[MS-OXOCNTC]:
Contact Object Protocol

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Revision Summary

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Table of Contents

1 Introduction 9
1.1 Glossary 9
1.2 References 10
1.2.1 Normative References 10
1.2.2 Informative References 11
1.3 Overview 11
1.4 Relationship to Other Protocols 11
1.5 Prerequisites/Preconditions 11
1.6 Applicability Statement 11
1.7 Versioning and Capability Negotiation 12
1.8 Vendor-Extensible Fields 12
1.9 Standards Assignments 12

2 Messages 13
2.1 Transport 13
2.2 Message Syntax 13
2.2.1 Contact Object Properties 13
2.2.1.1 Contact Name Properties 13
2.2.1.1.1 PidTagNickname Property 13
2.2.1.1.2 PidTagGeneration Property 13
2.2.1.1.3 PidTagDisplayNamePrefix Property 13
2.2.1.1.4 PidTagSurname Property 14
2.2.1.1.5 PidTagMiddleName Property 14
2.2.1.1.6 PidTagGivenName Property 14
2.2.1.1.7 PidTagInitials Property 14
2.2.1.1.8 PidTagDisplayName Property 14
2.2.1.1.9 PidLidYomiFirstName Property 14
2.2.1.1.10 PidLidYomiLastName Property 14
2.2.1.1.11 PidLidFileUnder Property 14
2.2.1.1.12 PidLidFileUnderId Property 15
2.2.1.1.13 PidLidFileUnderList Property 16
2.2.1.2 Electronic Address Properties 16
2.2.1.2.1 PidLidEmail1DisplayName, PidLidEmail2DisplayName, PidLidEmail3DisplayName Properties 18
2.2.1.2.2 PidLidEmail1AddressType, PidLidEmail2AddressType, PidLidEmail3AddressType Properties 18
2.2.1.2.3 PidLidEmail1EmailAddress, PidLidEmail2EmailAddress, PidLidEmail3EmailAddress Properties 18
2.2.1.2.4 PidLidEmail1OriginalDisplayName, PidLidEmail2OriginalDisplayName, PidLidEmail3OriginalDisplayName Properties 18
2.2.1.2.5 PidLidEmail1OriginalEntryId, PidLidEmail2OriginalEntryId, PidLidEmail3OriginalEntryId Properties 19
2.2.1.2.6 PidTagPrimaryFaxNumber, PidTagBusinessFaxNumber, PidTagHomeFaxNumber Properties 19
2.2.1.2.7 PidLidFax1AddressType, PidLidFax2AddressType, PidLidFax3AddressType Properties 19
2.2.1.2.8 PidLidFax1EmailAddress, PidLidFax2EmailAddress, PidLidFax3EmailAddress Properties 19
2.2.1.2.9 PidLidFax1OriginalDisplayName, PidLidFax2OriginalDisplayName, PidLidFax3OriginalDisplayName Properties 20

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2.2.1.2.10 PidLidFax1OriginalEntryId, PidLidFax2OriginalEntryId, PidLidFax3OriginalEntryId Properties 20
2.2.1.2.11 PidLidAddressBookProviderEmailList Property 20
2.2.1.2.12 PidLidAddressBookProviderArrayType Property 21
2.2.1.3 Physical Address Properties 21
2.2.1.3.1 PidLidWorkAddressStreet, PidTagHomeAddressStreet, PidTagOtherAddressStreet, PidTagStreetAddress Properties 22
2.2.1.3.2 PidLidWorkAddressCity, PidTagHomeAddressCity, PidTagOtherAddressCity, PidTagLocality Properties 22
2.2.1.3.3 PidLidWorkAddressState, PidTagHomeAddressStateOrProvince, PidTagOtherAddressStateOrProvince, PidTagStateOrProvince Properties 22
2.2.1.3.4 PidLidWorkAddressPostalCode, PidTagHomeAddressPostalCode, PidTagOtherAddressPostalCode, PidTagPostalCode Properties 23
2.2.1.3.5 PidLidWorkAddressCountry, PidTagHomeAddressCountry, PidTagOtherAddressCountry, PidTagCountry Properties 23
2.2.1.3.6 PidLidWorkAddressCountryCode, PidLidHomeAddressCountryCode, PidLidOtherAddressCountryCode, PidLidAddressCountryCode Properties 23
2.2.1.3.7 PidLidWorkAddressPostOfficeBox, PidTagHomeAddressPostOfficeBox, PidTagOtherAddressPostOfficeBox, PidTagPostOfficeBox Properties 23
2.2.1.3.8 PidLidWorkAddress, PidLidHomeAddress, PidLidOtherAddress, PidTagPostalAddress Properties 23
2.2.1.3.9 PidLidPostalAddressId Property 24
2.2.1.4 Telephone Properties 25
2.2.1.4.1 PidTagPagerTelephoneNumber Property 25
2.2.1.4.2 PidTagCallbackTelephoneNumber Property 25
2.2.1.4.3 PidTagBusinessTelephoneNumber Property 25
2.2.1.4.4 PidTagHomeTelephoneNumber Property 25
2.2.1.4.5 PidTagPrimaryTelephoneNumber Property 25
2.2.1.4.6 PidTagBusiness2TelephoneNumber Property 25
2.2.1.4.7 PidTagMobileTelephoneNumber Property 25
2.2.1.4.8 PidTagRadioTelephoneNumber Property 26
2.2.1.4.9 PidTagCarTelephoneNumber Property 26
2.2.1.4.10 PidTagOtherTelephoneNumber Property 26
2.2.1.4.11 PidTagAssistantTelephoneNumber Property 26
2.2.1.4.12 PidTagHome2TelephoneNumber Property 26
2.2.1.4.13 PidTagTelecommunicationsDeviceForDeafTelephoneNumber Property 26
2.2.1.4.14 PidTagCompanyMainTelephoneNumber Property 26
2.2.1.4.15 PidTagTelexNumber Property 26
2.2.1.4.16 PidTagIsdnNumber Property 27
2.2.1.5 Event Properties 27
2.2.1.5.1 PidTagBirthday Property 27
2.2.1.5.2 PidLidBirthdayLocal Property 27
2.2.1.5.3 PidLidBirthdayEventEntryId Property 27
2.2.1.5.4 PidTagWeddingAnniversary Property 27
2.2.1.5.5 PidLidWeddingAnniversaryLocal Property 27
2.2.1.5.6 PidLidAnniversaryEventEntryId Property 28
2.2.1.6 Professional Properties 28
2.2.1.6.1 PidTagTitle Property 28
2.2.1.6.2 PidTagCompanyName Property 28
2.2.1.6.3 PidTagDepartmentName Property 28
2.2.1.6.4 PidLidDepartment Property 28
2.2.1.6.5 PidTagOfficeLocation Property 28
2.2.1.6.6 PidTagManagerName Property 29

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2.2.1.6.7 PidTagAssistant Property 29
2.2.1.6.8 PidLidYomiCompanyName Property 29
2.2.1.6.9 PidTagProfession Property 29
2.2.1.7 Business Card Properties 29
2.2.1.7.1 PidLidBusinessCardDisplayDefinition Property 29
2.2.1.7.1.1 FieldInfo Structure 32
2.2.1.7.1.1.1 Properties Used for a Business Card Text Field 33
2.2.1.7.2 PidLidBusinessCardCardPicture Property 34
2.2.1.7.3 PidLidContactUserField1, PidLidContactUserField2, PidLidContactUserField3, PidLidContactUserField4 Properties 35
2.2.1.8 Contact Photo Properties 35
2.2.1.8.1 PidLidHasPicture Property 35
2.2.1.8.2 PidTagAttachmentContactPhoto Property 35
2.2.1.8.3 Contact Photo Attachment 35
2.2.1.9 Contact Aggregation Properties 36
2.2.1.9.1 PidLidContactLinkedGlobalAddressListEntryId Property 36
2.2.1.9.2 PidLidContactLinkGlobalAddressListLinkId Property 36
2.2.1.9.3 PidLidContactLinkGlobalAddressListLinkState Property 36
2.2.1.9.4 PidLidContactLinkLinkRejectHistory Property 36
2.2.1.9.5 PidLidContactLinkSMTPAddressCache Property 36
2.2.1.9.6 PidLidIsContactLinked Property 36
2.2.1.9.7 PidTagOscSyncEnabled Property 37
2.2.1.10 Other Contact Properties 37
2.2.1.10.1 PidLidReferenceEntryId Property 37
2.2.1.10.2 PidTagHobbies Property 37
2.2.1.10.3 PidTagSpouseName Property 37
2.2.1.10.4 PidTagLanguage Property 37
2.2.1.10.5 PidTagLocation Property 37
2.2.1.10.6 PidLidInstantMessagingAddress Property 37
2.2.1.10.7 PidTagOrganizationalIdNumber Property 38
2.2.1.10.8 PidTagCustomerId Property 38
2.2.1.10.9 PidTagGovernmentIdNumber Property 38
2.2.1.10.10 PidLidFreeBusyLocation Property 38
2.2.1.10.11 PidTagAccount Property 38
2.2.1.10.12 PidLidHtml Property 38
2.2.1.10.13 PidTagPersonalHomePage Property 38
2.2.1.10.14 PidTagBusinessHomePage Property 39
2.2.1.10.15 PidTagFtpSite Property 39
2.2.1.10.16 PidTagComputerNetworkName Property 39
2.2.1.10.17 PidTagChildrensNames Property 39
2.2.1.10.18 PidLidContactCharacterSet Property 39
2.2.1.10.19 PidLidAutoLog Property 39
2.2.1.10.20 PidTagGender Property 39
2.2.1.10.21 PidTagReferredByName Property 40
2.2.1.10.22 PidLidContactItemData Property 40
2.2.1.10.23 PidTagUserX509Certificate Property 41
2.2.1.10.24 PidLidBilling Property 41
2.2.1.11 Additional Property Constraints 41
2.2.1.11.1 PidTagNormalizedSubject Property 41
2.2.1.11.2 PidTagMessageClass Property 41
2.2.2 Personal Distribution List Properties 41
2.2.2.1 Personal Distribution List Name Properties 41
2.2.2.1.1 PidTagDisplayName Property 42

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2.2.2.1.2 PidLidDistributionListName Property 42
2.2.2.1.3 PidLidFileUnder Property 42
2.2.2.1.4 PidLidFileUnderId Property 42
2.2.2.2 Personal Distribution List Member Properties 42
2.2.2.2.1 PidLidDistributionListMembers Property 42
2.2.2.2.2 PidLidDistributionListOneOffMembers Property 42
2.2.2.2.3 PidLidDistributionListChecksum Property 43
2.2.2.2.4 PidLidDistributionListStream Property 43
2.2.2.2.4.1 DistListMemberInfo Structure 45
2.2.2.2.4.1.1 WrappedEntryId Structure 46
2.2.2.3 Other Personal Distribution List Properties 47
2.2.2.3.1 PidLidAddressBookProviderArrayType Property 47
2.2.2.4 Additional Property Constraints 48
2.2.2.4.1 PidTagNormalizedSubject Property 48
2.2.2.4.2 PidTagMessageClass Property 48
2.2.3 Contacts-Related Folders 48

3 Protocol Details 49
3.1 Client Details 49
3.1.1 Abstract Data Model 49
3.1.2 Timers 49
3.1.3 Initialization 49
3.1.4 Higher-Layer Triggered Events 49
3.1.4.1 Contact Object Events 49
3.1.4.1.1 Creating a Contact 49
3.1.4.1.2 Deleting a Contact 49
3.1.4.1.3 Modifying a Contact 49
3.1.4.2 Personal Distribution List Events 50
3.1.4.2.1 Creating a Personal Distribution List 50
3.1.4.2.2 Deleting a Personal Distribution List 50
3.1.4.2.3 Modifying a Personal Distribution List 50
3.1.5 Message Processing Events and Sequencing Rules 50
3.1.5.1 Modifying a Contact Name Property 50
3.1.5.2 Modifying a Physical Address Property 51
3.1.5.3 Modifying an E-Mail Address Property 52
3.1.5.4 Updating a FAX Number 53
3.1.5.5 Modifying an Event Property 54
3.1.5.6 Modifying a Business Card Property 55
3.1.5.7 Modifying a Contact Photo Property 55
3.1.5.8 Naming a Personal Distribution List 55
3.1.5.9 Adding a Member to a Personal Distribution List 56
3.1.5.10 Removing a Member from a Personal Distribution List 56
3.1.5.11 Updating the Checksum of a Personal Distribution List 56
3.1.6 Timer Events 57
3.1.7 Other Local Events 57
3.2 Server Details 57
3.2.1 Abstract Data Model 57
3.2.2 Timers 57
3.2.3 Initialization 57
3.2.4 Higher-Layer Triggered Events 57
3.2.5 Message Processing Events and Sequencing Rules 57
3.2.6 Timer Events 57
3.2.7 Other Local Events 58

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4 Protocol Examples 59
4.1 Creating a Contact 59
4.2 Creating a Personal Distribution List 67

5 Security 73
5.1 Security Considerations for Implementers 73
5.2 Index of Security Parameters 73

6 Appendix A: Product Behavior 74

7 Change Tracking 76

8 Index 77

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1 Introduction

The Contact Object Protocol serves as the basic organizational unit for the personal information of a user's associates and acquaintances. This protocol also serves as the basic organizational unit for lists of **email addresses**.

Sections 1.8, 2, and 3 of this specification are normative and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in [RFC2119]. Sections 1.5 and 1.9 are also normative but does not contain those terms. All other sections and examples in this specification are informative.

1.1 Glossary

The following terms are defined in [MS-GLOS]:

Coordinated Universal Time (UTC)
cyclic redundancy check (CRC)
flags
GUID
handle
little-endian
Unicode

The following terms are defined in [MS-OXGLOS]:

action
Address Book object
address type
Appointment object
Attachment object
character set
condition
contact
Contact object
Contacts folder
distribution list
email address
EntryID
File Transfer Protocol (FTP)
Folder object
free/busy status
Global Address List (GAL)
Integrated Services Digital Network (ISDN)
Joint Photographic Experts Group (JPEG)
Journal object
locale
long ID (LID)
mail user
mailbox
Message object
message store
multivalue property
one-off EntryID
Personal Distribution List object
point

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Portable Network Graphics (PNG)
property ID
property name
recipient
remote operation (ROP)
ROP request
Simple Mail Transfer Protocol (SMTP)
Uniform Resource Locator (URL)

The following terms are specific to this document:

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

1.2 References

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

1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information.

[ISO/IEC8802-3] ISO/IEC, "Information technology -- Telecommunications and information exchange between systems -- Local and metropolitan area networks -- Specific requirements -- Part 3", Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications, ISO/IEC 8802-3:2000, http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=31002

[MS-OXCDATA] Microsoft Corporation, "Data Structures".

[MS-OXCFOLD] Microsoft Corporation, "Folder Object Protocol".

[MS-OXCICAL] Microsoft Corporation, "iCalendar to Appointment Object Conversion Algorithm".

[MS-OXCMSG] Microsoft Corporation, "Message and Attachment Object Protocol".

[MS-OXCPRPT] Microsoft Corporation, "Property and Stream Object Protocol".

[MS-OXCROPS] Microsoft Corporation, "Remote Operations (ROP) List and Encoding Protocol".

[MS-OXOABK] Microsoft Corporation, "Address Book Object Protocol".

[MS-OXOCAL] Microsoft Corporation, "Appointment and Meeting Object Protocol".

[MS-OXOMSG] Microsoft Corporation, "Email Object Protocol".

[MS-OXPROPS] Microsoft Corporation, "Exchange Server Protocols Master Property List".

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

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[RFC2247] Kille, S., Wahl, M., Grimstad, A., et al., "Using Domains in LDAP/X.500 Distinguished Names", RFC 2247, January 1998, http://www.ietf.org/rfc/rfc2247.txt

[RFC5321] Klensin, J., "Simple Mail Transfer Protocol", RFC 5321, October 2008, http://rfc-editor.org/rfc/rfc5321.txt

[RFC959] Postel, J., and Reynolds, J., "File Transfer Protocol (FTP)", RFC 959, October 1985, http://www.ietf.org/rfc/rfc959.txt

1.2.2 Informative References

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

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

[MS-OXPROTO] Microsoft Corporation, "Exchange Server Protocols System Overview".

[MS-OXWSCOS] Microsoft Corporation, "Unified Contact Store Web Service Protocol".

1.3 Overview

The Contact Object Protocol defines a **Contact object** for storing and maintaining information about an associate of the user. The properties of a Contact object specify the associate's phone numbers, email addresses, mailing addresses, and other information. Details about all of a user's associates can be easily maintained through the use of Contact objects. This protocol also defines a **Personal Distribution List object** for storing a collection of email addresses. The Personal Distribution List object simplifies email distribution to multiple **recipients (2)**. An email that is addressed to the **distribution list** is sent to all recipients (2) in the distribution list, thereby eliminating the need to address the email to each recipient (2). A Contact object and a Personal Distribution List object are created within the **Contacts folder** in a **message store**.

The Contact Object Protocol extends the Message and Attachment Object Protocol by defining new properties on a **Message object** and by adding constraints to the existing properties of a Message object. For information about the Message and Attachment Object Protocol, see [MS-OXCMSG].

1.4 Relationship to Other Protocols

The Contact Object Protocol extends the Message and Attachment Object Protocol, and, therefore, has the same dependencies. For information about the Message and Attachment Object Protocol, see [MS-OXCMSG].

For conceptual background information and overviews of the relationships and interactions between this and other protocols, see [MS-OXPROTO].

1.5 Prerequisites/Preconditions

The Contact Object Protocol has the same prerequisites and preconditions as the Message and Attachment Object Protocol, as described in [MS-OXCMSG].

1.6 Applicability Statement

A client can use this protocol to organize a user's **contact (3)** information and distribution lists in the user's **mailbox**.<1>

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1.7 Versioning and Capability Negotiation

None.

1.8 Vendor-Extensible Fields

This protocol provides no vendor-extensibility beyond what is already specified in [MS-OXCMSG].

1.9 Standards Assignments

None.

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2 Messages

2.1 Transport

The Contact Object Protocol uses the same underlying transport as that used by the Message and Attachment Object protocol, which is specified in [MS-OXCMSG].

2.2 Message Syntax

Contact objects and Personal Distribution List objects can be created and modified by clients and servers. Except where noted, this section defines constraints under which both clients and servers operate.

Protocol clients operate on Contact objects and Personal Distribution List objects by using the Message and Attachment Object Protocol, as specified in [MS-OXCMSG], and the Folder Object Protocol, as specified in [MS-OXCFOLD]. The details of how a protocol server operates on Contact objects and Personal Distribution List objects are implementation-dependent, but the results of any such operations MUST be exposed to clients in a manner that is consistent with this protocol.

Unless otherwise specified, a Contact object and a Personal Distribution List object adhere to all property constraints specified in [MS-OXPROPS] and [MS-OXCMSG].

2.2.1 Contact Object Properties

Properties that are used in groups to define components of a Contact object are specified in sections 2.2.1.1 through 2.2.1.8. Standalone properties of a Contact object are specified in sections 2.2.1.10 and 2.2.1.11. Each property is set only when user data needs to be stored.

2.2.1.1 Contact Name Properties

Contact Name properties can be set on a Contact object to specify the name of the person represented by the contact (3).

2.2.1.1.1 PidTagNickname Property

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

The **PidTagNickname** property ([MS-OXPROPS] section 2.796) specifies the nickname of the contact (3). This property is optional.

2.2.1.1.2 PidTagGeneration Property

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

The **PidTagGeneration** property ([MS-OXPROPS] section 2.703) specifies the generation suffix of the contact (3), such as "Jr.", "Sr.", or "III". This property is optional.

2.2.1.1.3 PidTagDisplayNamePrefix Property

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

The **PidTagDisplayNamePrefix** property ([MS-OXPROPS] section 2.668) specifies the title of the contact (3), such as "Mr." or "Mrs.". This property is optional.

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2.2.1.1.4 PidTagSurname Property

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

The **PidTagSurname** property ([MS-OXPROPS] section 2.1024) specifies the surname (family name) of the contact (3). This property is optional.

2.2.1.1.5 PidTagMiddleName Property

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

The **PidTagMiddleName** property ([MS-OXPROPS] section 2.791) specifies the middle name(s) of the contact (3). This property is optional.

2.2.1.1.6 PidTagGivenName Property

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

The **PidTagGivenName** property ([MS-OXPROPS] section 2.704) specifies the given name (first name) of the contact (3). This property is optional.

2.2.1.1.7 PidTagInitials Property

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

The **PidTagInitials** property ([MS-OXPROPS] section 2.730) specifies the initials of the contact (3). This property is optional.

2.2.1.1.8 PidTagDisplayName Property

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

The **PidTagDisplayName** property ([MS-OXPROPS] section 2.667) specifies the full name of the contact (3). The full name is formatted according to an implementation-dependent algorithm that uses the values of the **PidTagDisplayNamePrefix** (section 2.2.1.1.3), **PidTagGivenName** (section 2.2.1.1.6), **PidTagMiddleName** (section 2.2.1.1.5), **PidTagSurname** (section 2.2.1.1.4), and **PidTagGeneration** (section 2.2.1.1.2) properties. This property is optional.

2.2.1.1.9 PidLidYomiFirstName Property

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

The **PidLidYomiFirstName** property ([MS-OXPROPS] section 2.364) specifies the phonetic pronunciation of the contact's (3) given name. This property is optional.

2.2.1.1.10 PidLidYomiLastName Property

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

The **PidLidYomiLastName** property ([MS-OXPROPS] section 2.365) specifies the phonetic pronunciation of the contact's (3) surname. This property is optional.

2.2.1.1.11 PidLidFileUnder Property

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

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The **PidLidFileUnder** property ([MS-OXPROPS] section 2.132) specifies the name under which to file this contact (3) when displaying a list of contacts (3). The client SHOULD treat this property as an empty string if it is missing from the Contact object. This property is optional.

2.2.1.1.12 PidLidFileUnderId Property

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

The **PidLidFileUnderId** property ([MS-OXPROPS] section 2.133) specifies how to format the value of the **PidLidFileUnder** property (section 2.2.1.1.11) by using the values of other Contact Name properties.

The valid values of The **PidLidFileUnderId** property are shown in the following table. If the **PidLidFileUnderId** property is either missing or set to a value that is not valid, the client can choose its own logic to format the value of the **PidLidFileUnder** property (section 2.2.1.1.11) as other Contact Name properties change.

In the following table, the notation <PropertyName> is used to represent the value of the property specified by *PropertyName*. For example, if the value of the **PidTagGivenName** property (section 2.2.1.1.6) is "Ben", then "<**PidTagGivenName**>" specifies the string "Ben". Other notation: "\r" specifies a carriage return character, "\n" specifies a line feed character, and <space> represents a space character. The table shows the format of the **PidLidFileUnder** property when all of the Contact Name properties are present. If a Contact Name property is not present, the separator characters surrounding it can be removed by the client.

Value of the PidLidFileUnderId property	Format of the PidLidFileUnder property
0x00000000	Empty string.
0x00003001	"<**PidTagDisplayName**>"
0x00003A06	"<**PidTagGivenName**>"
0x00003A11	"<**PidTagSurname**>"
0x00003A16	"<**PidTagCompanyName**>"
0x00008017	"<**PidTagSurname**>,<space><**PidTagGivenName**><space><**PidTagMiddleName**>"
0x00008018	"<**PidTagCompanyName**>\r\n<**PidTagSurname**>,<space><**PidTagGivenName**><space>< **PidTagMiddleName** >"
0x00008019	"<**PidTagSurname**>,<space><**PidTagGivenName**><space><**PidTagMiddleName**>\r\n<**PidTagCompanyName**>"
0x00008030	"<**PidTagSurname**>< **PidTagGivenName** ><space>< **PidTagMiddleName** >"
0x00008031	"<**PidTagSurname**><space><**PidTagGivenName**><space>< **PidTagMiddleName** >"
0x00008032	"<**PidTagCompanyName**>\r\n<**PidTagSurname**><**PidTagGivenName**><space><**PidTagMiddleName**>"
0x00008033	"<**PidTagCompanyName**>\r\n<**PidTagSurname**><space><**PidTagGivenName**><space><**PidTagMiddleName**>"
0x00008034	"<**PidTagSurname**><**PidTagGivenName**><space>< **PidTagMiddleName**

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Value of the PidLidFileUnderId property	Format of the PidLidFileUnder property
	>\r\n<**PidTagCompanyName**>"
0x00008035	"<**PidTagSurname**><space><**PidTagGivenName**><space><**PidTagMiddleName**>\r\n<**PidTagCompanyName**>"
0x00008036	"<**PidTagSurname**><space><**PidTagGivenName**><space><**PidTagMiddleName**><space><**PidTagGeneration**>"
0x00008037	"<**PidTagGivenName**><space><**PidTagMiddleName**><space><**PidTagSurname**><space><**PidTagGeneration**>"
0x00008038	"<**PidTagSurname**><**PidTagGivenName**><space><**PidTagMiddleName**><space><**PidTagGeneration**>"
0xFFFFFFFD	The client or server uses the current value of the **PidLidFileUnder** property and other contact properties to find a best match to one of the previous values in this table.
0xFFFFFFFE	The client or server chooses the default values based on the implementation.
0xFFFFFFFF	The value of the **PidLidFileUnder** property is a user-provided string. In this case, the value of the **PidLidFileUnder** property is not changed when the value of another Contact Name property changes.

2.2.1.1.13 PidLidFileUnderList Property

Type: **PtypMultipleInteger32** ([MS-OXCDATA] section 2.11.1)

The **PidLidFileUnderList** property ([MS-OXPROPS] section 2.134) specifies a list of possible values for the **PidLidFileUnderId** property (section 2.2.1.1.12). Each value in this **multivalue property** MUST be one of the allowed values for the **PidLidFileUnderId** property. The **PidLidFileUnderList** property is set by the client, but it is never used by either the client or the server. This property is optional.

2.2.1.2 Electronic Address Properties

The Contact object has built-in properties for up to three different email addresses (Email1, Email2, and Email3) and three different fax addresses (Primary Fax, Business Fax, and Home Fax). Each of these electronic addresses is optional, and each consists of a group of related properties associated with it.

Unless otherwise specified, when creating or modifying a Contact object, all properties in a group MUST be set, changed, or deleted together at the same time. Specifications of similar properties are grouped together in sections 2.2.1.2.1 through section 2.2.1.2.12. The following table specifies the properties in each Electronic Address group.

Group name	Description	Properties in group
Email1	Defines the first email address for a contact (3).	**PidLidEmail1DisplayName** (section 2.2.1.2.1) **PidLidEmail1AddressType** (section 2.2.1.2.2) **PidLidEmail1EmailAddress** (section 2.2.1.2.3) **PidLidEmail1OriginalDisplayName** (section 2.2.1.2.4)

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Group name	Description	Properties in group
		PidLidEmail1OriginalEntryId (section 2.2.1.2.5)
Email2	Defines the second email address for a contact (3).	**PidLidEmail2DisplayName** (section 2.2.1.2.1) **PidLidEmail2AddressType** (section 2.2.1.2.2) **PidLidEmail2EmailAddress** (section 2.2.1.2.3) **PidLidEmail2OriginalDisplayName** (section 2.2.1.2.4) **PidLidEmail2OriginalEntryId** (section 2.2.1.2.5)
Email3	Defines the third email address for a contact (3).	**PidLidEmail3DisplayName** (section 2.2.1.2.1) **PidLidEmail3AddressType** (section 2.2.1.2.2) **PidLidEmail3EmailAddress** (section 2.2.1.2.3) **PidLidEmail3OriginalDisplayName** (section 2.2.1.2.4) **PidLidEmail3OriginalEntryId** (section 2.2.1.2.5)
Primary Fax	Defines the primary fax address for a contact (3).	**PidTagPrimaryFaxNumber** (section 2.2.1.2.6) **PidLidFax1AddressType** (section 2.2.1.2.7) **PidLidFax1EmailAddress** (section 2.2.1.2.8) **PidLidFax1OriginalDisplayName** (section 2.2.1.2.9) **PidLidFax1OriginalEntryId** (section 2.2.1.2.10)
Business Fax	Defines the business fax address for a contact (3).	**PidTagBusinessFaxNumber** (section 2.2.1.2.6) **PidLidFax2AddressType** (section 2.2.1.2.7) **PidLidFax2EmailAddress** (section 2.2.1.2.8) **PidLidFax2OriginalDisplayName** (section 2.2.1.2.9) **PidLidFax2OriginalEntryId** (section 2.2.1.2.10)
Home Fax	Defines the home fax address for a contact (3).	**PidTagHomeFaxNumber** (section 2.2.1.2.6) **PidLidFax3AddressType** (section 2.2.1.2.7) **PidLidFax3EmailAddress** (section 2.2.1.2.8) **PidLidFax3OriginalDisplayName** (section 2.2.1.2.9) **PidLidFax3OriginalEntryId** (section 2.2.1.2.10)

If any of the email addresses are defined for the contact (3), then the properties **PidLidAddressBookProviderArrayType** (section 2.2.1.2.12) and **PidLidAddressBookProviderEmailList** (section 2.2.1.2.11) MUST be defined as well.

For each email address, if one property is defined, then the entire set of properties MUST be defined, and **PidLidAddressBookProviderArrayType** and **PidLidAddressBookProviderEmailList** MUST be defined as well.

If **PidTagPrimaryFaxNumber**, **PidTagBusinessFaxNumber**, or **PidTagHomeFaxNumber** is defined, then the **PidLidAddressBookProviderArrayType** and **PidLidAddressBookProviderEmailList** properties SHOULD be defined, as well as the rest of the

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Primary Fax, Business Fax, or Home Fax properties, respectively. The client sets the **PidLidAddressBookProviderEmailList** and **PidLidAddressBookProviderArrayType** and Primary Fax, Business Fax, or Home Fax properties only if the client is able to interpret the value of the **PidTagPrimaryFaxNumber**, **PidTagBusinessFaxNumber**, or **PidTagHomeFaxNumber** property, respectively, as an actual fax phone number. The server sets the **PidLidAddressBookProviderEmailList** and **PidLidAddressBookProviderArrayType** properties whenever the **PidTagPrimaryFaxNumber**, **PidTagBusinessFaxNumber**, or **PidTagHomeFaxNumber** property is set.<2>

2.2.1.2.1 PidLidEmail1DisplayName, PidLidEmail2DisplayName, PidLidEmail3DisplayName Properties

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

The **PidLidEmail1DisplayName** ([MS-OXPROPS] section 2.101), **PidLidEmail2DisplayName** ([MS-OXPROPS] section 2.106), and **PidLidEmail3DisplayName** ([MS-OXPROPS] section 2.111) properties specify the user-readable display name for the email address of the contact (3).

2.2.1.2.2 PidLidEmail1AddressType, PidLidEmail2AddressType, PidLidEmail3AddressType Properties

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

The **PidLidEmail1AddressType** ([MS-OXPROPS] section 2.100), **PidLidEmail2AddressType** ([MS-OXPROPS] section 2.105), and **PidLidEmail3AddressType** ([MS-OXPROPS] section 2.110) properties specify the **address type** of the electronic address for the contact (3). If one of these properties is present, the property value MUST be a valid address type. The **RopGetAddressTypes remote operation (ROP)** ([MS-OXCROPS] section 2.2.7.3) can be used to get a list of the valid address types; a third-party-defined address type is also valid. Address types commonly used by the client and server are "SMTP" and "EX".

2.2.1.2.3 PidLidEmail1EmailAddress, PidLidEmail2EmailAddress, PidLidEmail3EmailAddress Properties

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

The **PidLidEmail1EmailAddress** ([MS-OXPROPS] section 2.102), **PidLidEmail2EmailAddress** ([MS-OXPROPS] section 2.107), and **PidLidEmail3EmailAddress** ([MS-OXPROPS] section 2.112) properties specify the email address of the contact (3). The format of an email address is determined by its address type. Therefore, the values of these properties MUST be appropriate for the address types specified for these email addresses. Address types are specified by the **PidLidEmail1AddressType** (section 2.2.1.2.2), **PidLidEmail2AddressType** (section 2.2.1.2.2), and **PidLidEmail3AddressType** (section 2.2.1.2.2) properties. The client and server commonly use the "SMTP" and "EX" address types. The format of an "SMTP" email address is specified in [RFC5321]; the format of an "EX" email address is specified in [RFC2247].

The address type is intended to provide an avenue for various third-party delivery mechanisms to define their own email address format. A Contact object merely stores the address type and the email address; the address type and the email address have no special meaning in the context of this protocol.

2.2.1.2.4 PidLidEmail1OriginalDisplayName, PidLidEmail2OriginalDisplayName, PidLidEmail3OriginalDisplayName Properties

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

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The **PidLidEmail1OriginalDisplayName** ([MS-OXPROPS] section 2.103), **PidLidEmail2OriginalDisplayName** ([MS-OXPROPS] section 2.108), and **PidLidEmail3OriginalDisplayName** ([MS-OXPROPS] section 2.113) properties specify the **Simple Mail Transfer Protocol (SMTP)** email address corresponding to the email address specified in section 2.2.1.2.3 for the Contact object. If the value of the **PidLidEmail1AddressType** (section 2.2.1.2.2), **PidLidEmail2AddressType** (section 2.2.1.2.2), or **PidLidEmail3AddressType** (section 2.2.1.2.2) property is "SMTP", then the value of the respective **PidLidEmail1OriginalDisplayName**, **PidLidEmail2OriginalDisplayName**, or **PidLidEmail3OriginalDisplayName** property SHOULD equal the value of the respective **PidLidEmail1EmailAddress** (section 2.2.1.2.3), **PidLidEmail2EmailAddress** (section 2.2.1.2.3), or **PidLidEmail3EmailAddress** (section 2.2.1.2.3) property; otherwise, the values do not have to be equal. The purpose of the **PidLidEmail1OriginalDisplayName**, **PidLidEmail2OriginalDisplayName**, and **PidLidEmail3OriginalDisplayName** properties is to display an alternative user-friendly address that is equivalent to the one in the **PidLidEmail1EmailAddress**, **PidLidEmail2EmailAddress**, or **PidLidEmail3EmailAddress** property.

2.2.1.2.5 PidLidEmail1OriginalEntryId, PidLidEmail2OriginalEntryId, PidLidEmail3OriginalEntryId Properties

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

The **PidLidEmail1OriginalEntryId** ([MS-OXPROPS] section 2.104), **PidLidEmail2OriginalEntryId** ([MS-OXPROPS] section 2.109) and **PidLidEmail3OriginalEntryId** ([MS-OXPROPS] section 2.114) properties specify the **EntryID** of the object corresponding to this electronic address. It MUST be either a **one-off EntryID** for this electronic address or a valid **Address Book object** EntryID.

2.2.1.2.6 PidTagPrimaryFaxNumber, PidTagBusinessFaxNumber, PidTagHomeFaxNumber Properties

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

The **PidTagPrimaryFaxNumber** ([MS-OXPROPS] section 2.970), **PidTagBusinessFaxNumber** ([MS-OXPROPS] section 2.691), and **PidTagHomeFaxNumber** ([MS-OXPROPS] section 2.809) properties specify the fax number for the contact (3). The string MUST NOT be longer than 255 characters, not including the terminating null character. There are no other restrictions on the format of these properties.

2.2.1.2.7 PidLidFax1AddressType, PidLidFax2AddressType, PidLidFax3AddressType Properties

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

The **PidLidFax1AddressType** ([MS-OXPROPS] section 2.117), **PidLidFax2AddressType** ([MS-OXPROPS] section 2.121), and **PidLidFax3AddressType** ([MS-OXPROPS] section 2.125) properties specify the address type of the electronic address for the contact (3). These properties, if present, MUST be set to "FAX".

2.2.1.2.8 PidLidFax1EmailAddress, PidLidFax2EmailAddress, PidLidFax3EmailAddress Properties

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

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The **PidLidFax1EmailAddress** ([MS-OXPROPS] section 2.118), **PidLidFax2EmailAddress** ([MS-OXPROPS] section 2.122), and **PidLidFax3EmailAddress** ([MS-OXPROPS] section 2.126) properties specify a user-friendly combination of the display name and the corresponding fax number for the contact (3). These properties, if present, SHOULD each contain a user-readable display name, followed by the "@" character, followed by a fax number.

2.2.1.2.9 PidLidFax1OriginalDisplayName, PidLidFax2OriginalDisplayName, PidLidFax3OriginalDisplayName Properties

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

The **PidLidFax1OriginalDisplayName** ([MS-OXPROPS] section 2.119), **PidLidFax2OriginalDisplayName** ([MS-OXPROPS] section 2.123), and **PidLidFax3OriginalDisplayName** ([MS-OXPROPS] section 2.127) properties specify the normalized subject for the contact (3). These properties, if present, MUST each be set to the same value as **PidTagNormalizedSubject** ([MS-OXCMSG] section 2.2.1.10), as specified in section 2.2.1.11.1.

2.2.1.2.10 PidLidFax1OriginalEntryId, PidLidFax2OriginalEntryId, PidLidFax3OriginalEntryId Properties

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

The **PidLidFax1OriginalEntryId** ([MS-OXPROPS] section 2.120), **PidLidFax2OriginalEntryId** ([MS-OXPROPS] section 2.124), and **PidLidFax3OriginalEntryId** ([MS-OXPROPS] section 2.129) properties specify the one-off EntryID corresponding to this fax address.

2.2.1.2.11 PidLidAddressBookProviderEmailList Property

Type: **PtypMultipleInteger32** ([MS-OXCDATA] section 2.11.1)

The **PidLidAddressBookProviderEmailList** property ([MS-OXPROPS] section 2.2) specifies which Electronic Address properties are set on the Contact object. Each **PtypInteger32** value in this property MUST be unique in the property and MUST be set to one of the values in the following table. If this property is set, the **PidLidAddressBookProviderArrayType** property (section 2.2.1.2.12) MUST also be set. These two properties MUST be kept synchronized with each other.

For example, if one of the values in the **PidLidAddressBookProviderEmailList** property is 0x00000000, then the **PidLidAddressBookProviderArrayType** property would have the bit 0x00000001 set.

Value	Meaning
0x00000000	Email1 is defined for the contact (3).
0x00000001	Email2 is defined for the contact (3).
0x00000002	Email3 is defined for the contact (3).
0x00000003	Business Fax is defined for the contact (3).
0x00000004	Home Fax is defined for the contact (3).
0x00000005	Primary Fax is defined for the contact (3).

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2.2.1.2.12 PidLidAddressBookProviderArrayType Property

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

The **PidLidAddressBookProviderArrayType** property ([MS-OXPROPS] section 2.1) specifies the state of the contact's (3) electronic addresses and represents a set of bit **flags**. The value of the **PidLidAddressBookProviderArrayType** property MUST be a combination of flags that specify the state of the Contact object. Individual flags are specified in the following table. If this property is set, the **PidLidAddressBookProviderEmailList** property (section 2.2.1.2.11) MUST be set as well. These two properties MUST be kept in sync with each other.

For example, if this property has the bit 0x00000001 set, then one of the values of the **PidLidAddressBookProviderEmailList** property would be 0x00000000.

Bit	Meaning
0x00000001	Email1 is defined for the contact (3).
0x00000002	Email2 is defined for the contact (3).
0x00000004	Email3 is defined for the contact (3).
0x00000008	Business Fax is defined for the contact (3).
0x00000010	Home Fax is defined for the contact (3).
0x00000020	Primary Fax is defined for the contact (3).

2.2.1.3 Physical Address Properties

The Contact object provides built-in support for three physical addresses: Home Address, Work Address, and Other Address. One of the addresses can be marked as the Mailing Address. Each of these physical addresses is optional, and each consists of a group of related properties.

When creating or modifying a Contact object, all properties in a group MUST be set, changed, or deleted together at the same time. Specifications of similar properties are grouped together in sections 2.2.1.3.1 through 2.2.1.3.9.

Unless otherwise specified, for each physical address, when one property is set, all of the properties for that address MUST also be set. The following table specifies the properties in each Physical Address group.

Group name	Properties in group
Home Address	**PidTagHomeAddressStreet** (section 2.2.1.3.1) **PidTagHomeAddressCity** (section 2.2.1.3.2) **PidTagHomeAddressStateOrProvince** (section 2.2.1.3.3) **PidTagHomeAddressPostalCode** (section 2.2.1.3.4) **PidTagHomeAddressCountry** (section 2.2.1.3.5) **PidLidHomeAddressCountryCode** (section 2.2.1.3.6) **PidTagHomeAddressPostOfficeBox** (section 2.2.1.3.7) **PidLidHomeAddress** (section 2.2.1.3.8)
Work Address	**PidLidWorkAddressStreet** (section 2.2.1.3.1) **PidLidWorkAddressCity** (section 2.2.1.3.2)

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Group name	Properties in group
	PidLidWorkAddressState (section 2.2.1.3.3) **PidLidWorkAddressPostalCode** (section 2.2.1.3.4) **PidLidWorkAddressCountry** (section 2.2.1.3.5) **PidLidWorkAddressCountryCode** (section 2.2.1.3.6) **PidLidWorkAddressPostOfficeBox** (section 2.2.1.3.7) **PidLidWorkAddress** (section 2.2.1.3.8)
Other Address	**PidTagOtherAddressStreet** (section 2.2.1.3.1) **PidTagOtherAddressCity** (section 2.2.1.3.2) **PidTagOtherAddressStateOrProvince** (section 2.2.1.3.3) **PidTagOtherAddressPostalCode** (section 2.2.1.3.4) **PidTagOtherAddressCountry** (section 2.2.1.3.5) **PidLidOtherAddressCountryCode** (section 2.2.1.3.6) **PidTagOtherAddressPostOfficeBox** (section 2.2.1.3.7) **PidLidOtherAddress** (section 2.2.1.3.8)
Mailing Address	**PidTagStreetAddress** (section 2.2.1.3.1) **PidTagLocality** (section 2.2.1.3.2) **PidTagStateOrProvince** (section 2.2.1.3.3) **PidTagPostalCode** (section 2.2.1.3.4) **PidTagCountry** (section 2.2.1.3.5) **PidLidAddressCountryCode** (section 2.2.1.3.6) **PidTagPostOfficeBox** (section 2.2.1.3.7) **PidTagPostalAddress** (section 2.2.1.3.8)

2.2.1.3.1 PidLidWorkAddressStreet, PidTagHomeAddressStreet, PidTagOtherAddressStreet, PidTagStreetAddress Properties

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

The **PidLidWorkAddressStreet** ([MS-OXPROPS] section 2.361), **PidTagHomeAddressStreet** ([MS-OXOABK] section 2.2.4.20), **PidTagOtherAddressStreet** ([MS-OXPROPS] section 2.842), and **PidTagStreetAddress** ([MS-OXOABK] section 2.2.4.14) properties specify the street portion of the contact's (3) Work, Home, Other, or Mailing Address. These properties can also be used to store the post office box part of the address, if it exists.

2.2.1.3.2 PidLidWorkAddressCity, PidTagHomeAddressCity, PidTagOtherAddressCity, PidTagLocality Properties

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

The **PidLidWorkAddressCity** ([MS-OXPROPS] section 2.355), **PidTagHomeAddressCity** ([MS-OXPROPS] section 2.714), **PidTagOtherAddressCity** ([MS-OXPROPS] section 2.837), and **PidTagLocality** ([MS-OXOABK] section 2.2.4.21) properties specify the city or locality portion of the contact's (3) Work, Home, Other, or Mailing Address.

2.2.1.3.3 PidLidWorkAddressState, PidTagHomeAddressStateOrProvince, PidTagOtherAddressStateOrProvince, PidTagStateOrProvince Properties

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

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The **PidLidWorkAddressState** ([MS-OXPROPS] section 2.360), **PidTagHomeAddressStateOrProvince** ([MS-OXPROPS] section 2.718), **PidTagOtherAddressStateOrProvince** ([MS-OXPROPS] section 2.841), and **PidTagStateOrProvince** ([MS-OXOABK] section 2.2.4.22) properties specify the state or province portion of the contact's (3) Work, Home, Other, or Mailing Address.

2.2.1.3.4 PidLidWorkAddressPostalCode, PidTagHomeAddressPostalCode, PidTagOtherAddressPostalCode, PidTagPostalCode Properties

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

The **PidLidWorkAddressPostalCode** ([MS-OXPROPS] section 2.358), **PidTagHomeAddressPostalCode** ([MS-OXPROPS] section 2.716), **PidTagOtherAddressPostalCode** ([MS-OXPROPS] section 2.839), and **PidTagPostalCode** ([MS-OXOABK] section 2.2.4.23) properties specify the postal code (ZIP code) portion of the contact's (3) Work, Home, Other, or Mailing Address.

2.2.1.3.5 PidLidWorkAddressCountry, PidTagHomeAddressCountry, PidTagOtherAddressCountry, PidTagCountry Properties

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

The **PidLidWorkAddressCountry** ([MS-OXPROPS] section 2.356), **PidTagHomeAddressCountry** ([MS-OXPROPS] section 2.715), **PidTagOtherAddressCountry** ([MS-OXPROPS] section 2.838), and **PidTagCountry** ([MS-OXOABK] section 2.2.4.24) properties specify the country or region portion of the contact's (3) Work, Home, Other, or Mailing Address.

2.2.1.3.6 PidLidWorkAddressCountryCode, PidLidHomeAddressCountryCode, PidLidOtherAddressCountryCode, PidLidAddressCountryCode Properties

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

The **PidLidWorkAddressCountryCode** ([MS-OXPROPS] section 2.357), **PidLidHomeAddressCountryCode** ([MS-OXPROPS] section 2.145), **PidLidOtherAddressCountryCode** ([MS-OXPROPS] section 2.198), and **PidLidAddressCountryCode** ([MS-OXPROPS] section 2.3) properties specify the country/region code portion of the contact's (3) Work, Home, Other, or Mailing Address.

2.2.1.3.7 PidLidWorkAddressPostOfficeBox, PidTagHomeAddressPostOfficeBox, PidTagOtherAddressPostOfficeBox, PidTagPostOfficeBox Properties

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

The **PidLidWorkAddressPostOfficeBox** ([MS-OXPROPS] section 2.359), **PidTagHomeAddressPostOfficeBox** ([MS-OXPROPS] section 2.717), **PidTagOtherAddressPostOfficeBox** ([MS-OXPROPS] section 2.840) and **PidTagPostOfficeBox** ([MS-OXOABK] section 2.2.4.20) properties specify the post office box portion of the contact's (3) Work, Home, Other, or Mailing Address. The client and the server do not use these properties when generating the full address or when parsing the full address into components. Instead, they place the post office box data as part of the street address.

2.2.1.3.8 PidLidWorkAddress, PidLidHomeAddress, PidLidOtherAddress, PidTagPostalAddress Properties

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

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The **PidLidWorkAddress** ([MS-OXPROPS] section 2.354), **PidLidHomeAddress** ([MS-OXPROPS] section 2.144), **PidLidOtherAddress** ([MS-OXPROPS] section 2.197), and **PidTagPostalAddress** ([MS-OXPROPS] section 2.853) properties specify the complete address of the contact's (3) Work, Home, Other, or Mailing Address. Each of these properties SHOULD be a combination of other Physical Address properties and is based on client **locale**.

2.2.1.3.9 PidLidPostalAddressId Property

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

The **PidLidPostalAddressId** property ([MS-OXPROPS] section 2.203) specifies which physical address is the Mailing Address for this contact (3). If present, the property MUST have one of the values specified in the following table. If not set, the client SHOULD assume that the value is 0x00000000. This property is optional.

Value	Meaning
0x00000000	No address is selected as the Mailing Address. **PidTagStreetAddress** (section 2.2.1.3.1), **PidTagLocality** (section 2.2.1.3.2), **PidTagStateOrProvince** (section 2.2.1.3.3), **PidTagPostalCode** (section 2.2.1.3.4), **PidTagCountry** (section 2.2.1.3.5), **PidLidAddressCountryCode** (section 2.2.1.3.6), and **PidTagPostalAddress** (section 2.2.1.3.8) all MUST NOT be set.
0x00000001	The Home Address is the Mailing Address. The values of the **PidTagStreetAddress**, **PidTagLocality**, **PidTagStateOrProvince**, **PidTagPostalCode**, **PidTagPostOfficeBox** (section 2.2.1.3.7), **PidTagCountry**, **PidLidAddressCountryCode**, and **PidTagPostalAddress** properties MUST be equal to the values of the **PidTagHomeAddressStreet** (section 2.2.1.3.1), **PidTagHomeAddressCity** (section 2.2.1.3.2), **PidTagHomeAddressStateOrProvince** (section 2.2.1.3.3), **PidTagHomeAddressPostalCode** (section 2.2.1.3.4), **PidTagHomeAddressPostOfficeBox** (section 2.2.1.3.7), **PidTagHomeAddressCountry** (section 2.2.1.3.5), **PidLidHomeAddressCountryCode** (section 2.2.1.3.6), and **PidLidHomeAddress** (section 2.2.1.3.8) properties, respectively.
0x00000002	The Work Address is the Mailing Address. The values of the **PidTagStreetAddress**, **PidTagLocality**, **PidTagStateOrProvince**, **PidTagPostalCode**, **PidTagPostOfficeBox**, **PidTagCountry**, **PidLidAddressCountryCode**, and **PidTagPostalAddress** properties MUST be equal to the values of the **PidLidWorkAddressStreet** (section 2.2.1.3.1), **PidLidWorkAddressCity** (section 2.2.1.3.2), **PidLidWorkAddressState** (section 2.2.1.3.3), **PidLidWorkAddressPostalCode** (section 2.2.1.3.4), **PidLidWorkAddressPostOfficeBox** (section 2.2.1.3.7), **PidLidWorkAddressCountry** (section 2.2.1.3.5), **PidLidWorkAddressCountryCode** (section 2.2.1.3.6), and **PidLidWorkAddress** (section 2.2.1.3.8) properties, respectively.
0x00000003	The Other Address is the Mailing Address. The values of the **PidTagStreetAddress**, **PidTagLocality**, **PidTagStateOrProvince**, **PidTagPostalCode**, **PidTagPostOfficeBox**, **PidTagCountry**, **PidLidAddressCountryCode**, and **PidTagPostalAddress** properties MUST be equal to the values of the **PidTagOtherAddressStreet** (section 2.2.1.3.1), **PidTagOtherAddressCity** (section 2.2.1.3.2), **PidTagOtherAddressStateOrProvince** (section 2.2.1.3.3), **PidTagOtherAddressPostalCode** (section 2.2.1.3.4), **PidTagOtherAddressPostOfficeBox** (section 2.2.1.3.7), **PidTagOtherAddressCountry** (section 2.2.1.3.5), **PidLidOtherAddressCountryCode** (section 2.2.1.3.6), and **PidLidOtherAddress** (section 2.2.1.3.8) properties, respectively.

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2.2.1.4 Telephone Properties

Telephone properties specify telephone numbers for the contact (3). If present, each property MUST NOT exceed a length of 255 characters, excluding the terminating null character. Each property in this section is optional.

2.2.1.4.1 PidTagPagerTelephoneNumber Property

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

The **PidTagPagerTelephoneNumber** property ([MS-OXOABK] section 2.2.4.28) specifies the pager telephone number for the contact (3).

2.2.1.4.2 PidTagCallbackTelephoneNumber Property

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

The **PidTagCallbackTelephoneNumber** property ([MS-OXPROPS] section 2.618) specifies the callback telephone number for the contact (3).

2.2.1.4.3 PidTagBusinessTelephoneNumber Property

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

The **PidTagBusinessTelephoneNumber** property ([MS-OXOABK] section 2.2.4.21) specifies the business telephone number for the contact (3).

2.2.1.4.4 PidTagHomeTelephoneNumber Property

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

The **PidTagHomeTelephoneNumber** property ([MS-OXOABK] section 2.2.4.22) specifies the home telephone number for the contact (3).

2.2.1.4.5 PidTagPrimaryTelephoneNumber Property

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

The **PidTagPrimaryTelephoneNumber** property ([MS-OXPROPS] section 2.859) specifies the primary telephone number for the contact (3).

2.2.1.4.6 PidTagBusiness2TelephoneNumber Property

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

The **PidTagBusiness2TelephoneNumber** property ([MS-OXOABK] section 2.2.4.23) specifies the second business telephone number for the contact (3).

2.2.1.4.7 PidTagMobileTelephoneNumber Property

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

The **PidTagMobileTelephoneNumber** property ([MS-OXOABK] section 2.2.4.27) specifies the mobile telephone number for the contact (3).

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2.2.1.4.8 PidTagRadioTelephoneNumber Property

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

The **PidTagRadioTelephoneNumber** property ([MS-OXPROPS] section 2.866) specifies the radio telephone number for the contact (3).

2.2.1.4.9 PidTagCarTelephoneNumber Property

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

The **PidTagCarTelephoneNumber** property ([MS-OXPROPS] section 2.620) specifies the car telephone number for the contact (3).

2.2.1.4.10 PidTagOtherTelephoneNumber Property

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

The **PidTagOtherTelephoneNumber** property ([MS-OXPROPS] section 2.843) specifies an alternate telephone number for the contact (3).

2.2.1.4.11 PidTagAssistantTelephoneNumber Property

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

The **PidTagAssistantTelephoneNumber** property ([MS-OXOABK] section 2.2.4.31) specifies the telephone number of the contact's (3) assistant.

2.2.1.4.12 PidTagHome2TelephoneNumber Property

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

The **PidTagHome2TelephoneNumber** property ([MS-OXOABK] section 2.2.4.25) specifies a second home telephone number for the contact (3).

2.2.1.4.13 PidTagTelecommunicationsDeviceForDeafTelephoneNumber Property

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

The **PidTagTelecommunicationsDeviceForDeafTelephoneNumber** property ([MS-OXPROPS] section 2.1028) specifies the telephone number for the contact's (3) text telephone (TTY) or telecommunication device for the deaf (TDD).

2.2.1.4.14 PidTagCompanyMainTelephoneNumber Property

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

The **PidTagCompanyMainTelephoneNumber** property ([MS-OXPROPS] section 2.629) specifies the company phone number for the contact (3).

2.2.1.4.15 PidTagTelexNumber Property

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

The **PidTagTelexNumber** property ([MS-OXOABK] section 2.2.4.30) specifies the telex number for the contact (3).

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2.2.1.4.16 PidTagIsdnNumber Property

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

The **PidTagIsdnNumber** property ([MS-OXPROPS] section 2.745) specifies the **Integrated Services Digital Network (ISDN)** number for the contact (3).

2.2.1.5 Event Properties

Two events are associated with a contact (3): a birthday and an anniversary. Each event is defined by two properties: a **PtypTime** property and an object PtypBinary property. If one of the two properties is set for an event, the other MUST also be set. If either of the two events is defined for a contact (3), the **PidLidReferenceEntryId** property (section 2.2.1.10.1) SHOULD be set to the EntryID for this Contact object.

2.2.1.5.1 PidTagBirthday Property

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

The **PidTagBirthday** property ([MS-OXPROPS] section 2.607) specifies the birthday of the contact (3), at 0:00 in the client's local time zone. This time is then converted to and saved in **Coordinated Universal Time (UTC)**.

2.2.1.5.2 PidLidBirthdayLocal Property

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

The **PidLidBirthdayLocal** property ([MS-OXPROPS] section 2.44) specifies the birthday of the contact (3), at 0:00 in the client's local time zone. It is saved without any time zone conversions.

2.2.1.5.3 PidLidBirthdayEventEntryId Property

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

The **PidLidBirthdayEventEntryId** property ([MS-OXPROPS] section 2.43) specifies the object EntryID of an optional **Appointment object** that represents the contact's (3) birthday. The Appointment object specified by the EntryID MUST be linked to this contact (3) by using the **PidLidContactLinkEntry** ([MS-OXCMSG] section 2.2.1.57.1), **PidLidContactLinkSearchKey** ([MS-OXCMSG] section 2.2.1.57.4), and **PidLidContactLinkName** ([MS-OXCMSG] section 2.2.1.57.3) properties, as specified in [MS-OXCMSG] section 2.2.1.57.

For details about Appointment objects, see [MS-OXOCAL].

2.2.1.5.4 PidTagWeddingAnniversary Property

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

The **PidTagWeddingAnniversary** property ([MS-OXPROPS] section 2.1050) specifies the wedding anniversary of the contact (3), at 0:00 in the client's local time zone. This time is then converted to and saved in **UTC**.

2.2.1.5.5 PidLidWeddingAnniversaryLocal Property

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

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The **PidLidWeddingAnniversaryLocal** property ([MS-OXPROPS] section 2.351) specifies the wedding anniversary of the contact (3), at 0:00 in the client's local time zone. It is saved without any time zone conversions.

2.2.1.5.6 PidLidAnniversaryEventEntryId Property

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

The **PidLidAnniversaryEventEntryId** property ([MS-OXPROPS] section 2.7) specifies the object EntryID of the Appointment object that represents the contact's (3) anniversary. The Appointment object specified by the EntryID MUST be linked to this contact (3) by using **PidLidContactLinkEntry** ([MS-OXCMSG] section 2.2.1.57.1), **PidLidContactLinkSearchKey** ([MS-OXCMSG] section 2.2.1.57.4), and **PidLidContactLinkName** ([MS-OXCMSG] section 2.2.1.57.3), as specified in [MS-OXCMSG] section 2.2.1.57.

For details about Appointment objects, see [MS-OXOCAL].

2.2.1.6 Professional Properties

Professional properties are used to store professional details for the person represented by the contact (3).

2.2.1.6.1 PidTagTitle Property

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

The **PidTagTitle** property ([MS-OXOABK] section 2.2.4.4) specifies the job title of the contact (3). This property is optional.

2.2.1.6.2 PidTagCompanyName Property

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

The **PidTagCompanyName** property ([MS-OXOABK] section 2.2.4.7) specifies the company that employs the contact (3). This property is optional.

2.2.1.6.3 PidTagDepartmentName Property

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

The **PidTagDepartmentName** property ([MS-OXOABK] section 2.2.4.6) specifies the name of the department to which the contact (3) belongs. This property is optional.

2.2.1.6.4 PidLidDepartment Property

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

The **PidLidDepartment** property ([MS-OXPROPS] section 2.93) is not used and MUST be ignored by the server. The client MUST set this property to an empty string.

2.2.1.6.5 PidTagOfficeLocation Property

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

The **PidTagOfficeLocation** property ([MS-OXOABK] section 2.2.4.5) specifies the location of the office that the contact (3) works in. This property is optional.

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2.2.1.6.6 PidTagManagerName Property

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

The **PidTagManagerName** property ([MS-OXPROPS] section 2.768) specifies the name of the contact's (3) manager. This property is optional.

2.2.1.6.7 PidTagAssistant Property

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

The **PidTagAssistant** property ([MS-OXOABK] section 2.2.4.8) specifies the name of the contact's (3) assistant. This property is optional.

2.2.1.6.8 PidLidYomiCompanyName Property

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

The **PidLidYomiCompanyName** property ([MS-OXPROPS] section 2.363) specifies the phonetic pronunciation of the contact's (3) company name. This property is optional.

2.2.1.6.9 PidTagProfession Property

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

The **PidTagProfession** property ([MS-OXPROPS] section 2.862) specifies the profession of the contact (3). This property is optional.

2.2.1.7 Business Card Properties

Business Card properties can be used to customize the display of contact (3) information in business card format.<3> The business card format is a collection of information about how to display contact (3) data to the user. The server ignores the Business Card properties.

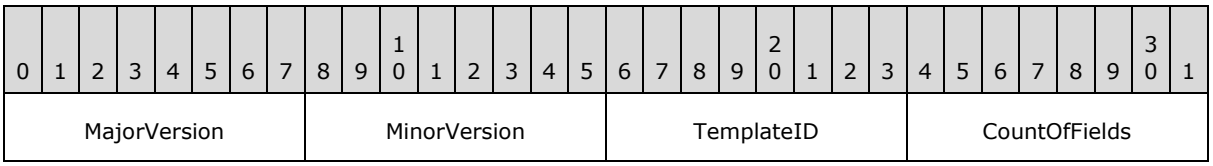
2.2.1.7.1 PidLidBusinessCardDisplayDefinition Property

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

The **PidLidBusinessCardDisplayDefinition** ([MS-OXPROPS] section 2.46) property specifies user-customization details for displaying a contact (3) as a business card. This property is optional.

The layout of a business card can be represented as an image and a number of text fields. The image can be either a contact photo, specified in section 2.2.1.8, or a card picture, specified in section 2.2.1.7.2. Text fields consist of a value from another **PtypString** property set on the Contact object and an optional customized label string provided by the user.

The following diagram specifies the format of the **PidLidBusinessCardDisplayDefinition** property. Note that multiple-byte values are stored in **little-endian** format in the buffer.



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FieldInfoSize	ExtraInfoSize	ImageAlignment	ImageSource
BackgroundColor			
ImageArea	Reserved		
...	FieldInfoN (variable)		
...			
ExtraInfo (variable)			
...			

MajorVersion (1 byte): An 8-bit value that specifies the major version number. This field MUST be set to 0x03 or greater.

MinorVersion (1 byte): An 8-bit value that specifies the minor version number. This field SHOULD be set to 0x00.

TemplateID (1 byte): An 8-bit value that specifies the layout of the business card. The valid values for this field are specified in the following table.

Value	Meaning
0x00	The image area will be left aligned, stretching the full height of the card vertically; text fields will appear to the right of the image area.
0x01	The image area will be right aligned, stretching the full height of the card vertically; text fields will appear to the left of the image area.
0x02	The image area will be aligned to the top, stretching the full width of the card horizontally; text fields will appear under the image area.
0x03	The image area will be aligned to the bottom, stretching the full width of the card horizontally; text fields will appear above the image area.
0x04	No image area is included in the card, only text fields are included. In this case, the **PidLidBusinessCardCardPicture** property (section 2.2.1.7.2) SHOULD NOT be set on the Contact object.
0x05	The image area will be used as a background for the card, stretching the full height and width of the card. Text fields are displayed on top of the image area.

CountOfFields (1 byte): An integer that specifies the number of **FieldInfo** structures, as specified in section 2.2.1.7.1.1, contained in the **FieldInfoN** field.

FieldInfoSize (1 byte): An integer that specifies the size, in bytes, of each **FieldInfo** structure that is contained in the **FieldInfoN** field. This field MUST be set to 16.

ExtraInfoSize (1 byte): An integer that specifies the size, in bytes, of the **ExtraInfo** field.

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ImageAlignment (1 byte): An 8-bit value that specifies the alignment of the image within the image area. If the value of the **TemplateID** field is 0x04, indicating a text-only card, this field is ignored. The valid values for this field are specified in the following table.

Value	Meaning
0x00	Image is stretched to fit.
0x01	Align top left.
0x02	Align top center.
0x03	Align top right.
0x04	Align middle left.
0x05	Align middle center.
0x06	Align middle right.
0x07	Align bottom left.
0x08	Align bottom center.
0x09	Align bottom right.

ImageSource (1 byte): An 8-bit value that specifies the source of the image that is used for the business card. The business card can display up to one image on the card. That image can be obtained from either the contact photo, as specified in section 2.2.1.8.1, or the card picture, as specified in section 2.2.1.7.2. If the value of the **ImageSource** field is 0x00, the contact photo SHOULD be used; otherwise, the card picture SHOULD be used.

If the value of this field is 0x00, the **PidLidBusinessCardCardPicture** property ([MS-OXPROPS] section 2.45) SHOULD NOT exist on the Contact object. This field MUST NOT be set to 0x00 when the value of the **PidLidHasPicture** property (section 2.2.1.8.1) is zero (FALSE). If the value of the **TemplateID** field is 0x04, indicating a text-only card, this field is ignored.

BackgroundColor (4 bytes): A 32-bit value that specifies the background color of the business card. This field has the format 0x00BBGGRR, where the high byte is 0x00 and the three lower bytes, represented by *BBGGRR*, specify blue, green, and red intensities, respectively.

ImageArea (1 byte): An integer that specifies the percent of space that the image will occupy on the business card. The value of this field SHOULD be between 4 and 50. The value of this field is ignored for text-only cards (**TemplateID** field is set to 0x04) and background image cards (**TemplateID** field is set to 0x05).

Reserved (4 bytes): This field MUST be set to zero when sent and MUST be ignored when received.

FieldInfoN (variable): An array of zero or more **FieldInfo** structures (section 2.2.1.7.1.1), each of which contains details about the text field of a business card. Each text field is associated with a user-customized label that is listed in the **ExtraInfo** field. The number of **FieldInfo** structures contained in this field is specified by the **CountOfFields** field.

ExtraInfo (variable): An array of null-terminated **Unicode** strings, each of which specifies a business card label that has been provided by the user. Each business card label SHOULD be limited to 16 Unicode characters, including the terminating null character. Each business card

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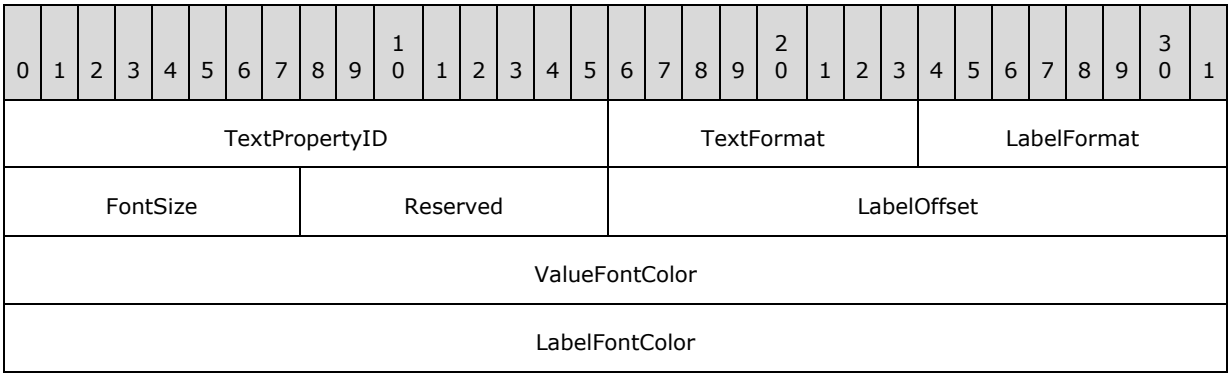
label is associated with a text field of the business card and is referenced by the **LabelOffset** field of one of the **FieldInfo** structures contained in the **FieldInfoN** field. The total size, in bytes, of the **ExtraInfo** field is specified by the **ExtraInfoSize** field.

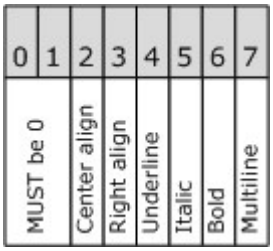
2.2.1.7.1.1 FieldInfo Structure

The **FieldInfo** structure contains details about a text field on the business card. The following diagram specifies the buffer format of the **FieldInfo** structure.



TextPropertyID (2 bytes): A 16-bit value that specifies the property to be used for the text field. The value of the **TextPropertyID** field MUST be either 0x0000, representing an empty text field, or the **property ID** of one of the properties specified in section 2.2.1.7.1.1.1.

TextFormat (1 byte): An 8-bit value that specifies the alignment and formatting for the text field. The following diagram shows the bits and their meanings. If none of the bits are set, the text field is displayed as a single line, left-aligned. The Right align and Center align bits MUST be mutually exclusive.



LabelFormat (1 byte): An 8-bit value that specifies the alignment of a user-provided label that is associated with the text field. The following diagram shows the bits and their meanings. If none of the bits are set, the text field has no label. The Label to the right and Label to the left bits MUST be mutually exclusive.

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FontSize (1 byte): An integer that specifies the font size, in **points**, of the text field. The font size MUST be between 3 and 32. The font size MUST zero if the text field is displayed as an empty line.

Reserved (1 byte): This field MUST be set to zero when sent and MUST be ignored when received.

LabelOffset (2 bytes): An integer that specifies the byte offset into the **ExtraInfo** field of the **PidLidBusinessCardDisplayDefinition** property (section 2.2.1.7.1). The offset points to the start of the label string in the **ExtraInfo** field. The offset MUST be less than the value of the **ExtraInfoSize** field, which specifies the total size of the **ExtraInfo** field. If the text field does not have a label, the value of the **LabelOffset** field MUST be 0xFFFE.

ValueFontColor (4 bytes): An integer that specifies the color of the text field. The value of the **ValueFontColor** field has the format 0x00BBGGRR, where the high byte is 0x00, the next highest byte identifies the blue intensity, the next highest byte identifies the green intensity, and the lowest byte identifies the red intensity.

LabelFontColor (4 bytes): An integer that specifies the color of the label. The value of the **LabelFontColor** field has the format 0x00BBGGRR, where the high byte is 0x00, the next highest byte identifies the blue intensity, the next highest byte identifies the green intensity, and the lowest byte identifies the red intensity.

2.2.1.7.1.1.1 Properties Used for a Business Card Text Field

The following properties can be used for the text field of a business card. The property to be used for the text field is specified in the **TextPropertyID** field of the **FieldInfo** structure section 2.2.1.7.1.1. All properties in the list are **PtypString** properties ([MS-OXCDATA] section 2.11.1).

PidTagDisplayName (section 2.2.1.1.8)

PidTagTitle ([MS-OXOABK] section 2.2.4.4)

PidTagDepartmentName ([MS-OXOABK] section 2.2.4.6)

PidTagCompanyName ([MS-OXOABK] section 2.2.4.7)

PidTagBusinessTelephoneNumber ([MS-OXOABK] section 2.2.4.21)

PidTagBusiness2TelephoneNumber ([MS-OXOABK] section 2.2.4.23)

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PidTagBusinessFaxNumber (section 2.2.1.2.6)

PidTagCompanyMainTelephoneNumber (section 2.2.1.4.14)

PidTagHomeTelephoneNumber ([MS-OXOABK] section 2.2.4.22)

PidTagHome2TelephoneNumber ([MS-OXOABK] section 2.2.4.25)

PidTagHomeFaxNumber (section 2.2.1.2.6)

PidTagMobileTelephoneNumber ([MS-OXOABK] section 2.2.4.27)

PidTagAssistantTelephoneNumber ([MS-OXOABK] section 2.2.4.31)

PidTagOtherTelephoneNumber (section 2.2.1.4.10)

PidTagTelecommunicationsDeviceForDeafTelephoneNumber (section 2.2.1.4.13)

PidTagPrimaryTelephoneNumber (section 2.2.1.4.5)

PidTagPrimaryFaxNumber ([MS-OXOABK] section 2.2.4.29)

PidTagPagerTelephoneNumber ([MS-OXOABK] section 2.2.4.28)

PidLidWorkAddress (section 2.2.1.3.8)

PidLidHomeAddress (section 2.2.1.3.8)

PidLidOtherAddress (section 2.2.1.3.8)

PidLidInstantMessagingAddress (section 2.2.1.10.6)

PidTagBusinessHomePage (section 2.2.1.10.14)

PidTagPersonalHomePage (section 2.2.1.10.13)

PidLidContactUserField1 (section 2.2.1.7.3)

PidLidContactUserField2 (section 2.2.1.7.3)

PidLidContactUserField3 (section 2.2.1.7.3)

PidLidContactUserField4 (section 2.2.1.7.3)

PidLidEmail1OriginalDisplayName (section 2.2.1.2.4)

PidLidEmail2OriginalDisplayName (section 2.2.1.2.4)

PidLidEmail3OriginalDisplayName (section 2.2.1.2.4)

2.2.1.7.2 PidLidBusinessCardCardPicture Property

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

The **PidLidBusinessCardCardPicture** property ([MS-OXPROPS] section 2.45) contains the image to be used on a business card, whose value MUST be either a **Portable Network Graphics (PNG)** or **Joint Photographic Experts Group (JPEG)** stream. This property SHOULD be used in conjunction with the **PidLidBusinessCardDisplayDefinition** property (section 2.2.1.7.1) as follows: the **PidLidBusinessCardCardPicture** property SHOULD NOT be present on a Contact

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object if the **PidLidBusinessCardDisplayDefinition** property is not present. This property also SHOULD NOT be present if the data in the **PidLidBusinessCardDisplayDefinition** property does not require a card image.

2.2.1.7.3 PidLidContactUserField1, PidLidContactUserField2, PidLidContactUserField3, PidLidContactUserField4 Properties

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

The **PidLidContactUserField1** ([MS-OXPROPS] section 2.78). **PidLidContactUserField2** ([MS-OXPROPS] section 2.79), **PidLidContactUserField3** ([MS-OXPROPS] section 2.80), and **PidLidContactUserField4** ([MS-OXPROPS] section 2.81) properties can be used to add custom text to a business card representation of a Contact object. These properties contain text that is unrelated to any other contact (3)-specific property. These properties are optional.

2.2.1.8 Contact Photo Properties

The **PidLidHasPicture** property (section 2.2.1.8.1) and the contact photo attachment specified in section 2.2.1.8.3 are optional and represent an optional photo associated with the contact (3).<4>

2.2.1.8.1 PidLidHasPicture Property

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

The **PidLidHasPicture** property ([MS-OXPROPS] section 2.143) indicates whether a contact photo attachment, specified in section 2.2.1.8.3, exists. If this property is set to nonzero (TRUE), then the contact photo attachment exists and the client uses it as the contact photo. If this property does not exist, or exists and is set to zero (FALSE), then there is no contact photo attachment.

2.2.1.8.2 PidTagAttachmentContactPhoto Property

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

The **PidTagAttachmentContactPhoto** property ([MS-OXPROPS] section 2.588) indicates whether an **Attachment object** is a contact photo attachment. This property is set to nonzero (TRUE) to identify the Attachment object as a contact photo attachment. There SHOULD be only one attachment with the **PidTagAttachmentContactPhoto** property set to TRUE on a Contact object. If more than one attachment has this property set to TRUE, the client can use any one of the marked attachments as the contact photo.

2.2.1.8.3 Contact Photo Attachment

The contact photo attachment is a picture attached to the Contact object. The Attachment object MUST have the **PidTagAttachmentContactPhoto** property (section 2.2.1.8.2) set to nonzero (TRUE). For more details about Attachment objects, see [MS-OXCMSG] section 2.2.2. Additionally, the following properties MUST be set on the Attachment object, as specified in [MS-OXCMSG]:

- The value of the **PidTagAttachDataBinary** property ([MS-OXCMSG] section 2.2.2.7), which is the contents of the attachment, SHOULD be in JPEG format. Support for other formats is as determined by the implementer.
- The **PidTagAttachExtension** property ([MS-OXPROPS] section 2.583) SHOULD be set to ".jpg".
- The **PidTagDisplayName** (section 2.2.1.1.8) and **PidTagAttachFilename** ([MS-OXPROPS] section 2.584) properties SHOULD be set to "ContactPicture.jpg".

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2.2.1.9 Contact Aggregation Properties

The contact aggregation properties are used for importing external contacts and linking duplicate contacts.<5> The linking of duplicate contacts allows the client to show one representation to the user.

2.2.1.9.1 PidLidContactLinkedGlobalAddressListEntryId Property

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

The **PidLidContactLinkedGlobalAddressListEntryId** property ([MS-OXPROPS] section 2.69) specifies the EntryID of the **GAL** contact to which the duplicate contact is linked.<6>

2.2.1.9.2 PidLidContactLinkGlobalAddressListLinkId Property

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

The **PidLidContactLinkGlobalAddressListLinkId** property ([MS-OXPROPS] section 2.71) specifies the **GUID** of the GAL contact to which the duplicate contact is linked.<7>

2.2.1.9.3 PidLidContactLinkGlobalAddressListLinkState Property

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

The **PidLidContactLinkGlobalAddressListLinkState** property ([MS-OXPROPS] section 2.72) specifies the state of the linking between the GAL contact and the duplicate contact.<8>

The valid values for this property are specified in the following table.

Value	Meaning
0	The duplicate contact is not linked to the GAL contact or the GAL contact is not downloaded.
1	The duplicate contact is linked to the GAL contact.
2	The duplicate contact cannot be automatically linked to the GAL contact.

2.2.1.9.4 PidLidContactLinkLinkRejectHistory Property

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

The **PidLidContactLinkLinkRejectHistory** property ([MS-OXPROPS] section 2.73) contains a list of any contacts that were previously rejected for linking with the duplicate contact.<9>

2.2.1.9.5 PidLidContactLinkSMTPAddressCache Property

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

The **PidLidContactLinkSMTPAddressCache** property ([MS-OXPROPS] section 2.76) contains a list of the SMTP addresses that are used by the GAL contact that are linked to the duplicate contact.<10>

2.2.1.9.6 PidLidIsContactLinked Property

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

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The **PidLidIsContactLinked** property ([MS-OXPROPS] section 2.154) specifies whether the contatct is linked to other contacts. The value TRUE indicates that the contact is linked.<11>

2.2.1.9.7 PidTagOscSyncEnabled Property

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

The **PidTagOscSyncEnabled** property ([MS-OXPROPS] section 2.836) specifies whether contatct synchronization with an external source (such as a social networking site) is handled by the server. This property is set on a message that is stored in the contacts folder.<12>

2.2.1.10 Other Contact Properties

2.2.1.10.1 PidLidReferenceEntryId Property

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

The **PidLidReferenceEntryId** property ([MS-OXPROPS] section 2.217) contains a value that is equal to the value of the EntryID of the Contact object unless the Contact object is a copy of an earlier original.

2.2.1.10.2 PidTagHobbies Property

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

The **PidTagHobbies** property ([MS-OXPROPS] section 2.711) specifies the hobbies of the contact (3). This property is optional.

2.2.1.10.3 PidTagSpouseName Property

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

The **PidTagSpouseName** property ([MS-OXPROPS] section 2.1012) specifies the name of the contact's (3) spouse/partner. This property is optional.

2.2.1.10.4 PidTagLanguage Property

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

The **PidTagLanguage** property ([MS-OXPROPS] section 2.752) specifies the language that the contact (3) uses. This property is optional.

2.2.1.10.5 PidTagLocation Property

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

The **PidTagLocation** property ([MS-OXPROPS] section 2.765) specifies the location of the contact (3). For example, this could be the building and office number of the contact (3). This property is optional.

2.2.1.10.6 PidLidInstantMessagingAddress Property

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

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The **PidLidInstantMessagingAddress** property ([MS-OXPROPS] section 2.150) specifies the contact's (3) instant messaging address. This property is optional.

2.2.1.10.7 PidTagOrganizationalIdNumber Property

Type: **PtypString**

The **PidTagOrganizationalIdNumber** property ([MS-OXPROPS] section 2.811) specifies an organizational ID number for the contact (3), such as an employee ID number. This property is optional.

2.2.1.10.8 PidTagCustomerId Property

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

The **PidTagCustomerId** property ([MS-OXPROPS] section 2.648) specifies the contact's (3) customer ID number. This property is optional.

2.2.1.10.9 PidTagGovernmentIdNumber Property

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

The **PidTagGovernmentIdNumber** property ([MS-OXPROPS] section 2.705) specifies the contact's (3) government ID number. This property is optional.

2.2.1.10.10 PidLidFreeBusyLocation Property

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

The **PidLidFreeBusyLocation** property ([MS-OXPROPS] section 2.141) specifies a **Uniform Resource Locator (URL)** path from which a client can retrieve **free/busy status** information for the contact (3) as an iCalendar file, as specified in [MS-OXCICAL]. This property is optional.

2.2.1.10.11 PidTagAccount Property

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

The **PidTagAccount** property ([MS-OXPROPS] section 2.499) specifies the account name of the contact (3). This property is not used by either the client or the server. This property is optional.

2.2.1.10.12 PidLidHtml Property

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

The **PidLidHtml** property ([MS-OXPROPS] section 2.146) specifies the contact's (3) business web page URL. The value of this property, if present, SHOULD be the same as the value of the **PidTagBusinessHomePage** property (section 2.2.1.10.14). This property is optional.

2.2.1.10.13 PidTagPersonalHomePage Property

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

The **PidTagPersonalHomePage** property ([MS-OXPROPS] section 2.851) specifies the contact's (3) personal web page URL. This property is optional.

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2.2.1.10.14 PidTagBusinessHomePage Property

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

The **PidTagBusinessHomePage** property ([MS-OXPROPS] section 2.616) specifies the contact's (3) business Web page URL. The value of this property, if present, SHOULD be the same as the value of the **PidLidHtml** property (section 2.2.1.10.12). This property is optional.

2.2.1.10.15 PidTagFtpSite Property

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

The **PidTagFtpSite** property ([MS-OXPROPS] section 2.700) specifies the contact's (3) **File Transfer Protocol (FTP)** URL. FTP is a protocol used to transfer data, as specified in [RFC959]. This property is optional.

2.2.1.10.16 PidTagComputerNetworkName Property

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

The **PidTagComputerNetworkName** property ([MS-OXPROPS] section 2.631) specifies the name of the network to which the contact's (3) computer is connected. This property is not used by either the client or the server. This property is optional.

2.2.1.10.17 PidTagChildrensNames Property

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

The **PidTagChildrensNames** property ([MS-OXPROPS] section 2.624) specifies the names of the contact's (3) children. This property is optional.

2.2.1.10.18 PidLidContactCharacterSet Property

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

The **PidLidContactCharacterSet** property ([MS-OXPROPS] section 2.67) specifies the **character set (2)** used for this Contact object.<13> Clients use this property to aid in generating a character-set-dependent list of choices for the properties **PidLidFileUnder** (section 2.2.1.1.11), **PidLidFileUnderList** (section 2.2.1.1.13), and **PidLidFileUnderId** (section 2.2.1.1.12). If the value of the **PidLidContactCharacterSet** property is 0x00000000 or 0x00000001, clients SHOULD treat this property as not being set. For U.S. English, the client sets the value of the **PidLidContactCharacterSet** property to 0x00000100, denoting a Western character set (2). This property is optional.

2.2.1.10.19 PidLidAutoLog Property

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

The **PidLidAutoLog** property ([MS-OXPROPS] section 2.39) specifies to the client whether to create a **Journal object** for each **action (3)** associated with this Contact object. This property is optional.

2.2.1.10.20 PidTagGender Property

Type: **PtypInteger16** ([MS-OXCDATA] section 2.11.1)

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The **PidTagGender** property ([MS-OXPROPS] section 2.702) specifies the gender of the contact (3). If present, the property MUST be one of the following values. This property is optional.

Value	Meaning
0x0000	The contact's (3) gender is unspecified.
0x0001	The contact (3) is female.
0x0002	The contact (3) is male.

2.2.1.10.21 PidTagReferredByName Property

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

The **PidTagReferredByName** property ([MS-OXPROPS] section 2.900) specifies the name of the person who referred this contact (3) to the user. This property is optional.

2.2.1.10.22 PidLidContactItemData Property

Type: **PtypMultipleInteger32** ([MS-OXCDATA] section 2.11.1)

The **PidLidContactItemData** property ([MS-OXPROPS] section 2.68) can be used to help display the contact (3) information. If present, the property MUST have six entries, each corresponding to a visible field in the client's user interface. This property is optional.

The meaning of each entry in the **PidLidContactItemData** property is defined in the following table.

The value MUST be one of the following	Meaning	One-based index into the multivalue property
0x00000001	The client SHOULD display the contact's (3) Home Address.	1
0x00000002 or 0x00000000	The client SHOULD display the contact's (3) Work Address.	1
0x00000003	The client SHOULD display the contact's (3) Other Address.	1
0x00008080	The client SHOULD display Email1.	2
0x00008090	The client SHOULD display Email2.	2
0x000080A0	The client SHOULD display Email3.	2
Property ID of any of the Telephone properties specified in section 2.2.1.4 or of any of the fax numbers specified in section 2.2.1.2.6.	The client SHOULD display the corresponding property.	3, 4, 5, 6

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2.2.1.10.23 PidTagUserX509Certificate Property

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

The **PidTagUserX509Certificate** property ([MS-OXPROPS] section 2.1042) specifies a list of certificates for the contact (3). The format and semantics of this property are specified in [MS-OXOABK] section 2.2.4.36. This property is optional.

2.2.1.10.24 PidLidBilling Property

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

The **PidLidBilling** property ([MS-OXPROPS] section 2.42) specifies billing information for the contact (3). This property is optional.

2.2.1.11 Additional Property Constraints

This protocol puts constraints on the **PidTagNormalizedSubject** property (section 2.2.1.11.1) and the **PidTagMessageClass** property (section 2.2.1.11.2) as they are defined in [MS-OXCMSG].This protocol adds constraints to the following Message object properties.

2.2.1.11.1 PidTagNormalizedSubject Property

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

The **PidTagNormalizedSubject** property ([MS-OXPROPS] section 2.801) specifies a combination of the full name and company name of the contact (3). This property is computed by the client according to an implementation-dependent algorithm that uses values of the **PidTagGivenName** (section 2.2.1.1.6), **PidTagMiddleName** (section 2.2.1.1.5), **PidTagSurname** (section 2.2.1.1.4), **PidTagGeneration** (section 2.2.1.1.2), and **PidTagCompanyName** (section 2.2.1.6.2) properties. The client uses the value of the **PidTagNormalizedSubject** property as the caption of the window displaying information about this contact (3). The value of the very similar **PidTagDisplayName** property (section 2.2.1.1.8) might contain characters that cannot be displayed as a window caption.

2.2.1.11.2 PidTagMessageClass Property

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

The **PidTagMessageClass** property ([MS-OXCMSG] section 2.2.1.3) specifies the type of the Message object. A Contact object MUST have this property set to either "IPM.Contact" or a string prefixed with "IPM.Contact."

2.2.2 Personal Distribution List Properties

Properties that are used in groups to define components of a Personal Distribution List object are specified in sections 2.2.2.1 and 2.2.2.2. Standalone properties of a Personal Distribution List object are specified in sections 2.2.2.3 and 2.2.2.4. Each property is set only when user data needs to be stored.

2.2.2.1 Personal Distribution List Name Properties

The properties specified in section 2.2.2.1.1 to section 2.2.2.1.4 are used to display the name of the Personal Distribution List object.

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2.2.2.1.1 PidTagDisplayName Property

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

The **PidTagDisplayName** property ([MS-OXPROPS] section 2.667) specifies the user-visible name of the personal distribution list.

2.2.2.1.2 PidLidDistributionListName Property

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

The **PidLidDistributionListName** property ([MS-OXPROPS] section 2.97) specifies the name of the personal distribution list. The value of this property SHOULD be the same as the value of the **PidTagDisplayName** property (section 2.2.2.1.1).

2.2.2.1.3 PidLidFileUnder Property

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

The value of the **PidLidFileUnder** property ([MS-OXPROPS] section 2.132) MUST be the same as the value of the **PidTagDisplayName** property (section 2.2.2.1.1).

2.2.2.1.4 PidLidFileUnderId Property

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

The **PidLidFileUnderId** property ([MS-OXPROPS] section 2.133) is not used for Personal Distribution List objects. If present, this property SHOULD<14> be set to 0xFFFFFFFF.

2.2.2.2 Personal Distribution List Member Properties

2.2.2.2.1 PidLidDistributionListMembers Property

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

The **PidLidDistributionListMembers** property ([MS-OXPROPS] section 2.96) specifies the list of EntryIDs of the objects corresponding to the members of the personal distribution list. Members of the personal distribution list can be other personal distribution lists, electronic addresses contained in a contact (3), Global Address List (GAL) members, or one-off email addresses. The format of each EntryID MUST be either a **One-Off EntryID** structure ([MS-OXCDATA] section 2.2.5.1) or a **WrappedEntryId** structure (section 2.2.2.2.4.1.1).

When setting this property, the client or the server MUST ensure its total size is less than 15,000 bytes.

2.2.2.2.2 PidLidDistributionListOneOffMembers Property

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

The **PidLidDistributionListOneOffMembers** property ([MS-OXPROPS] section 2.98) specifies the list of one-off EntryIDs corresponding to the members of the personal distribution list. These one-off EntryIDs encapsulate display names and email addresses of the personal distribution list members.

If the client or the server sets this property,<15> it MUST be synchronized with the **PidLidDistributionListMembers** property (section 2.2.2.2.1): for each entry in the

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PidLidDistributionListOneOffMembers property, there MUST be an entry in the same position in the **PidLidDistributionListMembers** property.

When setting this property, the client or the server MUST ensure that its total size is less than 15,000 bytes.

2.2.2.2.3 PidLidDistributionListChecksum Property

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

The **PidLidDistributionListChecksum** property ([MS-OXPROPS] section 2.95) specifies the 32-bit **cyclic redundancy check (CRC)** polynomial checksum, as specified in [ISO/IEC8802-3], calculated on the value of the **PidLidDistributionListMembers** property (section 2.2.2.2.1), as specified in section 3.1.5.11.

The value of this property can be used to detect when the **PidLidDistributionListMembers** property was updated without updating the other Personal Distribution List Member properties (by computing the CRC on the existing value of the **PidLidDistributionListMembers** property and comparing it with the value of the **PidLidDistributionListChecksum** property). The server does not set or update this property.

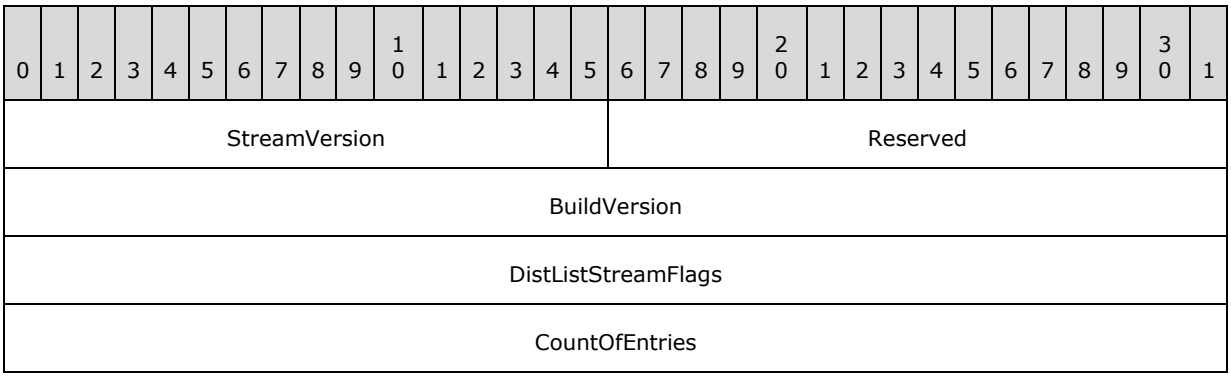
2.2.2.2.4 PidLidDistributionListStream Property

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

The **PidLidDistributionListStream** property ([MS-OXPROPS] section 2.99) specifies the list of EntryIDs and one-off EntryIDs corresponding to the members of the personal distribution list. Members of the personal distribution list can be other personal distribution lists, electronic addresses contained in a contact (3), GAL members, or one-off email addresses. The format of each EntryID MUST be as specified in section 2.2.2.2.1, and the format for each one-off EntryID MUST be as specified in section 2.2.2.2.2.

The **PidLidDistributionListStream** property is intended to allow a distribution list to grow past the size limits of the **PidLidDistributionListMembers** property (section 2.2.2.2.1) and the **PidLidDistributionListOneOffMembers** property (section 2.2.2.2.2). This property SHOULD<16> be used if the size of either **PidLidDistributionListMembers** or **PidLidDistributionListOneOffMembers** would be greater than 15,000 bytes. If this property is set, the **PidLidDistributionListMembers**, **PidLidDistributionListOneOffMembers**, and **PidLidDistributionListChecksum** (section 2.2.2.2.3) properties SHOULD<17> be ignored.

The following diagram specifies the buffer format of the **PidLidDistributionListStream** property.



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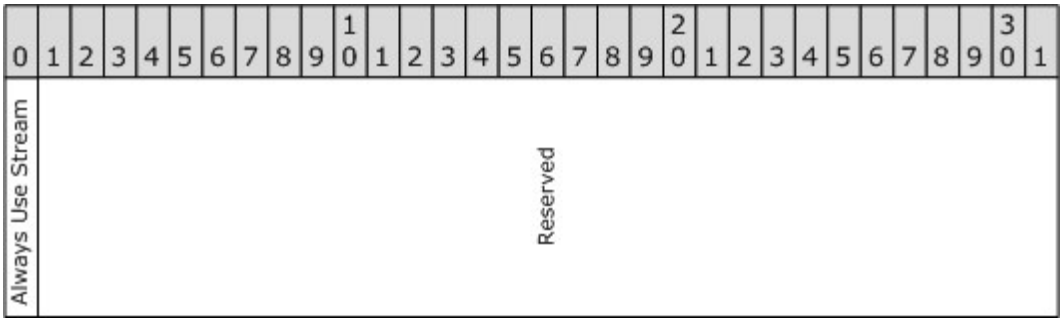
TotalEntryIDSize
TotalOneOffSize
TotalExtraSize
DistListMemberInfoArray (variable)
...
Terminator1
Terminator2

StreamVersion (2 bytes): A 16-bit value that specifies the version of the stream. This field MUST be set to 0x0001.

Reserved (2 bytes): This field MUST be set to zero when sent and MUST be ignored when received.

BuildVersion (4 bytes): A 32-bit value that specifies the build version of the stream. The value of this field is the value of the **MajorVersion** field of the **PidLidBusinessCardDisplayDefinition** property (section 2.2.1.7.1) multiplied by 10,000. The value of the **MinorVersion** field of the **PidLidBusinessCardDisplayDefinition** property is then added to the result.

DistListStreamFlags (4 bytes): A 32-bit value that contains bits that indicate overall behavior of the personal distribution list. The following table specifies the valid flags.



If the Always Use Stream bit is set, a client MUST save the personal distribution list members in the stream, even if the members would normally fit in the **PidLidDistributionListMembers** and **PidLidDistributionListOneOffMembers** properties.

When modifying the personal distribution list, a client MUST preserve any data in the Reserved portion of this field. When creating a new personal distribution list, this value MUST set the reserved bits to 0.

CountOfEntries (4 bytes): An integer that specifies the number of **DistListMemberInfo** structures, as specified in section 2.2.2.2.4.1, in the **DistListMemberInfoArray** field.

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TotalEntryIDSize (4 bytes): An integer that specifies the sum of the sizes (in bytes) of the EntryIDs stored in each **DistListMemberInfo** structure.

TotalOneOffSize (4 bytes): An integer that specifies the sum of the sizes (in bytes) of the one-off EntryIDs stored in each **DistListMemberInfo** structure.

TotalExtraSize (4 bytes): Not used. This field MUST be set to 0x00000000.

DistListMemberInfoArray (variable): An array of **DistListMemberInfo** structures (section 2.2.2.2.4.1), each of which contains information about one member of the personal distribution list.

Terminator1 (4 bytes): Not used. This field MUST be set to 0x00000000.

Terminator2 (4 bytes): Not used. This field MUST be set to 0x00000000.

2.2.2.2.4.1 DistListMemberInfo Structure

The **DistListMemberInfo** structure contains information about one member of the personal distribution list. The following table specifies the format of the **DistListMemberInfo** structure stored in the **PidLidDistributionListStream** property (section 2.2.2.2.4).

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
EntryIdSize																															
EntryIdData (variable)																															
...																															
one-offEntryIdSize																															
one-offEntryIdData (variable)																															
...																															
ExtraMemberInfoSize																															
ExtraMemberInfoData (variable)																															
...																															

EntryIdSize (4 bytes): An integer that specifies the size, in bytes, of the **EntryIdData** field.

EntryIdData (variable): An array of bytes that specify the EntryID of this member of the personal distribution list. A member can be another personal distribution list, an electronic address contained in a contact (3), a GAL member, a distribution list, or a one-off email address. The format of the EntryID MUST be either a **One-OffEntryID** structure ([MS-OXCDATA] section 2.2.5.1) or a **WrappedEntryId** structure (section 2.2.2.2.4.1.1).

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one-offEntryIdSize (4 bytes): An integer that specifies the size, in bytes, of the **one-offEntryIdData** field. If there is no corresponding one-off EntryID for this member, this value MUST be set to 0x00000000.

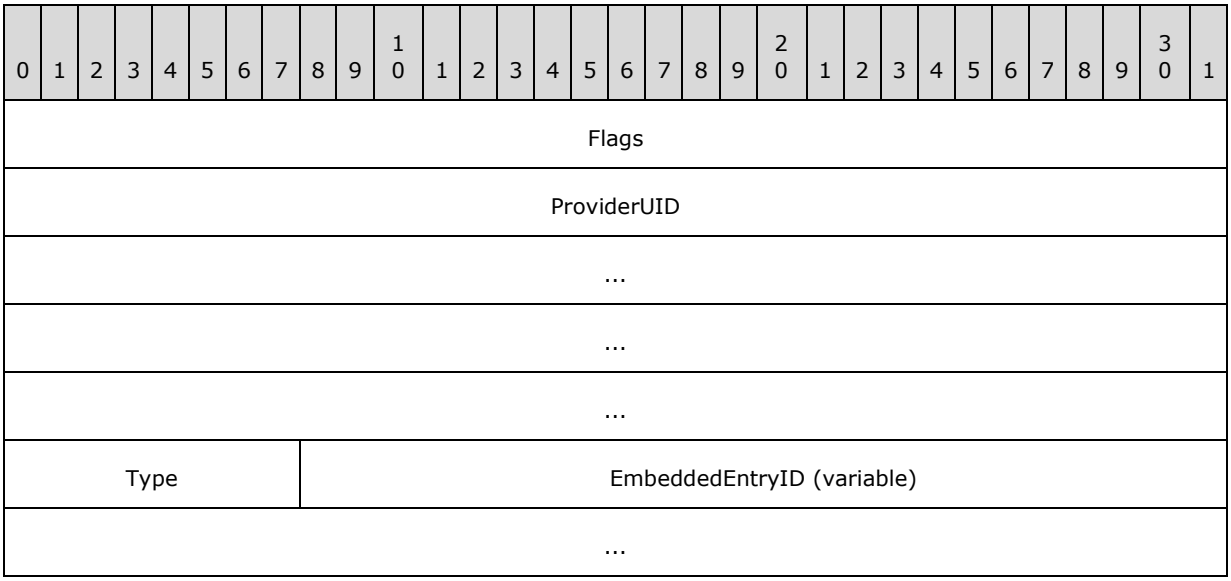
one-offEntryIdData (variable): An array of bytes that specify the one-off EntryID of this member of the personal distribution list. This one-off EntryID encapsulates the display name and email address of the personal distribution list member.

ExtraMemberInfoSize (4 bytes): This field MUST be set to 0.

ExtraMemberInfoData (variable): This field is not used by either the client or the server and MUST NOT be present.

2.2.2.2.4.1.1 WrappedEntryId Structure

The **WrappedEntryId** structure specifies the EntryID of a member of a personal distribution list. The following diagram specifies the format of the **WrappedEntryId** structure.



Flags (4 bytes): Not used. This field MUST be set to 0x00000000.

ProviderUID (16 bytes): This field MUST contain the value "%xC0.91.AD.D3.51.9D.CF.11.A4.A9.00.AA.00.47.FA.A4".

Type (1 byte): An 8-bit value that specifies how the **EmbeddedEntryID** field is interpreted and MUST be a combination of bits from the following table.

Bit mask	Description
0x0F	The lower 4 bits of the **Type** field are interpreted as an unsigned integer value that specifies what type of EntryID is embedded in this **Wrapped EntryID** structure. These bits MUST be set to one of the following values: ▪ A value of 0 designates a one-off EntryID; the **EmbeddedEntryID** field MUST be a **One-Off EntryID** structure ([MS-OXCDATA] section 2.2.5.1).

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Bit mask	Description
	▪ A value of 3 designates the EntryID of a Contact object; the **EmbeddedEntryID** field MUST be a **Message EntryID** structure ([MS-OXCDATA] section 2.2.4.2). ▪ A value of 4 designates the EntryID of a Personal Distribution List object; the **EmbeddedEntryID** field MUST be a **Message EntryID** structure ([MS-OXCDATA] section 2.2.4.2). ▪ A value of 5 designates the EntryID of a **mail user** in the GAL; the **EmbeddedEntryID** field MUST be an **Address Book EntryID** structure ([MS-OXCDATA] section 2.2.5.2). ▪ A value of 6 designates the EntryID of a distribution list in the GAL; the **EmbeddedEntryID** field MUST be an **Address Book EntryID** structure ([MS-OXCDATA] section 2.2.5.2).
0x70	The next 3 bits of the **Type** field are interpreted as an unsigned integer value. If the **EmbeddedEntryID** field contains a one-off EntryID, this value MUST be 0. If the **EmbeddedEntryID** field does not contain the EntryID of a Contact object, this value MUST be 3. If the **EmbeddedEntryID** field contains a the EntryID of a Contact object, this unsigned integer MUST have one of the following values: ▪ 0 (denoting a Business Fax electronic address) ▪ 1 (denoting a Home Fax electronic address) ▪ 2 (denoting a Primary Fax electronic address) ▪ 4 (denoting an Email1 address) ▪ 5 (denoting an Email2 address) ▪ 6 (denoting an Email3 address) Note that this value MUST NOT be set to 7.
0x80	If the **EmbeddedEntryID** field contains a one-off EntryID, this bit MUST NOT be set. Otherwise, this bit MUST be set.

EmbeddedEntryID (variable): An array of bytes that specifies an EntryID that MUST be interpreted according to the value of the **Type** field, more specifically according to the value contained in the lower 4 bits of the **Type** field, as specified in the previous table.

2.2.2.3 Other Personal Distribution List Properties

2.2.2.3.1 PidLidAddressBookProviderArrayType Property

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

The **PidLidAddressBookProviderArrayType** property ([MS-OXPROPS] section 2.1) specifies the state of the contact's (3) electronic addresses. The client SHOULD set this property to 0x00000000. The server does not set this property.

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2.2.2.4 Additional Property Constraints

This protocol puts additional constraints on the **PidTagNormalizedSubject** (section 2.2.2.4.1) and **PidTagMessageClass** (section 2.2.2.4.2) properties beyond what is specified in [MS-OXCMSG].

2.2.2.4.1 PidTagNormalizedSubject Property

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

The **PidTagNormalizedSubject** property ([MS-OXCMSG] section 2.2.1.10) specifies the user-visible name of the personal distribution list. The value of this property MUST be the same as the value of the **PidTagDisplayName** property (section 2.2.2.1.1).

2.2.2.4.2 PidTagMessageClass Property

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

The **PidTagMessageClass** property ([MS-OXCMSG] section 2.2.1.3) specifies the type of the Message object. A Personal Distribution List object MUST have this property set to either "IPM.DistList" or a string prefixed with "IPM.DistList".

2.2.3 Contacts-Related Folders

A contacts-related folder is a **Folder object** that has the **PidTagContainerClass** property ([MS-OXOCAL] section 2.2.11.1) set to a string that begins with "IPF.Contact.". In all other respects, a contacts-related folder conforms to the folder syntax and functionality specified by [MS-OXCFOLD]. The following contacts-related folders are defined.<18>

Folder name	Container class	Contents
Contacts	"IPF.Contact"	Contact objects and Personal Distribution List objects; subfolders that contain imported contacts.
Quick Contacts	"IPF.Contact.Moc.QuickContacts"	Contains Contact objects for the user's favorite contacts and instant messaging contacts.
IM Contact List	"IPF.Contact.Moc.ImContactList"	Contains Personal Distribution List objects for the user's favorite contacts.
<depends on the source from which the contact was obtained>	"IPF.Contact"	Contains Contact objects representing external contacts that have been imported from a source such as a social networking site. The name of the folder reflects the source of the contact. Each folder that contains external contacts is a subfolder of the Contacts folder.

A Contact object SHOULD be created in the Contacts folder, a subfolder of the Contacts folder, or the Quick Contacts folder. A Personal Distribution List object SHOULD be created in the Contacts folder or the IM Contact List folder.

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3 Protocol Details

3.1 Client Details

The client creates and manipulates a Contact object and a Personal Distribution List object and in all other ways operates within the client role as specified in [MS-OXCMSG].

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.

This protocol uses the abstract data model that is specified in [MS-OXCMSG] section 3.1.1 with the following adaptations:

- The Contact object and the Personal Distribution List object are extensions of the Message object.
- A Contact object and a Personal Distribution List object are created in the contacts-related folders, as specified in section 2.2.3.

3.1.2 Timers

None.

3.1.3 Initialization

None.

3.1.4 Higher-Layer Triggered Events

3.1.4.1 Contact Object Events

3.1.4.1.1 Creating a Contact

To create a Contact object, the client creates a Message object, as specified in [MS-OXCMSG] section 3.1.4.2; sets properties in accordance with the requirements in section 2.2.1 of this specification and [MS-OXCPRPT]; and saves the resulting Message object as described in [MS-OXCMSG] section 3.1.4.3.

3.1.4.1.2 Deleting a Contact

Contact objects have no special semantics in relation to deletion beyond what is specified in [MS-OXCFOLD].

3.1.4.1.3 Modifying a Contact

When modifying a Contact object, the client opens a Message object as specified in [MS-OXCMSG] section 3.1.4.1, modifies any of the properties in accordance with the requirements in [MS-OXCPRPT] and in section 2 and section 3.1.5.1 through section 3.1.5.7 of this specification, and saves the Message object as described in [MS-OXCMSG] section 3.1.4.3.

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3.1.4.2 Personal Distribution List Events

Personal distribution list events pertain to Personal Distribution List objects, as specified in section 3.1.4.2.1 to section 3.1.5.11.

3.1.4.2.1 Creating a Personal Distribution List

To create a Personal Distribution List object, the client creates a Message object as specified in [MS-OXCMSG] section 3.1.4.2, sets properties in accordance with the requirements in [MS-OXCPRPT] and in section 2.2.2 of this specification, and saves the resulting Message object as described in [MS-OXCMSG] section 3.1.4.3.

3.1.4.2.2 Deleting a Personal Distribution List

Personal Distribution List objects have no special semantics in relation to deletion beyond what is specified in [MS-OXCFOLD].

3.1.4.2.3 Modifying a Personal Distribution List

When modifying a Personal Distribution List object, the client opens a Message object as specified in [MS-OXCMSG] section 3.1.4.1, modifies any of the properties in accordance with the requirements in [MS-OXCPRPT] and in section 2 and section 3.1.5.8 through section 3.1.5.11 of this specification, and saves the Message object as described in [MS-OXCMSG] section 3.1.4.3.

It is possible that personal distribution lists contain circular references to one another. Such circular references SHOULD be avoided but are permitted under this protocol, and the client MUST be able to handle circular references.

3.1.5 Message Processing Events and Sequencing Rules

3.1.5.1 Modifying a Contact Name Property

Contact Name properties MUST be modified at the same time to preserve their relationship. The following table specifies the properties that SHOULD be updated when another property is changed (according to the definition of each property in section 2.2.1 of this specification). More than one **condition** can be met at the same time. Not all properties will need to be updated every time. Clients use the specifications in section 2.2.1 and section 2.2.1.2.8 to determine whether an update is required.

Changed property	Conditions	Properties that SHOULD be updated
PidTagGeneration (section 2.2.1.1.2)	None.	**PidTagDisplayName** (section 2.2.1.1.8), **PidTagNormalizedSubject** (section 2.2.1.11.1)
PidTagGeneration or **PidTagSurname** (section 2.2.1.1.4) or **PidTagMiddleName** (section 2.2.1.1.5) or **PidTagGivenName** (section 2.2.1.1.6) or **PidTagDisplayName** or **PidTagCompanyName** (section 2.2.1.6.2)	Value of the **PidLidFileUnderId** property (section 2.2.1.1.12) is not 0x00000000 or 0xFFFFFFFF.	**PidLidFileUnder** (section 2.2.1.1.11)

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Changed property	Conditions	Properties that SHOULD be updated
PidTagDisplayNamePrefix (section 2.2.1.1.3)	None.	**PidTagDisplayName**
PidTagSurname (section 2.2.1.1.4) or **PidTagMiddleName** or **PidTagGivenName**	None.	**PidTagDisplayName**, **PidTagNormalizedSubject**, **PidTagInitials** (section 2.2.1.1.7)
PidTagDisplayName	None.	**PidTagDisplayNamePrefix**, **PidTagGivenName**, **PidTagMiddleName**, **PidTagSurname**, **PidTagNormalizedSubject**, **PidTagGeneration**

The client SHOULD also update the **PidLidFax1EmailAddress** (section 2.2.1.2.8), **PidLidFax2EmailAddress** (section 2.2.1.2.8), or **PidLidFax3EmailAddress** (section 2.2.1.2.8) properties as needed to reflect any updates to the Contact Name properties if the contact (3) has a Primary Fax, Business Fax, or Home Fax address, respectively.

3.1.5.2 Modifying a Physical Address Property

Physical Address properties MUST be modified at the same time to preserve their relationship.

The following table specifies the properties that SHOULD be updated if another property is changed (according to the definition of each property in section 2.2.1 of this specification). Not all properties will need to be updated every time. Clients use the specifications in section 2.2.1.3 to determine whether an update is required. More than one condition can be met at the same time.

Changed property	Properties that SHOULD be updated
PidLidPostalAddressId (section 2.2.1.3.9)	**PidTagPostalAddress** (section 2.2.1.3.8), **PidTagStreetAddress** (section 2.2.1.3.1), **PidTagLocality** (section 2.2.1.3.2), **PidTagStateOrProvince** (section 2.2.1.3.3), **PidTagPostalCode** (section 2.2.1.3.4), **PidTagCountry** (section 2.2.1.3.5), **PidLidAddressCountryCode** (section 2.2.1.3.6)
PidLidWorkAddress (section 2.2.1.3.8)	**PidLidWorkAddressStreet** (section 2.2.1.3.1), **PidLidWorkAddressCity** (section 2.2.1.3.2), **PidLidWorkAddressState** (section 2.2.1.3.3), **PidLidWorkAddressPostalCode** (section 2.2.1.3.4), **PidLidWorkAddressCountry** (section 2.2.1.3.5), **PidLidWorkAddressCountryCode** (section 2.2.1.3.6)
PidLidHomeAddress (section 2.2.1.3.8)	**PidTagHomeAddressStreet** (section 2.2.1.3.1), **PidTagHomeAddressCity** (section 2.2.1.3.2), **PidTagHomeAddressStateOrProvince** (section 2.2.1.3.3), **PidTagHomeAddressPostalCode** (section 2.2.1.3.4), **PidTagHomeAddressCountry** (section 2.2.1.3.5), **PidLidHomeAddressCountryCode** (section 2.2.1.3.6)
PidLidOtherAddress (section 2.2.1.3.8)	**PidTagOtherAddressStreet** (section 2.2.1.3.1), **PidTagOtherAddressCity** (section 2.2.1.3.2), **PidTagOtherAddressStateOrProvince** (section 2.2.1.3.3), **PidTagOtherAddressPostalCode** (section 2.2.1.3.4), **PidTagOtherAddressCountry** (section 2.2.1.3.5),

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Changed property	Properties that SHOULD be updated
	PidLidOtherAddressCountryCode (section 2.2.1.3.6)
PidTagHomeAddressStreet	**PidLidHomeAddress**
PidLidWorkAddressStreet	**PidLidWorkAddress**
PidTagOtherAddressStreet	**PidLidOtherAddress**
PidTagHomeAddressCity	**PidLidHomeAddress**
PidLidWorkAddressCity	**PidLidWorkAddress**
PidTagOtherAddressCity	**PidLidOtherAddress**
PidTagHomeAddressStateOrProvince	**PidLidHomeAddress**
PidLidWorkAddressState	**PidLidWorkAddress**
PidTagOtherAddressStateOrProvince	**PidLidOtherAddress**
PidTagHomeAddressPostalCode	**PidLidHomeAddress**
PidLidWorkAddressPostalCode	**PidLidWorkAddress**
PidTagOtherAddressPostalCode	**PidLidOtherAddress**
PidTagHomeAddressCountry	**PidLidHomeAddress**
PidLidWorkAddressCountry	**PidLidWorkAddress**
PidTagOtherAddressCountry	**PidLidOtherAddress**
PidLidHomeAddressCountryCode	**PidLidHomeAddress**
PidLidWorkAddressCountryCode	**PidLidWorkAddress**
PidLidOtherAddressCountryCode	**PidLidOtherAddress**

The **PidTagPostalAddress**, **PidTagStreetAddress**, **PidTagLocality**, **PidTagStateOrProvince**, **PidTagPostalCode**, **PidTagCountry**, and **PidLidAddressCountryCode** properties SHOULD NOT be set without also setting one of the other addresses (either Home Address, Work Address, or Other Address) and **PidLidPostalAddressId**.

If the Home Address, Work Address, or Other Address is updated, and the **PidLidPostalAddressId** property is set and the physical address that it maps to is changed, then the Mailing Address MUST be updated if appropriate. For more details, see section 2.2.1.3.9.

3.1.5.3 Modifying an E-Mail Address Property

Electronic Address properties MUST be modified at the same time to preserve their relationship. The following table specifies the properties that SHOULD be updated when another property is changed (according to the definition of each property in section 2.2.1 of this specification). More than one condition can be met at the same time. The table includes property names only for the properties in the Email1 group (see section 2.2.1.2), but the same logic also applies to the properties in the Email2 and Email3 groups. Not all properties need to be updated every time. Clients use the specifications defined in section 2.2.1.2 to determine whether an update is required.

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Changed property	Conditions	Properties that SHOULD be updated
PidLidEmail1OriginalEntryId (section 2.2.1.2.5)	**PidLidEmail1OriginalEntryId** is now either an empty **PtypBinary** or not set.	**PidLidEmail1DisplayName** (section 2.2.1.2.1), **PidLidEmail1EmailAddress** (section 2.2.1.2.3), **PidLidEmail1AddressType** (section 2.2.1.2.2)
PidLidEmail1OriginalEntryId	**PidLidEmail1OriginalEntryId** is now a non-empty **PtypBinary**.	**PidLidEmail1EmailAddress**, **PidLidEmail1AddressType**, **PidLidEmail1DisplayName**, **PidLidEmail1OriginalDisplayName** (section 2.2.1.2.4)
PidLidEmail1DisplayName	**PidLidEmail1OriginalEntryId** is a one-off EntryID.	**PidLidEmail1OriginalEntryId**
PidLidEmail1AddressType	**PidLidEmail1OriginalEntryId** is a one-off EntryID.	**PidLidEmail1OriginalEntryId**
PidLidEmail1EmailAddress	**PidLidEmail1OriginalEntryId** is a one-off EntryID.	**PidLidEmail1OriginalEntryId**
PidLidEmail1EmailAddress	None.	**PidLidEmail1OriginalDisplayName**

The **PidLidEmail1OriginalDisplayName** property SHOULD be updated only when the other email properties are updated.

3.1.5.4 Updating a FAX Number

The electronic fax properties MUST be modified at the same time to preserve their relationship. When one of the fax number properties (**PidTagPrimaryFaxNumber**, **PidTagBusinessFaxNumber**, or **PidTagHomeFaxNumber**, specified in (section 2.2.1.2.6)) is defined, the following properties MUST be set, as specified in section 2.2.1 and the following table.

The fax properties SHOULD be updated only when the corresponding fax number is updated.

Fax number	Properties that SHOULD be updated or defined
PidTagPrimaryFaxNumber	**PidLidFax1AddressType** (section 2.2.1.2.7), **PidLidFax1EmailAddress** (section 2.2.1.2.8), **PidLidFax1OriginalDisplayName** (section 2.2.1.2.9), **PidLidFax1OriginalEntryId** (section 2.2.1.2.10)
PidTagBusinessFaxNumber	**PidLidFax2AddressType** (section 2.2.1.2.7), **PidLidFax2EmailAddress** (section 2.2.1.2.8), **PidLidFax2OriginalDisplayName** (section 2.2.1.2.9), **PidLidFax2OriginalEntryId** (section 2.2.1.2.10)
PidTagHomeFaxNumber	**PidLidFax3AddressType** (section 2.2.1.2.7), **PidLidFax3EmailAddress** (section 2.2.1.2.8), **PidLidFax3OriginalDisplayName** (section 2.2.1.2.9), **PidLidFax3OriginalEntryId** (section 2.2.1.2.10)

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3.1.5.5 Modifying an Event Property

Event properties MUST be modified at the same time to preserve their relationship.

The following table specifies the properties to be updated or defined when another property is changed as specified in section 2.2.1.5.

Changed property	Conditions	Properties to be updated or defined
PidTagBirthday (section 2.2.1.5.1)	None.	**PidLidReferenceEntryId** (section 2.2.1.10.1), **PidLidBirthdayEventEntryId** (section 2.2.1.5.3), **PidLidBirthdayLocal** (section 2.2.1.5.2) For more details, see the paragraph following the table.
PidLidBirthdayLocal	None.	**PidLidReferenceEntryId**, **PidLidBirthdayEventEntryId**, **PidTagBirthday**. For more details, see the paragraph following the table.
PidTagWeddingAnniversary (section 2.2.1.5.4)	None.	**PidLidReferenceEntryId**, **PidLidAnniversaryEventEntryId** (section 2.2.1.5.6), **PidLidWeddingAnniversaryLocal** (section 2.2.1.5.5) For more details, see the paragraph following the table.
PidLidWeddingAnniversaryLocal	None.	**PidLidReferenceEntryId**, **PidLidAnniversaryEventEntryId**, **PidTagWeddingAnniversary** For more details, see the paragraph following the table.
PidLidBirthdayEventEntryId	None.	**PidTagBirthday**, **PidLidBirthdayLocal**
PidLidAnniversaryEventEntryId	None.	**PidTagWeddingAnniversary**, **PidLidWeddingAnniversaryLocal**
PidTagNormalizedSubject (section 2.2.1.11.1)	**PidLidBirthdayEventEntryId** or **PidLidAnniversaryEventEntryId** is set.	Update the value of the **PidTagSubjectPrefix** property ([MS-OXOMSG] section 2.2.1.60) on the corresponding Appointment object to match the name of the contact (3).
PidLidPrivate ([MS-OXCMSG] section 2.2.1.15)	**PidLidBirthdayEventEntryId** or **PidLidAnniversaryEventEntryId** is set.	Update the value of the **PidLidPrivate** property on the corresponding Appointment object to match the one on the contact (3).

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When the **PidTagBirthday** property or the **PidLidBirthdayLocal** property is updated, the client SHOULD update the Appointment object associated with this contact's (3) birthday (**PidLidBirthdayEventEntryId** property) to match the time specified in the **PidTagBirthday** property. If no Appointment object has been created, the client SHOULD create an Appointment object, save the Appointment object's EntryID to the **PidLidBirthdayEventEntryId** property, and link the Appointment object to the Contact object by using the **PidLidContactLinkEntry** ([MS-OXCMSG] section 2.2.1.57.1), **PidLidContactLinkSearchKey** ([MS-OXCMSG] section 2.2.1.57.4), and **PidLidContactLinkName** ([MS-OXCMSG] section 2.2.1.57.3) properties, as specified in [MS-OXCMSG] section 2.2.1.57.

When the **PidTagWeddingAnniversary** property or the **PidLidWeddingAnniversaryLocal** property is updated, the client SHOULD update the Appointment object associated with this contact's (3) anniversary (**PidLidAnniversaryEventEntryId** property) to match the time specified in the **PidTagWeddingAnniversary** property. If no Appointment object has been created, the client SHOULD create an Appointment object, save the Appointment object's EntryID to the **PidLidAnniversaryEventEntryId** property, and link the Appointment object to the Contact object using the **PidLidContactLinkEntry**, **PidLidContactLinkSearchKey**, and **PidLidContactLinkName** properties, as specified in [MS-OXCMSG] section 2.2.1.57.

For details about Appointment objects, see [MS-OXOCAL].

3.1.5.6 Modifying a Business Card Property

Business Card properties MUST be modified at the same time to preserve their relationship. The following table specifies which properties MUST be updated when another property is updated.

Changed property	Conditions	Properties that MUST be updated
PidLidBusinessCardCardPicture (section 2.2.1.7.2)	On removal or addition.	The **ImageSource** field of the **PidLidBusinessCardDisplayDefinition** property (section 2.2.1.7.1) MUST be updated to reflect the removal or addition of the card picture.
PidLidBusinessCardDisplayDefinition	When the value of the **ImageSource** field changes.	The **PidLidBusinessCardCardPicture** property MUST be added or removed.

3.1.5.7 Modifying a Contact Photo Property

Contact Photo properties MUST be modified at the same time to preserve their relationship. The following table specifies which properties MUST be updated when another property is updated.

Changed property or attachment	Conditions	Properties that MUST be updated
Contact Photo Attachment as specified in section 2.2.1.8.3	On removal or addition.	The **PidLidHasPicture** property (section 2.2.1.8.1) MUST be updated to reflect the removal or addition of the contact photo.

3.1.5.8 Naming a Personal Distribution List

When the client changes the name of a personal distribution list, either by user input or by other means, the properties in the following table MUST be updated.

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Property name	Value
PidTagDisplayName (section 2.2.2.1.1)	The name of the Personal Distribution List object.
PidLidDistributionListName (section 2.2.2.1.2)	The name of the Personal Distribution List object.
PidLidFileUnder (section 2.2.2.1.3)	The name of the Personal Distribution List object.
PidLidFileUnderId (section 2.2.1.1.12)	This property MUST be set to 0xFFFFFFFF.
PidTagNormalizedSubject (section 2.2.2.4.1)	This MUST be set to the same value as the value **PidLidDistributionListName** property.

3.1.5.9 Adding a Member to a Personal Distribution List

Personal Distribution List objects SHOULD NOT contain duplicate entries for the same members. Whenever a member is added to a personal distribution list, the client SHOULD check that the new member isn't already in the list. Then the client MUST update the **PidLidDistributionListMembers** (section 2.2.2.2.1) and **PidLidDistributionListOneOffMembers** (section 2.2.2.2.2) properties.

The EntryID corresponding to the member MUST be added to the **PidLidDistributionListMembers** property, and the one-off EntryID corresponding to the member MUST be added to the **PidLidDistributionListOneOffMembers** property. The new values MUST be added such that the entry is in the same position of both multivalue properties.

After updating these properties, the client SHOULD update the **PidLidDistributionListChecksum** property (section 2.2.2.2.3), as specified in section 3.1.5.11.

3.1.5.10 Removing a Member from a Personal Distribution List

Whenever a member is removed from a personal distribution list, the client MUST update the **PidLidDistributionListMembers** (section 2.2.2.2.1) and **PidLidDistributionListOneOffMembers** (section 2.2.2.2.2) properties.

The EntryID corresponding to the member MUST be removed from the **PidLidDistributionListMembers** property, and the one-off EntryID corresponding to the member MUST be removed from the **PidLidDistributionListOneOffMembers** property.

After updating these properties, the client SHOULD update the **PidLidDistributionListChecksum** property (section 2.2.2.2.3), as specified in section 3.1.5.11.

3.1.5.11 Updating the Checksum of a Personal Distribution List

Whenever a member is added to or removed from a personal distribution list, the client SHOULD update the value of the **PidLidDistributionListChecksum** property (section 2.2.2.2.3). The checksum is calculated by iterating through each byte of each **PtypBinary** value in the multivalue **PidLidDistributionListMembers** property (section 2.2.2.2.1), as specified by the following algorithm.

```
SET CheckSum = 0
FOR EACH PtypBinaryValue in PidLidDistributionListMembers
FOR EACH byteValue in PtypBinaryValue
Checksum = CRC(Checksum, byteValue)
ENDFOR
```


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```
ENDFOR
```

This algorithm uses the IEEE 802.3 CRC polynomial 0xEDB88320 (x32 + x26 + x23 + x22 + x16 + x12 + x11 + x10 + x8 + x7 + x5 + x4 + x2 + x + 1) with a seed value of 0x00000000. For more details about the polynomial, see [ISO/IEC8802-3] section 3.2.8.

3.1.6 Timer Events

None.

3.1.7 Other Local Events

None.

3.2 Server Details

The server processes a client's requests regarding a Contact object and a Personal Distribution List object, and in all other ways operates within the server role as specified in [MS-OXCMSG].

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.

This protocol uses the abstract data model that is specified in [MS-OXCMSG] section 3.2.1 with the following adaptations:

- The Contact object and the Personal Distribution List object are extensions of the Message object.
- A Contact object and a Personal Distribution List object are created in the contacts-related folders, as specified in section 2.2.3.

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

The server responds to client requests as specified in [MS-OXCMSG].

3.2.6 Timer Events

None.

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3.2.7 Other Local Events

None.

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4 Protocol Examples

4.1 Creating a Contact

A user creates a contact (3) with a name (Jay Hamlin), email address (someone@example.com), and phone number ((206) 555-0123), and then saves it. The following is an example of what a client might do to accomplish the user's intentions, and the responses a server might return.

Before manipulating Contact objects, the client needs to ask the server to map **property names** or **long IDs (LIDs)** to property IDs by using the **RopGetPropertyIdsFromNames** ROP ([MS-OXCROPS] section 2.2.8.1).

Property	Property set GUID	LID
PidLidFileUnderList (section 2.2.1.1.13)	{00062004-0000-0000-C000-000000000046}	0x00008026
PidLidAutoLog (section 2.2.1.10.19)	{00062004-0000-0000-C000-000000000046}	0x00008025
PidLidAddressBookProviderEmailList (section 2.2.1.2.11)	{00062004-0000-0000-C000-000000000046}	0x00008028
PidLidAddressBookProviderArrayType section 2.2.1.2.12	{00062004-0000-0000-C000-000000000046}	0x00008029
PidLidFileUnder (section 2.2.1.1.11)	{00062004-0000-0000-C000-000000000046}	0x00008005
PidLidFileUnderId (section 2.2.1.1.12)	{00062004-0000-0000-C000-000000000046}	0x00008006
PidLidContactCharacterSet (section 2.2.1.10.18)	{00062004-0000-0000-C000-000000000046}	0x00008023
PidLidEmail1DisplayName (section 2.2.1.2.1)	{00062004-0000-0000-C000-000000000046}	0x00008080
PidLidEmail1AddressType (section 2.2.1.2.2)	{00062004-0000-0000-C000-000000000046}	0x00008082
PidLidEmail1EmailAddress (section 2.2.1.2.3)	{00062004-0000-0000-C000-000000000046}	0x00008083
PidLidEmail1OriginalDisplayName (section 2.2.1.2.4)	{00062004-0000-0000-C000-000000000046}	0x00008084
PidLidEmail1OriginalEntryId (section 2.2.1.2.5)	{00062004-0000-0000-C000-000000000046}	0x00008085

For this example, the server returns the following property IDs in response to the **RopGetPropertyIdsFromNames** **ROP request**. The actual property IDs are at the discretion of the server.

Property	Property ID
PidLidFileUnderList	0x827B

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Property	Property ID
PidLidAutoLog	0x8280
PidLidAddressBookProviderEmailList	0x81D4
PidLidAddressBookProviderArrayType	0x81D5
PidLidFileUnder	0x8016
PidLidFileUnderId	0x81DA
PidLidContactCharacterSet	0x8286
PidLidEmail1DisplayName	0x 8013
PidLidEmail1AddressType	0x81CE
PidLidEmail1EmailAddress	0x 8010
PidLidEmail1OriginalDisplayName	0x801F
PidLidEmail1OriginalEntryId	0x81CF

To create a Contact object, the client uses the **RopCreateMessage** ROP ([MS-OXCROPS] section 2.2.6.2). The server returns a success code and a **handle** to a Message object.

The properties of the Contact object are set according to data that is specified by the user. After the user has input the data for the Contact object, the client uses the **RopSetProperties** ROP ([MS-OXCROPS] section 2.2.8.6) to transmit the property settings to the server. The properties and their settings for this example are listed in the following table. The property types shown in the table are described in [MS-OXCDATA] section 2.11.1.

Property	Property type	Data	Meaning
PidTagDisplayNamePrefix (section 2.2.1.1.3)	**PtypString**	00 00	""
PidTagSurname (section 2.2.1.1.4)	**PtypString**	48 00 61 00 6D 00 6C 00 69 00 6E 00 00 00	"Hamlin"
PidTagMiddleName (section 2.2.1.1.5	**PtypString**	00 00	""
PidTagGivenName (section 2.2.1.1.6)	**PtypString**	4A 00 61 00 79 00 00 00	"Jay"
PidLidFileUnderList	**PtypMultipleInteger32**	05 00 00 00 17 80 00 00	cValues: 0x00000005 lpl: {0x00008017; 0x00008037; 0x00003A16;

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Property	Property type	Data	Meaning
		37 80 00 00 16 3A 00 00 19 80 00 00 18 80 00 00	0x00008019; 0x00008018}
PidLidAddressBookProviderEmailList	**PtypMultipleInteger32**	01 00 00 00 00 00 00 00	cValues: 0x00000001 lpl: {0x00000000}
PidLidAddressBookProviderArrayType	**PtypInteger32**	0x0000 0001	Email1 is defined
PidLidFileUnder	**PtypString**	48 00 61 00 6D 00 6C 00 69 00 6E 00 2C 00 20 00 4A 00 61 00 79 00 00 00	"Hamlin, Jay"
PidLidFileUnderId	**PtypInteger32**	0x0000 8017	**PidLidFileUnder** is "<**PidTagSurname**>, <**PidTagGivenName**> <**PidTagMiddleName**>"
PidTagGeneration (section 2.2.1.1.2)	**PtypString**	00 00	""
PidTagInitials (section 2.2.1.1.7)	**PtypString**	4A 00 2E 00 48 00 2E 00 00 00	"J.H."
PidLidAutoLog	**PtypBoolean**	0x00	FALSE
PidTagBusinessTelephoneNumber (section 2.2.4.21)	**PtypString**	28 00 32 00 30 00 36 00 29 00 20 00 35 00 35 00 35 00 2D 00	(206) 555-0123"

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Property	Property type	Data	Meaning
		30 00 31 00 32 00 33 00 00 00	
PidLidContactCharacterSet	**PtypInteger32**	0x0000 0100	US character set (2)
PidTagDisplayName (section 2.2.1.1.8)	**PtypString**	4A 00 61 00 79 00 20 00 48 00 61 00 6D 00 6C 00 69 00 6E 00 00 00	"Jay Hamlin"
PidLidEmail1DisplayName	**PtypString**	73 00 6F 00 6D 00 65 00 6F 00 6E 00 65 00 20 00 28 00 73 00 6F 00 6D 00 65 00 6F 00 6E 00 65 00 40 00 65 00 78 00 61 00 6D 00 70 00 6C 00 65 00 2E 00 63 00 6F 00 6D 00 29 00 00 00	"someone (someone@example.com)"
PidLidEmail1AddressType	**PtypString**	45 00 58 00 00 00	"EX"
PidLidEmail1EmailAddress	**PtypString**	2F 00 6F 00	"/o=First Organization/ou=Exchange

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Property	Property type	Data	Meaning
		3D 00 46 00 69 00 72 00 73 00 74 00 20 00 4F 00 72 00 67 00 61 00 6E 00 69 00 7A 00 61 00 74 00 69 00 6F 00 6E 00 2F 00 6F 00 75 00 3D 00 45 00 78 00 63 00 68 00 61 00 6E 00 67 00 65 00 20 00 41 00 64 00 6D 00 69 00 6E 00 69 00 73 00 74 00 72 00 61 00 74 00 69 00 76 00 65 00 20 00 47 00 72 00 6F 00 75 00 70 00 20 00 28 00 46 00 59 00 44 00 49 00 42 00 4F 00 48 00 46 00	Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients /cn=someone"

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Property	Property type	Data	Meaning
		32 00 33 00 53 00 50 00 44 00 4C 00 54 00 29 00 2F 00 63 00 6E 00 3D 00 52 00 65 00 63 00 69 00 70 00 69 00 65 00 6E 00 74 00 73 00 2F 00 63 00 6E 00 3D 00 73 00 6F 00 6D 00 65 00 6F 00 6E 00 65 00 00 00	
PidLidEmail1OriginalDisplayName	**PtypString**	73 00 6F 00 6D 00 65 00 6F 00 6E 00 65 00 40 00 65 00 78 00 61 00 6D 00 70 00 6C 00 65 00 2E 00 63 00 6F 00 6D 00 00 00	"someone@example.com"
PidLidEmail1OriginalEntryId	**PtypBinary**	7D 00 00 00 DC A7 40 C8	Size: 125 bytes ....@..B ......+/ ....

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Property	Property type	Data	Meaning
		C0 42 10 1A B4 B9 08 00 2B 2F E1 82 01 00 00 00 00 00 00 00 2F 6F 3D 46 69 72 73 74 20 4F 72 67 61 6E 69 7A 61 74 69 6F 6E 2F 6F 75 3D 45 78 63 68 61 6E 67 65 20 41 64 6D 69 6E 69 73 74 72 61 74 69 76 65 20 47 72 6F 75 70 20 28 46 59 44 49 42 4F 48 46 32 33 53 50 44 4C 54 29 2F 63 6E 3D 52 65 63 69 70 69 65 6E 74 73 2F 63 6E 3D 73 6F 6D 65 6F 6E 65 00	../o=First Organization/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=someone.
PidTagRtfCompressed ([MS-	**PtypBinary**	E6 14	Size: 5350 bytes

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Property	Property type	Data	Meaning
OXCMSG] section 2.2.1.56.4)		E2 14 00 00 93 52 00 00 4C 5A 46 75 62 F8 7E BB 07 00 06 01 01 0B 60 6E 67 31 30 32 66 35 00 64 00 72 63 70 0D D0 0E 00 32 05 0C 60 63 0D 44 66 33 31 35 30 42 37 00 F5 73 74 73 68 05 70 62 74 … (remainder of property excluded for brevity)	.....R.. LZFub.~. ......`n g102f5.d .rcp.... 2..`c.Df 3150B7.. stsh.pbt
PidTagMessageClass (section 2.2.1.11.2)	**PtypString**	49 00 50 00 4D 00 2E 00 43 00 6F 00 6E 00 74 00 61 00 63 00 74 00 00 00	"IPM.Contact"
PidTagIconIndex ([MS-OXOMSG] section 2.2.1.10)	**PtypInteger32**	00 20 00 00	512

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Property	Property type	Data	Meaning
PidTagSubjectPrefix ([MS-OXOMSG] section 2.2.1.60)	**PtypString**	00	""
PidTagSubject ([MS-OXPROPS] section 2.1021)	**PtypString**	4A 00 61 00 79 00 20 00 48 00 61 00 6D 00 6C 00 69 00 6E 00 00 00	"Jay Hamlin"

When the user is ready to save his or her changes, the client uses the **RopSaveChangesMessage** ROP ([MS-OXCROPS] section 2.2.6.3) to commit the properties on the server.

The values of some properties will change during the execution of the **RopSaveChangesMessage** ROP; however, none of the properties that change are Contact object properties.

4.2 Creating a Personal Distribution List

A user creates a personal distribution list that contains the previous sample contact (3) and another email address (user1@example.com). The following is a description of what a client might do to accomplish the user's intentions and what responses a server might return.

Before manipulating Contact objects, the client needs to ask the server to map property names or long IDs (LIDs) to property IDs by using the **RopGetPropertyIdsFromNames** ROP ([MS-OXCROPS] section 2.2.8.1).

Property	Property set GUID	LID
PidLidAutoLog (section 2.2.1.10.19)	{00062004-0000-0000-C000-000000000046}	0x00008025
PidLidAddressBookProviderArrayType (section 2.2.2.3.1)	{00062004-0000-0000-C000-000000000046}	0x00008029
PidLidFileUnder (section 2.2.2.1.3)	{00062004-0000-0000-C000-000000000046}	0x00008005
PidLidFileUnderId (section 2.2.2.1.4)	{00062004-0000-0000-C000-000000000046}	0x00008006
PidLidDistributionListName (section 2.2.2.1.2)	{00062004-0000-0000-C000-000000000046}	0x00008053
PidLidDistributionListChecksum (section 2.2.2.2.3)	{00062004-0000-0000-C000-000000000046}	0x0000804C
PidLidDistributionListMembers (section 2.2.2.2.1)	{00062004-0000-0000-C000-000000000046}	0x00008055
PidLidDistributionListOneOffMembers (section 2.2.2.2.2)	{00062004-0000-0000-C000-000000000046}	0x00008054

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For this example, the server returns the following property IDs in response to the **RopGetPropertyIdsFromNames** ROP request ([MS-OXCROPS] section 2.2.8.1). The actual property IDs are at the discretion of the server.

Property	Property ID
PidLidAutoLog	0x8280
PidLidAddressBookProviderArrayType	0x81D5
PidLidFileUnder	0x8016
PidLidFileUnderId	0x81DA
PidLidDistributionListName	0x81C9
PidLidDistributionListChecksum	0x81C7
PidLidDistributionListMembers	0x81C8
PidLidDistributionListOneOffMembers	0x81CA

To create a Personal Distribution List object, the client uses the **RopCreateMessage** ROP ([MS-OXCROPS] section 2.2.6.2). The server returns a success code and a handle to a Message object.

The properties of the Contact object are set according to data that is specified by the user. After the user has input content the data for the Personal Distribution List object, the client uses the **RopSetProperties** ROP ([MS-OXCROPS] section 2.2.8.6) to transmit the property settings to the server. The properties and their settings for this example are listed in the following table. The property types shown in the table are described in [MS-OXCDATA] section 2.11.1.

Property	Property type	Data	Meaning
PidTagDisplayNamePrefix (section 2.2.1.1.3)	**PtypString**	00 00	""
PidLidAddressBookProviderArrayType (section 2.2.2.3.1)	**PtypInteger32**	0x00000000	0
PidLidFileUnder	**PtypString**	46 00 72 00 69 00 65 00 6E 00 64 00 73 00 00 00	"Friends"
PidLidFileUnderId	**PtypInteger32**	0xFFFFFFFF	-1
PidLidAutoLog	**PtypBoolean**	0x00	FALSE
PidTagDisplayName (section 2.2.2.1.1)	**PtypString**	46 00 72 00 69 00 65 00 6E 00 64 00 73 00 00 00	"Friends"

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Property	Property type	Data	Meaning
PidLidDistributionListName	**PtypString**	46 00 72 00 69 00 65 00 6E 00 64 00 73 00 00 00	"Friends"
PidLidDistributionListChecksum	**PtypInteger32**	0xD4B0223A	-726654406
PidLidDistributionListMembers	**PtypMultipleBinary**	02 00 00 00 64 00 00 00 00 81 2B 1F A4 BE A3 10 19 9D 6E 00 DD 01 0F 54 02 00 00 01 80 54 00 68 00 6F 00 6D 00 61 00 73 00 20 00 48 00 61 00 6D 00 62 00 6F 00 72 00 67 00 00 00 53 00 4D 00 54 00 50 00 00 00 75 00 73 00 65 00 72 00 31 00 40 00 65 00 78 00 61 00 6D 00 70 00 6C 00 65 00 2E 00 63 00 6F 00 6D 00 00 00 5B 00 00 00 00 00 C0 91 AD D3 51 9D	2 binary large objects (BLOBs) to follow BLOB1 Size: 100 bytes .....+.. .....n.. ..T..... T.h.o.m. a.s. .H. a.m.b.o. r.g...S. M.T.P... u.s.e.r. 1.@.e.x. a.m.p.l. e...c.o. m... BLOB2 Size: 91 bytes .... Q....... .G...... ..BB.`.. G..\.w.K ...a*{.I .NK.R..Z S......N ...a*{.I .NK.R..Z S....... ...

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Property	Property type	Data	Meaning
		CF 11 A4 A9 00 AA 00 47 FA A4 C3 00 00 00 00 C2 42 42 82 60 00 16 47 AD A9 5C 07 77 B7 4B E2 07 00 61 2A 7B AB 49 F6 4E 4B 9C 52 DB FB 5A 53 AA 1C 00 00 00 F0 4E A6 00 00 61 2A 7B AB 49 F6 4E 4B 9C 52 DB FB 5A 53 AA 1C 00 00 00 F0 D5 B0 00 00	
PidLidDistributionListOneOffMembers	**PtypMultipleBinary**	02 00 00 00 64 00 00 00 00 00 81 2B 1F A4 BE A3 10 19 9D 6E 00 DD 01 0F 54 02 00 00 01 80 54 00 68 00 6F 00 6D 00 61 00 73 00 20 00 48 00 61 00 6D 00 62 00 6F 00 72 00 67 00 00 00 53 00 4D 00 54	2 BLOBs to follow BLOB1 Size: 100 bytes .....+.. .....n.. ..T..... T.h.o.m. a.s. .H. a.m.b.o. r.g...S. M.T.P... u.s.e.r. 1.@.e.x. a.m.p.l. e...c.o. m... BLOB2 Size: 172 bytes .....+.. .....n.. ..T..... u.s.e.r.

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Property	Property type	Data	Meaning
		00 50 00 00 00 75 00 73 00 65 00 72 00 31 00 40 00 65 00 78 00 61 00 6D 00 70 00 6C 00 65 00 2E 00 63 00 6F 00 6D 00 00 00 AC 00 00 00 00 00 81 2B 1F A4 BE A3 10 19 9D 6E 00 DD 01 0F 54 02 00 00 01 80 75 00 73 00 65 00 72 00 31 00 30 00 20 00 28 00 75 00 73 00 65 00 72 00 31 00 30 00 40 00 73 00 7A 00 66 00 6B 00 75 00 6B 00 2D 00 64 00 6F 00 6D 00 2E 00 65 00 78 00 6A 00 6D 00 70 00 6C 00 65 00 2E 00 63 00 6F 00 6D 00 29 00 00 00 53 00 4D 00 54 00 50 00 00 00 75 00 73	1.0. .(. u.s.e.r. 1.0.@.s. z.f.k.u. k.-.d.o. m...e.x. a.m.p.l. e...c.o. m.)...S. M.T.P... u.s.e.r. 1.0.@.s. z.f.k.u. k.-.d.o. m...e.x. a.m.p.l. e...c.o. m...

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Property	Property type	Data	Meaning
		00 65 00 72 00 31 00 30 00 40 00 73 00 7A 00 66 00 6B 00 75 00 6B 00 2D 00 64 00 6F 00 6D 00 2E 00 65 00 78 00 6A 00 6D 00 70 00 6C 00 65 00 2E 00 63 00 6F 00 6D 00 00 00	
PidTagMessageClass (section 2.2.2.4.2)	**PtypString**	49 00 50 00 4D 00 2E 00 44 00 69 00 73 00 74 00 4C 00 69 00 73 00 74 00 00 00	"IPM.DistList"
PidTagIconIndex ([MS-OXOMSG] section 2.2.1.10)	**PtypInteger32**	0x00000202	514
PidTagSubjectPrefix ([MS-OXOMSG] section 2.2.1.60)	**PtypString**	00 00	""
PidTagSubject ([MS-OXPROPS] section 2.1021)	**PtypString**	46 00 72 00 69 00 65 00 6E 00 64 00 73 00 00 00	"Friends"

When the user is ready to save his or her changes, the client uses the **RopSaveChangesMessage** ROP ([MS-OXCROPS] section 2.2.6.3) to commit the properties on the server.

The values of some properties will change during the execution of the **RopSaveChangesMessage** ROP; however, none of the properties that change are Personal Distribution List object properties.

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5 Security

5.1 Security Considerations for Implementers

There are no special security considerations specific to the Contact Object Protocol. General security considerations pertaining to the underlying transport apply, as described in [MS-OXCMSG].

5.2 Index of Security Parameters

None.

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6 Appendix A: Product Behavior

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

- Microsoft Exchange Server 2003
- Microsoft Exchange Server 2007
- Microsoft Exchange Server 2010
- Microsoft Exchange Server 2013
- Microsoft Office Communicator 2007 R2
- Microsoft Lync 2010
- Microsoft Lync 2013
- Microsoft Office Outlook 2003
- Microsoft Office Outlook 2007
- Microsoft Outlook 2010
- Microsoft Outlook 2013

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

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

<1> Section 1.6: Lync 2013 uses this protocol when connected to Exchange 2010 or Lync Server 2010. When Lync 2013 is connected to Exchange 2013 or Lync Server 2013, it uses the Unified Contact Store Web Service Protocol, as described in [MS-OXWSCOS].

<2> Section 2.2.1.2: Exchange 2003 sets the **PidLidAddressBookProviderArrayType** property (section 2.2.1.2.12) to 0x00000000 and never sets the **PidLidAddressBookProviderEmailList** property (section 2.2.1.2.11) unless an email address is defined for the contact (3).

<3> Section 2.2.1.7: Office Outlook 2003 does not use the Business Card properties.

<4> Section 2.2.1.8: Exchange 2003 does not use Contact Photo properties.

<5> Section 2.2.1.9: Exchange 2003, Exchange 2007, Exchange 2010, Office Outlook 2003, Office Outlook 2007, Outlook 2010, and Outlook 2013 do not support the contact aggregation properties.

<6> Section 2.2.1.9.1: Exchange 2003, Exchange 2007, Exchange 2010, Office Outlook 2003, Office Outlook 2007, Outlook 2010, and Outlook 2013 do not support the **PidLidContactLinkedGlobalAddressListEntryId** property (section 2.2.1.9.1).

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<7> Section 2.2.1.9.2: Exchange 2003, Exchange 2007, Exchange 2010, Office Outlook 2003, Office Outlook 2007, Outlook 2010, and Outlook 2013 do not support the **PidLidContactLinkGlobalAddressListLinkId** property (section 2.2.1.9.2).

<8> Section 2.2.1.9.3: Exchange 2003, Exchange 2007, Exchange 2010, Office Outlook 2003, Office Outlook 2007, Outlook 2010, and Outlook 2013 do not support the **PidLidContactLinkGlobalAddressListLinkState** property (section 2.2.1.9.3).

<9> Section 2.2.1.9.4: Exchange 2003, Exchange 2007, Exchange 2010, Office Outlook 2003, Office Outlook 2007, Outlook 2010, and Outlook 2013 do not support the **PidLidContactLinkLinkRejectHistory** property (section 2.2.1.9.4).

<10> Section 2.2.1.9.5: Exchange 2003, Exchange 2007, Exchange 2010, Office Outlook 2003, Office Outlook 2007, Outlook 2010, and Outlook 2013 do not support the **PidLidContactLinkSMTPAddressCache** property (section 2.2.1.9.5).

<11> Section 2.2.1.9.6: Exchange 2003, Exchange 2007, Exchange 2010, Office Outlook 2003, Office Outlook 2007, Outlook 2010, and Outlook 2013 do not support the **PidLidIsContactLinked** property (section 2.2.1.9.6).

<12> Section 2.2.1.9.7: Exchange 2003, Exchange 2007, Exchange 2010, Office Outlook 2003, Office Outlook 2007, Outlook 2010, and Outlook 2013 do not support the **PidTagOscSyncEnabled** property (section 2.2.1.9.7).

<13> Section 2.2.1.10.18: Exchange 2003 and Exchange 2007 do not set or use the **PidLidContactCharacterSet** property (section 2.2.1.9.18).

<14> Section 2.2.2.1.4: Exchange 2007, Exchange 2010, and Exchange 2013 set the **PidLidFileUnderId** property (section 2.2.2.1.4) to 0 when it creates a distribution list.

<15> Section 2.2.2.2.2: Exchange 2003 does not set or update the **PidLidDistributionListOneOffMembers** property.

<16> Section 2.2.2.2.4: Exchange 2003, Exchange 2007, and Office Outlook 2003 do not use the **PidLidDistributionListStream** property (section 2.2.2.2.4).

<17> Section 2.2.2.2.4: If the **PidLidDistributionListStream** property (section 2.2.2.2.4) is set, Office Outlook 2003 does not ignore the **PidLidDistributionListMembers** (section 2.2.2.2.1), **PidLidDistributionListOneOffMembers** (section 2.2.2.2.2), and **PidLidDistributionListChecksum** (section 2.2.2.2.3) properties.

<18> Section 2.2.3: Exchange 2003, Exchange 2007, Exchange 2010, Office Outlook 2003, Office Outlook 2007, Outlook 2010, and Outlook 2013 do not support the Quick Contacts folder, the IM Contact List folder, and the contacts folders that contain imported contacts.

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7 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.

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8 Index

A

Abstract data model
  client 49
  server 57
Additional property constraints
  Contact object properties 41
  personal distribution list properties 48
Applicability 11

B

Business Card Contact object properties 29

C

Capability negotiation 12
Change tracking 76
Client
  abstract data model 49
  initialization 49
  other local events 57
  overview 49
  timer events 57
  timers 49
Client - higher-layer triggered events - personal distribution list events 50
Contact aggregation Contact object properties 36
Contact Name Contact object properties 13
Contact object properties
  additional property constraints 41
  Business Card properties 29
  Contact aggregation properties 36
  Contact Name properties 13
  Contact Photo properties 35
  Electronic Address properties 16
  event properties 27
  Physical Address properties 21
  Professional properties 28
  Telephone properties 25
Contact Object Properties message 13
Contact Photo Contact object properties 35
Contacts-Related Folders message 48
Creating a contact example 59
Creating a personal distribution list example 67

D

Data model - abstract
  client 49
  server 57

E

Electronic Address Contact object properties 16
Event Contact object properties 27
Examples
  creating a contact 59
  creating a personal distribution list 67

F

Fields - vendor-extensible 12

G

Glossary 9

H

Higher-layer triggered events
  server 57
Higher-layer triggered events - client
  personal distribution list events 50

I

Implementer - security considerations 73
Index of security parameters 73
Informative references 11
Initialization
  client 49
  server 57
Introduction 9

M

Message processing
  server 57
Message syntax - overview 13
Messages
  Contact Object Properties 13
  Contacts-Related Folders 48
  Personal Distribution List Properties 41
  transport 13

N

Normative references 10

O

Other local events
  client 57
  server 58
Overview (synopsis) 11

P

Parameters - security index 73
Personal Distribution List Name personal distribution list properties 41
Personal distribution list properties
  additional property constraints 48
  Personal Distribution List Name properties 41
Personal Distribution List Properties message 41
Physical Address Contact object properties 21
Preconditions 11

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Prerequisites 11
Product behavior 74
Professional Contact object properties 28

R

References 10
  informative 11
  normative 10
Relationship to other protocols 11

S

Security
  implementer considerations 73
  parameter index 73
Sequencing rules
  server 57
Server
  abstract data model 57
  higher-layer triggered events 57
  initialization 57
  message processing 57
  other local events 58
  overview 57
  sequencing rules 57
  timer events 57
  timers 57
Standards assignments 12

T

Telephone Contact object properties 25
Timer events
  client 57
  server 57
Timers
  client 49
  server 57
Tracking changes 76
Transport 13
Triggered events - client
  personal distribution list events 50
Triggered events - higher-layer
  server 57

V

Vendor-extensible fields 12
Versioning 12

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