS-OXCPRPT] section 2.2.1.2)	0x00000001
<b>PidTagUriCompName</b> ([MS-OXPROPS] section 2.1114)	No Subject.EML
<b>PidTagCreationTime</b> (section	The time the <b>RopCreateMessage</b> ROP ([MS-OXCROPS] section

Property name	Initial data
<a href="#">2.2.2.3</a> )	2.2.6.2) was processed
<b>PidTagLastModificationTime</b> (section <a href="#">2.2.2.2</a> )	Same as the <b>PidTagCreationTime</b> property
<b>PidTagSearchKey</b> ([MS-OXCPRPT] section 2.2.1.9)	Server generated search key
<b>PidTagMessageLocaleId</b> (section <a href="#">2.2.1.5</a> )	The Logon object LocaleID.
<b>PidTagCreatorName</b> ([MS-OXPROPS] section 2.726)	Name of the creator.
<b>PidTagCreatorEntryId</b> (section <a href="#">2.2.1.31</a> )	Address book EntryID of the creator
<b>PidTagLastModifierName</b> ([MS-OXCPRPT] section 2.2.1.5)	Same as the <b>PidTagCreatorName</b> property
<b>PidTagLastModifierEntryId</b> (section <a href="#">2.2.1.32</a> )	Same as the <b>PidTagCreatorEntryId</b> property
<b>PidTagHasNamedProperties</b> (section <a href="#">2.2.1.39</a> )	"0x00"
<b>PidTagLocaleId</b> ([MS-OXPROPS] section 2.841)	Same as the <b>PidTagMessageLocaleId</b> property
<b>PidTagLocalCommitTime</b> ([MS-OXPROPS] section 2.840)	Same as the <b>PidTagCreationTime</b> property

The following specific error code applies to this ROP.

Error code name	Value	Meaning
ecAccessDenied	0x80000009	The user does not have permissions to create this message.

### 3.2.5.3 Receiving a RopSaveChangesMessage ROP Request

After processing the **RopSaveChangesMessage** ROP ([MS-OXCROPS] section 2.2.6.3), when the message has been successfully saved and all changes committed to the store, the server determines the status of the Message object after the commit by the value of the **SaveFlags** flag as documented in section [2.2.3.3.1](#).

The response contains the MID ([MS-OXCDATA] section 2.2.1.2) of the committed message.

For this ROP, the index in the **ResponseHandleIndex** field references the containing Folder object or, for an embedded message, the Embedded Message object. The index in the **InputHandleIndex** field references a Message object.

When the server receives multiple requests to open the same Message object, it returns a different handle and maintains a separate transaction (3) for each. Any changes made on one transaction (3) MUST NOT be visible to another transaction (3) until the changes are committed via the **RopSaveChangesMessage** ROP. Once a transaction (3) on one handle has been committed, the server MUST return "ecObjectModified" for **RopSaveChangesMessage** ROP requests on other

handles and MUST NOT [<10>](#) allow those transactions (3) to be committed, unless the client instructs the server to override previous changes with the **ForceSave** flag.

If pending changes include changes to read-only properties, the server MAY [<11>](#) return an error.

The following specific error codes apply to this ROP.

Error code name	Value	Meaning
ecNotSupported	0x80040102	The message has been opened or previously saved as read only; changes cannot be saved. The values of the <b>SaveFlags</b> flags are not a supported combination.
ecObjectModified	0x80040109	The underlying data for this Message object was changed through another transaction (3) context.

### 3.2.5.4 Receiving a RopRemoveAllRecipients ROP Request

When processing the **RopRemoveAllRecipients** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.4), the server ignores the value of the **Reserved** field.

Until the server receives a **RopSaveChangesMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.3) from the client, the server adheres to the following:

- The **PidTagRowid** property (section [2.2.1.38](#)) and associated data of removed recipients (2) MUST NOT be returned as part of any subsequent handling of ROPs for the opened Message object on the same Message object handle.
- The changes made to the recipients (2) MUST NOT be included in the response buffer returned for ROP requests that apply to recipients (2) on different Message object handles.

The call to the **RopRemoveAllRecipients** ROP succeeds even if the Message object on which it is executed has no recipients (2).

The following specific error code applies to this ROP.

Error code name	Value	Meaning
ecNullObject	0x000004B9	The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to a Message object.

### 3.2.5.5 Receiving a RopModifyRecipients ROP Request

When processing the **RopModifyRecipients** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.5), for each recipient (2) provided, the server locates its representation of the recipient (2) based on the value of the **RowId** field within the **RecipientRows** field. If the recipient (2) indicated by the value of the **RowId** field does not exist, the server creates a new recipient (2) with that **RowId** field value and applies the data from the request.

If the recipient (2) currently exists on the Message object and the value of **RecipientRowSize** field in the request buffer is nonzero, the server replaces all existing properties of the recipient (2) with the property values supplied in the request. If the value of the **RecipientRowSize** field in the **ModifyRecipientRow** structure within the **RecipientRows** field of the request buffer is 0x0000, then the server deletes the recipient (2) from the Message object.

Until the server receives a **RopSaveChangesMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.3) from the client, the server adheres to the following:

- If a recipient (2) was deleted, its **RowId** field and associated data MUST NOT be returned as part of any subsequent handling of ROPs for the opened Message object.
- Any changes made to the recipients (2) MUST be included in the response buffer for any subsequent ROP requests that apply to recipients (2) for the same Message object handle.
- The changes made to the recipients (2) MUST NOT be included in the response buffer returned for ROP requests that apply to recipients (2) on different Message object handles.

The following specific error code applies to this ROP.

Error code name	Value	Meaning
ecNullObject	0x000004B9	The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to a Message object.

### 3.2.5.6 Receiving a RopReadRecipients ROP Request

The **RopReadRecipients** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.6) is used to obtain information for all recipients (2) in the Message object, regardless of the number of recipients (2) on the message.

The server provides the recipient (2) information starting with the recipient (2) specified by the **RowId** field. If there is a recipient (2) with the given value of the **RowId** field, the server provides the information for that recipient (2) and as many recipients (2) as possible, limited by the number of actual recipients (2) in the message and the amount of recipient (2) information that fits in the response buffer.

When the value of the **RowId** field is 0x00000000, the server returns all recipients (2) for the message, beginning with the first recipient (2) and filling the response buffer with as many **RecipientRow** structures ([\[MS-OXCDATA\]](#) section 2.8.3) as will fit. If the message does not have recipients (2), the server returns the error ecNotFound.

The following specific error codes apply to this ROP.

Error code name	Value	Meaning
ecNotFound	0x8004010F	Recipient row <b>RowId</b> does not exist on the message.
ecBufferTooSmall	0x0000047D	Unable to fit at least one recipient (2) in the response buffer.
ecNullObject	0x000004B9	The <b>InputHandleIndex</b> on which this ROP was called does not refer to a Message object.

### 3.2.5.7 Receiving a RopReloadCachedInformation ROP Request

The following specific error code applies to the **RopReloadCachedInformation** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.7).

Error code name	Value	Meaning
ecNullObject	0x000004b9	The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to a Message object.

### 3.2.5.8 Receiving a RopSetMessageStatus ROP Request

When processing the **RopSetMessageStatus** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.8), the server modifies the bits on the **PidTagMessageStatus** property (section [2.2.1.8](#)) specified by the **MessageStatusMask** field, preserving only those flags that are set in both the **MessageStatusMask** field and the **MessageStatusFlags** field, and clearing any other flags set only in the **MessageStatusMask** field.

The server immediately commits the changes to the Message object as if the Message object had been opened and the **RopSaveChangesMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.3) had been called, except that it changes only the **PidTagMessageStatus** property, not the **PidTagChangeKey** property ([\[MS-OXCFXICS\]](#) section 2.2.1.2.7), the **PidTagLastModificationTime** property (section [2.2.2.2](#)), or any other property that is modified during the **RopSaveChangesMessage** ROP request. The following specific error code applies to this ROP.

Error code name	Value	Meaning
ecNullObject	0x000004B9	The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to a Folder object.

### 3.2.5.9 Receiving a RopGetMessageStatus ROP Request

When processing the **RopGetMessageStatus** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.9), the server MUST NOT require the Message object to be opened.

The following specific error code applies to this ROP.

Error code name	Value	Meaning
ecNullObject	0x000004B9	The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to a Folder object.

### 3.2.5.10 Receiving a RopSetReadFlags ROP Request

The server immediately commits the changes to the Message objects as if the Message objects had been opened and the **RopSaveMessageChanges** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.3) had been called, except that it only changes the **PidTagMessageFlags** property (section [2.2.1.6](#)), not the **PidTagChangeKey** property ([\[MS-OXCFXICS\]](#) section 2.2.1.2.7), the **PidTagLastModificationTime** property (section [2.2.2.2](#)), or any other property that is modified during a **RopSaveChangesMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.3).

If the **WantAsynchronous** flag, as specified in section [2.2.3.10.1](#), is nonzero, the server SHOULD return a **RopSetReadFlags** ROP response ([\[MS-OXCROPS\]](#) section 2.2.6.10) but MAY return a **RopProgress** ROP response ([\[MS-OXCROPS\]](#) section 2.2.8.13) instead. If the **SUPPORT\_PROGRESS** flag, as specified in [\[MS-OXCSTOR\]](#) section 2.2.1.1.1, is not set by the

client in the **OpenFlags** field in the **RopLogon** ROP ([\[MS-OXCROPS\]](#) section 2.2.3.1), then the server SHOULD disable asynchronous processing of the **RopSetReadFlags** ROP and SHOULD NOT [<12>](#) return the **RopProgress** ROP whether or not the **WantAsynchronous** flag is set.

If the server has not received a **SUPPORT\_PROGRESS** flag in the request buffer of the **RopLogon** ROP ([\[MS-OXCROPS\]](#) section 2.2.3.1), the server MUST disable asynchronous processing for the **RopSetReadFlags** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.10), overriding any value of the **WantAsynchronous** flag. In this case, a **RopProgress** ROP SHOULD NOT [<13>](#) be sent. If the client does not pass the **SUPPORT\_PROGRESS** flag, the server will process the entire **RopSetReadFlags** ROP request before returning a response to the client. If the client does pass a **SUPPORT\_PROGRESS** flag, and the client also passes the **WantAsynchronous** flag, the server performs asynchronously and returns the **RopProgress** ROP to inform the client of the status of processing the **RopSetReadFlags** ROP.

If the server is unable to modify one or more of the Message objects that are specified in the **MessageIds** field, as specified in section [2.2.3.10.1](#), of the request buffer, then the server returns the **PartialCompletion** flag, as specified in section [2.2.3.10.2](#), in the response buffer.

The following specific error code applies to this ROP.

Error code name	Value	Meaning
ecNullObject	0x000004B9	The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to a Folder object.

### 3.2.5.11 Receiving a RopSetMessageReadFlag ROP Request

If the **RopSetMessageReadFlag** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.11) is performed in public folder mode as specified in section [2.2.3.11](#), the server finds the message associated with the LongTermID structure, as specified in [\[MS-OXCADATA\]](#) section 2.2.1.3.1, which is contained in the **ClientData** field in the request. The server finds the message by using the method specified in [\[MS-OXCSTOR\]](#) section 3.2.5.9.

The server immediately commits the changes to the Message object as if the Message object had been opened and the **RopSaveChangesMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.3) had been called, except that it only changes the **PidTagMessageFlags** property (section [2.2.1.6](#)), not the **PidTagChangeKey** property ([\[MS-OXCFXICS\]](#) section 2.2.1.2.7), the **PidTagLastModificationTime** property (section [2.2.2.2](#)), or any other property that is modified during a **RopSaveChangesMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.3).

The following specific error code applies to this ROP.

Error code name	Value	Meaning
ecNullObject	0x000004B9	The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to a Message object.

### 3.2.5.12 Receiving a RopOpenAttachment ROP Request

The handle returned by the **RopOpenAttachment** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.12) is used in subsequent ROPs, such as the **RopGetPropertiesSpecific** ROP ([\[MS-OXCROPS\]](#) section 2.2.8.3). For details about which ROPs operate on Attachment objects, see the sections for the ROPs in [\[MS-OXCROPS\]](#).



The following specific error codes apply to this ROP.

Error code name	Value	Meaning
ecNotFound	0x8004010F	The value of the <b>AttachmentID</b> field does not correspond to an attachment on the Message object.
ecAccessDenied	0x80000009	The user has insufficient privileges.
ecNullObject	0x000004B9	The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to a Message object.

### 3.2.5.13 Receiving a RopCreateAttachment ROP Request

**Note** Some of the information in this section is subject to change because it applies to a preliminary implementation of the protocol or structure. For information about specific differences between versions, see the behavior notes that are provided in the Product Behavior appendix.

When processing the **RopCreateAttachment** ROP ([MS-OXCROPS] section 2.2.6.13), the server does not commit the new Attachment object until it receives a call to the **RopSaveChangesAttachment** ROP ([MS-OXCROPS] section 2.2.6.15).

The server MUST initialize the following properties before responding.

Property name	Initial data
<b>PidTagAttachNumber</b> (section 2.2.2.6)	Varies, depending on the number of existing attachments on the Message object
<b>PidTagAttachSize</b> (section 2.2.2.5)	0x00000040<14>
<b>PidTagAccessLevel</b> ([MS-OXCPRPT] section 2.2.1.2)	0x00000001<15>
<b>PidTagRenderingPosition</b> (section 2.2.2.16)	0xFFFFFFFF
<b>PidTagCreationTime</b> (section 2.2.2.3)	The time the <b>RopCreateAttachment</b> ROP ([MS-OXCROPS] section 2.2.6.13) was processed
<b>PidTagLastModificationTime</b> (section 2.2.2.2)	Same as the <b>PidTagCreationTime</b> property<16>

The following specific error codes apply to this ROP.

Error code name	Value	Meaning
ecMaxAttachmentExceeded	0x000004DB	The (server defined) maximum number of attachments for a message has been exceeded.
ecNullObject	0x000004B9	The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to a Message object.

### 3.2.5.14 Receiving a RopSaveChangesAttachment ROP Request

After processing the **RopSaveChangesAttachment** ROP ([MS-OXCROPS] section 2.2.6.15), the server determines the status of the Attachment object after the commit by the values of the **SaveFlags** field as specified in section 2.2.3.3.1.

Although the server commits any pending changes to the Attachment object in the context of its containing Message object, the changes MUST NOT be committed to the database until the **RopSaveChangesMessage** ROP ([MS-OXCROPS] section 2.2.6.3) has been executed on the handle of the Message object.

The following specific error code applies to this ROP.

Error code name	Value	Meaning
ecNotSupported	0x80040102	The value of the <b>SaveFlags</b> field is not a supported combination as specified in section 2.2.3.3.1. The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to an Attachment object.

### 3.2.5.15 Receiving a RopDeleteAttachment ROP Request

The server recalculates the **PidTagHasAttachments** property (section 2.2.1.2) while processing the **RopDeleteAttachment** ROP ([MS-OXCROPS] section 2.2.6.14).

The attachment is not permanently removed from the message until the client calls the **RopSaveChangesMessage** ROP ([MS-OXCROPS] section 2.2.6.3).

The following specific error codes apply to this ROP.

Error code name	Value	Meaning
ecNotFound	0x8004010F	The value of the <b>AttachmentID</b> field does not correspond to an attachment on the Message object.
ecAccessDenied	0x80000009	The user has insufficient privileges.
ecNullObject	0x000004B9	The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to a Message object.

### 3.2.5.16 Receiving a RopOpenEmbeddedMessage ROP Request

If the embedded object does not exist, the client creates an Attachment object following the process specified in section 3.1.4.18. Once the attachment is created and its properties initialized, the client sends a **RopOpenEmbeddedMessage** ROP ([MS-OXCROPS] section 2.2.6.16) on the attachment to get a Message object handle. The returned handle is used in subsequent ROPs (similar to the one returned by the **RopOpenMessage** ROP ([MS-OXCROPS] section 2.2.6.1)). The server MUST NOT commit the Message object to the containing Attachment object until the **RopSaveChangesMessage** ROP ([MS-OXCROPS] section 2.2.6.3) is called with the Embedded Message object's handle.

The following specific error codes apply to this ROP.

Error code name	Value	Meaning
ecAccessDenied	0x80000009	The user does not have permission to open or create this message.
ecNullObject	0x000004B9	The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to an Attachment object.
ecUnknownCodePage	0x000003ef	The code page is unknown.

### 3.2.5.17 Receiving a RopGetAttachmentTable ROP Request

The Table object returned by the **RopGetAttachmentTable** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.17) allows access to the properties of Attachment objects.

The following specific error codes apply to this ROP.

Error code name	Value	Meaning
ecNullObject	0x000004B9	The value of the <b>InputHandleIndex</b> field on which this ROP was called does not refer to a Message object.
ecBusy	0x80040108	The server is too busy to complete the request.

### 3.2.6 Timer Events

None.

### 3.2.7 Other Local Events

None.

## 4 Protocol Examples

A user creates a new HTML-format e-mail, sets its subject to "abc123sample" and its body to "This is a sample body text". The user also adds two attachments, an HTML embedded image and a text file, adds a recipient (2), and then saves and closes the message.

### 4.1 Create Message

The client first creates a new Message object by sending a **RopCreateMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.2).

#### 4.1.1 RopCreateMessage Request Buffer

```
0000: 06 00 00 01 ff 0f 01 00-00 00 00 f0 79 93 00
```

**RopId:** 0x06

**LogonId:** 0x00

**InputHandleIndex:** 0x00

**OutputHandleIndex:** 0x01

**CodePageId:** 0x0FFF

**FolderId:** 01 00 00 00 00 f0 79 93

**AssociatedFlag:** 0x00

#### 4.1.2 RopCreateMessage Response Buffer

```
0000: 06 01 00 00 00 00 00
```

**RopId:** 0x06

**OutputHandleIndex:** 0x01

**ReturnValue:** 0x00000000

**HasMessageId:** 0x00

### 4.2 Name to Id Mapping

Before manipulating named properties on Message objects, the client needs to ask the server to map from the named properties to property identifiers, using the **RopGetPropertyIdsFromNames** ROP ([\[MS-OXCROPS\]](#) section 2.2.8.1) as described in [\[MS-OXCPRPT\]](#) section 2.2.12.

### 4.3 Get Attachment Table

The client sends a **RopGetAttachmentTable** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.17) to retrieve the attachments table for a Message object.

### 4.3.1 RopGetAttachmentTable Request Buffer

```
0000:21 00 00 01 00
```

**RopId:** 0x21

**LogonId:** 0x00

**InputHandleIndex:** 0x00

**OutputHandleIndex:** 0x01

**TableFlags:** 0x00 (Standard)

### 4.3.2 RopGetAttachmentTable Response Buffer

```
0000:21 01 00 00 00 00
```

**RopId:** 0x21

**OutputHandleIndex:** 0x01

**ReturnValue:** 0x00000000

## 4.4 Insert HTML Embedded Image

The client first creates the Attachment object on the Message object, then sets its properties and commits the changes.

### 4.4.1 RopCreateAttachment Request Buffer

```
0000: 23 00 00 01
```

**RopId:** 0x23

**LogonId:** 0x00

**InputHandleIndex:** 0x00

**OutputHandleIndex:** 0x01

### 4.4.2 RopCreateAttachment Response Buffer

```
0000: 23 01 00 00 00 00 00 00-00 00
```

**RopId:** 0x23

**OutputHandleIndex:** 0x01

**ReturnValue:** 0x00000000

**AttachmentID:** 0x00000000

### 4.4.3 Setting Properties

At this point, the client uses the **RopSetProperties** ROP ([\[MS-OXCROPS\]](#) section 2.2.8.6) as described in [\[MS-OXCPRPT\]](#) section 2.2.5 to set properties on the Attachment objects.

Property tag	Property name	Data
0x37050003	<b>PidTagAttachMethod</b> (section <a href="#">2.2.2.9</a> )	0x00000001
0x370B0003	<b>PidTagRenderingPosition</b> (section <a href="#">2.2.2.16</a> )	0xFFFFFFFF
0x7FFD0003	<b>PidTagAttachmentFlags</b> (section <a href="#">2.2.2.23</a> )	0x00000000
0x3001001F	<b>PidTagDisplayName</b> (section <a href="#">2.2.2.4</a> )	"image001.PNG"
0x3712001F	<b>PidTagAttachContentId</b> (section <a href="#">2.2.2.26</a> )	"image001.PNG@01C86E1C.F1954390"
0x370E001F	<b>PidTagAttachMimeType</b> (section <a href="#">2.2.2.26</a> )	"image/PNG"
0x7FFA0003	<b>PidTagAttachmentLinkId</b> (section <a href="#">2.2.2.22</a> )	0x00000000
0x37140003	<b>PidTagAttachFlags</b> (section <a href="#">2.2.2.18</a> )	"0x00000004"
0x7FFE000b	<b>PidTagAttachmentHidden</b> (section <a href="#">2.2.2.24</a> )	"0x01"
0x3707001F	<b>PidTagAttachLongFilename</b> (section <a href="#">2.2.2.10</a> )	"image001.PNG"
0x3704001F	<b>PidTagAttachFilename</b> (section <a href="#">2.2.2.11</a> )	"image001.PNG"
0x3703001F	<b>PidTagAttachExtension</b> (section <a href="#">2.2.2.12</a> )	".PNG"

To set the contents of the embedded image, the client uses four ROPs.

The **RopOpenStream** ROP ([\[MS-OXCROPS\]](#) section 2.2.9.1) with the **PidTagAttachDataBinary** property (section [2.2.2.7](#)).

The **RopSetStreamSize** ROP ([\[MS-OXCROPS\]](#) section 2.2.9.6) with the size of image file data.

The **RopWriteStream** ROP request ([\[MS-OXCROPS\]](#) section 2.2.9.3) with the actual file contents.

The **RopRelease** ROP ([\[MS-OXCROPS\]](#) section 2.2.15.3) for the handle returned from the **RopOpenStream** ROP.

### 4.4.4 RopSaveChangesAttachment Request Buffer

```
0000: 25 00 01 00 0A
```

**RopId:** 0x25

**LogonId:** 0x00

**ResponseHandleIndex:** 0x01

**InputHandleIndex:** 0x00

**SaveFlags:** 0x0A (**KeepOpenReadWrite**)

#### 4.4.5 RopSaveChangesAttachment Response Buffer

0000: 25 01 00 00 00 00

**RopId:** 0x25

**ResponseHandleIndex:** 0x01

**ReturnValue:** 0x00000000

#### 4.4.6 Releasing Attachment Object

Finally, the client releases the Attachment object by using the **RopRelease** ROP ([\[MS-OXCROPS\]](#) section 2.2.15.3).

### 4.5 Attach Text File

The client first creates the Attachment object on the Message object and then sets its properties and commits the changes.

#### 4.5.1 RopCreateAttachment Request Buffer

0000:23 00 00 03

**RopId:** 0x23

**LogonId:** 0x00

**InputHandleIndex:** 0x00

**OutputHandleIndex:** 0x03

#### 4.5.2 RopCreateAttachment Response Buffer

0000: 23 03 00 00 00 00 01 00-00 00

**RopId:** 0x23

**OutputHandleIndex:** 0x03

**ReturnValue:** 0x00000000

**AttachmentID:** 0x00000001

#### 4.5.3 Setting Properties

At this point the client uses the **RopSetProperties** ROP ([\[MS-OXCROPS\]](#) section 2.2.8.6) as described in [\[MS-OXCPRPT\]](#) section 2.2.5 to set properties on the Attachment objects.

Property tag	Property name	Data
0x37050003	<b>PidTagAttachMethod</b> (section	"0x00000001"

Property tag	Property name	Data
	<a href="#">2.2.2.9</a> )	
0x370B0003	<b>PidTagRenderingPosition</b> (section <a href="#">2.2.2.16</a> )	"0xFFFFFFFF"
0x7FFD0003	<b>PidTagAttachmentFlags</b> (section <a href="#">2.2.2.23</a> )	"0x00000000"
0x3001001F	<b>PidTagDisplayName</b> (section <a href="#">2.2.2.4</a> )	"test.txt"
0x7FFA0003	<b>PidTagAttachmentLinkId</b> (section <a href="#">2.2.2.22</a> )	"0x00000000"
0x37140003	<b>PidTagAttachFlags</b> (section <a href="#">2.2.2.18</a> )	"0x00000000"
0x7FFE000B	<b>PidTagAttachmentHidden</b> (section <a href="#">2.2.2.24</a> )	"0x00"
0x3707001F	<b>PidTagAttachLongFilename</b> (section <a href="#">2.2.2.10</a> )	"test.txt"
0x3704001F	<b>PidTagAttachFilename</b> (section <a href="#">2.2.2.11</a> )	"test.txt"
0x3703001F	<b>PidTagAttachExtension</b> (section <a href="#">2.2.2.12</a> )	".txt"
0x30070040	<b>PidTagCreationTime</b> (section <a href="#">2.2.2.3</a> )	"2008/02/1222:28:34.636"
0x30080040	<b>PidTagLastModificationTime</b> (section <a href="#">2.2.2.2</a> )	"2008/02/1222:28:50.112"
0x37090102	<b>PidTagAttachRendering</b> (section <a href="#">2.2.2.17</a> )	3,512 bytes representing a Windows metafile format (WMF) file. For more information on <b>WMF</b> , see <a href="#">[MS-WMF]</a> .

To set the contents of the embedded image, the client uses four ROPs:

1. The **RopOpenStream** ROP ([\[MS-OXCROPS\]](#) section 2.2.9.1) with **PidTagAttachDataBinary** (section [2.2.2.7](#)).
2. The **RopSetStreamSize** ROP ([\[MS-OXCROPS\]](#) section 2.2.9.6) with the size of image file data.
3. The **RopWriteStream** ROP request ([\[MS-OXCROPS\]](#) section 2.2.9.3) with the actual file contents.
4. The **RopRelease** ROP ([\[MS-OXCROPS\]](#) section 2.2.15.3) for the handle returned from the **RopOpenStream** ROP.

#### 4.5.4 RopSaveChangesAttachment Request Buffer

```
0000: 25 00 02 01 0A
```



**RopId:** 0x25

**LogonId:** 0x00

**ResponseHandleIndex:** 0x02

**InputHandleIndex:** 0x01

**SaveFlags:** 0x0A (**KeepOpenReadWrite**)

#### 4.5.5 RopSaveChangesAttachment Response Buffer

```
0000: 25 02 00 00 00 00
```

**RopId:** 0x25

**ResponseHandleIndex:** 0x02

**ReturnValue:** 0x00000000

#### 4.5.6 Releasing Attachment Object

Finally, the client releases the Attachment object by using the **RopRelease** ROP ([\[MS-OXCROPS\]](#) section 2.2.15.3).

### 4.6 Setting Message Properties

The client uses the **RopSetProperties** ROP ([\[MS-OXCROPS\]](#) section 2.2.8.6) to set all the necessary properties.

The HTML body, stored in the **PidTagBodyHtml** property (section [2.2.1.49.3](#)), is the following:

```
<html>
<head>
<meta http-equiv=Content-Type content="text/html; charset=us-ascii">
</head>
<body lang=EN-US link=blue vlink=purple>
<p>This is a sample body text<o:p></o:p></p>
<p ><o:p></o:p></p>
</div>
</body>
</html>
```

### 4.7 Adding Recipients

#### 4.7.1 RopModifyRecipients Request Buffer

```
0000:0e 00 08 0c 00 03 00 fe-0f 03 00 00 39 1f 00 ff
0010:39 1f 00 fe 39 03 00 71-3a 03 00 05 39 1f 00 f6
0020:5f 03 00 fd 5f 03 00 ff-5f 03 00 de 5f 03 00 df
0030:5f 02 01 f7 5f 01 00 00-00 00 00 01 27 01 51 06
0040:5a 00 55 73 65 72 32 00-75 00 73 00 65 00 72 00
0050:32 00 00 00 75 00 73 00-65 00 72 00 32 00 00 00
```

```
0060:0c 00 00 06 00 00 00 00-00 00 00 75 00 73 00 65
0070:00 72 00 32 00 00 00 75-00 73 00 65 00 72 00 32
0080:00 40 00 73 00 7a 00 66-00 6b 00 75 00 6b 00 2d
0090:00 64 00 6f 00 6d 00 2e-00 65 00 78 00 74 00 65
00a0:00 73 00 74 00 2e 00 6d-00 69 00 63 00 72 00 6f
00b0:00 73 00 6f 00 66 00 74-00 2e 00 63 00 6f 00 6d
00c0:00 00 00 00 00 00 00 00-00 00 40 75 00 73 00 65
00d0:00 72 00 32 00 00 00 01-00 00 00 00 00 00 00 00
00e0:00 00 00 00 00 00 00 7c-00 00 00 00 00 dc a7 40
00f0:c8 c0 42 10 1a b4 b9 08-00 2b 2f e1 82 01 00 00
0100:00 00 00 00 00 00 2f 6f 3d-46 69 72 73 74 20 4f 72
0110:67 61 6e 69 7a 61 74 69-6f 6e 2f 6f 75 3d 45 78
0120:63 68 61 6e 67 65 20 41-64 6d 69 6e 69 73 74 72
0130:61 74 69 76 65 20 47 72-6f 75 70 20 28 46 59 44
0140:49 42 4f 48 46 32 33 53-50 44 4c 54 29 2f 63 6e
0150:3d 52 65 63 69 70 69 65-6e 74 73 2f 63 6e 3d 75
0160:73 65 72 32 00
```

**RopId:** 0x0E

**LogonId:** 0x00

**InputHandleIndex:** 0x08

**ColumnCount:** 0x000C (number of following **RecipientColumns**)

**PidTagObjectType** ([\[MS-OXCPRPT\]](#) section 2.2.1.7): 0x0FFE0003

**PidTagDisplayType** ([\[MS-OXOABK\]](#) section 2.2.3.11): 0x39000003

**PidTagAddressBookDisplayNamePrintable** (section [2.2.1.30](#)): 0x39FF001F

**PidTagSmtAddress** ([\[MS-OXOABK\]](#) section 2.2.3.21): 0x39FE001f

**PidTagSendInternetEncoding** ([\[MS-OXOABK\]](#) section 2.2.3.19): 0x3a710003

**PidTagDisplayTypeEx** ([\[MS-OXOABK\]](#) section 2.2.3.12): 0x39050003

**PidTagRecipientDisplayName** ([\[MS-OXPROPS\]](#) section 2.963): 0x5FF6001F

**PidTagRecipientFlags** ([\[MS-OXOCAL\]](#) section 2.2.4.10.1): 0x5FFD0003

**PidTagRecipientTrackStatus** ([\[MS-OXOCAL\]](#) section 2.2.4.10.2): 0x5FFF0003

**PidTagRecipientResourceState** ([\[MS-OXPROPS\]](#) section 2.971): 0x5FDE0003

**PidTagRecipientOrder** ([\[MS-OXPROPS\]](#) section 2.966): 0x5FDF0003

**PidTagRecipientEntryId** ([\[MS-OXPROPS\]](#) section 2.964): 0x5FF70102

**RowCount:** 0x0001 (number of following **ModifyRecipientRows**)

**RowId:** 0x00000000

**RecipientType:** 0x01 (primary recipient)

**RecipientRowSize:** 0x0127 (bytes in following **RecipientRow**)

**RecipientFlags:** 0101000100000110 (S,D,Type=X500DN,I,U)  
**AddressPrefixUsed:** 0x5A (present because Type=X500DN)  
**DisplayType:** 0x00 (present because Type=X500DN)  
**EmailAddress:** User2 (present because Type=X500DN)  
**DisplayName:** user2 (present because D is set)  
**SimpleDisplayName:** user2 (present because I is set)  
**RecipientColumnCount:** 0x000C (matches **ColumnCount**)  
**StandardPropertyRow:**  
**Flag:** 0x00  
**ValueArray:** (property order defined by **RecipientColumns**)  
**PidTagObjectType:** 0x00000006  
**PidTagDisplayType:** 0x00000000  
**PidTagAddressBookDisplayNamePrintable** (section [2.2.1.30](#)): user2  
**PidTagSmtpAddress:** user2@szfkuk-dom.extest.microsoft.com  
**PidTagSendInternetEncoding:** 0  
**PidTagDisplayTypeEx:** 0x40000000  
**PidTagRecipientDisplayName:** user2  
**PidTagRecipientFlags:** 0x00000001  
**PidTagRecipientTrackStatus:** 0x00000000  
**PidTagRecipientResourceState:** 0x00000000  
**PidTagRecipientOrder:** 0x00000000  
**PidTagRecipientEntryId:** 0x007C and the subsequent 124 (0x7C) bytes

#### 4.7.2 RopModifyRecipients Response Buffer

0000: 0e 08 00 00 00 00

**RopId:** 0x0E  
**InputHandleIndex:** 0x08  
**ReturnValue:** 0x000000

#### 4.8 Save Message

After all necessary properties were set for the message, it was saved. The client sends a **RopSaveChangesMessage** ROP request ([\[MS-OXCROPS\]](#) section 2.2.6.3).

#### 4.8.1 RopSaveChangesMessage Request Buffer

```
0000: 0c 00 00 01 0a
```

**RopId:** 0x0C

**LogonId:** 0x00

**ResponseHandleIndex:** 0x00

**InputHandleIndex:** 0x01

**SaveFlags:** 0x0A (**KeepOpenReadWrite**)

#### 4.8.2 RopSaveChangesMessage Response Buffer

```
0000: 0c 00 00 00 00 00 01 01-00 00 00 00 f0 86 39
```

**RopId:** 0x0C

**ResponseHandleIndex:** 0x00

**ReturnValue:** 0x00000000

**InputHandleIndex:** 0x01

**MessageId:** 01 00 00 00 00 F0 86 39

#### 4.9 Releasing Message Object

Finally, the client releases the Message object by using the **RopRelease** ROP ([\[MS-OXCROPS\]](#) section 2.2.15.3).

## 5 Security

### 5.1 Security Considerations for Implementers

There are no special security considerations specific to this protocol. General security considerations pertaining to the underlying **remote procedure call (RPC)**-based transport apply, as described in [\[MS-OXCROPS\]](#).

### 5.2 Index of Security Parameters

None.

## 6 Appendix A: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include released service packs:

- Microsoft® Exchange Server 2003
- Microsoft® Exchange Server 2007
- Microsoft® Exchange Server 2010
- Microsoft® Exchange Server 2013 Preview
- Microsoft® Office Outlook® 2003
- Microsoft® Office Outlook® 2007
- Microsoft® Outlook® 2010
- Microsoft® Outlook® 2013 Preview

Exceptions, if any, are noted below. If a service pack or Quick Fix Engineering (QFE) number appears with the product version, behavior changed in that service pack or QFE. 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 that is 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 the product does not follow the prescription.

[<1> Section 2.2:](#) Exchange 2010 returns Success without persisting changes to read-only properties.

[<2> Section 2.2.1.6:](#) Office Outlook 2003, Office Outlook 2007, and Outlook 2010 ignore the **mfEverRead** flag.

[<3> Section 2.2.1.45:](#) The **PidTagTrustSender** property (section [2.2.1.45](#)) is not supported in Exchange 2010 and Exchange 2013 Preview.

[<4> Section 2.2.1.49.2:](#) Exchange 2003 and Exchange 2007 do not support the **PidTagNativeBody** property.

[<5> Section 2.2.2.20:](#) Office Outlook 2003 only correctly detects MacBinary I and MacBinary II.

[<6> Section 2.2.3.1:](#) Exchange 2010 can output unexpected results when using the **RopOpenMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.1) when Client Access Services are deployed on an Exchange server that does not also have a mailbox store installed.

[<7> Section 2.2.3.15:](#) Exchange 2010 returns a GeneralFailure error if pending changes include changes to read-only properties.

[<8> Section 2.2.3.18:](#) Exchange 2010 does not support the **RopgetValidAttachments** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.18).

[<9> Section 3.2.5.2:](#) Exchange 2013 Preview does not initialize the following properties: **PidTagCreatorName** ([\[MS-OXPROPS\]](#) section 2.726), **PidTagCreatorEntryId** (section [2.2.1.31](#)), **PidTagLastModifierName** ([\[MS-OXCPRPT\]](#) section 2.2.1.5), **PidTagLastModifierEntryId** (section

[2.2.1.32](#)), and **PidTagLastModificationTime** (section [2.2.2.2](#)). Exchange 2010 and Exchange 2013 Preview do not initialize the **PidTagUrlCompName** property ([\[MS-OXPROPS\]](#) section 2.1114).

<10> [Section 3.2.5.3](#): Exchange 2010 returns Success for **RopSaveChangesMessage** ROP requests ([\[MS-OXCROPS\]](#) section 2.2.6.3) when a previous request has already been committed against the Message object, even though the changes to the object are not actually committed to the server store.

<11> [Section 3.2.5.3](#): Exchange 2010 returns a GeneralFailure error if pending changes include changes to read-only properties.

<12> [Section 3.2.5.10](#): Exchange 2003, Exchange 2007, Exchange 2010, Office Outlook 2003, Office Outlook 2007, and Outlook 2010 do not support this behavior. Exchange 2010 SP1 and Outlook 2010 SP1 support this behavior.

<13> [Section 3.2.5.10](#): Exchange 2003, Exchange 2007, Exchange 2010, Office Outlook 2003, Office Outlook 2007, and Outlook 2010 do not support this behavior. Exchange 2010 SP1 and Outlook 2010 SP1 support this behavior.

<14> [Section 3.2.5.13](#): Exchange 2013 Preview sets the **PidTagAttachSize** property (section [2.2.2.5](#)) to 0x00000084.

<15> [Section 3.2.5.13](#): Exchange 2013 Preview sets the **PidTagAccessLevel** property ([\[MS-OXCPRPT\]](#) section 2.2.1.2) to 0x00000000.

<16> [Section 3.2.5.13](#): Exchange 2013 Preview sets the **PidTagLastModificationTime** property (section [2.2.2.2](#)) to a value that is within 100 nanoseconds of the value of the **PidTagCreationTime** property (section [2.2.2.3](#)).

## 7 Change Tracking

This section identifies changes that were made to the [MS-OXCMSG] protocol document between the April 2012 and July 2012 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](mailto:protocol@microsoft.com).

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
<a href="#">1.1 Glossary</a>	Added "E-mail object" and "Web Distributed Authoring and Versioning Protocol (WebDAV)" to the list of terms defined in [MS-OXGLOS].	N	Content updated.
<a href="#">2.2.1.3 PidTagMessageClass Property</a>	Clarified case sensitivity when executing equality or matching operations against the value of this property.	N	Content updated.
<a href="#">2.2.1.45 PidTagTrustSender</a>	Added product behavior note about support for the PidTagTrustSender property.	Y	New product behavior note added.
<a href="#">2.2.1.48 PidNameContentClass Property</a>	Added new section to define the PidNameContentClass property.	N	New content added.
<a href="#">3.1.1.1 Per Global</a>	Added link to description of the Global.Handle ADM element.	N	Content updated.
<a href="#">3.2.1.1 Per Global</a>	Added link to description of the Global.Handle ADM element.	N	Content updated.
<a href="#">3.2.5.2 Receiving a RopCreateMessage ROP Request</a>	Added product behavior note listing properties that are not initialized by Exchange 2010 or Exchange 2013 Preview.	Y	New product behavior note added.
<a href="#">3.2.5.2 Receiving a RopCreateMessage ROP</a>	Changed normative language from "The server MUST initialize the following properties..." to "The server SHOULD initialize the following"	Y	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
<a href="#">Request</a>	properties...".		
<a href="#">3.2.5.2 Receiving a RopCreateMessage ROP Request</a>	Removed PidTagSecurityDescriptor and PidTagUrlCompNameSet properties from the table of initialized properties.	N	Content updated.
<a href="#">3.2.5.13 Receiving a RopCreateAttachment ROP Request</a>	Added product behavior note specifying that Exchange 2013 Preview initializes PidTagAttachSize to 0x00000084.	Y	New product behavior note added.
<a href="#">3.2.5.13 Receiving a RopCreateAttachment ROP Request</a>	Added product behavior note specifying that Exchange 2013 Preview initializes PidTagAccessLevel to 0x00000000.	Y	New product behavior note added.
<a href="#">3.2.5.13 Receiving a RopCreateAttachment ROP Request</a>	Added product behavior note specifying that Exchange 2013 Preview initializes PidTagLastModificationTime to a value that is within 100 nanoseconds of the value of PidTagCreationTime.	Y	New product behavior note added.

## 8 Index

### A

Abstract data model  
[client](#) 50  
[server](#) 57

Abstract data model types - client  
[global](#) 50  
[per mailbox](#) 50  
[per Message object](#) 50

Abstract data model types - server  
[global](#) 57  
[per mailbox](#) 57  
[per Message object](#) 57

Add recipients example  
[RopModifyRecipients request buffer](#) 73  
[RopModifyRecipients response buffer](#) 75

[Applicability](#) 14

Attach text file example  
[overview](#) 71  
[releasing Attachment object](#) 73  
[RopCreateAttachment request buffer](#) 71  
[RopCreateAttachment response buffer](#) 71  
[RopSaveChangesAttachment request buffer](#) 72  
[RopSaveChangesAttachment response buffer](#) 73  
[setting properties](#) 71

Attachment object properties  
[general properties](#) 31  
[MIME properties](#) 35  
[PidTagAttachAdditionalInformation property](#) 35  
[PidTagAttachDataBinary property](#) 32  
[PidTagAttachDataObject property](#) 32  
[PidTagAttachEncoding property](#) 34  
[PidTagAttachExtension property](#) 33  
[PidTagAttachFilename property](#) 33  
[PidTagAttachFlags property](#) 34  
[PidTagAttachLongFilename property](#) 33  
[PidTagAttachLongPathname property](#) 33  
[PidTagAttachmentFlags property](#) 35  
[PidTagAttachmentHidden property](#) 35  
[PidTagAttachmentLinkId property](#) 35  
[PidTagAttachMethod property](#) 32  
[PidTagAttachNumber property](#) 32  
[PidTagAttachPathname property](#) 33  
[PidTagAttachRendering property](#) 34  
[PidTagAttachSize property](#) 32  
[PidTagAttachTag property](#) 33  
[PidTagAttachTransportName property](#) 34  
[PidTagCreationTime property](#) 31  
[PidTagDisplayName property](#) 31  
[PidTagLastModificationTime property](#) 31  
[PidTagRenderingPosition property](#) 34  
[PidTagTextAttachmentCharset property](#) 35

### B

[Body Message object properties](#) 25

### C

[Capability negotiation](#) 14  
[Change tracking](#) 80

Client  
[abstract data model](#) 50  
[initialization](#) 50  
[other local events](#) 56  
[timer events](#) 56  
[timers](#) 50

Client - abstract data model types  
[global](#) 50  
[per mailbox](#) 50  
[per Message object](#) 50

Client - higher-layer triggered events  
[accessing the attachments table](#) 52

adding  
deleting  
[or modifying a recipient](#) 51  
[creating a Message object](#) 51  
[creating an attachment](#) 52  
[creating an embedded message](#) 52  
[deleting an attachment](#) 52  
[getting message status](#) 51  
[linking a Contact object](#) 53  
[opening a Message object](#) 51  
[opening an attachment](#) 52  
[opening an Embedded Message object](#) 52  
[reading recipients](#) 51  
[reload Message object header info](#) 51  
[removing all recipients](#) 51  
[saving an embedded message](#) 52  
[saving changes on a Message object](#) 51  
[saving changes on an Attachment object](#) 52  
[setting Attachment object content](#) 52  
[setting Message object read status](#) 51  
[setting message status](#) 51

Client - message processing  
[sending a RopCreateAttachment ROP request](#) 55  
[sending a RopCreateMessage ROP request](#) 53  
[sending a RopGetAttachmentTable ROP request](#) 56  
[sending a RopGetMessageStatus ROP request](#) 55  
[sending a RopGetPropertiesSpecific ROP request](#) 56  
[sending a RopModifyRecipients ROP request](#) 54  
[sending a RopOpenAttachment ROP request](#) 55  
[sending a RopOpenEmbeddedMessage ROP request](#) 56  
[sending a RopOpenMessage ROP request](#) 53  
[sending a RopReadRecipients ROP request](#) 54  
[sending a RopRemoveAllRecipients ROP request](#) 54  
[sending a RopSaveChangesAttachment ROP request](#) 56  
[sending a RopSaveChangesMessage ROP request](#) 53  
[sending a RopSetMessageStatus ROP request](#) 54  
[sending a RopSetProperties ROP request](#) 55  
[sending a RopSetReadFlags ROP request](#) 55

Client - sequencing rules  
[sending a RopCreateAttachment ROP request](#) 55  
[sending a RopCreateMessage ROP request](#) 53  
[sending a RopGetAttachmentTable ROP request](#) 56  
[sending a RopGetMessageStatus ROP request](#) 55  
[sending a RopGetPropertiesSpecific ROP request](#) 56  
[sending a RopModifyRecipients ROP request](#) 54  
[sending a RopOpenAttachment ROP request](#) 55  
[sending a RopOpenEmbeddedMessage ROP request](#) 56  
[sending a RopOpenMessage ROP request](#) 53  
[sending a RopReadRecipients ROP request](#) 54  
[sending a RopRemoveAllRecipients ROP request](#) 54  
[sending a RopSaveChangesAttachment ROP request](#) 56  
[sending a RopSaveChangesMessage ROP request](#) 53  
[sending a RopSetMessageStatus ROP request](#) 54  
[sending a RopSetProperties ROP request](#) 55  
[sending a RopSetReadFlags ROP request](#) 55  
[Contact linking Message object properties](#) 27  
Create message example  
[overview](#) 68  
[RopCreateMessage request buffer](#) 68  
[RopCreateMessage response buffer](#) 68

## D

Data model - abstract  
[client](#) 50  
[server](#) 57

## E

Examples  
[name to id mapping](#) 68  
[releasing Message object](#) 76  
[setting message properties](#) 73  
Examples - add recipients  
[RopModifyRecipients request buffer](#) 73  
[RopModifyRecipients response buffer](#) 75  
Examples - attach text file  
[overview](#) 71  
[releasing Attachment object](#) 73  
[RopCreateAttachment request buffer](#) 71  
[RopCreateAttachment response buffer](#) 71  
[RopSaveChangesAttachment request buffer](#) 72  
[RopSaveChangesAttachment response buffer](#) 73  
[setting properties](#) 71  
Examples - create message  
[overview](#) 68  
[RopCreateMessage request buffer](#) 68  
[RopCreateMessage response buffer](#) 68  
Examples - get attachment table  
[overview](#) 68  
[RopGetAttachmentTable request buffer](#) 69  
[RopGetAttachmentTable response buffer](#) 69  
Examples - insert HTML embedded image  
[overview](#) 69

[RopCreateAttachment request buffer](#) 69  
[RopCreateAttachment response buffer](#) 69  
[RopSaveChangesAttachment request buffer](#) 70  
[RopSaveChangesAttachment response buffer](#) 71  
[setting properties](#) 70

Examples - save message  
[overview](#) 75  
[RopSaveChanges request buffer](#) 76  
[RopSaveChanges response buffer](#) 76

## F

[FAI messages](#) 12  
[Fields - vendor-extensible](#) 14

## G

[General Attachment object properties](#) 31  
[General Message object properties](#) 15  
Get attachment table example  
[overview](#) 68  
[RopGetAttachmentTable request buffer](#) 69  
[RopGetAttachmentTable response buffer](#) 69  
Global abstract data model type  
[client](#) 50  
[server](#) 57  
[Glossary](#) 9

## H

Higher-layer triggered events  
[server](#) 57  
Higher-layer triggered events - client  
[accessing the attachments table](#) 52  
adding  
deleting  
[or modifying a recipient](#) 51  
[creating a Message object](#) 51  
[creating an attachment](#) 52  
[creating an embedded message](#) 52  
[deleting an attachment](#) 52  
[getting message status](#) 51  
[linking a Contact object](#) 53  
[opening a Message object](#) 51  
[opening an attachment](#) 52  
[opening an Embedded Message object](#) 52  
[reading recipients](#) 51  
[reload Message object header info](#) 51  
[removing all recipients](#) 51  
[saving an embedded message](#) 52  
[saving changes on a Message object](#) 51  
[saving changes on an Attachment object](#) 52  
[setting Attachment object content](#) 52  
[setting Message object read status](#) 51  
[setting message status](#) 51

## I

[Implementer - security considerations](#) 77  
[Index of security parameters](#) 77  
[Informative references](#) 12  
Initialization

[client](#) 50  
[server](#) 57  
Insert HTML embedded image example  
[overview](#) 69  
[RopCreatetAttachment request buffer](#) 69  
[RopCreatetAttachment response buffer](#) 69  
[RopSaveChangesAttachment request buffer](#) 70  
[RopSaveChangesAttachment response buffer](#) 71  
[setting properties](#) 70  
[Introduction](#) 9

## M

[Message attachments](#) 13  
Message object properties  
[body properties](#) 25  
[contact linking properties](#) 27  
[general properties](#) 15  
[PidLidAgingDontAgeMe property](#) 23  
[PidLidCategories property](#) 21  
[PidLidClassification property](#) 21  
[PidLidClassificationDescription property](#) 21  
[PidLidClassified property](#) 21  
[PidLidCommonEnd property](#) 21  
[PidLidCommonStart property](#) 20  
[PidLidCurrentVersion property](#) 23  
[PidLidCurrentVersionName property](#) 23  
[PidLidInfoPathFormName property](#) 22  
[PidLidPrivate property](#) 19  
[PidLidSideEffects property](#) 20  
[PidLidSmartNoAttach property](#) 19  
[PidNameAcceptLanguage property](#) 24  
[PidNameContentBase property](#) 24  
[PidNameContentClass property](#) 25  
[PidNameKeywords property](#) 20  
[PidTagAddressBookDisplayNamePrintable property](#) 22  
[PidTagAlternateRecipientAllowed property](#) 23  
[PidTagAutoForwardComment property](#) 21  
[PidTagAutoForwarded property](#) 21  
[PidTagCreatorEntryId property](#) 22  
[PidTagHasAttachments property](#) 15  
[PidTagHasNamedProperties property](#) 23  
[PidTagImportance property](#) 18  
[PidTagInternetReferences property](#) 22  
[PidTagLastModifierEntryId property](#) 22  
[PidTagMessageClass property](#) 16  
[PidTagMessageCodepage property](#) 16  
[PidTagMessageFlags property](#) 16  
[PidTagMessageLocaleId property](#) 16  
[PidTagMessageRecipients property](#) 25  
[PidTagMessageSize property](#) 17  
[PidTagMessageStatus property](#) 18  
[PidTagMimeSkeleton property](#) 22  
[PidTagNormalizedSubject property](#) 18  
[PidTagPriority property](#) 19  
[PidTagPurportedSenderDomain property](#) 24  
[PidTagRecipientOrder property](#) 24  
[PidTagResponsibility property](#) 23  
[PidTagRowid property](#) 23  
[PidTagSensitivity property](#) 19  
[PidTagStoreEntryId property](#) 24

[PidTagSubject property](#) 25  
[PidTagSubjectPrefix property](#) 18  
[PidTagTnefCorrelationKey property](#) 22  
[PidTagTrustSender property](#) 24  
[retention and archive properties](#) 28

### Message object ROPs

[RopCreateAttachment ROP](#) 46  
[RopCreateMessage ROP](#) 38  
[RopDeleteAttachment ROP](#) 47  
[RopGetAttachmentTable ROP](#) 48  
[RopGetMessageStatus ROP](#) 43  
[RopGetValidAttachments ROP](#) 49  
[RopModifyRecipients ROP](#) 40  
[RopOpenAttachment ROP](#) 45  
[RopOpenEmbeddedMessage ROP](#) 48  
[RopOpenMessage ROP](#) 36  
[RopReadRecipients ROP](#) 41  
[RopReloadCachedInformation ROP](#) 42  
[RopRemoveAllRecipients ROP](#) 40  
[RopSaveChangesAttachment ROP](#) 47  
[RopSaveChangesMessage ROP](#) 39  
[RopSetMessageReadFlag ROP](#) 45  
[RopSetMessageStatus ROP](#) 42  
[RopSetReadFlags ROP](#) 44  
[Message Object ROPs message](#) 36

### Message processing - client

[sending a RopCreateAttachment ROP request](#) 55  
[sending a RopCreateMessage ROP request](#) 53  
[sending a RopGetAttachmentTable ROP request](#) 56  
[sending a RopGetMessageStatus ROP request](#) 55  
[sending a RopGetPropertiesSpecific ROP request](#) 56  
[sending a RopModifyRecipients ROP request](#) 54  
[sending a RopOpenAttachment ROP request](#) 55  
[sending a RopOpenEmbeddedMessage ROP request](#) 56  
[sending a RopOpenMessage ROP request](#) 53  
[sending a RopReadRecipients ROP request](#) 54  
[sending a RopRemoveAllRecipients ROP request](#) 54  
[sending a RopSaveChangesAttachment ROP request](#) 56  
[sending a RopSaveChangesMessage ROP request](#) 53  
[sending a RopSetMessageStatus ROP request](#) 54  
[sending a RopSetProperties ROP request](#) 55  
[sending a RopSetReadFlags ROP request](#) 55

### Message processing - server

[receiving a RopCreateAttachment ROP request](#) 65  
[receiving a RopCreateMessage ROP request](#) 59  
[receiving a RopDeleteAttachment ROP request](#) 66  
[receiving a RopGetAttachmentTable ROP request](#) 67  
[receiving a RopGetMessageStatus ROP request](#) 63  
[receiving a RopModifyRecipients ROP request](#) 61  
[receiving a RopOpenAttachment ROP request](#) 64  
[receiving a RopOpenEmbeddedMessage ROP request](#) 66  
[receiving a RopOpenMessage ROP request](#) 58

[receiving a RopReadRecipients ROP request](#) 62  
[receiving a RopReloadCachedInformation ROP request](#) 62  
[receiving a RopRemoveAllRecipients ROP request](#) 61  
[receiving a RopSaveChangesAttachment ROP request](#) 66  
[receiving a RopSaveChangesMessage ROP request](#) 60  
[receiving a RopSetMessageReadFlag ROP request](#) 64  
[receiving a RopSetMessageStatus ROP request](#) 63  
[receiving a RopSetReadFlags ROP request](#) 63  
[Message recipients](#) 13  
[Message syntax - overview](#) 15  
Messages  
[FAI messages](#) 12  
[message attachments](#) 13  
[Message Object ROPs](#) 36  
[message recipients](#) 13  
[transport](#) 15  
[MIME Attachment object properties](#) 35

## N

[Name to id mapping example](#) 68  
[Normative references](#) 11

## O

Other local events  
[client](#) 56  
[server](#) 67  
Overview  
[messages](#) 12  
[Overview \(synopsis\)](#) 12

## P

[Parameters - security index](#) 77  
Per mailbox abstract data model type  
[client](#) 50  
[server](#) 57  
Per Message object abstract data model type  
[client](#) 50  
[server](#) 57  
[PidLidAgingDontAgeMe Message object property](#) 23  
[PidLidCategories Message object property](#) 21  
[PidLidClassification Message object property](#) 21  
[PidLidClassificationDescription Message object property](#) 21  
[PidLidClassified Message object property](#) 21  
[PidLidCommonEnd Message object property](#) 21  
[PidLidCommonStart Message object property](#) 20  
[PidLidCurrentVersion Message object property](#) 23  
[PidLidCurrentVersionName Message object property](#) 23  
[PidLidInfoPathFormName Message object property](#) 22  
[PidLidPrivate Message object property](#) 19  
[PidLidSideEffects Message object property](#) 20  
[PidLidSmartNoAttach Message object property](#) 19

[PidNameAcceptLanguage Message object property](#) 24  
[PidNameContentBase Message object property](#) 24  
[PidNameContentClass Message object property](#) 25  
[PidNameKeywords Message object property](#) 20  
[PidTagAddressBookDisplayNamePrintable Message object property](#) 22  
[PidTagAlternateRecipientAllowed Message object property](#) 23  
[PidTagAttachAdditionalInformation Attachment object property](#) 35  
[PidTagAttachDataBinary Attachment object property](#) 32  
[PidTagAttachDataObject Attachment object property](#) 32  
[PidTagAttachEncoding Attachment object property](#) 34  
[PidTagAttachExtension Attachment object property](#) 33  
[PidTagAttachFilename Attachment object property](#) 33  
[PidTagAttachFlags Attachment object property](#) 34  
[PidTagAttachLongFilename Attachment object property](#) 33  
[PidTagAttachLongPathname Attachment object property](#) 33  
[PidTagAttachmentFlags Attachment object property](#) 35  
[PidTagAttachmentHidden Attachment object property](#) 35  
[PidTagAttachmentLinkId Attachment object property](#) 35  
[PidTagAttachMethod Attachment object property](#) 32  
[PidTagAttachNumber Attachment object property](#) 32  
[PidTagAttachPathname Attachment object property](#) 33  
[PidTagAttachRendering Attachment object property](#) 34  
[PidTagAttachSize Attachment object property](#) 32  
[PidTagAttachTag Attachment object property](#) 33  
[PidTagAttachTransportName Attachment object property](#) 34  
[PidTagAutoForwardComment Message object property](#) 21  
[PidTagAutoForwarded Message object property](#) 21  
[PidTagCreationTime Attachment object property](#) 31  
[PidTagCreatorEntryId Message object property](#) 22  
[PidTagDisplayName Attachment object property](#) 31  
[PidTagHasAttachments Message object property](#) 15  
[PidTagHasNamedProperties Message object property](#) 23  
[PidTagImportance Message object property](#) 18  
[PidTagInternetReferences Message object property](#) 22  
[PidTagLastModificationTime Attachment object property](#) 31  
[PidTagLastModifierEntryId Message object property](#) 22  
[PidTagMessageClass Message object property](#) 16

[PidTagMessageCodepage Message object property](#) 16  
[PidTagMessageFlags Message object property](#) 16  
[PidTagMessageLocaleId Message object property](#) 16  
[PidTagMessageRecipients Message object property](#) 25  
[PidTagMessageSize Message object property](#) 17  
[PidTagMessageStatus Message object property](#) 18  
[PidTagMimeSkeleton Message object property](#) 22  
[PidTagNormalizedSubject Message object property](#) 18  
[PidTagPriority Message object property](#) 19  
[PidTagPurportedSenderDomain Message object property](#) 24  
[PidTagRecipientOrder Message object property](#) 24  
[PidTagRenderingPosition Attachment object property](#) 34  
[PidTagResponsibility Message object property](#) 23  
[PidTagRowid Message object property](#) 23  
[PidTagSensitivity Message object property](#) 19  
[PidTagStoreEntryId Message object property](#) 24  
[PidTagSubject Message object property](#) 25  
[PidTagSubjectPrefix Message object property](#) 18  
[PidTagTextAttachmentCharset Attachment object property](#) 35  
[PidTagTnefCorrelationKey Message object property](#) 22  
[PidTagTrustSender Message object property](#) 24  
[Preconditions](#) 13  
[Prerequisites](#) 13  
[Product behavior](#) 78

## R

[References](#) 10  
   [informative](#) 12  
   [normative](#) 11  
[Relationship to other protocols](#) 13  
[Releasing Message object example](#) 76  
[Retention and archive Message object properties](#) 28  
[RopCreateAttachment Message object ROP](#) 46  
[RopCreateMessage Message object ROP](#) 38  
[RopDeleteAttachment Message object ROP](#) 47  
[RopGetAttachmentTable Message object ROP](#) 48  
[RopGetMessageStatus Message object ROP](#) 43  
[RopGetValidAttachments Message object ROP](#) 49  
[RopModifyRecipients Message object ROP](#) 40  
[RopOpenAttachment Message object ROP](#) 45  
[RopOpenEmbeddedMessage Message object ROP](#) 48  
[RopOpenMessage Message object ROP](#) 36  
[RopReadRecipients Message object ROP](#) 41  
[RopReloadCachedInformation Message object ROP](#) 42  
[RopRemoveAllRecipients Message object ROP](#) 40  
[RopSaveChangesAttachment Message object ROP](#) 47  
[RopSaveChangesMessage Message object ROP](#) 39  
[RopSetMessageReadFlag Message object ROP](#) 45  
[RopSetMessageStatus Message object ROP](#) 42  
[RopSetReadFlags Message object ROP](#) 44

## S

[Save message example](#)  
   [overview](#) 75  
   [RopSaveChanges request buffer](#) 76  
   [RopSaveChanges response buffer](#) 76  
[Security](#)  
   [implementer considerations](#) 77  
   [parameter index](#) 77  
[Sequencing rules - client](#)  
   [sending a RopCreateAttachment ROP request](#) 55  
   [sending a RopCreateMessage ROP request](#) 53  
   [sending a RopGetAttachmentTable ROP request](#) 56  
   [sending a RopGetMessageStatus ROP request](#) 55  
   [sending a RopGetPropertiesSpecific ROP request](#) 56  
   [sending a RopModifyRecipients ROP request](#) 54  
   [sending a RopOpenAttachment ROP request](#) 55  
   [sending a RopOpenEmbeddedMessage ROP request](#) 56  
   [sending a RopOpenMessage ROP request](#) 53  
   [sending a RopReadRecipients ROP request](#) 54  
   [sending a RopRemoveAllRecipients ROP request](#) 54  
   [sending a RopSaveChangesAttachment ROP request](#) 56  
   [sending a RopSaveChangesMessage ROP request](#) 53  
   [sending a RopSetMessageStatus ROP request](#) 54  
   [sending a RopSetProperties ROP request](#) 55  
   [sending a RopSetReadFlags ROP request](#) 55  
[Sequencing rules - server](#)  
   [receiving a RopCreateAttachment ROP request](#) 65  
   [receiving a RopCreateMessage ROP request](#) 59  
   [receiving a RopDeleteAttachment ROP request](#) 66  
   [receiving a RopGetAttachmentTable ROP request](#) 67  
   [receiving a RopGetMessageStatus ROP request](#) 63  
   [receiving a RopModifyRecipients ROP request](#) 61  
   [receiving a RopOpenAttachment ROP request](#) 64  
   [receiving a RopOpenEmbeddedMessage ROP request](#) 66  
   [receiving a RopOpenMessage ROP request](#) 58  
   [receiving a RopReadRecipients ROP request](#) 62  
   [receiving a RopReloadCachedInformation ROP request](#) 62  
   [receiving a RopRemoveAllRecipients ROP request](#) 61  
   [receiving a RopSaveChangesAttachment ROP request](#) 66  
   [receiving a RopSaveChangesMessage ROP request](#) 60  
   [receiving a RopSetMessageReadFlag ROP request](#) 64  
   [receiving a RopSetMessageStatus ROP request](#) 63  
   [receiving a RopSetReadFlags ROP request](#) 63  
[Server](#)  
   [abstract data model](#) 57  
   [higher-layer triggered events](#) 57

- [initialization](#) 57
- [other local events](#) 67
- [timer events](#) 67
- [timers](#) 57
- Server - abstract data model types
  - [global](#) 57
  - [per mailbox](#) 57
  - [per Message object](#) 57
- Server - message processing
  - [receiving a RopCreateAttachment ROP request](#) 65
  - [receiving a RopCreateMessage ROP request](#) 59
  - [receiving a RopDeleteAttachment ROP request](#) 66
  - [receiving a RopGetAttachmentTable ROP request](#) 67
  - [receiving a RopGetMessageStatus ROP request](#) 63
  - [receiving a RopModifyRecipients ROP request](#) 61
  - [receiving a RopOpenAttachment ROP request](#) 64
  - [receiving a RopOpenEmbeddedMessage ROP request](#) 66
  - [receiving a RopOpenMessage ROP request](#) 58
  - [receiving a RopReadRecipients ROP request](#) 62
  - [receiving a RopReloadCachedInformation ROP request](#) 62
  - [receiving a RopRemoveAllRecipients ROP request](#) 61
  - [receiving a RopSaveChangesAttachment ROP request](#) 66
  - [receiving a RopSaveChangesMessage ROP request](#) 60
  - [receiving a RopSetMessageReadFlag ROP request](#) 64
  - [receiving a RopSetMessageStatus ROP request](#) 63
  - [receiving a RopSetReadFlags ROP request](#) 63
- Server - sequencing rules
  - [receiving a RopCreateAttachment ROP request](#) 65
  - [receiving a RopCreateMessage ROP request](#) 59
  - [receiving a RopDeleteAttachment ROP request](#) 66
  - [receiving a RopGetAttachmentTable ROP request](#) 67
  - [receiving a RopGetMessageStatus ROP request](#) 63
  - [receiving a RopModifyRecipients ROP request](#) 61
  - [receiving a RopOpenAttachment ROP request](#) 64
  - [receiving a RopOpenEmbeddedMessage ROP request](#) 66
  - [receiving a RopOpenMessage ROP request](#) 58
  - [receiving a RopReadRecipients ROP request](#) 62
  - [receiving a RopReloadCachedInformation ROP request](#) 62
  - [receiving a RopRemoveAllRecipients ROP request](#) 61
  - [receiving a RopSaveChangesAttachment ROP request](#) 66
  - [receiving a RopSaveChangesMessage ROP request](#) 60
  - [receiving a RopSetMessageReadFlag ROP request](#) 64
  - [receiving a RopSetMessageStatus ROP request](#) 63
  - [receiving a RopSetReadFlags ROP request](#) 63
  - [Setting message properties example](#) 73

- [Standards assignments](#) 14

## T

- Timer events
  - [client](#) 56
  - [server](#) 67
- Timers
  - [client](#) 50
  - [server](#) 57
- [Tracking changes](#) 80
- [Transport](#) 15
- Triggered events - client
  - [accessing the attachments table](#) 52
  - adding
    - deleting
      - [or modifying a recipient](#) 51
    - [creating a Message object](#) 51
    - [creating an attachment](#) 52
    - [creating an embedded message](#) 52
    - [deleting an attachment](#) 52
    - [getting message status](#) 51
    - [linking a Contact object](#) 53
    - [opening a Message object](#) 51
    - [opening an attachment](#) 52
    - [opening an Embedded Message object](#) 52
    - [reading recipients](#) 51
    - [reload Message object header info](#) 51
    - [removing all recipients](#) 51
    - [saving an embedded message](#) 52
    - [saving changes on a Message object](#) 51
    - [saving changes on an Attachment object](#) 52
    - [setting Attachment object content](#) 52
    - [setting Message object read status](#) 51
    - [setting message status](#) 51
- Triggered events - higher-layer
  - [server](#) 57

## V

- [Vendor-extensible fields](#) 14
- [Versioning](#) 14