

[MS-OXCMMSG]: Message and Attachment Object Protocol Specification

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1 Introduction

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

1.1 Glossary

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

8.3 name
address book
appointment
Archive Policy
ASCII
attachment
Attachment object
Bcc recipient
Cc recipient
code page
contact
Contact object
contents table
Coordinated Universal Time (UTC)
download
Embedded Message object
EntryID
flags
folder
Folder Associated Information (FAI)
folder ID (FID)
Folder object
GUID
handle
header
HTML
identifier
Inbox folder
LogonID
Logon object
LongTermID
message
message class
message ID (MID)
Message object
metafile
MIME
named property
non-Unicode
permissions
plain text
primary recipient
property (1)
property ID
property tag

public folder
read receipt
recipient (1)
remote operation (ROP)
remote procedure call (RPC)
Retention Policy
Rich Text Format (RTF)
ROP request
ROP request buffer
ROP response buffer
S/MIME
soft delete
store
Store object
table
To recipient
Transport Neutral Encapsulation Format (TNEF)
Unicode
Uniform Resource Identifier (URI)

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**. For more information on clear-signed **messages**, see [\[MS-OXOSMIME\]](#) section 2.2.1.

header message object: A **Message object** that contains partial information about a **message** left on a server such as an **identifier** for the **message**, the display names of the **recipients** and sender of the **message**, 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 which **messages** to **download**.

language code identifier (LCID): A 32-bit number that identifies the user interface human language dialect/variation supported by an application or client computer.

Object Linking and Embedding (OLE): A Microsoft compound document standard that enables cross-application linking and embedding of objects.

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

undefined body: A body with no defined content.

transaction: The process of opening or creating an object on a server, and the subsequent committing of changes to the object by calling the required save function, at which time all changes to that instance of the object are either saved to the server, or discarded if a failure occurs before saving is completed successfully. Until successfully saved, changes are invisible to any other instances of the object.

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

1.2 References

1.2.1 Normative References

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

[MS-LCID] Microsoft Corporation, "Windows Language Code Identifier (LCID) Reference", March 2007, <http://msdn.microsoft.com/en-us/library/cc233965.aspx>

[MS-OXBBODY] Microsoft Corporation, "[Best Body Retrieval Protocol Specification](#)", April 2008.

[MS-OXCDATA] Microsoft Corporation, "[Data Structures](#)", April 2008.

[MS-OXCFOLD] Microsoft Corporation, "[Folder Object Protocol Specification](#)", April 2008.

[MS-OXCMAIL] Microsoft Corporation, "[RFC2822 and MIME to E-Mail Object Conversion Protocol Specification](#)", April 2008.

[MS-OXCPRPT] Microsoft Corporation, "[Property and Stream Object Protocol Specification](#)", April 2008.

[MS-OXCROPS] Microsoft Corporation, "[Remote Operations \(ROP\) List and Encoding Protocol Specification](#)", April 2008.

[MS-OXCSTOR] Microsoft Corporation, "[Store Object Protocol Specification](#)", April 2008.

[MS-OXCSYNC] Microsoft Corporation, "[Mailbox Synchronization Protocol Specification](#)", April 2008.

[MS-OXCTABL] Microsoft Corporation, "[Table Object Protocol Specification](#)", April 2008.

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

[MS-OXOCAL] Microsoft Corporation, "[Appointment and Meeting Object Protocol Specification](#)", April 2008.

[MS-OXOCFG] Microsoft Corporation, "[Configuration Information Protocol Specification](#)", April 2008.

[MS-OXOCNTC] Microsoft Corporation, "[Contact Object Protocol Specification](#)", April 2008.

[MS-OXODOC] Microsoft Corporation, "[Document Object Protocol Specification](#)", April 2008.

[MS-OXOJRNL] Microsoft Corporation, "[Journal Object Protocol Specification](#)", April 2008.

[MS-OXOMSG] Microsoft Corporation, "[E-Mail Object Protocol Specification](#)", April 2008.

[MS-OXONOTE] Microsoft Corporation, "[Note Object Protocol Specification](#)", April 2008.

[MS-OXOPOST] Microsoft Corporation, "[Post Object Protocol Specification](#)", April 2008.

[MS-OXORSS] Microsoft Corporation, "[RSS Object Protocol Specification](#)", April 2008.

[MS-OXOSFLD] Microsoft Corporation, "[Special Folders Protocol Specification](#)", April 2008.

[MS-OXOSMIME] Microsoft Corporation, "[S/MIME E-Mail Object Protocol Specification](#)", April 2008.

[MS-OXOSMMS] Microsoft Corporation, "[Short Message Service \(SMS\) and Multimedia Messaging Service \(MMS\) Object Protocol Specification](#)", April 2008.

[MS-OXOTASK] Microsoft Corporation, "[Task-Related Objects Protocol Specification](#)", April 2008.

[MS-OXOUM] Microsoft Corporation, "[Voice Mail and Fax Objects Protocol Specification](#)", April 2008.

[MS-OXPROPS] Microsoft Corporation, "[Exchange Server Protocols Master Property List](#)", April 2008.

[MS-OXRTFCP] Microsoft Corporation, "[Rich Text Format \(RTF\) Compression Protocol Specification](#)", April 2008.

[MS-OXRTFEX] Microsoft Corporation, "[Rich Text Format \(RTF\) Extensions Specification](#)", April 2008.

[MS-OXTNEF] Microsoft Corporation, "[Transport Neutral Encapsulation Format \(TNEF\) Data Structure](#)", April 2008.

[MS-WMF] Microsoft Corporation, "Windows Metafile Format Specification", June 2007, <http://msdn.microsoft.com/en-us/library/cc215212.aspx>

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

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

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

1.2.2 Informative References

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

1.3 Overview

1.3.1 Messages

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

Folder Associated Information (FAI) messages are a type of message that contains non-user 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** to a message. A recipient is a set of properties that describe where the message is to be delivered. Clients add, remove or modify recipients through the **RecipientRows**.

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 sub-objects. Operations that affect the location of a Message object also apply to its **attachments**. Clients retrieve information about attachments in a message via an attachment **table**, which is a table object as specified in the [\[MS-OXCTABL\]](#).

1.4 Relationship to Other Protocols

The Message and Attachment Object Protocol relies on folders, tables, and properties, as specified in [\[MS-OXCFOLD\]](#), [\[MS-OXOSFLD\]](#), [\[MS-OXCTABL\]](#), [\[MS-OXCPRPT\]](#), as well as the underlying **remote operations (ROP)** transport, specified 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, [\[MS-OXOCAL\]](#)
- Contact Object Protocol, [\[MS-OXOCNTC\]](#)
- E-mail Object Protocol, [\[MS-OXOMSG\]](#)
- Task-Related Objects Protocol, [\[MS-OXOTASK\]](#)
- Note Object Protocol, [\[MS-OXONOTE\]](#)
- Journal Object Protocol, [\[MS-OXOJRNL\]](#)
- RSS Object Protocol, [\[MS-OXORSS\]](#)
- Post Object Protocol, [\[MS-OXOPOST\]](#)
- SMS and MMS Object Protocol, [\[MS-OXOSMMS\]](#)
- Document Object Protocol, [\[MS-OXODOC\]](#)
- S/MIME E-mail Object Protocol, [\[MS-OXOSMIME\]](#)
- Voice Mail and Fax Objects Protocol, [\[MS-OXOUM\]](#)

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, see [\[MS-OXCFOLD\]](#) and [\[MS-OXCSTOR\]](#).

1.6 Applicability Statement

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

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 specified in [\[MS-OXCPRPT\]](#). A third-party application can also extend the Message and Attachment

Object Protocol to implement its own object type, by changing [PidTagMessageClass](#). See [\[MS-OXONOTE\]](#) for a simple example that extends this protocol to implement an electronic representation of a "Sticky Note".

1.9 Standards Assignments

None.

PRELIMINARY

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 below, 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. See [\[MS-OXCPRPT\]](#) section 2.2 for more details.

Unless otherwise specified below, 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 returns an error and ignores any request to change the value of that property. [<1>](#)

2.2.1 Message Object Properties

All property value types (for example, **PtypBoolean** and **PtypInteger32**) that are specified in the following sub-sections are defined in [\[MS-OXCDATA\]](#) section 2.11.1.

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](#) ([\[MS-OXCPRPT\]](#) section 2.2.1.3)

[PidTagCreationTime](#) ([\[MS-OXCPRPT\]](#) section 2.2.1.4)

[PidTagLastModificationTime](#) ([\[MS-OXCPRPT\]](#) section 2.2.1.6)

[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

Type: **PtypBoolean**

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 [PidTagMessageFlags](#).

2.2.1.3 PidTagMessageClass

Type: **PtypString**

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 [PidTagMessageClass](#).

The value of this property is interpreted in groups of characters separated by periods ("."). Each group specifies a type of object. If a server or client does not recognize a **message class**, it reverts to acting on all but the last group, recursively, until a recognized form remains. 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

Type: **PtypInteger32**, unsigned

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

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

Type: **PtypInteger32**

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 [RopSaveChangesMessage](#), as described in section [2.2.3.3](#), these **flags** are read-only for the client.

Name	Value	Description
mfRead	0x00000001	The message is marked as having been read.
mfUnsent	0x00000008	The message is still being composed. This bit is cleared by the server when responding to RopSubmitMessage with a success code. See [MS-OXOMSG] for details.
mfResend	0x00000080	The message includes a request for a resend operation with a non-delivery

Name	Value	Description
		report. See [MS-OXOMSG] for details.

These flags are always read-only for the client.

Type	Value	Description
mfUnmodified	0x00000002	The message has not been modified since it was first saved (if unsent) or it was delivered (if sent).
mfSubmitted	0x00000004	The message is marked for sending as a result of a call to RopSubmitMessage [MS-OXOMSG].
mfHasAttach	0x00000010	The message has at least one attachment. This flag corresponds to the message's PidTagHasAttachments property.
mfFromMe	0x00000020	The user receiving the message was also the user who sent the message.
mfFAI	0x00000040	The message is an FAI message.
mfNotifyRead	0x00000100	The user who sent the message has requested notification when a recipient first reads it.
mfNotifyUnread	0x00000200	The user who sent the message has requested notification when a recipient deletes it before reading or the Message object expires as specified in [MS-OXOMSG].
mfEverRead	0x00000400	The message has been read at least once. This flag is set or cleared by the server whenever the mfRead flag is set or cleared. <2>
mfInternet	0x00002000	The incoming message arrived over the Internet and originated either outside the organization or from a source the gateway does not consider trusted.
mfUntrusted	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.

[PidTagMessageFlags](#) is also modified using [RopSetMessageReadFlag](#) requests, as described in section [2.2.3.11](#), or [RopSetReadFlags](#), as described in section [2.2.3.10](#).

2.2.1.7 PidTagMessageSize

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

Type: **PtypInteger32**

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

Type	Value	Description
msRemoteDownload	0x00001000	The message has been marked for downloading from the remote message store to the local client.
msInConflict	0x00000800	This is a conflict resolve message as specified in [MS-OXCSYNC] . This is a read-only value for the client.
msRemoteDelete	0x00002000	The message has been marked for deletion at the remote message store without downloading to the local client.

In order to set [PidTagMessageStatus](#), the client does not include it in a [RopSetProperties](#) request, as specified in [\[MS-OXCPRPT\]](#) section 2.2.5. Instead, the client calls [RopGetMessageStatus](#), as specified in section [2.2.3.9](#).

In order to get [PidTagMessageStatus](#), the client does not include it in a [RopGetPropertiesSpecific](#) request. Instead, the client calls [RopSetMessageStatus](#), as specified in section [2.2.3.8](#). Additionally, [PidTagMessageStatus](#) can be set as a column on a contents table (for more details on tables, see [\[MS-OXCSTBL\]](#)).

2.2.1.9 PidTagSubjectPrefix

Type: **PtypString**

Contains the prefix for the subject of the message. Set by the client, but can be an empty string if there is no subject. The sum of the lengths of [PidTagNormalizedSubject](#) and [PidTagSubjectPrefix](#) MUST be less than 254 characters.

The client does not include [PidTagSubjectPrefix](#) in a [RopGetPropertiesSpecific](#) request. Instead, the client uses the **SubjectPrefix** field from the [RopOpenMessage](#) response buffer.

2.2.1.10 PidTagNormalizedSubject

Type: **PtypString**

Contains the normalized subject of the message. Set by the client, but can be an empty string if there is no subject. The sum of the lengths of [PidTagNormalizedSubject](#) and [PidTagSubjectPrefix](#) MUST be less than 254 characters.

The client does not include [PidTagNormalizedSubject](#) in a [RopGetPropertiesSpecific](#) request. Instead, the client uses the **NormalizedSubject** field from the [RopOpenMessage](#) response buffer.

2.2.1.11 PidTagImportance

Type: **PtypInteger32**

Indicates the level of importance assigned by the end user to the Message object; MUST be set to one of the following values.

Value	Description
0x00000000	Low importance.
0x00000001	Normal importance.
0x00000002	High importance.

2.2.1.12 PidTagPriority

Type: **PtypInteger32**

Indicates the client's request for the priority at which the message is to be sent by the messaging system. Is one of the following values.

Value	Description
0x00000001	Urgent.
0x00000000	Normal.
0xFFFFFFFF	Non-Urgent

2.2.1.13 PidTagSensitivity

Type: **PtypInteger32**

Indicates the sender's assessment of the sensitivity of the Message object. Is one of the following.

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

2.2.1.14 PidLidSmartNoAttach

Type: **PtypBoolean**

Set to TRUE (0x01) if the Message object has no end-user visible attachments. If this property is unset, a default value of FALSE (0x00) is used.

2.2.1.15 PidLidPrivate

Type: **PtypBoolean**

Set to TRUE (0x01) if the end-user wishes for this Message object to be hidden from other users who have access to the Message object.

2.2.1.16 PidLidSideEffects

Type: **PtypInteger32**

Controls how a Message object is handled by the client when acting on end-user input. Is set to a bitwise OR of zero or more of the following flags.

Name	Value	Description
seOpenToDelete	0x0001	The client opens the Message object when deleting.

Name	Value	Description
seNoFrame	0x0008	No UI is associated with the Message object.
seCoerceToInbox	0x0010	The client moves the Message object to the Inbox folder when moving or copying to a Folder object with a PidTagContainerClass of "IPF.Note". For more details about the PidTagContainerClass property, see [MS-OXOSFLD] section 2.2.5.
seOpenToCopy	0x0020	The client opens the Message object when copying to another folder.
seOpenToMove	0x0040	The client opens the Message object when moving to another folder.
seOpenForCtxMenu	0x0100	The client opens the Message object when displaying context-sensitive commands, such as a context menu, to the end-user.
seCannotUndoDelete	0x0400	Cannot undo delete operation, MUST NOT be set unless seOpenToDelete is set.
seCannotUndoCopy	0x0800	Cannot undo copy operation, MUST NOT be set unless seOpenToCopy is set.
seCannotUndoMove	0x1000	Cannot undo move operation, MUST NOT be set unless seOpenToMove is set.
seHasScript	0x2000	The Message object contains end-user script.
seOpenToPermDelete	0x4000	The client opens the Message object to permanently delete it.

2.2.1.17 PidNameKeywords

Type: **PtypMultipleString**

Contains keywords or categories for the Message object. The length of each string within the multi-value string is less than 256.

2.2.1.18 PidLidCommonStart

Type: **PtypTime**

Indicates the start time for the Message object. Is less than or equal to the value of [PidLidCommonEnd](#). This time is interpreted as **Coordinated Universal Time (UTC)** or local depending on the specification of an extension to this protocol.

2.2.1.19 PidLidCommonEnd

Type: **PtypTime**

Indicates the end time for the Message object. MUST be greater than or equal to the value of [PidLidCommonStart](#). This time is interpreted as UTC or local depending on the specification of an extension to this protocol.

2.2.1.20 PidTagAutoForwarded

Type: **PtypBoolean**

Indicates that this message has been automatically generated or automatically forwarded. If this property is unset, then a default value of "0x00" is assumed.

2.2.1.21 PidTagAutoForwardComment

Type: **PtypString**

Contains a comment added by the auto-forwarding agent.

2.2.1.22 Body Properties

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

2.2.1.22.1 PidTagBody

Type: **PtypString**

Contains the unformatted text analogous to the text/plain body of [\[RFC2822\]](#).

2.2.1.22.2 PidTagNativeBody

Type: **PtypInteger32**

Indicates the best available format for storing the message body. The value of this property is limited to one of the property values shown in the following table.

Meaning	Value
Undefined body	0x00
Plain text body	0x01
Rich Text Format (RTF) compressed body	0x02
Hypertext Markup Language (HTML) body	0x03
Clear signed body	0x04

2.2.1.22.3 PidTagBodyHtml

Type: **PtypBinary**

Contains the HTML body as specified in [\[RFC2822\]](#) section 2.3.

2.2.1.22.4 PidTagRtfCompressed

Type: **PtypBinary**

Contains a Rich Text Format (RTF) body compressed as specified in [\[MS-OXRTFCP\]](#).

2.2.1.22.5 PidTagRtfInSync

Type: **PtypBoolean**

Set to TRUE (0x01) if the RTF body has been synchronized with the contents in [PidTagBody](#).

2.2.1.22.6 PidTagInternetCodepage

Type: **PtypInteger32**

Indicates the code page used for [PidTagBody](#) or [PidTagBodyHtml](#).

2.2.1.23 Contact Linking Properties

A group of related properties valid on any Message object containing information about the linked **Contact objects**.

2.2.1.23.1 PidLidContactLinkEntry

Type: **PtypBinary**

Contains the list of **address book EntryIDs** linked to by this Message object.

Size in bytes	Meaning	Notes
4	Address Entry COUNT	
4	Size of this property minus 4 (FieldSize)	
variable	Address book EntryID data	Repeats Address Entry COUNT times. Address book EntryIDs are specified in [MS-OXCDATA] section 2.2.5.2.
0 – 3	Padding to make FieldSize a multiple of 4	Each padding BYTE MUST be 0x00.

2.2.1.23.2 PidLidContacts

Type: **PtypMultipleString**

Contains the [PidTagDisplayName](#) of each address book EntryID referenced in the value of [PidLidContactLinkEntry](#). Can also include names not referenced in [PidLidContactLinkEntry](#).

2.2.1.23.3 PidLidContactLinkName

Type: **PtypString**

Contains the elements of [PidLidContacts](#), separated by a semicolon and a space ("; ").

2.2.1.23.4 PidLidContactLinkSearchKey

Type: **PtypBinary**

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 [PidTagSearchKey](#) in [\[MS-OXOABK\]](#).

Length in bytes	Meaning	Notes
2	ContactEntryCount	

Length in bytes	Meaning	Notes
variable	SearchKey data	Repeats ContactEntryCount times

2.2.1.24 Retention and Archive Properties

Properties that 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 2.2.4.2.3.

2.2.1.24.1 PidTagArchiveTag

Type: **PtypBinary**

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.

2.2.1.24.2 PidTagPolicyTag

Type: **PtypBinary**

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.

2.2.1.24.3 PidTagRetentionPeriod

Type: **PtypInteger32**

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 [PidTagRetentionPeriod](#) 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.

2.2.1.24.4 PidTagStartDateEtc

Type: **PtypBinary**

A composite property that holds two pieces of information, as follows:

- Default retention period — The first four bytes contain the retention period of the default retention tag. (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.)

- Start date — The next eight bytes contain the date, in UTC, from which the Message object's age is calculated.

The [PidTagStartDateEtc](#) property can be present on only Message objects. The [PidTagStartDateEtc](#) property is read-only for the client and is set by only the server. <3>

2.2.1.24.5 PidTagRetentionDate

Type: **PtypTime**

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](#) + [PidTagRetentionPeriod](#). If [PidTagMessageDeliveryTime](#) does not exist, [PidTagCreationTime](#) is used.
- When the Message object has the default Retention Policy:

[PidTagRetentionDate](#) = [PidTagMessageDeliveryTime](#) + default retention period. If [PidTagMessageDeliveryTime](#) does not exist, [PidTagCreationTime](#) is used.

2.2.1.24.6 PidTagRetentionFlags

Type: **PtypInteger32**

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:

Name	Value	Description
ExplicitTag	0x00000001	The retention tag on the folder is explicitly set.
UserOverride	0x00000002	The retention tag was not changed by the end-user.
AutoTag	0x00000004	The retention tag on the Message object is an auto-tag, which is predicted by the system.
PersonalTag	0x00000008	The retention tag on the folder is of a personal type and can be made available to the end-user.
ExplicitArchiveTag	0x00000010	The archive tag on the folder is explicitly set.
KeepInPlace	0x00000020	The Message object remains in place and is not archived.

Name	Value	Description
SystemData	0x00000040	The Message object or folder is system data.

2.2.1.24.7 PidTagArchivePeriod

Type: **PtypInteger32**

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 moved to archive 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.

2.2.1.24.8 PidTagArchiveDate

Type: **PtypTime**

Specifies the date, in UTC, after which a Message object is moved to archive 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 moved to archive by the server.

The value of the [PidTagArchiveDate](#) property is calculated from the values of other properties as follows:

[PidTagArchiveDate](#) = start date + [PidTagArchivePeriod](#)

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

2.2.2 Attachment Object Properties

All property value types (for example, **PtypBoolean** and **PtypInteger32**) that are specified in the following sub-sections are defined in [\[MS-OXCDATA\]](#) section 2.11.1.

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

Type: **PtypTime**, in UTC

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

Type: **PtypTime**, in UTC

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

Type: **PtypString**

Contains the name of the attachment as input by the end user. Set to the same value as [PidTagAttachLongFilename](#).

2.2.2.5 PidTagAttachSize

Type: **PtypInteger32**, unsigned

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

Type: **PtypInteger32**, unsigned

Identifies the Attachment object within its Message object. MUST be unique among the Attachment objects in a message.

2.2.2.7 PidTagAttachDataBinary

Type: **PtypBinary**

Contains the contents of the file to be attached.

2.2.2.8 PidTagAttachDataObject

Type: **PtypObject**

Contains the binary representation of the Attachment object in an application-specific format.

2.2.2.9 PidTagAttachMethod

Type: **PtypInteger32**

Represents the way the contents of an attachment are accessed. Set to one of the following values.

Name	Value	Description
afNone	0x00000000	The attachment has just been created.
afByValue	0x00000001	PidTagAttachDataBinary contains the attachment data.
afByReference	0x00000002	PidTagAttachLongPathname contains a fully qualified path

Name	Value	Description
		identifying the attachment To recipients with access to a common file server.
afByReferenceOnly	0x00000004	PidTagAttachLongPathname contains a fully qualified path identifying the attachment.
afEmbeddedMessage	0x00000005	The attachment is an embedded message that is accessed via RopOpenEmbeddedMessage .
afStorage	0x00000006	PidTagAttachDataObject contains data in an application-specific format.

2.2.2.10 PidTagAttachLongFilename

Type: **PtypString**

Contains the full filename and extension of the Attachment object.

2.2.2.11 PidTagAttachFilename

Type: **PtypString**

Contains the **8.3 name** of [PidTagAttachLongFilename](#).

2.2.2.12 PidTagAttachExtension

Type: **PtypString**

Contains a filename extension that indicates the document type of an attachment.

2.2.2.13 PidTagAttachLongPathname

Type: **PtypString**

Contains the fully qualified path and filename with extension.

2.2.2.14 PidTagAttachPathname

Type: **PtypString**

Contains the 8.3 name of [PidTagAttachLongPathname](#).

2.2.2.15 PidTagAttachTag

Type: **PtypBinary**

Contains the **identifier** information for the application which supplied the Attachment object's data. This property can be left unset; if set, it MUST be one of the following.

Definition	Data	Comments
Transport Neutral Encapsulation Format (TNEF)	{0x2A,86,48,86,F7,14,03,0A,01}	See [MS-OXTNEF]

Definition	Data	Comments
afStorage	{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}	See [MS-OXCMAIL]

2.2.2.16 PidTagRenderingPosition

Type: **PtypInteger32**, unsigned

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 **PidTagRenderingPosition** values of 200, 100, and 500, 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 4.2.

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

2.2.2.17 PidTagAttachRendering

Type: **PtypBinary**

Contains a Windows **metafile** as specified in [\[MS-WMF\]](#) for the Attachment object.

2.2.2.18 PidTagAttachFlags

Type: **PtypInteger32**, as a bit field

Indicates which body formats might reference this attachment when rendering data. Contains a bitwise OR of zero or more of the following flags. If this property is absent or its value is 0x00000000, then the attachment is available to be rendered in any format.

Value	Meaning
0x00000001	The Attachment object is not available to be rendered in HTML.
0x00000002	The Attachment object is not available to be rendered in Rich Text Format.
0x00000004	The Attachment object is referenced and rendered within the HTML body of the associated Message object. See PidTagBodyHtml .

2.2.2.19 PidTagAttachTransportName

Type: **PtypString**

Contains the name of an attachment file, modified so that it can be correlated with TNEF messages, see [\[MS-OXTNEF\]](#).

2.2.2.20 PidTagAttachEncoding

Type: **PtypBinary**

Contains encoding information about the Attachment object. If the attachment is in MacBinary format, then this property is set to "{0x2A,86,48,86,F7,14,03,0B,01}"; otherwise, it is unset. <4> This property is used to indicate that the attachment content, which is the value of the [PidTagAttachDataBinary](#) property, MUST be encoded in the MacBinary format, as specified in [\[MS-OXCMAIL\]](#).

2.2.2.21 PidTagAttachAdditionalInformation

Type: **PtypString**

MUST be set to an empty string if [PidTagAttachEncoding](#) is unset. If [PidTagAttachEncoding](#) is set, then it 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

Type: **PtypInteger32**

The type of Message object to which this attachment is linked. MUST be "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

Type: **PtypInteger32**

Indicates special handling for this Attachment object. MUST be "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

Type: **PtypBoolean**

Set to TRUE (0x01) if this Attachment object is hidden from the end user.

2.2.2.25 MIME Properties

The following properties contain MIME information and can be left unset. For MIME specifications, see [\[RFC2045\]](#). For the specification on mapping these properties, see [\[MS-OXCMAIL\]](#).

Type	Property	Content
PtypString	PidTagAttachMimeTag	The content-type MIME header.
PtypString	PidTagAttachContentId	A content identifier unique to this Message object that matches a corresponding "cid:" Uniform Resource Identifier (URI) scheme reference in the HTML body of the Message object.
PtypString	PidTagAttachContentLocation	A relative or full URI that matches a corresponding reference in the HTML body of the Message object.
PtypString	PidTagAttachContentBase	The base of a relative URI. MUST be set if PidTagAttachContentLocation contains a relative URI.

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 Buffer Format

[RopOpenMessage](#) provides access to an existing Message object, which is identified by the **message ID (MID)**. The folder containing the Message object is identified by the **folder ID (FID)**.

For this ROP, the **InputHandleIndex** 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 **OutputHandleIndex** 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** for each.

2.2.3.1.1 Request Buffer

The syntax of the [RopOpenMessage](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopOpenMessage](#) request buffer.

2.2.3.1.1.1 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.

2.2.3.1.1.2 FolderId

8 bytes containing the FID of the folder from which the message is to be opened.

2.2.3.1.1.3 OpenModeFlags

1 byte; MUST be one of the following.

Name	Value	Meaning
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.
OpenSoftDeleted	0x04	Open a soft deleted Message object if available.

2.2.3.1.1.4 MessageId

8 bytes containing the MID for the Message object to open.

2.2.3.1.2 Response Buffer

The syntax of the [RopOpenMessage](#) response buffer is specified in the [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopOpenMessage](#) response buffer.

2.2.3.1.2.1 HasNamedProperties

1 byte.

Value	Meaning
0x00	No named properties are included in the ROP response buffer.
Nonzero	Named properties are included.

2.2.3.1.2.2 SubjectPrefix

A **TypedString** structure ([\[MS-OXCADATA\]](#) section 2.11.7) specifying the prefix for the subject of the Message object. Contains the value of the [PidTagSubjectPrefix](#) property.

2.2.3.1.2.3 NormalizedSubject

A **TypedString** structure ([\[MS-OXCADATA\]](#) section 2.11.7) specifying the normalized subject of the Message object. Contains the value of the [PidTagNormalizedSubject](#) property.

2.2.3.1.2.4 RecipientCount

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

2.2.3.1.2.5 ColumnCount

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

2.2.3.1.2.6 RecipientColumns

An array of **PropertyTag** structures ([\[MS-OXCADATA\]](#) section 2.9) with <ColumnCount> elements. Each **PropertyTag** value is valid for a recipient as specified in [\[MS-OXPROPS\]](#).

2.2.3.1.2.7 RowCount

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

2.2.3.1.2.8 RecipientRows

An array of **OpenRecipientRow** structures with <RowCount> elements, as specified in [\[MS-OXCROPS\]](#) section 2.2.6.1.2.1.

The RecipientType value 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.

Types are as follows.

Value	Description
0x01	Primary recipient.
0x02	Carbon copy (Cc) recipient.
0x03	Bcc recipient.

Flags are as follows.

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

2.2.3.2 RopCreateMessage Buffer Format

[RopCreateMessage](#) is used to create a new Message object.

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

2.2.3.2.1 Request Buffer

The syntax of the [RopCreateMessage](#) request buffer is specified in the [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopCreateMessage](#) request buffer.

2.2.3.2.1.1 CodePageId

2 bytes specifying the code page that 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.

2.2.3.2.1.2 FolderId

8 bytes containing the FID for the Folder object in which the Message object is to be created.

2.2.3.2.1.3 AssociatedFlag

1 byte.

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

2.2.3.2.2 Response Buffer

The syntax of the [RopCreateMessage](#) response buffer is specified in the [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopCreateMessage](#) response buffer.

2.2.3.2.2.1 HasMessageId

1 byte.

Value	Meaning
0x00	This is the last byte in the buffer.
Nonzero	MessageId follows beginning with the next byte in the buffer.

2.2.3.2.2.2 MessageId

8 bytes containing the MID for the newly created Message object.

2.2.3.3 RopSaveChangesMessage Buffer Format

[RopSaveChangesMessage](#) commits the changes made to the Message object.

For this ROP, the **ResponseHandleIndex** references the containing Folder object or, for an embedded message, the **Embedded Message object**. The **InputHandleIndex** 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 for each. Any changes made on one transaction MUST NOT be visible to another transaction until the changes are committed via [RopSaveChangesMessage](#). Once a transaction on one handle has been committed, the server MUST return **ecObjectModified** for [RopSaveChangesMessage](#) requests on other handles and MUST NOT allow those transactions to be committed, unless the client instructs the server to override previous changes with the **ForceSave** flag from section [2.2.3.3.1.1.<5>](#)

If pending changes include changes to read-only properties, the server MAY<6> return an error.

2.2.3.3.1 Request Buffer

The syntax of the [RopSaveChangesMessage](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopSaveChangesMessage](#) request buffer.

2.2.3.3.1.1 SaveFlags

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

SaveType

Name	Value	Description
KeepOpenReadOnly	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. For more information about access levels, see [MS-OXCPRPT] section 2.2.1.2.

Name	Value	Description
KeepOpenReadWrite	0x0A	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.
ForceSave	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 ecObjectModified error code is not valid when this flag is set: the server overwrites any changes instead.

2.2.3.3.2 Response Buffer

The syntax of the [RopSaveChangesMessage](#) response buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopSaveChangesMessage](#) response buffer.

2.2.3.3.2.1 MessageId

8 bytes containing the MID for the saved Message object.

2.2.3.4 RopRemoveAllRecipients Buffer Format

The client sends the [RopRemoveAllRecipients](#) request to delete all recipients from a message.

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

2.2.3.4.1 Request Buffer

The syntax of the [RopRemoveAllRecipients](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopRemoveAllRecipients](#) request buffer.

2.2.3.4.1.1 Reserved

4 bytes; unspecified value.

2.2.3.4.2 Response Buffer

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

This protocol adds no additional field information to the [RopRemoveAllRecipients](#) response buffer.

2.2.3.5 RopModifyRecipients Buffer Format

[RopModifyRecipients](#) modifies recipients associated with the Message object.

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

2.2.3.5.1 Request Buffer

The syntax of the [RopModifyRecipients](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopModifyRecipients](#) request buffer.

2.2.3.5.1.1 ColumnCount

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

2.2.3.5.1.2 RecipientColumns

An array of **PropertyTag** structures with <ColumnCount> elements. Each element is valid for a recipient 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**, as specified in [\[MS-OXCADATA\]](#), section [2.8.3.2](#):

[PidTagAddressType](#) [PidTagDisplayName](#)

[PidTagEmailAddress](#) [PidTagEntryId](#)

[PidTagInstanceKey](#) [PidTagRecipientType](#)

[PidTagSearchKey](#) [PidTagSendRichInfo](#) [PidTagTransmittableDisplayName](#)

2.2.3.5.1.3 RowCount

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

2.2.3.5.1.4 RecipientRows

An array of **ModifyRecipientRow** structures ([\[MS-OXCROPS\]](#) section 2.2.6.5.1.1) with <RowCount> elements.

2.2.3.5.2 Response Buffer

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

This protocol adds no additional field information to the [RopModifyRecipients](#) response buffer.

2.2.3.6 RopReadRecipients Buffer Format

[RopReadRecipients](#) retrieves the recipients associated with the Message object.

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

2.2.3.6.1 Request Buffer

The syntax of the [RopReadRecipients](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopReadRecipients](#) request buffer.

2.2.3.6.1.1 RowId

4 bytes containing the starting index for the recipients to be retrieved.

2.2.3.6.1.2 Reserved

2 bytes; MUST be 0x0000.

2.2.3.6.2 Response Buffer

The syntax of the [RopReadRecipients](#) response buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopReadRecipients](#) response buffer.

2.2.3.6.2.1 RowCount

1 byte containing the number of elements in the **RecipientRows** field. Is greater than or equal to "0x00" and less than "0x7FEF".

2.2.3.6.2.2 RecipientRows

An array of **ReadRecipientRow** structures with <RowCount> elements, as specified in [\[MS-OXCROPS\]](#) section 2.2.6.6.2.1.

2.2.3.7 RopReloadCachedInformation Buffer Format

[RopReloadCachedInformation](#) retrieves the same information as [RopOpenMessage](#) but operates on an already opened Message object.

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

2.2.3.7.1 Request Buffer

The syntax of the [RopReloadCachedInformation](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopReloadCachedInformation](#) request buffer.

2.2.3.7.1.1 Reserved

2 bytes; MUST be "0x0000".

2.2.3.7.2 Response Buffer

The response buffer for [RopReloadCachedInformation](#) is identical to the response buffer for [RopOpenMessage](#).

2.2.3.8 RopSetMessageStatus Buffer Format

[RopSetMessageStatus](#) sets [PidTagMessageStatus](#) on a message in a folder without the need to open or save the Message object.

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

2.2.3.8.1 Request Buffer

The syntax of the [RopSetMessageStatus](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopSetMessageStatus](#) request buffer.

2.2.3.8.1.1 MessageId

8 bytes containing the MID for the Message object to modify.

2.2.3.8.1.2 MessageStatusFlags

4 bytes containing the [PidTagMessageStatus](#).

2.2.3.8.1.3 MessageStatusMask

4 bytes indicating which status flags are to be set and which are to be cleared. Contains a bitwise OR of zero or more values from the table in section [2.2.1.8](#). The server sets all flags that are set in both **MessageStatusMask** and **MessageStatusFlags**, and clears all flags that are set in **MessageStatusMask** but clear in **MessageStatusFlags**.

2.2.3.8.2 Response Buffer

The syntax of the [RopSetMessageStatus](#) response buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopSetMessageStatus](#) response buffer.

2.2.3.8.2.1 MessageStatusFlags

4 bytes indicating the status flags that were set on the Message object prior to processing this request. MUST contain a bitwise OR of zero or more values from the table in section [2.2.1.8](#).

2.2.3.9 RopGetMessageStatus Buffer Format

[RopGetMessageStatus](#) gets the message status of a message in a folder.

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

2.2.3.9.1 Request Buffer

The syntax of the [RopGetMessageStatus](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopGetMessageStatus](#) request buffer.

2.2.3.9.1.1 MessageId

8 bytes containing the MID for the Message object in which to operate.

2.2.3.9.2 Response Buffer

The syntax of the [RopGetMessageStatus](#) response buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopSetMessageStatus](#) response buffer.

2.2.3.9.2.1 MessageStatusFlags

4 bytes indicating the status of the Message object. Contains a bitwise OR of zero or more values from the table in section [2.2.1.8](#).

2.2.3.10 RopSetReadFlags Buffer Format

[RopSetReadFlags](#) changes the state of the [PidTagMessageFlags](#) property 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 **InputHandleIndex** references a Folder object.

2.2.3.10.1 Request Buffer

The syntax of the [RopSetReadFlags](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopSetReadFlags](#) request buffer.

2.2.3.10.1.1 WantAsynchronous

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.

1 byte indicating whether client is prepared for the [RopSetReadFlags](#) request to be processed asynchronously with status reported via [RopProgress](#).

If the value is nonzero, the server SHOULD return a **RopProgress** ([\[MS-OXCPRPT\]](#) section 2.2.22) response but MAY return a [RopSetReadFlags](#) response instead. For more details on the asynchronous behavior of ROPs see [\[MS-OXCROPS\]](#). If the SUPPORT_PROGRESS flag, as specified in [\[MS-OXCSTOR\]](#) section 2.2.1.1.1.2, is not set by the client in the **OpenFlags** field in [RopLogon](#), then the server MUST disable asynchronous processing of [RopSetReadFlags](#), and MUST NOT return [RopProgress](#) whether or not **WantAsynchronous** is set [<7>](#)

2.2.3.10.1.2 ReadFlags

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

Name	Value	Description
rfDefault	0x00	The server sets the read flag and sends the receipt.
rfSuppressReceipt	0x01	The user requests that any pending read report be canceled; server sets mfRead bit.
rfReserved	0x0A	Ignored by the server.
rfClearReadFlag	0x04	Server clears the mfRead bit; client MUST include rfSuppressReceipt with this flag.

Name	Value	Description
rfGenerateReceiptOnly	0x10	The server sends a read report if one is pending, but does not change the mfRead bit.
rfClearNotifyRead	0x20	The server clears the mfNotifyRead bit, but does not send a read report.
rfClearNotifyUnread	0x40	The server clears the mfNotifyUnread bit, but does not send a non-read report.

2.2.3.10.1.3 MessageIdCount

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

2.2.3.10.1.4 MessageIds

An array of MIDs with <MessageIdCount> elements.

2.2.3.10.2 Response Buffer

The syntax of the [RopSetReadFlags](#) response buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopSetReadFlags](#) response buffer.

2.2.3.10.2.1 PartialCompletion

1 byte Boolean flag indicating the server was unable to modify one or more of the Message objects represented in the **MessageIds** field.

2.2.3.11 RopSetMessageReadFlag

[RopSetMessageReadFlag](#) changes the state of the [PidTagMessageFlags](#) property 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 **LogonID** from the request was created with the Private flag unset ([\[MS-OXCSTOR\]](#)).

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

2.2.3.11.1 Request Buffer

The syntax of the [RopSetMessageReadFlag](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopSetMessageReadFlag](#) request buffer.

2.2.3.11.1.1 ReadFlags

1 byte containing a bitwise OR of one or more values from the table in section [2.2.3.10.1.2](#).

2.2.3.11.1.2 ClientData

The *ClientData* parameter is a 24 byte **LongTermID** (see [\[MS-OXCDATA\]](#) section 2.2.1.3.1) that represents the **message** read when in public folder mode; 0 bytes otherwise.

2.2.3.11.2 Response Buffer

The syntax of the [RopSetMessageReadFlag](#) response buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopSetMessageReadFlag](#) response buffer.

2.2.3.11.2.1 ReadStatusChanged

1 byte.

Value	Description
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.

2.2.3.11.2.2 LogonId

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

2.2.3.11.2.3 ClientData

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

2.2.3.12 RopOpenAttachment

[RopOpenAttachment](#) opens an Attachment object stored on the Message object.

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

2.2.3.12.1 Request Buffer

The syntax of the [RopOpenAttachment](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopOpenAttachment](#) request buffer.

2.2.3.12.1.1 OpenAttachmentFlags

1 byte containing one of the following values.

Name	Value	Meaning
ReadOnly	0x00	Message will be opened as read-only.
ReadWrite	0x01	Message will be opened for both reading and writing.

Name	Value	Meaning
BestAccess	0x03	Open for read/write if possible, read-only if not.

2.2.3.12.1.2 AttachmentID

4 bytes containing the ID of the Attachment object to be opened. See [PidTagAttachNumber](#).

2.2.3.12.2 Response Buffer

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

This protocol adds no additional field information to the [RopOpenAttachment](#) response buffer.

2.2.3.13 RopCreateAttachment

[RopCreateAttachment](#) creates a new Attachment object on the Message object.

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

2.2.3.13.1 Request Buffer

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

This protocol adds no additional field information to the [RopCreateAttachment](#) request buffer.

2.2.3.13.2 Response Buffer

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

The fields specified in the following sub-sections are part of the [RopCreateAttachment](#) response buffer.

2.2.3.13.2.1 AttachmentID

4 bytes containing the ID for the Attachment object that was created. See [PidTagAttachNumber](#).

2.2.3.14 RopDeleteAttachment

[RopDeleteAttachment](#) deletes an existing Attachment object from the Message object.

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

2.2.3.14.1 Request Buffer

The syntax of the [RopDeleteAttachment](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopDeleteAttachment](#) request buffer.

2.2.3.14.1.1 AttachmentID

4 bytes containing the ID of the Attachment object to be deleted. See [PidTagAttachNumber](#).

2.2.3.14.2 Response Buffer

The syntax of the [RopDeleteAttachment](#) response buffer is specified in [\[MS-OXCROPS\]](#).

This protocol adds no additional field information to the [RopDeleteAttachment](#) response buffer.

2.2.3.15 RopSaveChangesAttachment Buffer Format

[RopSaveChangesAttachment](#) commits the changes made to the Attachment object.

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

If pending changes include changes to read-only properties, the server MAY<8> return an error.

2.2.3.15.1 Request Buffer

The syntax of the [RopSaveChangesAttachment](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopSaveChangesAttachment](#) request buffer.

2.2.3.15.1.1 SaveFlags

See section [2.2.3.3.1.1](#).

2.2.3.15.2 Response Buffer

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

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

2.2.3.16 RopOpenEmbeddedMessage Buffer Format

[RopOpenEmbeddedMessage](#) retrieves a handle to a Message object from the given Attachment object.

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

2.2.3.16.1 Request Buffer

The syntax of the [RopOpenEmbeddedMessage](#) request buffer is specified in [\[MS-OXCROPS\]](#). The fields specified in the following sub-sections are part of the [RopOpenEmbeddedMessage](#) request buffer.

2.2.3.16.1.1 CodePageId

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

2.2.3.16.1.2 OpenModeFlags

1 byte.

Name	Value	Meaning
ReadOnly	0x00	Message will be opened as read-only.
ReadWrite	0x01	Message will be opened 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 Response Buffer

The syntax of the [RopOpenEmbeddedMessage](#) response buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopOpenEmbeddedMessage](#) response buffer.

2.2.3.16.2.1 MessageId

8 bytes containing the MID for the Message object.

2.2.3.16.2.2 HasNamedProperties

See section [2.2.3.1.2.1](#).

2.2.3.16.2.3 SubjectPrefix

See section [2.2.3.1.2.2](#).

2.2.3.16.2.4 NormalizedSubject

See section [2.2.3.1.2.3](#).

2.2.3.16.2.5 RecipientCount

See section [2.2.3.1.2.4](#).

2.2.3.16.2.6 ColumnCount

See section [2.2.3.1.2.5](#).

2.2.3.16.2.7 RecipientColumns

See section [2.2.3.1.2.6](#).

2.2.3.16.2.8 RowCount

See section [2.2.3.1.2.7](#).

2.2.3.16.2.9 RecipientRows

The format of this field is specified in section [2.2.3.1.2.8](#).

The presence of data in this field is indeterminate, even when the embedded message exists.

2.2.3.17 RopGetAttachmentTable Buffer Format

[RopGetAttachmentTable](#) retrieves a handle to a table object that represents the attachments stored on the Message object. See [\[MS-OXCSTBL\]](#) for more details on table objects.

For this ROP, the **InputHandleIndex** references a Message object and the **OutputHandleIndex** references a table object.

2.2.3.17.1 Request Buffer

The syntax of the [RopGetAttachmentTable](#) request buffer is specified in [\[MS-OXCROPS\]](#).

The fields specified in the following sub-sections are part of the [RopGetAttachmentTable](#) request buffer.

2.2.3.17.1.1 Table Flags

1 byte.

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 Response Buffer

The syntax of the [RopGetAttachmentTable](#) response buffer is specified in [\[MS-OXCROPS\]](#).

This protocol adds no additional field information to the [RopGetAttachmentTable](#) response buffer.

2.2.3.18 RopGetValidAttachments

RopGetValidAttachments gets the valid attachment identifiers of a message. [<9>](#)

2.2.3.18.1 Request Buffer

The request buffer for **RopGetValidAttachments** is specified in [\[MS-OXCROPS\]](#) section 2.2.6.18.1.

2.2.3.18.2 Response Buffer

The response buffer for **RopGetValidAttachments** is specified in [\[MS-OXCROPS\]](#) section 2.2.6.18.2.

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 types are defined in this section:

Global

Mailbox

Message Object

3.1.1.1 Global

The following abstract data elements are defined as common to both client and server:

Handle: Represents an open connection by a client to a server object.

3.1.1.2 Per Mailbox

Mailboxes are represented by the **Mailbox** abstract object type. The following abstract 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** abstract data type. The following abstract data 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](#) request. In order to send this request, the client first obtains the MID for the Message object to be opened, and either the FID or the LogonID. The MID is accessible from the contents table of the Folder Object that contains the Message object by including [PidTagMid](#) in a [RopSetColumns](#) request. For more details, see [\[MS-OXCTABL\]](#).

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

When the client receives the response buffer, it caches the data from the **NormalizedSubject** and **SubjectPrefix** fields; it also updates the cache when issuing [RopSetProperties](#) for [PidTagNormalizedSubject](#) and [PidTagSubjectPrefix](#) and uses the cached values.

The client uses the opened Message object in subsequent ROPs; it MUST eventually send a [RopRelease](#) request 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 [PidLidPrivate](#) is set to "0x01".

3.1.4.2 Creating a Message Object

A client creates a new Message object by sending a [RopCreateMessage](#) request. The client sends a [RopSaveChangesMessage](#) request to commit the new Message object, and uses the opened Message object in subsequent ROPs. It MUST eventually send a [RopRelease](#) request on the Message object and after doing so MUST NOT use the Message object for any subsequent ROPs.

3.1.4.3 Saving Message Object Changes

A client saves all the changes to a Message object by sending a [RopSaveChangesMessage](#) request.

The client controls the access level of the Message object after saving changes by setting the proper flags as specified in section [2.2.3.3.1.1](#).

3.1.4.4 Removing All Recipients

A client clears all recipients from a Message object by sending a [RopRemoveAllRecipients](#) request.

The client sends a [RopSaveChangesMessage](#) for the Message object associated with the removed recipients in order to commit the changes.

3.1.4.5 Adding, Deleting, and Modifying Recipients

A client modifies recipients of the Message object by sending a [RopModifyRecipients](#) request.

To modify an existing recipient the client sets the **RowId** field to the **RowId** of the recipient to be modified and sets all of the **ModifyRecipientRow** data to the desired values for that recipient, including any additional property information for the recipients. Additional property information is set by adding **PropertyTag** values to the **RecipientColumns** field and including the property values in the **RecipientProperties** field.

To delete an existing recipient the client sets the **RowId** field to the **RowId** of the recipient to be deleted and sets the **RecipientRowSize** field to "0x0000".

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

The client sends a [RopSaveChangesMessage](#) for the Message object associated with the added recipients in order to commit the changes.

3.1.4.6 Reading Recipients

A client retrieves a list of all recipients on the Message object by sending a [RopReadRecipients](#) request.

If the COUNT of recipients and the COUNT of recipient rows in the [RopOpenMessage](#) response buffer are the same, then the client can use the **RecipientRow** information from [RopOpenMessage](#) instead of sending a [RopReadRecipients](#) request. If the counts are not equal, the client MUST issue a series of [RopReadRecipients](#) 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](#) with an increasing **RowId** value to obtain the recipients that did not fit in the previous request.

3.1.4.7 Reload Message Object Header Info

A client retrieves the current state of the data returned in [RopOpenMessage](#) by sending a [RopReloadCachedInformation](#) request.

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](#) request.

To modify the status of a header message object:

1. Obtain the message's MID, see section [3.1.4.1](#).
2. Send the [RopSetMessageStatus](#) request, setting the mask and status appropriately.

3.1.4.9 Getting Message Status

A client checks the status of a header message object by sending a [RopGetMessageStatus](#) request.

To retrieve the status of a header message object:

1. Obtain the message's MID, see section [3.1.4.1](#).
2. Sent the [RopGetMessageStatus](#) request; if the request succeeds then the header message object's [PidTagMessageStatus](#) value is returned in the response buffer.

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](#) request. The client obtains a list of MIDs using a contents table; see section [3.1.4.1](#), and uses the list of MIDs in the [RopSetReadFlags](#) request.

When a higher layer wants to mark or unmark a single opened Message object as read, the client sends a [RopSetMessageReadFlag](#) request.

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 [2.2.3.10.1.2](#).

3.1.4.11 Opening Attachments

A client opens and manipulates an existing Attachment object to a Message object by sending a [RopOpenAttachment](#) request.

The client MUST use a valid AttachmentID (see section [2.2.3.12.1.2](#)) when requesting to open an attachment. See section [3.1.4.16](#).

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

3.1.4.12 Creating Attachments

A client adds a new Attachment object to a Message object by sending a [RopCreateAttachment](#) request.

The client sends a [RopSaveChangesAttachment](#) request to commit the new Attachment object, and uses the newly created Attachment object in subsequent ROPs. The client eventually sends a [RopRelease](#) request on the Attachment object and after doing so, MUST NOT use the Attachment object for any subsequent ROPs.

The client sends a [RopSaveChangesMessage](#) request to commit the Attachment object change to the Message object.

3.1.4.13 Setting Attachment Object Content

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

Depending on the type of Attachment object the higher layer intends to use, the client sets the appropriate value for [PidTagAttachMethod](#) as specified in section [2.2.2.9](#).

The client sends a [RopSaveChangesAttachment](#) request to commit the change to the Attachment object and a [RopSaveChangesMessage](#) request to commit the Attachment object change to the Message object.

3.1.4.14 Saving Attachment Object Changes

A client saves changes to an Attachment object by sending a [RopSaveChangesAttachment](#) request. It sends a [RopSaveChangesMessage](#) request to commit the Attachment object changes to the Message object.

3.1.4.15 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](#) request.

The client uses the opened Message object in subsequent ROPs; it eventually sends a [RopRelease](#) request on the Message object and after doing so, MUST NOT use the Message object for any subsequent ROPs.

3.1.4.16 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](#) request.

The server returns a table of properties for each Attachment object associated with the Message object as specified in [\[MS-OXCTABL\]](#). To retrieve the **AttachmentID**, the client includes [PidTagAttachNumber](#) when sending a [RopSetColumns](#) request.

3.1.4.17 Creating an Embedded Message

A client creates an embedded message by sending a [RopCreateAttachment](#) request to create an attachment on a message. The client uses [RopSetProperties](#) to set the value of [PidTagAttachMethod](#) to **afEmbeddedMessage**. Finally the client sends a [RopOpenEmbeddedMessage](#) on the attachment to get a Message object handle.

3.1.4.18 Saving an Embedded Message

A client saves an embedded message by sending a [RopSaveChangesMessage](#) on the embedded message. Then the client sends a [RopSaveChangesAttachment](#) on the attachment from which the embedded message was opened. Finally, the client sends a [RopSaveChangesMessage](#) on the enclosing message.

3.1.4.19 Linking a Contact Object

To link a Contact object with another Message object, the client sets the following properties. For more details, see section [2.2.1.23](#).

- **PidLidContactLinkEntry** (section [2.2.1.23.1](#))
- **PidLidContactLinkName** (section [2.2.1.23.3](#))
- **PidLidContactLinkSearchKey** (section [2.2.1.23.4](#))
- **PidLidContacts** (section [2.2.1.23.2](#))

3.1.5 Message Processing Events and Sequencing Rules

None.

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 abstract data types are defined in this section.

Global

Mailbox

Message Object

3.2.1.1 Global

The following abstract data elements are defined as common to both client and server.

Handle: Represents an open connection by a client to a server object.

3.2.1.2 Per Mailbox

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

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

MessageObject.Transactions: A record of the open **Handles** against a **MessageObject**. Each **Handle** is given its own transaction. If a change to a **MessageObject** is committed on one **Handle**, the server prevents changes from being saved against other open **Handles** 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.

3.2.5 Message Processing Events and Sequencing Rules

3.2.5.1 RopOpenMessage

Provides access to existing Message objects stored by the server. The Message object returned by this ROP is used in subsequent ROPs, such as [RopGetPropertiesSpecific](#). See specific ROPs for information of which operate on Message objects, as specified in [\[MS-OXCROPS\]](#).

[RopOpenMessage](#) MUST NOT succeed if a Message object with the specified ID does not exist or the client has insufficient access rights to view the Message object.

If the **OpenModeFlag** field includes the **OpenSoftDeleted** flag, then [RopOpenMessage](#) provides access to all Message objects, including soft deleted Message objects. If **OpenSoftDeleted** is not included, then the server MUST NOT provide access to soft deleted Message objects.

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

The following are specific error codes which apply to this ROP.

Name	Value	Meaning
ecNotFound	0x8004010F	The MID does not correspond to a message in the database. The user does not have rights to the message. The folder corresponding to the FID entered in the ROP request buffer does not contain a message with the entered MID. The InputHandleIndex on which this ROP was called does not refer to a folder or Logon object. The message is soft deleted and the client has not specified the OpenSoftDeleted flag as part of the OpenModeFlag field.

3.2.5.2 RopCreateMessage

Creates a new Message object on the server and provides access to it by returning a Message object handle for use in subsequent ROPs. The server MUST NOT commit the new Message object until it receives a [RopSaveChangesMessage](#) request.

The server MUST initialize the following properties before responding.

Property name	Initial Data
PidTagImportance	"0x00000001"
PidTagMessageClass	"IPM.Note"
PidTagSensitivity	"0x00000000"
PidTagDisplayBcc	""
PidTagDisplayCc	""
PidTagDisplayTo	""

Property name	Initial Data
PidTagMessageFlags	"0x00000009"
PidTagMessageSize	See PidTagMessageSize in section 2.2.1.7
PidTagHasAttachments	"0x00"
PidTagSecurityDescriptor	See PidTagSecurityDescriptor
PidTagUrlCompNameSet	"0x00"
PidTagTrustSender	"0x00000001"
PidTagAccess	"0x00000003"
PidTagAccessLevel	"0x00000001"
PidTagUrlCompName	"No Subject.EML"
PidTagCreationTime	Time RopCreateMessage was processed
PidTagLastModificationTime	Same as PidTagCreationTime
PidTagSearchKey	Server generated SearchKey.
PidTagMessageLocaleId	The Logon object LocaleID.
PidTagCreatorName	Name of the creator.
PidTagCreatorEntryId	Address Book EntryID of the creator
PidTagLastModifierName	Same as PidTagCreatorName
PidTagLastModifierEntryId	Same as PidTagCreatorEntryId
PidTagHasNamedProperties	"0x00"
PidTagLocaleId	Same as PidTagMessageLocaleId
PidTagLocalCommitTime	Same as PidTagCreationTime

The following specific error code applies to this ROP.

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

3.2.5.3 RopSaveChangesMessage

Commits the changes made to a Message object on the server. The status of the Message object after the commit is determined by the value of the **SaveFlags** as documented in section [2.2.3.3.1.1](#).

The response contains the message ID of the committed message.

The following specific error code applies to this ROP.

Name	Value	Meaning
ecNotSupported	0x80040102	The values of the SaveFlags are not a supported combination as documented in section 2.2.3.3.1.1 .
ecObjectModified	0x80040109	The underlying data for this Message object was changed through another transaction context.

3.2.5.4 RopRemoveAllRecipients

Removes all the recipients from a Message object.

The server ignores the value of Reserved.

Until the server receives a [RopSaveChangesMessage](#) request from the client, the server adheres to the following:

- The **RowIds** and associated data of removed recipients 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 MUST NOT be included in the response buffer returned for ROP requests that apply to recipients on different Message object handles.

The following specific error code applies to this ROP.

Name	Value	Meaning
ecNullObject	0x000004b9	The InputHandleIndex on which this ROP was called does not refer to a Message object.

3.2.5.5 RopModifyRecipients

Modifies the recipients on a Message object according to the data in the request buffer. The format of the request buffer is specified in section [2.2.3.5.1](#).

For each recipient provided the server locates its representation of the recipient based on **RowId**. If the recipient indicated by **RowId** does not exist then the server creates a new recipient with that **RowId** and applies the data from the request.

If the recipient currently exists on the Message object and the value of **RecipientRowSize** in the request buffer is nonzero, the server replaces all existing properties of the recipient with the property values supplied in the request. If the value of **RecipientRowSize** in the request buffer is "0x0000" then the server deletes the recipient from the Message object.

Until the server receives a [RopSaveChangesMessage](#) request from the client, the server adheres to the following:

- If a recipient was deleted, its **RowId** 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 MUST be included in the response buffer for any subsequent ROP requests that apply to recipients for the same Message object handle.
- The changes made to the recipients MUST NOT be included in the response buffer returned for ROP requests that apply to recipients on different Message object handles.

The following specific error code applies to this ROP.

Name	Value	Meaning
ecNullObject	0x000004b9	The InputHandleIndex on which this ROP was called does not refer to a Message object.

3.2.5.6 RopReadRecipients

Provides the recipient information for the Message object in a tabular form, where each row has information for a single recipient. [RopReadRecipients](#) is used to obtain information for all recipients in the Message object, regardless of the number of recipients on the message.

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

When **RowId** is "0x00000000", the server returns all recipients for the message, beginning with the first recipient 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, the server returns **ecNotFound**.

The following specific error codes apply to this ROP.

Name	Value	Meaning
ecNotFound	0x8004010F	Recipient row RowId does not exist on the message.
ecBufferTooSmall	0x0000047D	Unable to fit at least one recipient in the response buffer. See [MS-OXCROPS] for specific handling.
ecNullObject	0x000004b9	The InputHandleIndex on which this ROP was called does not refer to a Message object.

3.2.5.7 RopReloadCachedInformation

Returns the same information as would be returned by [RopOpenMessage](#), except that it is updated with the information that has been modified on the Message object.

The following specific error code applies to this ROP.

Name	Value	Meaning
ecNullObject	0x000004b9	The InputHandleIndex on which this ROP was called does not refer to a Message object.

3.2.5.8 RopSetMessageStatus

Modifies the [PidTagMessageStatus](#) property of a single message.

The server modifies the bits on this property specified by the **MessageStatusMask**.

The server immediately commits the changes to the Message object as if the Message object had been opened and [RopSaveChangesMessage](#) had been called, except that it only changes

[PidTagMessageStatus](#), not [PidTagChangeKey](#), [PidTagLastModificationTime](#), or any other property that is modified during [RopSaveChangesMessage](#).

The following specific error code applies to this ROP.

Name	Value	Meaning
ecNullObject	0x000004b9	The InputHandleIndex on which this ROP was called does not refer to a Folder object.

3.2.5.9 RopGetMessageStatus

Provides the value of [PidTagMessageStatus](#) property of a single message; MUST NOT require the Message object to be opened.

The following specific error code applies to this ROP.

Name	Value	Meaning
ecNullObject	0x000004b9	The InputHandleIndex on which this ROP was called does not refer to a Folder object.

3.2.5.10 RopSetReadFlags

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.

Modifies the [PidTagMessageFlags](#) property of several messages.

The server immediately commits the changes to the Message objects as if the Message objects had been opened and [RopSaveMessageChanges](#) had been called, except that it only changes [PidTagMessageFlags](#), not [PidTagChangeKey](#), [PidTagLastModificationTime](#), or any other property that is modified during [RopSaveChangesMessage](#).

If the **WantAsynchronous** flag is nonzero, then the server MAY execute this ROP asynchronously. For more details, see [RopProgress](#) in [\[MS-OXCPRPT\]](#).

If the server has not received a SUPPORT_PROGRESS flag in the request buffer of [RopLogon](#), as specified in [\[MS-OXCSTOR\]](#) section 2.2.1.1.1.2, then the server MUST disable asynchronous processing for [RopSetReadFlags](#), overriding any value of the [WantAsynchronous](#) flag. In this case [RopProgress](#) MUST NOT be sent [<10>](#). If the client does not pass SUPPORT_PROGRESS, the server will process the entire [RopSetReadFlags](#) request before returning a response to the client. If the client does pass SUPPORT_PROGRESS, and the client also passes the [WantAsynchronous](#) flag, the server performs asynchronously and returns [RopProgress](#) to inform the client of status processing [RopSetReadFlags](#).

If the server is unable to modify one or more of the Message objects that are specified in the [MessageIds](#) field of the [Request Buffer](#), then the server returns the [PartialCompletion](#) flag, in the [Response Buffer](#).

The following specific error code applies to this ROP.

Name	Value	Meaning
ecNullObject	0x000004b9	The InputHandleIndex on which this ROP was called does not refer to a Folder object.

3.2.5.11 RopSetMessageReadFlag

Modifies the [PidTagMessageFlags](#) property of a single message.

If this operation is performed in **public folder** mode as specified in section [2.2.3.11](#), the server finds the message associated with the LongTermID contained in the *ClientData* request parameter 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 [RopSaveChangesMessage](#) had been called, except that it only changes [PidTagMessageFlags](#), not [PidTagChangeKey](#), [PidTagLastModificationTime](#), or any other property that is modified during [RopSaveChangesMessage](#).

The following specific error code applies to this ROP.

Name	Value	Meaning
ecNullObject	0x000004b9	The InputHandleIndex on which this ROP was called does not refer to a Message object.

3.2.5.12 RopOpenAttachment

Provides access to a single existing Attachment object. The handle returned by this ROP is used in subsequent ROPs, such as [RopGetPropertiesSpecific](#). See specific ROPs for information of which operate on Attachment objects [\[MS-OXCROPS\]](#).

The following specific error codes apply to this ROP.

Name	Value	Meaning
ecNotFound	0x8004010F	The AttachmentID does not correspond to an attachment on the Message object.
ecAccessDenied	0x80000009	The user has insufficient privileges.
ecNullObject	0x000004b9	The InputHandleIndex on which this ROP was called does not refer to a Message object.

3.2.5.13 RopCreateAttachment

Creates a new Attachment object and provides a handle to it for use in subsequent ROPs. The server does not commit the new Attachment object until it receives a call to [RopSaveChangesAttachment](#).

The server MUST initialize the following properties before responding.

PropertyName	Initial Data
PidTagAttachNumber	Varies, depending on the number of existing attachments on the Message object.

PropertyName	Initial Data
PidTagAttachSize	"0x00000000"
PidTagAccessLevel	"0x00000001"
PidTagRenderingPosition	"0x00000000"
PidTagCreationTime	Time RopCreateAttachment was processed.
PidTagLastModificationTime	Same as PidTagCreationTime .

The following specific error codes apply to this ROP.

Name	Value	Meaning
ecAccessDenied	0x80000009	The user does not have permissions to create an attachment on this message.
ecMaxAttachmentExceeded	0x000004DB	The (server defined) maximum number of attachments for a message has been exceeded.
ecNullObject	0x000004b9	The InputHandleIndex on which this ROP was called does not refer to a Message object.

3.2.5.14 RopSaveChangesAttachment

Commits the changes made to an Attachment object. The status of the Attachment object after the commit is determined by the values of the **SaveFlags** as documented in section [2.2.3.3.1.1](#).

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 [RopSaveChangesMessage](#) has been executed on the handle of the Message object.

The following specific error code applies to this ROP.

Name	Value	Meaning
ecNotSupported	0x80040102	The value of SaveFlags is not a supported combination as documented in section 2.2.3.3.1.1 . The InputHandleIndex on which this ROP was called does not refer to an Attachment object.

3.2.5.15 RopDeleteAttachment

Removes an Attachment object from a message. The server recalculates [PidTagHasAttachments](#) during this ROP.

The **attachment** is not permanently removed from the message until the client calls **RopSaveChangesMessage** (section [2.2.3.3](#)).

The following specific error codes apply to this ROP.

Name	Value	Meaning
ecNotFound	0x8004010F	The AttachmentID does not correspond to an attachment on the Message object.
ecAccessDenied	0x80000009	The user has insufficient privileges.
ecNullObject	0x000004b9	The InputHandleIndex on which this ROP was called does not refer to a Message object.

3.2.5.16 RopOpenEmbeddedMessage

Provides access to an Embedded Message object stored in an Attachment object. If the embedded object does not exist, then the client creates an Attachment object following the process defined in section [3.1.4.17](#). Once the attachment is created and its properties initialized, as specified in section [3.1.4.17](#), the client sends a [RopOpenEmbeddedMessage](#) on the attachment to get a Message object handle. The returned handle is used in subsequent ROPs (similar to the one returned by [RopOpenMessage](#)). The server MUST NOT commit the Message object to the containing Attachment object until [RopSaveChangesMessage](#) is called with the Embedded Message object's handle.

The following specific error codes apply to this ROP.

Name	Value	Meaning
ecAccessDenied	0x80000009	The user does not have permission to open or create this message.
ecNullObject	0x000004b9	The InputHandleIndex on which this ROP was called does not refer to an Attachment object.
ecUnknownCodePage	0x000003ef	The code page is unknown

3.2.5.17 RopGetAttachmentTable

Returns a handle to a table object for use in subsequent ROPs as specified in [\[MS-OXCTABL\]](#). The table object returned allows access to the properties of Attachment objects.

The following specific error codes apply to this ROP.

Name	Value	Meaning
ecNullObject	0x000004b9	The InputHandleIndex 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, then saves and closes the message.

4.1 Create Message

The client first creates a new Message object by sending a [RopCreateMessage](#) request.

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 perform a mapping from the named properties to **property identifiers**, using [RopGetPropertyIdsFromNames](#) as specified in [\[MS-OXCPRPT\]](#) section 2.2.12.

4.3 Get Attachment Table

The client sends a [RopGetAttachmentTable](#) request to retrieve the attachment 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 [RopSetProperties](#) as described in [\[MS-OXCPRPT\]](#) section 2.2.5 to set properties on the Attachment objects.

Property tag	Property name	Data
0x37050003	PidTagAttachMethod	"0x00000001"
0x370b0003	PidTagRenderingPosition	"0xFFFFFFFF"
0x7ffd0003	PidTagAttachmentFlags	"0x00000000"
0x3001001f	PidTagDisplayName	"image001.PNG"
0x3712001f	PidTagAttachContentId	"image001.PNG@01C86E1C.F1954390"
0x370e001f	PidTagAttachMimeTag	"image/PNG"
0x7ffa0003	PidTagAttachmentLinkId	"0x00000000"
0x37140003	PidTagAttachFlags	"0x00000004"
0x7ffe000b	PidTagAttachmentHidden	"0x01"
0x3707001f	PidTagAttachLongFilename	"image001.PNG"
0x3704001f	PidTagAttachFilename	"image001.PNG"
0x3703001f	PidTagAttachExtension	".PNG"

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

[RopOpenStream](#) ([\[MS-OXCPRPT\]](#) section 2.2.14) with [PidTagAttachDataBinary](#) (section [2.2.2.7](#)).

[RopSetStreamSize](#) ([\[MS-OXCPRPT\]](#) section 2.2.19) with the size of image file data.

[RopWriteStream](#) request ([\[MS-OXCPRPT\]](#) section 2.2.16) with the actual file contents.

[RopRelease](#) for the handle returned from [RopOpenStream](#).

4.4.4 RopSaveChangesAttachment Request Buffer

```
0000: 25 00 01 00 02
```

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 [RopRelease](#), as specified in [\[MS-OXCROPS\]](#).

4.5 Attach Text File

The client first creates the Attachment object on the Message object, 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 [RopSetProperties](#) as described in [\[MS-OXCPRPT\]](#) section 2.2.5 to set properties on the Attachment objects.

Property tag	Property name	Data
0x37050003	PidTagAttachMethod	"0x00000001"

Property tag	Property name	Data
0x370b0003	PidTagRenderingPosition	"0xFFFFFFFF"
0x7ffd0003	PidTagAttachmentFlags	"0x00000000"
0x3001001f	PidTagDisplayName	"test.txt"
0x7ffa0003	PidTagAttachmentLinkId	"0x00000000"
0x37140003	PidTagAttachFlags	"0x00000000"
0x7ffe000b	PidTagAttachmentHidden	"0x00"
0x3707001f	PidTagAttachLongFilename	"test.txt"
0x3704001f	PidTagAttachFilename	"test.txt"
0x3703001f	PidTagAttachExtension	".txt"
0x30070040	PidTagCreationTime	"2008/02/1222:28:34.636"
0x30080040	PidTagLastModificationTime	"2008/02/1222:28:50.112"
0x37090102	PidTagAttachRendering	3512 Bytes of Windows Metafile

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

1. [RopOpenStream](#) ([\[MS-OXCPRPT\]](#) section 2.2.14) with [PidTagAttachDataBinary](#) (section [2.2.2.7](#)).
2. [RopSetStreamSize](#) ([\[MS-OXCPRPT\]](#) section 2.2.19) with the size of image file data.
3. [RopWriteStream](#) request ([\[MS-OXCPRPT\]](#) section 2.2.16) with the actual file contents.
4. [RopRelease](#) for the handle returned from [RopOpenStream](#).

4.5.4 RopSaveChangesAttachment Request Buffer

```
0000: 25 00 02 01 02
```

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 [RopRelease](#), as specified in [\[MS-OXCROPS\]](#).

4.6 Setting Message Properties

The client sets all the necessary properties using [RopSetProperties](#) as described in [\[MS-OXCPRPT\]](#) section 2.2.5.

The HTML body, stored in [PidTagBodyHtml](#), 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</p></p></p>
<p ></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 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 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 (COUNT of following **RecipientColumns**)
[PidTagObjectType](#): 0x0ffe0003
[PidTagDisplayType](#): 0x39000003
[PidTagAddressBookDisplayNamePrintable](#): 0x39ff001f
[PidTagSmtpAddress](#): 0x39fe001f
[PidTagSendInternetEncoding](#): 0x3a710003
[PidTagDisplayTypeEx](#): 0x39050003
[PidTagRecipientDisplayName](#): 0x5ff6001f
[PidTagRecipientFlags](#): 0x5ffd0003
[PidTagRecipientTrackStatus](#): 0x5fff0003
[PidTagRecipientResourceState](#): 0x5fde0003
[PidTagRecipientOrder](#): 0x5fdf0003
[PidTagRecipientEntryId](#): 0x5ff70102
RowCount: 0x0001 (COUNT 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

[PidTag7BitDisplayName](#): 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 set for the message it was saved. The client sends [RopSaveChangesMessage](#) request.

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 [RopRelease](#), as specified in [\[MS-OXCROPS\]](#).

PRELIMINARY

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 (see [\[MS-OXCROPS\]](#)).

5.2 Index of Security Parameters

None.

PRELIMINARY

6 Appendix A: Product Behavior

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

- Microsoft® Office Outlook® 2003
- Microsoft® Exchange Server 2003
- Microsoft® Office Outlook® 2007
- Microsoft® Exchange Server 2007
- Microsoft® Outlook® 2010
- Microsoft® Exchange Server 2010
- Microsoft® Outlook® 2010 Service Pack 1 (SP1) Beta
- Microsoft® Exchange Server 2010 Service Pack 1 (SP1)

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

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

<1> [Section 2.2](#): Exchange 2010 returns Success when attempting to save read-only properties; the values, however, are not persisted to the server store.

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

<3> [Section 2.2.1.24.4](#): Outlook 2010 sets [PidTagStartDateEtc](#) on a message if it was not defined by the server, using the value of [PidTagMessageDeliveryTime](#) if it exists and the value of [PidTagCreationTime](#) otherwise.

<4> [Section 2.2.2.20](#): Office Outlook 2007 correctly detects MacBinary I, MacBinary II, and MacBinary III formats. Office Outlook 2003 only correctly detects MacBinary I and MacBinary II.

<5> [Section 2.2.3.3](#): Exchange 2010 returns Success for **RopSaveChangesMessage** requests 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.

<6> [Section 2.2.3.3](#): Exchange 2010 returns a GeneralFailure error if pending changes include changes to read-only properties.

<7> [Section 2.2.3.10.1.1](#): 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 Beta support this behavior.

<8> [Section 2.2.3.15](#): Exchange 2010 returns a GeneralFailure error if pending changes include changes to read-only properties.

<9> [Section 2.2.3.18](#): Exchange 2010 does not support **RopGetValidAttachments**.

<10> [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 Beta support this behavior.

PRELIMINARY

7 Change Tracking

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

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

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

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

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 revision type descriptions are defined as follows:

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

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

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change Type
1.1 Glossary	57739 Added "language code identifier (LCID)" to list of terms defined in this document.	N	New content added.
1.1 Glossary	56598 Added the term "Inbox folder" to the glossary list.	N	Content updated.
1.1 Glossary	58034 Added the term "transaction" to the list of terms defined in this document.	N	Content updated.
1.1 Glossary	57711 Added "8.3 name" to the list of terms defined in [MS-OXGLOS].	N	Content updated.
1.2.1 Normative References	58883 Added reference for [MS-OXRTFEX].	N	Content updated.
2.2 Message Syntax	57552 Added section reference to [MS-OXCPRPT]	N	New content added.
2.2 Message Syntax	58157 Added product behavior note explaining that Exchange Server 2010 does not return an error when attempting to save read-only properties.	Y	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change Type
2.2.1.1 General Properties	57552 Added section reference to [MS-OXCPRPT].	N	New content added.
2.2.1.3 PidTagMessageClass	57712 Removed the word "derived" from the last paragraph.	N	Content updated.
2.2.1.5 PidTagMessageLocaleId	57739 Removed product specific modifier for LCID and linked to glossary.	N	Content updated.
2.2.1.6 PidTagMessageFlags	58153 Added mfEverRead flag.	Y	New content added.
2.2.1.8 PidTagMessageStatus	57552 Added section reference to [MS-OXCPRPT].	N	New content added.
2.2.1.16 PidLidSideEffects	56598 Added the description of the client actions implied by flags.	Y	Content updated.
2.2.1.16 PidLidSideEffects	56510 Replaced bit values with flag names in flag descriptions.	N	Content updated.
2.2.1.22.2 PidTagNativeBody	56591 Clarified the possible values of this property.	Y	Content updated.
2.2.1.22.3 PidTagBodyHtml	57791 Added section reference to [RFC2822].	N	Content updated.
2.2.1.23.1 PidLidContactLinkEntry	56513 Added reference to where the terms "Address book" and "EntryID" are specified.	N	Content updated.
2.2.1.24.4 PidTagStartDateEtc	57778 Removed the qualifying phrase "not on folders."	N	Content updated.
2.2.2.1 General Properties	57552 Added section reference to [MS-OXCPRPT].	N	New content added.
2.2.2.16 PidTagRenderingPosition	56601 Elaborated on the meaning of this property's values.	Y	Content updated.
2.2.2.21 PidTagAttachAdditionalInformation	56632 Changed "MUST be unset" to "MUST be set to an empty string".	N	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change Type
2.2.3.1 RopOpenMessage Buffer Format	58034 Added glossary to transaction.	N	Content updated.
2.2.3.1 RopOpenMessage Buffer Format	56675 Clarified that InputHandleIndex and OutputHandleIndex reference objects on the server and are not the objects themselves.	N	Content updated.
2.2.3.1.1.3 OpenModeFlags	56514 Changed title of section from "OpenModeFlag" to "OpenModeFlags".	Y	Content updated.
2.2.3.2 RopCreateMessage Buffer Format	56675 Clarified that InputHandleIndex and OutputHandleIndex reference objects on the server and are not the objects themselves.	N	Content updated.
2.2.3.3 RopSaveChangesMessage Buffer Format	56675 Clarified that InputHandleIndex and ResponseHandleIndex reference objects on the server and are not the objects themselves.	N	Content updated.
2.2.3.3 RopSaveChangesMessage Buffer Format	58133 Added product behavior note stating that Exchange Server 2010 returns Success when committing multiple transactions against the same Message object.	Y	Content updated.
2.2.3.3.1.1 SaveFlags	58033 Added reference to access levels in [MS-OXCPRPT].	N	New content added.
2.2.3.4 RopRemoveAllRecipients Buffer Format	56675 Clarified that InputHandleIndex references an object on the server and is not the object itself.	N	Content updated.
2.2.3.5 RopModifyRecipients Buffer Format	56675 Clarified that InputHandleIndex references an object on the server and is not the object itself.	N	Content updated.
2.2.3.5.1.2 RecipientColumns	56517 Clarified contents of RecipientColumns field.	N	Content updated.
2.2.3.5.1.4 RecipientRows	57965 Replaced table of structure members with a link to the same table in the ModifyRecipientRow structure documentation in [MS-OXCROPS].	N	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change Type
2.2.3.6 RopReadRecipients Buffer Format	56675 Clarified that InputHandleIndex references an object on the server and is not the object itself.	N	Content updated.
2.2.3.7 RopReloadCachedInformation Buffer Format	56675 Clarified that InputHandleIndex references an object on the server and is not the object itself.	N	Content updated.
2.2.3.8 RopSetMessageStatus Buffer Format	56675 Clarified that InputHandleIndex references an object on the server and is not the object itself.	N	Content updated.
2.2.3.9 RopGetMessageStatus Buffer Format	56675 Clarified that InputHandleIndex references an object on the server and is not the object itself.	N	Content updated.
2.2.3.10 RopSetReadFlags Buffer Format	56675 Clarified that InputHandleIndex references an object on the server and is not the object itself.	N	Content updated.
2.2.3.10.1.1 WantAsynchronous	56603 Changed RopAsyncProgress to RopProgress, and linked text to [MS-OXCPRPT].	Y	Content updated.
2.2.3.10.1.1 WantAsynchronous	58985 Added description of impact of SUPPORT_PROGRESS flag on asynchronous operation of RopSetReadFlags.	Y	Content updated.
2.2.3.10.2.1 PartialCompletion	56905 Added data type to PartialCompletion field.	N	Content updated.
2.2.3.11 RopSetMessageReadFlag	56675 Clarified that InputHandleIndex and ResponseHandleIndex reference objects on the server and are not the objects themselves.	N	Content updated.
2.2.3.11.1.2 ClientData	56871 Clarified that this parameter references a public message, and not a user.	Y	Content updated.
2.2.3.12 RopOpenAttachment	56675 Clarified that InputHandleIndex and OutputHandleIndex reference objects on the server and are not the objects themselves.	N	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change Type
2.2.3.13 RopCreateAttachment	56675 Clarified that InputHandleIndex and OutputHandleIndex reference objects on the server and are not the objects themselves.	N	Content updated.
2.2.3.14 RopDeleteAttachment	56675 Clarified that InputHandleIndex references an object on the server and is not the object itself.	N	Content updated.
2.2.3.15 RopSaveChangesAttachment Buffer Format	56675 Clarified that InputHandleIndex and ResponseHandleIndex reference objects on the server and are not the objects themselves.	N	Content updated.
2.2.3.16 RopOpenEmbeddedMessage Buffer Format	56675 Clarified that InputHandleIndex and OutputHandleIndex reference objects on the server and are not the objects themselves.	N	Content updated.
2.2.3.16.2.9 RecipientRows	58147 Removed "The server MAY NOT return data in RecipientRows".	N	Content updated.
2.2.3.17 RopGetAttachmentTable Buffer Format	56675 Clarified that InputHandleIndex and OutputHandleIndex reference objects on the server and are not the objects themselves.	N	Content updated.
2.2.3.18 RopGetValidAttachments	58208 Added topic.	Y	New content added.
2.2.3.18.1 Request Buffer	58208 Added topic.	Y	New content added.
2.2.3.18.2 Response Buffer	58208 Added topic.	Y	New content added.
3.1.1.1 Global	56520 Added topic.	Y	Content updated.
3.1.1.2 Per Mailbox	56520 Added topic.	Y	New content added.
3.1.1.3 Per Message Object	56520 Added topic.	Y	New content

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change Type
			added.
3.1.4.3 Saving Message Object Changes	56602 Clarified that the access level pertains to the Message object, as opposed to the Message object handle.	N	Content updated.
3.1.4.6 Reading Recipients	56524 Clarified when the client can use the return result from RopOpenMessage and when it has to use a series of RopReadRecipients requests to retrieve all of the recipients.	Y	Content updated.
3.1.4.6 Reading Recipients	56904 Updated RowId value to be four bytes.	Y	Content updated.
3.1.4.13 Setting Attachment Object Content	57552 Added section reference to [MS-OXCPRPT].	N	New content added.
3.1.4.19 Linking a Contact Object	56520 Added topic.	Y	New content added.
3.2.1 Abstract Data Model	56525 Added detailed Abstract Data Model information.	Y	Content updated.
3.2.1.1 Global	56525 Added new section.	Y	New content added.
3.2.1.2 Per Mailbox	56525 Added new section.	Y	New content added.
3.2.1.3 Per Message Object	56525 Added new section.	Y	New content added.
3.2.5.1 RopOpenMessage	58180 Replaced error description for ecNotSupported with ecNotFound.	Y	Content updated.
3.2.5.1 RopOpenMessage	56903 Added a condition for the ecNotFound error code.	N	Content updated.
3.2.5.2 RopCreateMessage	56709 Changed the initial data for PidTagMessageSize to refer to the specification of the property.	Y	Content updated.
3.2.5.4 RopRemoveAllRecipients	56680 Clarified behavior on different Message	N	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change Type
	object handles prior to the server receiving a RopSaveChangesMessage request from the client.		
3.2.5.4 RopRemoveAllRecipients	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.
3.2.5.5 RopModifyRecipients	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.
3.2.5.6 RopReadRecipients	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.
3.2.5.6 RopReadRecipients	58178 Clarified that a RowId value of 0x0000 will fill the buffer with RecipientRow structures, starting from the first recipient.	Y	Content updated.
3.2.5.6 RopReadRecipients	56904 Updated RowId value to be four bytes.	Y	Content updated.
3.2.5.7 RopReloadCachedInformation	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.
3.2.5.8 RopSetMessageStatus	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.
3.2.5.9 RopGetMessageStatus	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.
3.2.5.10 RopSetReadFlags	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.
3.2.5.10 RopSetReadFlags	56905 Added content describing the operation of the PartialCompletion flag.	Y	Content updated.
3.2.5.10 RopSetReadFlags	58985 Added behavior related to SUPPORT_PROGRESS flag.	Y	Content updated.
3.2.5.11 RopSetMessageReadFlag	56871 Specified how the server processes the ClientData request parameter.	Y	Content updated.
3.2.5.11 RopSetMessageReadFlag	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change Type
3.2.5.12 RopOpenAttachment	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.
3.2.5.13 RopCreateAttachment	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.
3.2.5.15 RopDeleteAttachment	56969 Specified that the changes made by this ROP are not committed until the client calls RopSaveChangesMessage.	Y	Content updated.
3.2.5.15 RopDeleteAttachment	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.
3.2.5.16 RopOpenEmbeddedMessage	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.
3.2.5.17 RopGetAttachmentTable	57465 Changed ecNotSupported (0x80040102) to ecNullObject (0x000004b9).	Y	Content updated.
4.2 Name to Id Mapping	57552 Added section reference to [MS-OXCPRPT].	N	New content added.
4.4.3 Setting Properties	57552 Added section references to [MS-OXCPRPT].	N	New content added.
4.5.3 Setting Properties	57552 Added section references to [MS-OXCPRPT].	N	New content added.
4.6 Setting Message Properties	57552 Added section reference to [MS-OXCPRPT].	N	New content added.
6 Appendix A: Product Behavior	58985 Added Outlook 2010 SP1 Beta to the product list.	Y	New content added.
3.1.1.1 Linking a Contact Object	56520 Moved section from Abstract Data Model to Higher Layer Triggered Events.	Y	Content updated.

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