# [MS-OXOCNTC]: Contact Object Protocol Specification

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# Table of Contents

# 1 Introduction

This document specifies the Contact Object Protocol, a **Message object** that serves as the basic organizational unit for personal information, such as phone numbers, e-mail addresses, and mailing addresses. It also serves as the basic organizational unit for collections of e-mail addresses, which can be used to create mailing lists.

This document extends the Message and Attachment Object Protocol, as specified in [MS-OXCMSG], and specifies the properties that are set on **Contact objects** and **Personal Distribution List objects** in addition to the **Message** object properties specified in [MS-OXCMSG] section 2.2.1. This specification assumes that the reader has familiarity with the concepts and requirements of [MS-OXCMSG]. Those concepts and requirements are not repeated in this specification.

## *1.1 Glossary*

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

**Address Book object**
**binary large object (BLOB)**
**Coordinated Universal Time (UTC)**
**folder**
**.jpg**
**little-endian**
**locale**
**mailbox**
**Message object**
**one-off EntryId**
**portable network graphics (PNG)**
**property**
**store**
**Unicode**

The following data types are defined in [MS-OXCDATA]:

**PtypBinary**
**PtypBoolean**
**PtypInteger16**
**PtypInteger32**
**PtypMultipleBinary**
**PtypMultipleInteger32**
**PtypMultipleString**
**PtypString**

The following terms are specific to this document:

**address type:** An identifier for the type of e-mail address, such as SMTP and EX.

**Contact object:** A **Message object** that contains properties pertaining to a contact.

**Personal Distribution List object**: A **Message object** that contains properties that pertain specifically to user-created distribution lists.

**point**: A unit of length used in typography to specify text character height and width.

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

## *1.2 References*

### 1.2.1 Normative References

[ISO/IEC 8802-3] International Organization for Standardization, "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 Protocol Specification", June 2008.

[MS-OXCFOLD] Microsoft Corporation, "Folder Object Protocol Specification", June 2008.

[MS-OXCICAL] Microsoft Corporation, " iCalendar to Appointment Object Conversion Protocol Specification", June 2008.

[MS-OXCMSG] Microsoft Corporation, "Message and Attachment Object Protocol Specification", June 2008.

[MS-OXCPRPT] Microsoft Corporation, "Property and Stream Object Protocol Specification", June 2008.

[MS-OXGLOS] Microsoft Corporation, "Exchange Server Protocols Master Glossary", June 2008.

[MS-OXOABK] Microsoft Corporation, "Address Book Object Protocol Specification", June 2008.

[MS-OXOCAL] Microsoft Corporation, "Appointment and Meeting Object Protocol Specification", June 2008.

[MS-OXPROPS] Microsoft Corporation, "Exchange Server Protocols Master Property List Specification", June 2008.

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

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

None.

## *1.3 Protocol Overview*

A **Contact object** is a **Message object** that represents a person or an entity. A **Personal Distribution List object** is a **Message** object that represents a group of e-mail addresses.

This protocol is an extension of the Message and Attachment Object Protocol, as specified in [MS-OXCMSG], and specifies the representation of a contact or personal distribution list in a messaging **store**. This document specifies the **properties** that are unique to **Contact** and **Personal Distribution List** objects, and the interdependencies that exist between subsets of these properties. A **Contact** object can contain subsets of properties that together define a subobject stored on a **Contact** object, such as an e-mail address or a mailing address.

## *1.4 Relationship to Other Protocols*

The Contact Object Protocol Specification is an extension to the Message and Attachment Object Protocol, as specified in [MS-OXCMSG], which specifies **Message objects**. [MS-OXCMSG] specifies the ROPs used to create and modify **Message** objects, and the **properties** that are common to all **Message** objects.

This protocol also requires an understanding of properties, as specified in [MS-OXPROPS], and **folders**, as specified in [MS-OXCFOLD].

## *1.5 Prerequisites/Preconditions*

None.

## 1.6 Applicability Statement

A client can use this protocol to represent contact information and personal distribution lists electronically in a user's **mailbox**.

## 1.7 Versioning and Capability Negotiation

None.

## 1.8 Vendor-Extensible Fields

None.

## 1.9 Standards Assignments

None.

# 2 Messages

## 2.1 Transport

None.

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

Unless otherwise specified, a **Contact** object or a **Personal Distribution List** object adheres to all **property** constraints specified in [MS-OXPROPS] and [MS-OXCMSG]. A **Contact** object or **Personal Distribution List** object MAY also contain other properties <1> <2> <3> as specified in [MS-OXPROPS], but these properties have no impact on this protocol.

### 2.2.1 Contact Object Properties

The **properties** specified in section 2.2.1 are specific to **Contact objects**. They SHOULD only be set on **Contact** objects. Unless otherwise specified, each of these properties are optional and they only need to be set when there is user data that needs to be stored.

#### 2.2.1.1 Contact Name Properties

The **properties** specified in section 2.2.1.1 can be set on a **Contact object** and are used to specify the name of the person represented by the contact.

##### 2.2.1.1.1 PidTagNickname

This optional **PtypString** property specifies the nickname of the contact.

##### 2.2.1.1.2 PidTagGeneration

This optional **PtypString** property specifies the generation suffix of the contact, such as “Jr.”, “Sr.”, or “III”.

##### 2.2.1.1.3 PidTagDisplayNamePrefix

This optional **PtypString** property specifies the title of the contact, such as “Mr.”, “Mrs.”.

##### 2.2.1.1.4 PidTagSurname

This optional **PtypString** property specifies the surname (family name) of the contact.

##### 2.2.1.1.5 PidTagMiddleName

This optional **PtypString** property specifies the middle name(s) of the contact.

##### 2.2.1.1.6 PidTagGivenName

This optional **PtypString** property specifies the given name (first name) of the contact.

##### 2.2.1.1.7 PidTagInitials

This optional **PtypString** property specifies the initials of the contact.

##### 2.2.1.1.8 PidTagDisplayName

This optional **PtypString** property specifies the full name of the contact. This property SHOULD be computed by the application according to an implementation-dependent algorithm that uses the values of the **PidTagDisplayNamePrefix**, **PidTagGivenName**, **PidTagMiddleName**, **PidTagSurname**, and **PidTagGeneration** properties.

##### 2.2.1.1.9 PidLidYomiFirstName

This optional **PtypString** property specifies the phonetic pronunciation of the contact’s given name.

##### 2.2.1.1.10 PidLidYomiLastName

This optional **PtypString** property specifies the phonetic pronunciation of the contact’s surname.

#### 2.2.1.1.11 PidLidFileUnder

This **PtypString** property SHOULD be set to the name under which to file this contact when displaying a list of contacts. The application SHOULD treat this property as an empty **PtypString** if it is missing from the **Contact object**.

#### 2.2.1.1.12 PidLidFileUnderId

This **PtypInteger32** property specifies how to generate and recompute the value of the **PidLidFileUnder** property when other **Contact Name** properties change. This **property** SHOULD be set to one of the values in the following table. If this property is missing or set to a value not in the following table, the application can choose its own logic to recompute the value of **PidLidFileUnder** as other **Contact Name** properties change.

In the following table, the notation <PropertyName> is used to specify "the value of PropertyName". For example, if the value of the **PidTagSurname** property is "Smith", and the value of the **PidTagGivenName** property is "Ben", then "<**PidTagGivenName**> <**PidTagSurname**>" specifies the string "Ben Smith". In the table, "\r" specifies a carriage return character, "\n" specifies a line feed character, and <space> represents a space character.

**Computing the value of the PidLidFileUnder property based on PidLidFileUnderId property value**

| Value of the PidLidFileUnderId property | Meaning of the PidLidFileUnder property <4> |
|---|---|
| 0x00000000 | Empty **PtypString**. |
| 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**>" |

| Value of the PidLidFileUnderId property | Meaning of the PidLidFileUnder property <4> |
|---|---|
| 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**>\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 | Specifies that, when displaying the **Contact object**, the application SHOULD attempt to use the current value of **PidLidFileUnder** and other contact properties to find a "best match" for **PidLidFileUnderId** to one of the previous values in this table. |
| 0xfffffffe | Specifies that, when displaying the **Contact** object, the application SHOULD choose the appropriate default values (according to the language **locale**) for **PidLidFileUnderId** and update **PidLidFileUnder** to match the choice. |
| 0xffffffff | **PidLidFileUnder** is a user-provided **PtypString**, and SHOULD NOT be changed when another **Contact Name** property changes. |

#### 2.2.1.1.13 PidLidFileUnderList

This optional **PtypMultipleInteger32** property specifies a list of possible values for **PidLidFileUnderId**. Each value in the multi-value property MUST be one of the allowed values for **PidLidFileUnderId** specified in section 2.2.1.1.12.<5>

### 2.2.1.2 Electronic Address Properties

The **Contact object** has built-in **properties** for up to three different e-mail 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 2.2.1.2.13. The following table specifies the properties in each electronic address group.

| Group name | Description | Properties in group |
|---|---|---|
| Email1 | Refers to the group of properties that define the first e-mail address for a contact. | **PidLidEmail1DisplayName**<br>**PidLidEmail1AddressType**<br>**PidLidEmail1EmailAddress**<br>**PidLidEmail1OriginalDisplayName**<br>**PidLidEmail1OriginalEntryId** |
| Email2 | Refers to the group of properties that define the second e-mail address for a contact. | **PidLidEmail2DisplayName**<br>**PidLidEmail2AddressType**<br>**PidLidEmail2EmailAddress**<br>**PidLidEmail2OriginalDisplayName**<br>**PidLidEmail2OriginalEntryId** |
| Email3 | Refers to the group of properties that define the third e-mail address for a contact. | **PidLidEmail3DisplayName**<br>**PidLidEmail3AddressType**<br>**PidLidEmail3EmailAddress**<br>**PidLidEmail3OriginalDisplayName**<br>**PidLidEmail3OriginalEntryId** |
| Primary Fax | Refers to the group of properties that define the primary fax address for a contact. | **PidTagPrimaryFaxNumber**<br>**PidLidFax1AddressType**<br>**PidLidFax1EmailAddress**<br>**PidLidFax1OriginalDisplayName**<br>**PidLidFax1OriginalEntryId** |
| Business Fax | Refers to the group of | **PidTagBusinessFaxNumber**, |

| | | |
|---|---|---|
| | properties that define the business fax address for a contact. | **PidLidFax2AddressType**, **PidLidFax2EmailAddress**, **PidLidFax2OriginalDisplayName** **PidLidFax2OriginalEntryId** |
| Home Fax | Refers to the group of properties that define the home fax address for a contact. | **PidTagHomeFaxNumber** **PidLidFax3AddressType** **PidLidFax3EmailAddress** **PidLidFax3OriginalDisplayName** **PidLidFax3OriginalEntryId** |

If any of the e-mail addresses are defined for the contact, then the properties **PidLidAddressBookProviderArrayType** and **PidLidAddressBookProviderEmailList** MUST be defined as well.

For each e-mail 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 Primary Fax, Business Fax, or Home Fax properties respectively.<6>

#### 2.2.1.2.1 PidLidEmail1DisplayName, PidLidEmail2DisplayName, PidLidEmail3DisplayName

This **PtypString** property specifies the user-readable display name for the e-mail address.

#### 2.2.1.2.2 PidLidEmail1AddressType, PidLidEmail2AddressType, PidLidEmail3AddressType

This **PtypString** property specifies the **address type** of the electronic address; if present, the property value MUST be a valid <7> address type.

#### 2.2.1.2.3 PidLidEmail1EmailAddress, PidLidEmail2EmailAddress, PidLidEmail3EmailAddress

This **PtypString** property specifies the e-mail address of the contact. The value of this **property** MUST be appropriate <8> for the **address type** specified for this e-mail address. Address types are specified by the **PidLidEmail1AddressType**, **PidLidEmail2AddressType**, **PidLidEmail3AddressType** properties.

#### 2.2.1.2.4 PidLidEmail1OriginalDisplayName, PidLidEmail2OriginalDisplayName, PidLidEmail3OriginalDisplayName

This **PtypString** property SHOULD specify the SMTP e-mail address corresponding to the e-mail address specified in 2.2.1.2.3 for the **Contact object**. If the value of the **PidLidEmail1AddressType**, **PidLidEmail2AddressType**, or **PidLidEmail3AddressType** property is "SMTP", the value of the respective **PidLidEmail1OriginalDisplayName**, **PidLidEmail2OriginalDisplayName**, or **PidLidEmail3OriginalDisplayName** property SHOULD equal the value of the respective **PidLidEmail1EmailAddress**, **PidLidEmail2EmailAddress**, or **PidLidEmail3EmailAddress** property. The purpose of this **property** 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

This **PtypBinary** property specifies 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

This **PtypString** property specifies the fax number for the contact. The **PtypString** MUST NOT be longer than 255 characters, not including the terminating NULL character. There are no other restrictions on the format of this **PtypString**.

#### 2.2.1.2.7 PidLidFax1AddressType, PidLidFax2AddressType, PidLidFax3AddressType

This **PtypString** property, if present, MUST be set to "FAX".

#### 2.2.1.2.8 PidLidFax1EmailAddress, PidLidFax2EmailAddress, PidLidFax3EmailAddress

This **PtypString** property, if present, SHOULD contain a user-readable display name, followed by the "@" character, followed by a fax number.

#### 2.2.1.2.9 PidLidFax1OriginalDisplayName, PidLidFax2OriginalDisplayName, PidLidFax3OriginalDisplayName

This **PtypString** property, if present, MUST be set to the same value as **PidTagNormalizedSubject**.

#### 2.2.1.2.10 PidLidFax1OriginalEntryId, PidLidFax2OriginalEntryId, PidLidFax3OriginalEntryId

This **PtypBinary** property, if present, MUST specify the **one-off EntryId** corresponding to this fax address.

#### 2.2.1.2.11 PidLidEmailList

The value of this **PtypMultipleInteger32** property MUST be ignored.<9>

#### 2.2.1.2.12 PidLidAddressBookProviderEmailList

This **PtypMultipleInteger32** property 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, then **PidLidAddressBookProviderArrayType** MUST also be set. These two properties MUST be kept synchronized with each other.<10> For example, if one of the values in **PidLidAddressBookProviderEmailList** is "0x00000000", then **PidLidAddressBookProviderArrayType** MUST have the bit" 0x00000001" set.

| Value | Meaning |
|---|---|
| 0x00000000 | Email1 is defined for the contact. |
| 0x00000001 | Email2 is defined for the contact. |
| 0x00000002 | Email3 is defined for the contact. |
| 0x00000003 | Business fax is defined for the contact. |
| 0x00000004 | Home fax is defined for the contact. |
| 0x00000005 | Primary fax is defined for the contact. |

#### 2.2.1.2.13 PidLidAddressBookProviderArrayType

This **PtypInteger32** property specifies the state of the contact's 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, then **PidLidAddressBookProviderEmailList** 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 **PidLidAddressBookProviderEmailList** MUST be "0x00000000".

| Bit | Meaning |
|---|---|
| 0x00000001 | Email1 is defined for the contact. |
| 0x00000002 | Email2 is defined for the contact. |
| 0x00000004 | Email3 is defined for the contact. |

| Bit | Meaning |
|---|---|
| 0x00000008 | Business fax is defined for the contact. |
| 0x00000010 | Home fax is defined for the contact. |
| 0x00000020 | Primary fax is defined for the contact. |

#### 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 associated with it.

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**<br>**PidTagHomeAddressCity**<br>**PidTagHomeAddressStateOrProvince**<br>**PidTagHomeAddressPostalCode**<br>**PidTagHomeAddressCountry**<br>**PidLidHomeAddressCountryCode**<br>**PidLidHomeAddress** |
| Work Address | **PidLidWorkAddressStreet**<br>**PidLidWorkAddressCity**<br>**PidLidWorkAddressState**<br>**PidLidWorkAddressPostalCode**<br>**PidLidWorkAddressCountry**<br>**PidLidWorkAddressCountryCode**<br>**PidLidWorkAddress**. |
| Other Address | **PidTagOtherAddressStreet**<br>**PidTagOtherAddressCity**<br>**PidTagOtherAddressStateOrProvince**<br>**PidTagOtherAddressPostalCode** |

| | |
|---|---|
| | **PidTagOtherAddressCountry**<br>**PidLidOtherAddressCountryCode**<br>**PidLidOtherAddress**. |
| Mailing Address | **PidTagStreetAddress**<br>**PidTagLocality**<br>**PidTagStateOrProvince**<br>**PidTagPostalCode**<br>**PidTagCountry**<br>**PidLidAddressCountryCode**<br>**PidTagPostalAddress** |

#### 2.2.1.3.1 PidLidWorkAddressStreet, PidTagHomeAddressStreet, PidTagOtherAddressStreet, PidTagStreetAddress

This **PtypString** property specifies the street portion of the contact's work, home, other, or mailing address.<11>

#### 2.2.1.3.2 PidLidWorkAddressCity, PidTagHomeAddressCity, PidTagOtherAddressCity, PidTagLocality

This **PtypString** property specifies the city or locality portion of the contact's work, home, other, or mailing address.

#### 2.2.1.3.3 PidLidWorkAddressState, PidTagHomeAddressStateOrProvince, PidTagOtherAddressStateOrProvince, PidTagStateOrProvince

This **PtypString** property specifies the state or province portion of the contact's work, home, other, or mailing address.

#### 2.2.1.3.4 PidLidWorkAddressPostalCode, PidTagHomeAddressPostalCode, PidTagOtherAddressPostalCode, PidTagPostalCode

This **PtypString** property specifies the postal code (ZIP code) portion of the contact's work, home, other, or mailing address.

#### 2.2.1.3.5 PidLidWorkAddressCountry, PidTagHomeAddressCountry, PidTagOtherAddressCountry, PidTagCountry

This **PtypString** property specifies the country or region portion of the contact's work, home, other, or mailing address.

#### 2.2.1.3.6 PidLidWorkAddressCountryCode, PidLidHomeAddressCountryCode, PidLidOtherAddressCountryCode, PidLidAddressCountryCode

This **PtypString** property specifies the country code portion of the contact's work, home, other, or mailing address.

#### 2.2.1.3.7 PidLidWorkAddressPostOfficeBox, PidTagHomeAddressPostOfficeBox, PidTagOtherAddressPostOfficeBox, PidTagPostOfficeBox

This **PtypString** property specifies the post office box portion of the contact's work, home, other, or mailing address.<12>

#### 2.2.1.3.8 PidLidWorkAddress, PidLidHomeAddress, PidLidOtherAddress, PidTagPostalAddress

This **PtypString** property specifies the complete address of the contact's work, home, other, or mailing address. This property SHOULD be a combination of other physical address **properties**, and is based on client **locale**.

#### 2.2.1.3.9 PidLidPostalAddressId

This optional **PtypInteger32** property specifies which physical address is the mailing address for this contact. If present, the property MUST have one of the values specified in the following table. If not set, the application SHOULD assume that the value is "0x00000000".

| Value | Description |
|---|---|
| 0x00000000 | No address is selected as the mailing address. **PidTagStreetAddress**, **PidTagLocality**, **PidTagStateOrProvince**, **PidTagPostalCode**, **PidTagCountry**, **PidLidAddressCountryCode**, and **PidTagPostalAddress** all MUST NOT be set. |
| 0x00000001 | The Home Address is the mailing address.<br>The values of the **PidTagStreetAddress**, **PidTagLocality**, **PidTagStateOrProvince**, **PidTagPostalCode**, **PidTagPostOfficeBox**, **PidTagCountry**, **PidLidAddressCountryCode**, and **PidTagPostalAddress** properties MUST be equal to the values of the **PidTagHomeAddressStreet**, **PidTagHomeAddressCity**, **PidTagHomeAddressStateOrProvince**, **PidTagHomeAddressPostalCode**, **PidTagHomeAddressPostOfficeBox**, **PidTagHomeAddressCountry**, **PidLidHomeAddressCountryCode**, and **PidLidHomeAddress** 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**, **PidLidWorkAddressCity**, **PidLidWorkAddressState**, **PidLidWorkAddressPostalCode**, **PidLidWorkAddressPostOfficeBox**, **PidLidWorkAddressCountry**, **PidLidWorkAddressCountryCode**, and |

| Value | Description |
|---|---|
| | **PidLidWorkAddress** 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**, **PidTagOtherAddressCity**, **PidTagOtherAddressStateOrProvince**, **PidTagOtherAddressPostalCode**, **PidTagOtherAddressPostOfficeBox**, **PidTagOtherAddressCountry**, **PidLidOtherAddressCountryCode**, and **PidLidOtherAddress** properties, respectively. |

#### 2.2.1.4 Telephone Properties

The following properties all specify optional telephone numbers for the contact. If present, each property MUST NOT exceed a length of 255 characters, excluding the NULL character. Each of the properties in this section are optional.

##### 2.2.1.4.1 PidTagPagerTelephoneNumber

This **PtypString** property specifies the pager telephone number.

##### 2.2.1.4.2 PidTagCallbackTelephoneNumber

This **PtypString** property specifies the callback telephone number.

##### 2.2.1.4.3 PidTagBusinessTelephoneNumber

This **PtypString** property specifies the business telephone number.

##### 2.2.1.4.4 PidTagHomeTelephoneNumber

This **PtypString** property specifies the home telephone number.

##### 2.2.1.4.5 PidTagPrimaryTelephoneNumber

This **PtypString** property specifies the primary telephone number.

##### 2.2.1.4.6 PidTagBusiness2TelephoneNumber

This **PtypString** property specifies the second business telephone number.

##### 2.2.1.4.7 PidTagMobileTelephoneNumber

This **PtypString** property specifies the mobile telephone number.

#### 2.2.1.4.8 PidTagRadioTelephoneNumber

This **PtypString** property specifies the radio telephone number.

#### 2.2.1.4.9 PidTagCarTelephoneNumber

This **PtypString** property specifies the car telephone number.

#### 2.2.1.4.10 PidTagOtherTelephoneNumber

This **PtypString** property specifies an alternate telephone number.

#### 2.2.1.4.11 PidTagAssistantTelephoneNumber

This **PtypString** property specifies the telephone number of the contact's assistant.

#### 2.2.1.4.12 PidTagHome2TelephoneNumber

This **PtypString** property specifies a second home telephone number.

#### 2.2.1.4.13 PidTagTtyTddPhoneNumber

This **PtypString** property specifies the telephone number for the contact's text telephone (TTY) or telecommunication device for the deaf (TDD).

#### 2.2.1.4.14 PidTagCompanyMainTelephoneNumber

This **PtypString** property specifies the company phone number.

#### 2.2.1.4.15 PidTagTelexNumber

This **PtypString** property specifies the telex number.

#### 2.2.1.4.16 PidTagIsdnNumber

This **PtypString** property specifies the integrated services digital network (ISDN) number.

### 2.2.1.5 Event Properties

There are two events associated with a contact, a birthday and an anniversary. Each event is defined by two properties: a **time** property and an object **EntryId** property. If one of the two properties is set for an event, the other MUST also be set. If either event is defined for a contact, then **PidLidReferenceEntryId** SHOULD be set and its value SHOULD be equal to the value of **PidTagEntryId**.

#### 2.2.1.5.1 PidTagBirthday

If present, this **PtypTime** property specifies the birthday of the contact, at 0:00 in the client's local time zone.

#### 2.2.1.5.2 PidLidBirthdayEventEntryId

If present, this **PtypBinary** property specifies the object **EntryId** of an optional **Appointment** object [MS-OXOCAL] that represents the contact's birthday. The **Appointment** object specified by **PidLidBirthdayEventEntryId** MUST be linked to this contact using **PidLidContactLinkEntry**, **PidLidContactLinkSearchKey**, and **PidLidContactLinkName**, as specified in [MS-OXCMSG] section 2.2.1.20.

#### 2.2.1.5.3 PidTagWeddingAnniversary

If present, this **PtypTime** property specifies the wedding anniversary of the contact, at 0:00 in the client's local time zone.

#### 2.2.1.5.4 PidLidAnniversaryEventEntryId

If present, this **PtypBinary** property specifies the object **EntryId** of the **Appointment** object, [MS-OXOCAL] that represents the contact's anniversary. The **Appointment** object specified by **PidLidAnniversaryEventEntryId** MUST be linked to this contact using **PidLidContactLinkEntry**, **PidLidContactLinkSearchKey**, and **PidLidContactLinkName**, as specified in [MS-OXCMSG] section 2.2.1.20.

### 2.2.1.6 Professional Properties

The following **properties** are used to store professional details for the person represented by the contact.

#### 2.2.1.6.1 PidTagTitle

This optional **PtypString** property specifies the job title of the contact.

#### 2.2.1.6.2 PidTagCompanyName

This optional **PtypString** property specifies the company that employs the contact.

#### 2.2.1.6.3 PidTagDepartmentName

This optional **PtypString** property specifies the name of the department to which the contact belongs.

#### 2.2.1.6.4 PidLidDepartment

This optional **PtypString** property MUST be ignored.<13>

#### 2.2.1.6.5 PidTagOfficeLocation

This optional **PtypString** property specifies the location of the office that the contact works in.

#### 2.2.1.6.6 PidTagManagerName

This optional **PtypString** property specifies the name of the contact's manager.

#### 2.2.1.6.7 PidTagAssistant

This optional **PtypString** property specifies the name of the contact's assistant.

#### 2.2.1.6.8 PidLidYomiCompanyName

This optional **PtypString** property specifies the phonetic pronunciation of the contact's company name.

#### 2.2.1.6.9 PidTagProfession

This optional **PtypString** property specifies the profession of the contact.

### 2.2.1.7 Business Card Properties

The **properties** specified in this section can be used to customize the display of contact information in business card format.<14> The business card format is a collection of information about how to display contact data to the user.

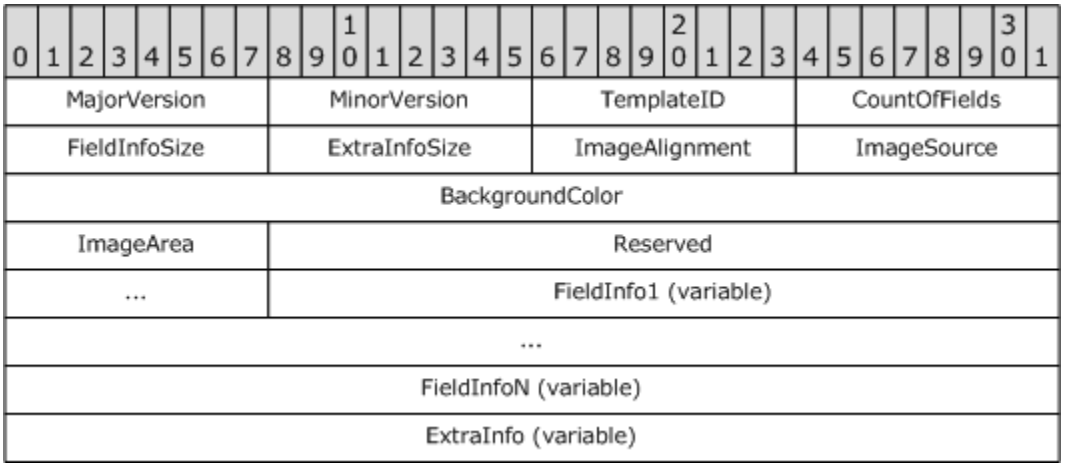
#### 2.2.1.7.1 PidLidBusinessCardDisplayDefinition

**PidLidBusinessCardDisplayDefinition** is an optional **PtypBinary** property that contains user customization details for displaying a contact as a business card. 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 sections specify the format of the **PidLidBusinessCardDisplayDefinition** property. Note that multi-byte values are stored in **little-endian** format in the buffer.

##### 2.2.1.7.1.1 PidLidBusinessCardDisplayDefinition Buffer Format

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



**MajorVersion (1 byte)**: An 8-bit value that specifies the major version number, as specified in section 2.2.1.7.1.1.1.

**MinorVersion (1 byte):** An 8-bit value that specifies the minor version number, as specified in section 2.2.1.7.1.1.1.

**TemplateID (1 byte):** An 8-bit value that specifies the display template to use, as specified in section 2.2.1.7.1.1.2.

**CountOfFields (1 byte):** An 8-bit value that specifies the count of **FieldBuffer** structures in the **PidLidBusinessCardDisplayDefinition** property.

**FieldInfoSize (1 byte):** An 8-bit value that specifies the size, in bytes, of **FieldInfo** structures, as specified in section 2.2.1.7.1.2. This value MUST be greater or equal to "0x10".

**ExtraInfoSize (1 byte):** An 8-bit value that specifies the size, in bytes, of any additional data provided in the **ExtraInfo** BYTE Array, as specified in section 2.2.1.7.1.3.

**ImageAlignment (1 byte):** An 8-bit value that specifies the image alignment in the image area, as specified in section 2.2.1.7.1.1.3.

**ImageSource (1 byte):** An 8-bit value that specifies the image source, as specified in section 2.2.1.7.1.1.4.

**BackgroundColor (4 bytes):** A **PtypInteger32** that specifies the background business card color, as specified in section 2.2.1.7.1.1.5.

**ImageArea (1 byte):** An 8-bit value that specifies the percent of space on the card that the image will take up, as specified in section 2.2.1.7.1.1.6.

**Reserved (4 bytes):** MUST be set to "0x00000000".

**FieldInfo1 (variable):** A structure value that contains field information, as specified in section 2.2.1.7.1.2.

**FieldInfoN (variable):** A structure that contains field information, as specified in section 2.2.1.7.1.2. The number of **FieldInfo** structures included in the buffer is equal to the value of **CountOfFields**.

**ExtraInfo (ExtraInfoSize):** A byte array that specifies additional information, as specified in 2.2.1.7.1.3.

#### 2.2.1.7.1.1.1 MajorVersion and MinorVersion

The value of the **MajorVersion** field MUST be "0x03" or greater. The value of the **MinorVersion** MAY be any value. A user agent implementing this protocol SHOULD set the value of **MajorVersion** to "0x03" and SHOULD set the value of **MinorVersion** to "0x00".<15>

#### 2.2.1.7.1.1.2 TemplateID

This field represents the business card layout type. The value of this field MUST be set to one of the following values.

| Value | Description |
|---|---|
| 0x00 | The image will be left aligned, stretching the full height of the card vertically; text fields will appear to the right of the image. |
| 0x01 | The image will be right aligned, stretching the full height of the card vertically; text fields will appear to the left of the image. |
| 0x02 | The image will be aligned to the top, stretching the full width of the card horizontally; text fields will appear under the image. |
| 0x03 | The image will be aligned to the bottom, stretching the full width of the card horizontally; text fields will appear above the image |
| 0x04 | No image is included in the card, only text fields are included. **PidLidBusinessCardCardPicture** SHOULD NOT be set on the **Contact object** in this case. |
| 0x05 | The image 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. |

#### 2.2.1.7.1.1.3 ImageAlignment

This field indicates how the image is aligned in the image area. The value of this field is ignored for text-only cards (i.e. when the value of **TemplateID** is "0x04"). The value of this field MUST have one of the following values:

| Value | Description |
|---|---|
| 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. |

| Value | Description |
|---|---|
| 0x06 | Align middle right. |
| 0x07 | Align bottom left. |
| 0x08 | Align bottom center. |
| 0x09 | Align bottom right. |

#### 2.2.1.7.1.1.4 ImageSource

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, 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 **property** SHOULD be used. If the value of this field is "0x00", the **PidLidBusinessCardCardPicture** property SHOULD NOT exist on the **Contact object**. The value of this field is ignored for text-only cards (when the value of **TemplateID** is "0x04").

#### 2.2.1.7.1.1.5 BackgroundColor

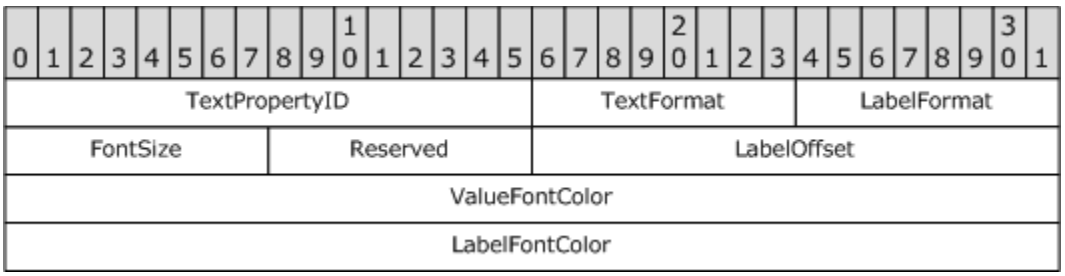
A **PtypInteger32** value representing the color of the card background, expressed as 0x00BBGGRR, where the high byte is "0x00", the next highest byte identifies the blue intensity value, the next highest byte identifies the green intensity value, and the lowest byte identifies the red intensity value.

#### 2.2.1.7.1.1.6 ImageArea

This field indicates the percentage of space on the card on which to display the image. The value of this field SHOULD be between "0x04" and "0x32" (representing 4% and respectively 50%). The value of this field is ignored for text-only cards and background image cards (when the value of **TemplateID** is "0x04" or "0x05").

### 2.2.1.7.1.2 FieldInfo Buffer Format

The following diagram specifies the buffer format of the **FieldInfo** structure.



**TextPropertyID (2 bytes):** A 16-bit value that specifies the property ID of the field, as specified in section 2.2.1.7.1.2.1.

**TextFormat (1 byte):** An 8-bit value that specifies the text decoration and alignment information, as specified in section 2.2.1.7.1.2.2.

**LabelFormat (1 byte):** An 8-bit value that specifies the label information, as specified in section 2.2.1.7.1.2.3.

**FontSize (1 byte):** An 8-bit value that specifies the font size in **points**, as specified in section 2.2.1.7.1.2.4.

**Reserved (1 byte):** MUST be set to "0x00".

**LabelOffset (2 bytes):** A **PtypInteger16** value that specifies the byte offset into extra byte information, as specified in section 2.2.1.7.1.2.5.

**ValueFontColor (4 bytes):** A **PtypInteger32** value that specifies the color reference code for the value font color, as specified in section 2.2.1.7.1.2.6.

**LabelFontColor (4 bytes):** A **PtypInteger32** value that specifies the color reference code for the label font color, as specified in section 2.2.1.7.1.2.7.

#### 2.2.1.7.1.2.1 TextPropertyID

The value of this field MUST be either 0x0000, representing an empty field, or the property ID of one of the properties from the following list. Note that all properties in the list are **PtypString** properties.

Allowed Properties

**PidTagDisplayName**

**PidTagTitle**

**PidTagDepartmentName**

**PidTagCompanyName**

**PidTagBusinessTelephoneNumber**

**PidTagBusiness2TelephoneNumber**

**PidTagBusinessFaxNumber**

**PidTagCompanyMainTelephoneNumber**

**PidTagHomeTelephoneNumber**

**PidTagHome2TelephoneNumber**

**PidTagHomeFaxNumber**

**PidTagMobileTelephoneNumber**

**PidTagAssistantTelephoneNumber**

**PidTagOtherTelephoneNumber**

**PidTagTtyTddPhoneNumber**

**PidTagPrimaryTelephoneNumber**

**PidTagPrimaryFaxNumber**

**PidTagPagerTelephoneNumber**

**PidLidWorkAddress**

**PidLidHomeAddress**

**PidLidOtherAddress**

**PidLidInstantMessagingAddress**

**PidTagBusinessHomePage**

**PidTagPersonalHomePage**

**PidLidContactUserField1**

**PidLidContactUserField2**

**PidLidContactUserField3**

**PidLidContactUserField4**

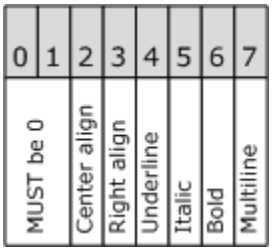
**PidLidEmail1OriginalDisplayName**

**PidLidEmail2OriginalDisplayName**

**PidLidEmail3OriginalDisplayName**

#### 2.2.1.7.1.2.2 TextFormat

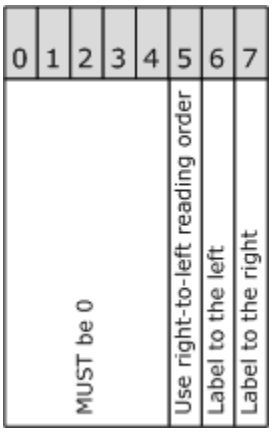
This byte value contains bit flags that indicate alignment and font formatting for the text value of the field. If none of the bits defined in the following diagram are set, the field text is displayed as a single line, left-aligned. The **Right align** and **Center align** bits MUST be mutually exclusive.




#### 2.2.1.7.1.2.3 LabelFormat

This byte value contains bit flags that indicate the presence and alignment of a custom label associated with the field text. If none of the bits defined in the following diagram are set, the

field has no label. The **Label to the right** and **Label to the left** bits MUST be mutually exclusive.




#### 2.2.1.7.1.2.4 FontSize

**FontSize** MUST be a value between "0x03" and "0x20" (representing 3 and 32) indicating the font size, in **points**, to be used by this field text. The value of this field MUST be set to "0x00" if the field represents an empty line.

#### 2.2.1.7.1.2.5 LabelOffset

**LabelOffset** MUST be set to the byte offset into the **ExtraInfo** buffer pointing to the start of the label string. If the field does not have a label, the value of **LabelOffset** MUST be "0xFFFE". All label strings MUST be stored as **Unicode**, null-terminated **PtypStrings** in the **ExtraInfo** buffer. Each label SHOULD be limited to 16 Unicode characters, including the terminating character. The value of **LabelOffset** MUST be less than the value of the **ExtraInfoSize** field, which is the total size of the **ExtraInfo** buffer.

#### 2.2.1.7.1.2.6 ValueFontColor

**ValueFontColor** is a color reference code indicating the font color of the value. (0x00BBGGRR), where the high byte is" 0x00", the next highest byte identifies the blue intensity value, the next highest byte identifies the green intensity value, and the lowest byte identifies the red intensity value.

#### 2.2.1.7.1.2.7 LabelFontColor

**LabelFontColor** is a color reference code indicating the font color of the label (0x00BBGGRR), where the high byte is "0x00", the next highest byte identifies the blue intensity value, the next highest byte identifies the green intensity value, and the lowest byte identifies the red intensity value.

### 2.2.1.7.1.3 ExtraInfo Buffer Format

This byte array buffer contains a set of **Unicode PtypString** values of labels that have been customized by the user. The labels MUST be stored as Unicode **PtypStrings**, each ending in a terminating NULL character. Each of these **PtypStrings** SHOULD be referenced by a **LabelOffset** field in one or more **FieldInfo** structures, as specified in section 2.2.2.6.2.2. The total size, in bytes, of the **ExtraInfo** field MUST be specified by the value of the **ExtraInfoSize** field.

#### 2.2.1.7.2 PidLidBusinessCardCardPicture

A **PtypBinary** property that contains the image to be used on a business card, whose value MUST be either a **portable network graphics (PNG)** or **JPEG** stream. This property SHOULD be used in conjunction with **PidLidBusinessCardDisplayDefinition** as follows: **PidLidBusinessCardCardPicture** SHOULD NOT be present on a **Contact object** if **PidLidBusinessCardDisplayDefinition** is not present. This property also SHOULD NOT be present if the data in **PidLidBusinessCardDisplayDefinition** (as specified in section 2.2.1.7.1.1) does not require a card image.

#### 2.2.1.7.3 PidLidContactUserField1, PidLidContactUserField2, PidLidContactUserField3, PidLidContactUserField4

These four optional **PtypString** 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-specific **property**.

### 2.2.1.8 Contact Photo Properties

The property and attachment specified in this section are optional and represent an optional photo associated with the contact.<16>

#### 2.2.1.8.1 PidLidHasPicture

If this **PtypBoolean** property exists and is set to TRUE (“0x00000001”), then the attachment specified in section 2.2.1.8.2 SHOULD exist, and the application SHOULD use it as the contact photo.

#### 2.2.1.8.2 Contact Photo Attachment

The contact photo attachment is a picture attached to the **Contact object**. For more details about **Message object** attachments, 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 **PtypBoolean PidTagAttachmentContactPhoto** property MUST be set to TRUE (“0x00000001”). There SHOULD <17> only be one attachment with **PidTagAttachmentContactPhoto** set to TRUE on a given **Contact** object.

- The value of the **PtypBinary PidTagAttachDataBinary** property, which is the contents of the attachment, MUST be a stream in **JPEG** format.
- The value of the **PtypString PidTagAttachExtension PtypString** property MUST be set to ".jpg".
- The value of the **PidTagDisplayName** and **PidTagAttachFilename PtypString** properties MUST be set to "ContactPicture.jpg".

#### 2.2.1.9 Other Contact Properties

##### 2.2.1.9.1 PidLidReferenceEntryId

If present, this **PtypBinary** property SHOULD be equal to the value of the **EntryId** of the **Contact object**.<18>

##### 2.2.1.9.2 PidTagHobbies

This optional **PtypString** property specifies the hobbies of the contact.

##### 2.2.1.9.3 PidTagSpouseName

This optional **PtypString** property specifies the name of the contact's spouse.

##### 2.2.1.9.4 PidTagLanguage

This optional **PtypString** property specifies the language that the contact uses.

##### 2.2.1.9.5 PidTagLocation

This optional **PtypString** property specifies the location of the contact. For example, this could be the building and office number of the contact.

##### 2.2.1.9.6 PidLidInstantMessagingAddress

This optional **PtypString** property specifies the contact's instant messaging address.

##### 2.2.1.9.7 PidTagOrganizationalIdNumber

This optional **PtypString** property specifies an organizational ID number for the contact, such as an employee ID number.

##### 2.2.1.9.8 PidTagCustomerId

This optional **PtypString** property specifies the contact's customer ID number.

##### 2.2.1.9.9 PidTagGovernmentIdNumber

This optional **PtypString** property specifies the contact's government ID number.

#### 2.2.1.9.10 PidLidFreeBusyLocation

This optional **PtypString** property specifies a URL path from which a client can retrieve free/busy information for the contact as an iCal file, as specified in [MS-OXCICAL].

#### 2.2.1.9.11 PidTagAccount

This optional **PtypString** property specifies the account name of the contact.<19>

#### 2.2.1.9.12 PidLidHtml

This optional **PtypString** property specifies the contact's business web page URL. The value of this **property**, if present, SHOULD be the same as the value of **PidTagBusinessHomePage**.

#### 2.2.1.9.13 PidTagPersonalHomePage

This optional **PtypString** property specifies the contact's personal web page URL.

#### 2.2.1.9.14 PidTagBusinessHomePage

This optional **PtypString** property specifies the contact's business web page URL. The value of this **property**, if present, SHOULD be the same as the value of **PidLidHtml**.

#### 2.2.1.9.15 PidTagFtpSite

This optional **PtypString** property specifies the contact's File Transfer Protocol (FTP) URL. FTP is a protocol used to transfer data, as specified in [RFC959].

#### 2.2.1.9.16 PidTagComputerNetworkName

This optional **PtypString** property specifies the name of the network to which the contact's computer is connected.<20>

#### 2.2.1.9.17 PidTagChildrensNames

This optional **PtypMultipleString** property specifies the names of the contact's children.

#### 2.2.1.9.18 PidLidContactCharacterSet

This optional unsigned **PtypInteger32** property specifies the character set <21> used for this **Contact object**. Applications can use this property to aid in generating a character-set dependent list of choices for the properties **PidLidFileUnder**, **PidLidFileUnderList**, and **PidLidFileUnderId**. If the value of the **property** is "0x00000000" or "0x00000001", applications SHOULD treat the property as not being set.

#### 2.2.1.9.19 PidLidAutoLog

This optional **PtypBoolean** property specifies to the application whether to create a **Journal** object for each action associated with this **Contact object**.

#### 2.2.1.9.20 PidTagGender

This optional **PtypInteger16** property specifies the gender of the contact. If present, the **property** MUST be one of the following values.

| Value | Meaning |
|---|---|
| 0x0000 | The contact's gender is unspecified. |
| 0x0001 | The contact is female. |
| 0x0002 | The contact is male. |

#### 2.2.1.9.21 PidTagReferredByName

This optional **PtypString** property specifies the name of the person who referred this contact to the user.

#### 2.2.1.9.22 PidLidContactItemData

This optional **PtypMultipleInteger32** property can be used to help display the contact information. If present, the **property** MUST have six entries, each corresponding to a visible field in the application's user interface.

The meaning of each entry in the **PtypMultipleInteger32** property is defined in the following table.

| One-based index into the multi-valued property | The value MUST be one of the following | Meaning |
|---|---|---|
| 1 | 0x00000001 | The application SHOULD display the contact's home address . |
| | 0x00000002 or 0x00000000 | The application SHOULD display the contact's work address. |
| | 0x00000003 | The application SHOULD display the contact's other address. |
| 2 | 0x00008080 | The application SHOULD display Email1. |
| | 0x00008090 | The application SHOULD |

| One-based index into the multi-valued property | The value MUST be one of the following | Meaning |
|---|---|---|
| | | display Email2. |
| | 0x000080A0 | The application SHOULD display Email3. |
| 3,4,5,6 | **PropertyID** 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 application SHOULD display the corresponding property. |

#### 2.2.1.9.23 PidTagUserX509Certificate

This optional **PtypMultipleBinary** property specifies a list of certificates for the contact. The format and semantics of this **property** are the same as specified in [MS-OXOABK] for the **PidTagUserX509Certificate**.

### 2.2.1.10 Additional Property Constraints

This protocol specifies additional constraints on the following **properties** in addition to those specified in [MS-OXCMSG].

#### 2.2.1.10.1 PidTagNormalizedSubject

This optional **PtypString** property specifies a combination of the full name and company name of the contact. This **property** SHOULD be computed by the application according to an implementation-dependent algorithm that uses values of the **PidTagGivenName**, **PidTagMiddleName**, **PidTagSurname**, **PidTagGeneration**, and **PidTagCompanyName** properties.<22>

#### 2.2.1.10.2 PidTagMessageClass

A **Contact object** MUST have this **PtypString** property set to "IPM.Contact", or a **PtypString** prefixed with "IPM.Contact."

## 2.2.2 Personal Distribution List Properties

The properties specified in this section are specific to **Personal Distribution List objects**. They SHOULD only be set on **Personal Distribution List** objects.

#### 2.2.2.1 Personal Distribution List Name Properties

The following properties are used to display the name of the **Personal Distribution List object**.

##### 2.2.2.1.1 PidTagDisplayName

This **PtypString** property specifies the user-visible name of the personal distribution list.

##### 2.2.2.1.2 PidLidDistributionListName

This **PtypString** property specifies the name of the personal distribution list. The value of this **property** SHOULD <23> be the same as the value of the **PidTagDisplayName** property.

##### 2.2.2.1.3 PidLidFileUnder

The value of this **PtypString** property MUST be the same as the value of the **PidTagDisplayName** property.

##### 2.2.2.1.4 PidLidFileUnderId

This optional **PtypInteger32** property SHOULD <24> be set to "0xffffffff", if present.

#### 2.2.2.2 Personal Distribution List Member Properties

##### 2.2.2.2.1 PidLidDistributionListMembers

This **PtypMultipleBinary** property 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, Global Address List users or distribution lists, or one-off e-mail addresses. The format of each **EntryId** MUST be either a **one-off EntryId,** as specified in [MS-OXCDATA] section 2.2.4.1, or a **Wrapped EntryId**, as specified in section 2.2.2.2.5.

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

This **PtypMultipleBinary** property specifies the list of one-off EntryIds corresponding to the members of the personal distribution list. These one-off EntryIds encapsulate display names and e-mail addresses of the personal distribution list members.

If the client or the server set this **property** <25>, it MUST be synchronized with **PidLidDistributionListMembers**: for each entry in the **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 in size.

#### 2.2.2.2.3 PidLidDistributionListChecksum

This **PtypInteger32** property specifies the 32-bit cyclic redundancy check (CRC-32) polynomial checksum, as specified in [ISO/IEC 8802-3], calculated on the value of **PidLidDistributionListMembers**, as specified in section 3.1.4.2.2.4. 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-32 on the existing value of **PidLidDistributionListMembers** and comparing it with the value of the **PidLidDistributionListChecksum** property).<26>

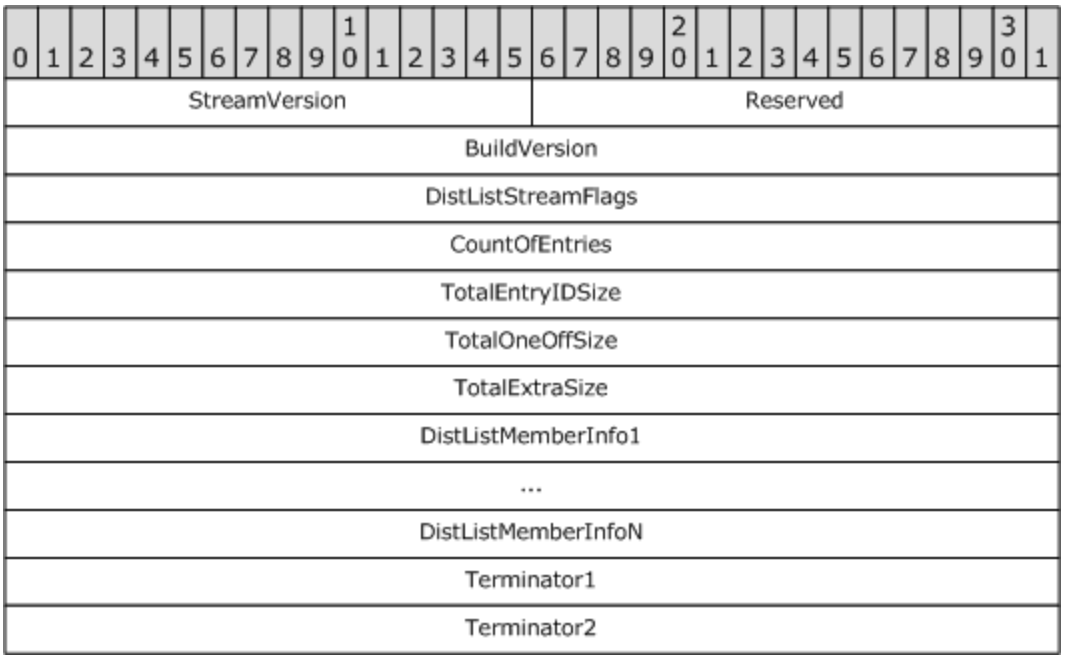
#### 2.2.2.2.4 PidLidDistributionListStream

This **PtypBinary** property 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, Global Address List users or distribution lists, or one-off e-mail addresses. The format of each **EntryId** MUST be as described in **PidLidDistributionListMembers** and the format for each **one-off EntryId** MUST be as described in **PidLidDistributionListOneOffMembers**.

**PidLidDistributionListStream** is intended to allow distribution lists to grow past the size limits of **PidLidDistributionListMembers** and **PidLidDistributionListOneOffMembers** . This property SHOULD be used if either **PidLidDistributionListMembers** or **PidLidDistributionListOneOffMembers** would be over 15,000 bytes. If this property is set then **PidLidDistributionListMembers**, **PidLidDistributionListOneOffMembers** and **PidLidDistributionListChecksum** SHOULD be ignored.<27>

##### 2.2.2.2.4.1 PidLidDistributionListStream Buffer Format

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

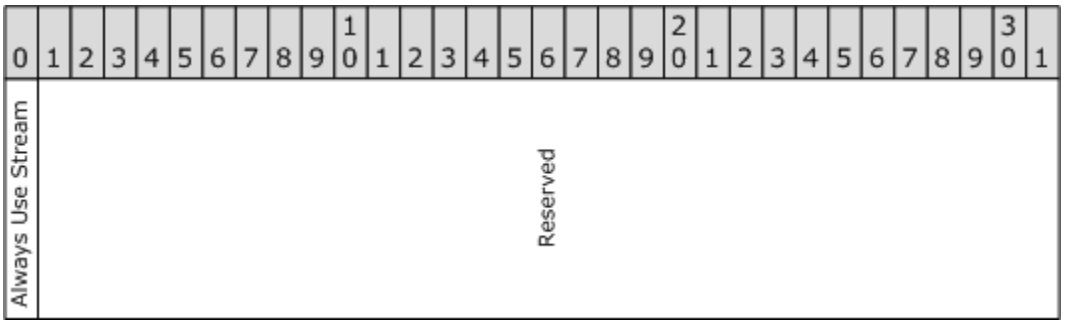



**StreamVersion (2 bytes):** MUST be set to 0x0001

**Reserved (2 bytes):** MUST be set to "0x0000"

**BuildVersion (4 bytes):** A 32-bit value that takes the major version number, as specified in section 2.2.1.7.1.1.1, and multiplies it by 10,000. The minor version, also specified in 2.2.1.7.1.1.1, is then added to the result.

**DistListStreamFlags (4 bytes):** This 32-bit value contains bit flags that indicate overall behavior of the personal distribution list, as specified in the table below.




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

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

**CountOfEntries (4 bytes):** A 32-bit value that specifies the number of **DistListMemberInfo** structures in the PidLidDistributionListStream.

**TotalEntryIDSize (4 bytes):** Value representing the sum of the sizes (in bytes) of the EntryIds stored in each DistListMemberInfo.

**TotalOneOffSize (4 bytes):** Value representing the sum of the sizes (in bytes) of the one-off EntryIds stored in each DistListMemberInfo.

**TotalExtraSize (4 bytes):** Value representing the sum of the sizes (in bytes) of the ExtraMemberInfo data for each member of the distribution list.

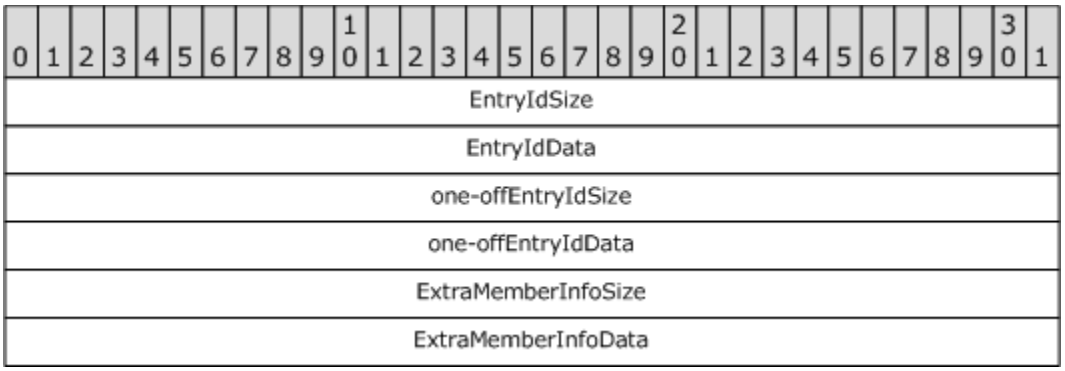
**DistListMemberInfo (variable):** An array of structures that contain information about one member of the Personal Distribution List, as specified in section 2.2.2.2.4.2.

**Terminator1 (4 bytes):**MUST be set to "0x00000000".

**Terminator2 (4 bytes):**MUST be set to "0x00000000".

#### 2.2.2.2.4.2 DistListMemberInfo Format

The following table specifies the format of each **DistListMemberInfo** structure stored in the **PidLidDistributionListStream** buffer.




**EntryIdSize (4 bytes):** A 32-bit value representing the count of bytes contained in **EntryIdData**.

**EntryIdData (variable):** A byte array corresponding to the byte array of a **PtypBinary** representing the **EntryId** of this member of the personal distribution list. Members can be other personal distribution lists, electronic addresses contained in a contact, Global Address List users or distribution lists, or one-off e-mail addresses. The format of each **EntryId** MUST be either a **one-off EntryId**, as specified in [MS-OXCDATA] section 2.2.4.1, or a **WrappedEntryId**, as specified in section 2.2.2.2.5.

**one-offEntryIdSize (4 bytes):** A 32-bit value denoting the count of bytes contained in **one-offEntryIdData.** This value MAY be set to 0x00000000, in which case there is no corresponding **one-offEntryId** for this member.

**one-offEntryIdData (variable):** A byte array corresponding to the byte array of a **PtypBinary** representing the **one-offEntryId** of this member of the personal distribution list. These **one-off EntryIds** encapsulate display names and e-mail addresses of the personal distribution list members.

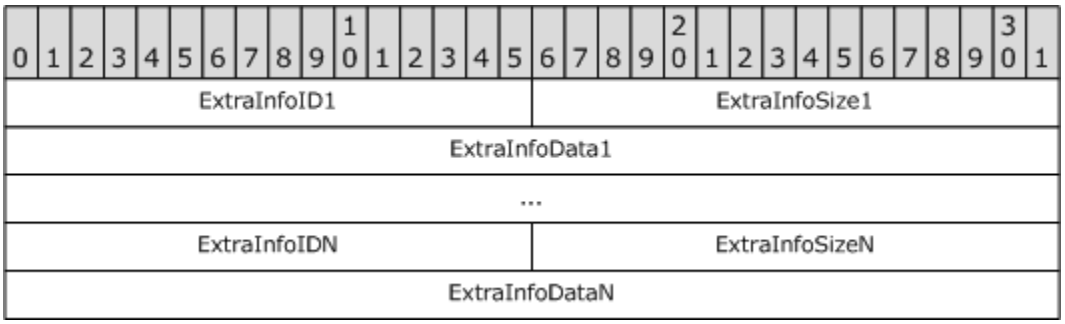
**ExtraMemberInfoSize (4 bytes):** A 32-bit value denoting the count of bytes contained in the **ExtraMemberInfoData** structure.

**ExtraMemberInfoData (variable):** A structure containing additional client specific information about this member of the personal distribution list. The format of this structure is specified in section 2.2.2.2.4.3.

#### 2.2.2.2.4.3 ExtraMemberInfoData Format

The **ExtraMemberInfoData** contains additional information about a member of a Personal Distribution List. This contains a set of **ExtraInfoID**, **ExtraInfoSize**, and **ExtraInfoData** segments. When adding or modifying a set of **ExtraInfoID**, **ExtraInfoSize**, and **ExtraInfoData** to the **ExtraMemberInfoData** structure, a client MUST maintain existing data but MAY change the ordering of the ID/Size/Data sets within the structure.

The following diagram specifies the format of the **ExtraMemberInfoData** buffer.




**ExtraInfoID (2 bytes):** A 16-bit value that specifies a unique identifier for the block to follow. This value MUST NOT be 0. This value is broken into ranges for specific clients. The ranges are as follows <28>.

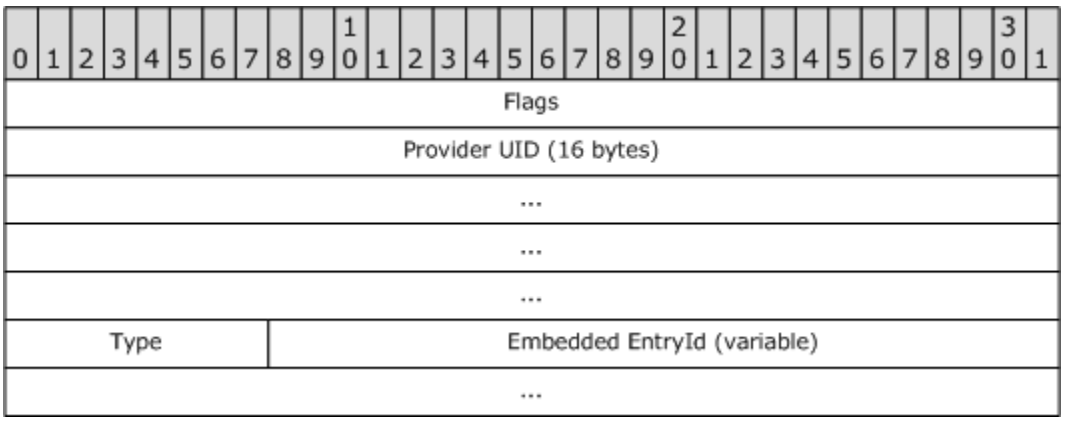
| Value | Client |
|---|---|
| 1 – 1000 (inclusive) | Microsoft Office Outlook |
| 1001 – 2000 (inclusive) | Microsoft Exchange Server |
| 2001 – 3000 (inclusive) | Microsoft Office Communicator |
| 3001 – 60,000 (inclusive) | All other clients |

**ExtraInfoSize (2 bytes):** An unsigned 16-bit value that specifies the count of bytes in the **ExtraInfoData** stream. This value SHOULD NOT be 0.

**ExtraInfoData (variable):** A set of sequential bytes containing client-defined data. The size of this field, in bytes, MUST be the same as the value of the preceding **ExtraInfoSize** field. The data contained within these bytes is client specific and the format is determined by the value of the **ExtraInfoID** field.

#### 2.2.2.2.5 Wrapped EntryId Format

When used as members of a personal distribution list, Address Book EntryIds can be wrapped inside a Wrapped EntryId. The format of the Wrapped EntryId is specified in the following diagram.




**Flags (4 bytes):** MUST be "0x00000000".

**Provider UID (16 bytes):** MUST be "%xC0.91.AD.D3.51.9D.CF.11.A4.A9.00.AA.00.47.FA.A4".

**Type (1 byte):** This bit-field specifies how the next field is interpreted, and MUST be a combination of flags 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. These bits MUST be set to one of the following values:<br>• A value of 0 designates a **one-off EntryId**; the **Embedded EntryId** field MUST be a one-off EntryId as specified in [MS-OXCDATA] section 2.2.4.1.<br>• A value of 3 designates a **Contact object** EntryId; the **Embedded EntryId** field MUST be the Message EntryId (as specified in [MS-OXCDATA section 2.2.1.2]) of a **Contact** object.<br>• A value of 4 designates a **Personal Distribution List object** EntryId ; the **Embedded EntryId** field MUST be the Message EntryId (as specified in |

| Bit Mask | Description |
|---|---|
| | [MS-OXCDATA] section 2.2.4.4) of a **Personal Distribution List** object.<br>• A value of 5 designates a Global Address List local mail user EntryId ; the **Embedded EntryId** field MUST be the Global Address List EntryId (as specified in [MS-OXCDATA] section 2.2.4.2) of a user in the Global Address List.<br>• A value of 6 designates a Global Address List distribution list EntryId; the **Embedded EntryId** field MUST be the Global Address List EntryId (as specified in [MS-OXCDATA] section 2.2.4.2) of a distribution list in the Global Address List. |
| 0x70 | The next 3 bits of the **Type** field are interpreted as an unsigned integer value. If the embedded EntryId is a one-off EntryId, this value MUST be 0. Otherwise, if the embedded EntryId is not a **Contact** object EntryId, this value MUST be 3.<br>If the embedded EntryId is a **Contact** object EntryId, this unsigned integer MUST have one of the following values:<br>• 0 (denoting a Business Fax electronic address)<br>• 1 (denoting a Home Fax electronic address)<br>• 2 (denoting a Primary Fax electronic address)<br>• 4 (denoting an Email1 address)<br>• 5 (denoting an Email2 address)<br>• 6 (denoting an Email3 address)<br>Note that this value MUST NOT be set to 7. |
| 0x80 | If the embedded EntryId is a one-off EntryId, this bit MUST NOT be set. Otherwise, this bit MUST be set. |

**Embedded EntryId (variable):** This field represents an EntryId that MUST be interpreted according to 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

This **PtypInteger32** property SHOULD <29> be set to "0x00000000".

#### 2.2.2.4 Additional Property Constraints

This protocol specifies additional constraints on the following **properties** beyond what is specified in [MS-OXCMSG].

##### 2.2.2.4.1 PidTagNormalizedSubject

The value of this **PtypString** property MUST be the same as the value of the **PidTagDisplayName** property.

##### 2.2.2.4.2 PidTagMessageClass

A **Personal Distribution List object** MUST have this **PtypString** property set to "IPM.DistList", or a **PtypString** prefixed with "IPM.DistList".

### 2.2.3 Contact Folder Syntax

Contact **folders** are folders [MS-OXCFOLD] that have the value of the **PidTagContainerClass PtypString** property set to "IPF.Contact", or a **PtypString** prefixed with "IPF.Contact.". In all other respects, they conform to the folder syntax and functionality specified by [MS-OXCFOLD].

Contact objects and **Personal Distribution List objects** SHOULD be created in contact folders.

# 3 Protocol Details

## *3.1 Client and Server Details*

The client and server roles create and manipulate contacts and personal distribution lists, and otherwise operate within their roles, as specified in [MS-OXCMSG].

### 3.1.1 Abstract Data Model

This section describes a conceptual model of possible data organization that an implementation could maintain 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.

#### 3.1.1.1 Contact Object

**Contact objects** extend the **Message objects** specified in [MS-OXCMSG] and define additional contact-specific properties. These **properties** are either stand-alone properties, or they are used in groups to define conceptual subobjects. Each of these subobjects are defined in sections 3.1.1.1.1 through 3.1.1.1.7.

##### 3.1.1.1.1 Name Subobject

This subobject contains all the **properties** relating to the contact's name. It parses the name and keeps all of the properties synchronized with one another.

#### 3.1.1.1.2 E-Mail Subobjects

These subobjects contain e-mail properties. There are six such objects: one for each of the three e-mail addresses and one for each of the three fax addresses.

#### 3.1.1.1.3 Physical Address Subobjects

These subobjects contain business address, home address, and other address **properties**. They parse an address and keep all of the properties synchronized with one another. There is also one property that specifies which of the Physical Address subobjects is the Mailing Address subobject.

#### 3.1.1.1.4 Event Subobjects

These subobjects contain information about the birthday and anniversary **properties** and maintain the property that links to the corresponding **Appointment** objects in the calendar module.

#### 3.1.1.1.5 Professional Subobject

This subobject contains the contact's company, job title, and related **properties**.

#### 3.1.1.1.6 Business Card Subobject

The **Business Card** object is a set of related **properties** that are used to customize the visual representation of a contact. A **Business Card** object can contain one image and one or more text fields.

#### 3.1.1.1.7 Contact Photo Subobject

The **Contact Photo** object is a set of related **properties** that specifies an optional image of the person or entity represented by the **Contact object**. This image exists independently of the **Business Card** object, but can be used by it.

### 3.1.1.2 Personal Distribution Lists

**Personal Distribution List objects** extend the **Message object** specified in [MS-OXCMSG]. Conceptually, personal distribution lists represent a list of e-mail addresses.

### 3.1.1.3 Contact Folders

Contact **folders** are folders identified by a special value that are used to store **Contact objects** and **Personal Distribution List objects**.

### 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 server or client creates a **Message object** ([MS-OXCMSG] section 4.1), 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 4.8.

##### 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 or server opens a **Message object** as specified in [MS-OXCMSG], modifies any of the **properties** in accordance with the requirements in section 2 and sections 3.1.4.1.3.1 through 3.1.4.1.3.7 of this specification, and [MS-OXCPRPT], and saves the **Message** object as described in [MS-OXCMSG] section 4.8.

###### 3.1.4.1.3.1 Modifying a Contact Name Property

Contact name properties MUST be modified at the same time in order 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.

| Changed property | Additional conditions | Properties that SHOULD <30> be updated |
|---|---|---|
| **PidTagGeneration** | None. | **PidTagDisplayName**, **PidTagNormalizedSubject** |
| **PidTagGeneration** or **PidTagSurname** or **PidTagMiddleName** or **PidTagGivenName** or | Value of the **PidLidFileUnderId** property is not 0x00000000 or | **PidLidFileUnder** |

| Changed property | Additional conditions | Properties that SHOULD <30> be updated |
|---|---|---|
| **PidTagDisplayName** or **PidTagCompanyName** | 0xffffffff. | |
| **PidTagDisplayNamePrefix** | None. | **PidTagDisplayName** |
| **PidTagSurname** or **PidTagMiddleName** or **PidTagGivenName** | None. | **PidTagDisplayName**, **PidTagNormalizedSubject**, **PidTagInitials** |
| **PidTagDisplayName** | None. | **PidTagDisplayNamePrefix**, **PidTagGivenName**, **PidTagMiddleName**, **PidTagSurname**, **PidTagNormalizedSubject**, **PidTagGeneration** |

The application SHOULD also update **PidLidFax1EmailAddress**, **PidLidFax2EmailAddress**, or **PidLidFax3EmailAddress** as needed to reflect any updates to the contact name properties if the contact has a primary fax, business fax, or home fax address, respectively.

#### 3.1.4.1.3.2 Modifying a Physical Address Property

Physical address **properties** MUST be modified at the same time as 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). More than one condition can be met at the same time.

| Changed property | Properties that SHOULD <31> be updated |
|---|---|
| **PidLidPostalAddressId** | **PidTagPostalAddress**, **PidTagStreetAddress**, **PidTagLocality**, **PidTagStateOrProvince**, **PidTagPostalCode**, **PidTagCountry**, **PidLidAddressCountryCode** |
| **PidLidWorkAddress** | **PidLidWorkAddressStreet**, **PidLidWorkAddressCity**, **PidLidWorkAddressState**, **PidLidWorkAddressPostalCode**, |

| Changed property | Properties that SHOULD <31> be updated |
|---|---|
| | **PidLidWorkAddressCountry**, **PidLidWorkAddressCountryCode** |
| **PidLidHomeAddress** | **PidTagHomeAddressStreet**, **PidTagHomeAddressCity**, **PidTagHomeAddressStateOrProvince**, **PidTagHomeAddressPostalCode**, **PidTagHomeAddressCountry**, **PidLidHomeAddressCountryCode** |
| **PidLidOtherAddress** | **PidTagOtherAddressStreet**, **PidTagOtherAddressCity**, **PidTagOtherAddressStateOrProvince**, **PidTagOtherAddressPostalCode**, **PidTagOtherAddressCountry**, **PidLidOtherAddressCountryCode** |
| **PidTagHomeAddressStreet** | **PidLidHomeAddress** |
| **PidLidWorkAddressStreet** | **PidLidWorkAddress** |
| **PidTagOtherAddressStreet** | **PidLidOtherAddress** |
| **PidTagHomeAddressCity** | **PidLidHomeAddress** |
| **PidLidWorkAddressCity** | **PidLidWorkAddress** |
| **PidTagOtherAddressCity** | **PidLidOtherAddress** |
| **PidTagHomeAddressStateOrProvince** | **PidLidHomeAddress** |
| **PidLidWorkAddressState** | **PidLidWorkAddress** |
| **PidTagOtherAddressStateOrProvince** | **PidLidOtherAddress** |
| **PidTagHomeAddressPostalCode** | **PidLidHomeAddress** |
| **PidLidWorkAddressPostalCode** | **PidLidWorkAddress** |
| **PidTagOtherAddressPostalCode** | **PidLidOtherAddress** |

| Changed property | Properties that SHOULD <31> be updated |
|---|---|
| **PidTagHomeAddressCountry** | **PidLidHomeAddress** |
| **PidLidWorkAddressCountry** | **PidLidWorkAddress** |
| **PidTagOtherAddressCountry** | **PidLidOtherAddress** |
| **PidLidHomeAddressCountryCode** | **PidLidHomeAddress** |
| **PidLidWorkAddressCountryCode** | **PidLidWorkAddress** |
| **PidLidOtherAddressCountryCode** | **PidLidOtherAddress** |

**PidTagPostalAddress, PidTagStreetAddress, PidTagLocality, PidTagStateOrProvince, PidTagPostalCode,** and **PidTagCountry, PidLidAddressCountryCode** SHOULD NOT be set without also setting one of the other addresses (either home address, business address, or other address) and **PidTagPostalAddress**.

If the home address, business address, or other address is updated, and **PidTagPostalAddress** is set and the physical address that it maps to is changed, then the mailing address MUST be updated if appropriate. See section 2.2.1.3.9 for more details.

#### 3.1.4.1.3.3 Modifying an Electronic Address Property

Electronic address **properties** MUST be modified at the same time in order 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 following table includes property names for the primary e-mail address only (**PidLidEmail1EmailType**), but the same logic also applies to the **PidLidEmail2EntryId** and **PidLidEmail3EntryId** properties.

| Changed property | Additional conditions | Properties that SHOULD <32> be updated |
|---|---|---|
| **PidLidEmail1OriginalEntryId** | **PidLidEmail1OriginalEntryId** is now either an empty **PtypBinary**, or it is not set. | **PidLidEmail1DisplayName, PidLidEmail1EmailAddress, PidLidEmail1AddressType** |
| | **PidLidEmail1OriginalEntryId** is now a non-empty **PtypBinary.** | **PidLidEmail1EmailAddress, PidLidEmail1AddressType, PidLidEmail1DisplayName, PidLidEmail1OriginalDispla** |

| Changed property | Additional conditions | Properties that SHOULD <32> be updated |
|---|---|---|
| | | **yName** |
| **PidLidEmail1DisplayName** | **PidLidEmail1OriginalEntryId** is a **one-off EntryId**. | **PidLidEmail1OriginalEntryId** |
| **PidLidEmail1AddressType** | **PidLidEmail1OriginalEntryId** is a one-off EntryId. | **PidLidEmail1OriginalEntryId** |
| **PidLidEmail1EmailAddress** | **PidLidEmail1OriginalEntryId** is a one-off EntryId. | **PidLidEmail1OriginalEntryId** |
| | None. | **PidLidEmail1OriginalDisplayName** |
| **PidLidEmail1OriginalDisplayName** | None. | None. |

**PidLidEmail1OriginalDisplayName** SHOULD only be updated when the other e-mail properties are updated.

#### 3.1.4.1.3.4 Updating a FAX Number

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

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

| Fax number | Properties that SHOULD <33> be updated or defined |
|---|---|
| **PidTagPrimaryFaxNumber** | **PidLidFax1AddressType, PidLidFax1EmailAddress, PidLidFax1OriginalDisplayName, PidLidFax1OriginalEntryId** |
| **PidTagBusinessFaxNumber** | **PidLidFax2AddressType, PidLidFax2EmailAddress,** |

| Fax number | Properties that SHOULD <33> be updated or defined |
|---|---|
| | **PidLidFax2OriginalDisplayName, PidLidFax2OriginalEntryId** |
| **PidTagHomeFaxNumber** | **PidLidFax3AddressType, PidLidFax3EmailAddress, PidLidFax3OriginalDisplayName, PidLidFax3OriginalEntryId** |

#### 3.1.4.1.3.5 Modifying an Event Property

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

The following table specifies the properties that SHOULD be updated or defined when another property is changed.

| Changed property | Conditions | Properties that SHOULD<34> be updated or defined |
|---|---|---|
| **PidTagBirthday** | None. | **PidLidReferenceEntryId, PidLidBirthdayEventEntryId**<br>See the following paragraph for more details. |
| **PidTagWeddingAnniversary** | None. | **PidLidReferenceEntryId, PidLidAnniversaryEventEntryId**<br>See the following paragraph for more details. |
| **PidLidBirthdayEventEntryId** | None. | **PidTagBirthday** |
| **PidLidAnniversaryEventEntryId** | None. | **PidTagWeddingAnniversary** |
| **PidTagNormalizedSubject** | **PidLidBirthdayEventEntryId** or **PidLidAnniversaryEventEnt** | Update the value of the **PidTagSubjectPrefix** property on the corresponding **Appointment** |

| Changed property | Conditions | Properties that SHOULD<34> be updated or defined |
|---|---|---|
| | **ryId** is set. | object to match the name of the contact. |
| **PidLidPrivate** | **PidLidBirthdayEventEntryId** or**PidLidAnniversaryEventEntryId** is set. | Update the value of the **PidLidPrivate** property on the corresponding **Appointment** object to match the one on the contact. |

When the property **PidTagBirthday** is updated, the client SHOULD update the appointment associated with this contact's birthday (**PidLidBirthdayEventEntryId**) to match the time specified in **PidTagBirthday**. If no appointment has been created, the client SHOULD create an **Appointment** object, save the **Appointment** object's EntryId to **PidLidBirthdayEventEntryId**, and link the **Appointment** object to the **Contact object** using **PidLidContactLinkEntry**, **PidLidContactLinkSearchKey**, and **PidLidContactLinkName**, as specified in [MS-OXCMSG] section 2.2.1.20.

When the property **PidTagWeddingAnniversary** is updated, the client SHOULD update the appointment associated with this contact's anniversary (**PidLidAnniversaryEventEntryId**) to match the time specified in **PidTagWeddingAnniversary**. If no appointment has been created, the client SHOULD create an **Appointment** object, save the **Appointment** object's EntryId to **PidLidAnniversaryEventEntryId**, and link the **Appointment** object to the **Contact** object using **PidLidContactLinkEntry**, **PidLidContactLinkSearchKey**, and **PidLidContactLinkName**, as specified in [MS-OXCMSG] section 2.2.1.20.

#### 3.1.4.1.3.6 Modifying a Business Card Property

Business card **properties** MUST be modified at the same time as 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** | On removal or addition. | **PidLidBusinessCardDisplayDefinition's ImageSource** MUST be updated to account for the card picture, as specified in section 2.2.2.7.2.1. |
| **PidLidBusinessCardDisplayDefinition** | When the **ImageSource** section of | **PidLidBusinessCardCardPicture** MUST be added or removed. |

| Changed property | Conditions | Properties that MUST be updated |
|---|---|---|
| | the buffer changes. | |

#### 3.1.4.1.3.7 Modifying a Contact Photo Property

| Changed property | Conditions | Properties that MUST be updated |
|---|---|---|
| **PidLidBusinessCardCardPicture** | On removal or addition. | **PidLidBusinessCardDisplayDefinition's ImageSource** MUST be updated to account for the Card Picture, as specified in section 2.2.2.7.2.1. |
| **PidLidBusinessCardDisplayDefinition** | When the **ImageSource** section of the buffer changes. | **PidLidBusinessCardCardPicture** MUST be added or removed. |

### 3.1.4.2 Personal Distribution List Events

The following events pertain to **Personal Distribution List objects**.

#### 3.1.4.2.1 Creating a Personal Distribution List

To create a **Contact object**, the server or client creates a **Message object** ([MS-OXCMSG] section 4.2), sets **properties** in accordance with the requirements in section 2.2.2 of this specification and [MS-OXCPRPT], and saves the resulting **Message** object as described in [MS-OXCMSG] section 4.8.

#### 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 or server opens a **Message object** [MS-OXCMSG], modifies any of the **properties** in accordance with the requirements in section 2 and sections 3.1.4.2.3.1 through 3.1.4.2.3.4 of this specification , and [MS-OXCPRPT], and saves the **Message** object as described in [MS-OXCMSG] section 4.8.

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 application MUST be able to handle circular references.

#### 3.1.4.2.3.1 Naming a Personal Distribution List

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

| Property | Value |
|---|---|
| **PidTagDisplayName** | The name of the **Personal Distribution List object**. |
| **PidLidDistributionListName** | The name of the **Personal Distribution List** object. |
| **PidLidFileUnder** | The name of the **Personal Distribution List** object. |
| **PidLidFileUnderId** | This MUST be set to "0xffffffff". |
| **PidTagNormalizedSubject** | This MUST be set to the same value as **PidLidDistributionListName**. |

#### 3.1.4.2.3.2 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 application SHOULD check that the new member isn't already in the list. Then the application MUST update **PidLidDistributionListMembers** and **PidLidDistributionListOneOffMembers**.

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

After updating these properties, the application SHOULD update the **PidLidDistributionListChecksum** property, as specified in section 3.1.4.2.3.4.

#### 3.1.4.2.3.3 Removing a Member from a Personal Distribution List

Whenever a member is removed from a personal distribution list, the application MUST update **PidLidDistributionListMembers** and **PidLidDistributionListOneOffMembers**.

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

After updating these **properties**, the application SHOULD update the **PidLidDistributionListChecksum** property, as specified in section 3.1.4.2.3.4.

#### 3.1.4.2.3.4 Updating the Checksum of a Personal Distribution List

Whenever a member is added to or removed from a personal distribution list, the value of the **property PidLidDistributionListChecksum** SHOULD <35> be updated. The checksum MUST be calculated starting with a seed value of "0x00000000" and then iterating through each byte of the each **PtypBinary** value in the multi-valued **PidLidDistributionListMembers** property. Use the following algorithm to update **PidLidDistributionListChecksum** value (where CRC32 is defined in [ISO/IEC 8802-3]).

```
SET CheckSum = 0
FOR EACH PtypBinaryValue in PidLidDistributionListMembers
      FOR EACH byteValue in PtypBinaryValue
            Checksum = CRC32(Checksum, byteValue)
      ENDFOR
ENDFOR
```

### 3.1.5 Message Processing Events and Sequencing Rules

None.

### 3.1.6 Timer Events

None.

### 3.1.7 Other Local Events

None.

# 4 Protocol Examples

## *4.1 Creating a Contact*

A user creates a contact with a name (Jacqueline Haddad), e-mail address (someone@example.com), and phone number (555-1234), and then saves it. The following is a description 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 perform a mapping from named **properties** to property identifiers, using **RopGetPropertyIdsFromNames**:

| Property | Property set GUID | Name ID |
|---|---|---|
| **PidLidFileUnderList** | {00062004-0000-0000-c000-000000000046} | 0x8026 |
| **PidLidAutoLog** | {00062004-0000-0000-c000-000000000046} | 0x8025 |
| **PidLidAddressBookProviderEmailList** | {00062004-0000-0000-c000-000000000046} | 0x8028 |
| **PidLidAddressBookProviderArrayType** | {00062004-0000-0000-c000-000000000046} | 0x8029 |
| **PidLidFileUnder** | {00062004-0000-0000-c000-000000000046} | 0x8005 |
| **PidLidFileUnderId** | {00062004-0000-0000-c000-000000000046} | 0x8006 |
| **PidLidContactCharacterSet** | {00062004-0000-0000-c000-000000000046} | 0x8023 |
| **PidLidEmail1DisplayName** | {00062004-0000-0000-c000-000000000046} | 0x8080 |
| **PidLidEmail1AddressType** | {00062004-0000-0000-c000-000000000046} | 0x8082 |
| **PidLidEmail1EmailAddress** | {00062004-0000-0000-c000-000000000046} | 0x8083 |
| **PidLidEmail1OriginalDisplayName** | {00062004-0000-0000-c000-000000000046} | 0x8084 |
| **PidLidEmail1OriginalEntryId** | {00062004-0000-0000-c000-000000000046} | 0x8085 |

The server returns the following property IDs in response to **RopGetPropertyIdsFromNames**.

| Property | Property ID |
|---|---|
| **PidLidFileUnderList** | 0x827b |
| **PidLidAutoLog** | 0x8280 |
| **PidLidAddressBookProviderEmailList** | 0x81d4 |
| **PidLidAddressBookProviderArrayType** | 0x81d5 |
| **PidLidFileUnder** | 0x8016 |
| **PidLidFileUnderId** | 0x81da |
| **PidLidContactCharacterSet** | 0x8286 |
| **PidLidEmail1DisplayName** | 0x 8013 |

| Property | Property ID |
|---|---|
| **PidLidEmail1AddressType** | 0x81ce |
| **PidLidEmail1EmailAddress** | 0x 8010 |
| **PidLidEmail1OriginalDisplayName** | 0x801f |
| **PidLidEmail1OriginalEntryId** | 0x81cf |

To create a **Contact** object, the client uses **RopCreateMessage** ([MS-OXCMSG] section 2.2.3.2). The server returns a success code and a handle to a **Message object**.

After the user has input his content for the **Contact** object, the client uses **RopSetProperties** ([MS-OXCPRPT] section 2.2.5) to transmit the user's data to the server.

| Property | Property type | Data | Meaning |
|---|---|---|---|
| **PidTagDisplayNamePrefix** | **PtypString** | 00 00 | "" |
| **PidTagSurname** | **PtypString** | 48 00 61 00 64 00 64 00 61 00 64 00 00 00 | "Haddad" |
| **PidTagMiddleName** | **PtypString** | 00 00 | "" |
| **PidTagGivenName** | **PtypString** | 4a 00 61 00 63 00 71 00 75 00 65 00 6c 00 69 00 6e 00 65 00 00 00 | "Jacqueline" |
| **PidLidFileUnderList** | **PtypMultipleInteger32** | 05 00 00 00<br>17 80 00 00<br>37 80 00 00<br>16 3a 00 00<br>19 80 00 00<br>18 80 00 00 | cValues: 0x00000005<br>lpl: {0x00008017;<br>0x00008037;<br>0x00003a16;<br>0x00008019;<br>0x00008018} |
| **PidLidAddressBookProviderEmailList** | **PtypMultipleInteger32** | 01 00 00 00<br>00 00 00 00 | cValues: 0x00000001<br>lpl: {0x00000000} |
| **PidLidAddressBookProviderArrayType** | **PtypInteger32** | 0x00000001 | Email1 is defined |
| **PidLidFileUnder** | **PtypString** | 48 00 61 00 64 00 64 00 61 00 64 00 2c 00 20 00 4a 00 61 00 63 00 71 00 75 00 65 00 6c 00 69 00 6e 00 65 00 00 00 | "Haddad, Jacqueline" |
| **PidLidFileUnderId** | **PtypInteger32** | 0x00008017 | **PidLidFileUnder** SHOULD be "<**PidTagSurname**>, <**PidTagGivenName**> <**PidTagMiddleName**>" |

| Property | Property type | Data | Meaning |
|---|---|---|---|
| **PidTagGeneration** | **PtypString** | 00 00 | "" |
| **PidTagInitials** | **PtypString** | 4a 00 2e 00 48 00 2e 00 00 00 | "J.H." |
| **PidLidAutoLog** | **PtypBoolean** | 0x00 | FALSE |
| **PidTagBusinessTelephoneNumber** | **PtypString** | 35 00 35 00 35 00 2d 00 31 00 32 00 33 00 34 00 00 | "555-1234" |
| **PidLidContactCharacterSet** | **PtypInteger32** | 0x00000100 | US Character set |
| **PidTagDisplayName** | **PtypString** | 4a 00 61 00 63 00 71 00 75 00 65 00 6c 00 69 00 6e 00 65 00 20 00 48 00 61 00 64 00 64 00 61 00 64 00 00 00 | "Jacqueline Haddad" |
| **PidLidEmail1DisplayName** | **PtypString** | 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 61 00 6d 00 70 00 6c 00 65 00 2e 00 63 00 6f 00 6d 00 29 00 00 00 | "user10 (user10@szfkuk-dom.example.com)" |
| **PidLidEmail1AddressType** | **PtypString** | 45 00 58 00 00 00 | "EX" |
| **PidLidEmail1EmailAddress** | **PtypString** | 2f 00 6f 00 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 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 75 00 73 00 65 00 72 00 31 00 30 00 | "/o=First Organization/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=user10" |

| Property | Property type | Data | Meaning |
|---|---|---|---|
| | | 00 00 | |
| **PidLidEmail1OriginalDisplayName** | **PtypString** | 75 00 73 00 65 00 72 00<br>31 00 30 00 40 00 73 00<br>7a 00 66 00 6b 00 75 00<br>6b 00 2d 00 64 00 6f 00<br>6d 00 2e 00 65 00 78 00<br>61 00 6d 00 70 00 6c 00<br>65 00 2e 00 63 00 6f 00<br>6d 00 00 00 | "user10@szfkuk-<br>dom.example.com" |
| **PidLidEmail1OriginalEntryId** | **PtypBinary** | 7d 00<br>00 00 DC A7 40 C8 C0 42<br>10 1A B4 B9 08 00 2B 2F<br>E1 82 01 00 00 00 00 00<br>00 00 2F 6F 3D 46 69 72<br>73 74 20 4F 72 67 61 6E<br>69 7A 61 74 69 6F 6E 2F<br>6F 75 3D 45 78 63 68 61<br>6E 67 65 20 41 64 6D 69<br>6E 69 73 74 72 61 74 69<br>76 65 20 47 72 6F 75 70<br>20 28 46 59 44 49 42 4F<br>48 46 32 33 53 50 44 4C<br>54 29 2F 63 6E 3D 52 65<br>63 69 70 69 65 6E 74 73<br>2F 63 6E 3D 75 73 65 72<br>31 30 00 | Size: 125 bytes<br>....@..B<br>......+/<br>........<br>../o=Fir<br>st Organ<br>ization/<br>ou=Excha<br>nge Admi<br>nistrati<br>ve Group<br>(FYDIBO<br>HF23SPDL<br>T)/cn=Re<br>cipients<br>/cn=user<br>10. |
| **PidTagRtfCompressed** | **PtypBinary** | e6 14<br>E2 14 00 00 93 52 00 00<br>4C 5A 46 75 62 F8 7E BB<br>07 00 06 01 01 0B 60 6E<br>67 31 30 32 66 35 00 64<br>00 72 63 70 0D D0 0E 00<br>32 05 0C 60 63 0D 44 66<br>33 31 35 30 42 37 00 F5<br>73 74 73 68 05 70 62 74<br>… (remainder of property<br>excluded for brevity) | Size: 5350 bytes<br>.....R..<br>LZFub.~.<br>......`n<br>g102f5.d<br>.rcp....<br>2..`c.Df<br>3150B7..<br>stsh.pbt |
| **PidTagMessageClass** | **PtypString** | 49 00 50 00 4d 00 2e 00<br>43 00 6f 00 6e 00 74 00<br>61 00 63 00 74 00 00 00 | "IPM.Contact" |
| **PidTagIconIndex** | **PtypInteger32** | 00 20 00 00 | 512 |
| **PidTagSubjectPrefix** | **PtypString** | 00 | "" |
| **PidTagSubject** | **PtypString** | 4a 00 61 00 63 00 71 00<br>75 00 65 00 6c 00 69 00<br>6e 00 65 00 20 00 48 00<br>61 00 64 00 64 00 61 00<br>64 00 00 00 | "Jacqueline Haddad" |

When the user is ready to save his or her changes, the client uses **RopSaveChanges** to commit the properties on the server.

The values of some properties will change during the execution of **RopSaveChanges**; however, none of the properties that change are specified contact properties.

## *4.2 Creating a Personal Distribution List*

A user creates a personal distribution list that contains the previous sample contact and another e-mail address (user1@example.com). The following is a description 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 perform a mapping from named **properties** to property identifiers, using **RopGetPropertyIdsFromNames** ([MS-OXCPRPT] section 2.2.12).

| Property | Property set GUID | Name ID |
|---|---|---|
| **PidLidAutoLog** | {00062004-0000-0000-c000-000000000046} | 0x8025 |
| **PidLidAddressBookProviderArrayType** | {00062004-0000-0000-c000-000000000046} | 0x8029 |
| **PidLidFileUnder** | {00062004-0000-0000-c000-000000000046} | 0x8005 |
| **PidLidFileUnderId** | {00062004-0000-0000-c000-000000000046} | 0x8006 |
| **PidLidDistributionListName** | {00062004-0000-0000-c000-000000000046} | 0x8053 |
| **PidLidDistributionListChecksum** | {00062004-0000-0000-c000-000000000046} | 0x804c |
| **PidLidDistributionListMembers** | {00062004-0000-0000-c000-000000000046} | 0x8055 |
| **PidLidDistributionListOneOffMembers** | {00062004-0000-0000-c000-000000000046} | 0x8054 |

The server returns the following property IDs in response to **RopGetPropertyIdsFromNames**.

| 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 **RopCreateMessage** ([MS-OXCMSG] section 2.2.3.2). The server returns a success code and a handle to a **Message object**.

After the user has input content for the **Personal Distribution List** object, the client uses **RopSetProperties** ([MS-OXCPRPT] section 2.2.5) to transmit his data to the server.

| Property | Property type | Data | Meaning |
|---|---|---|---|
| **PidTagDisplayNamePrefix** | **PtypString** | 00 00 | "" |
| **PidLidAddressBookProviderArrayType** | **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** | **PtypString** | 46 00 72 00 69 00 65 00 6e 00 64 00 73 00 00 00 | Friends |
| **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<br>64 00<br>00 00 00 00 81 2b 1f a4 be a3<br>10 19 9d 6e 00 dd 01 0f 54 02<br>00 00 01 80 54 00 68 00 6f 00<br>6d 00 61 00 73 00 20 00 48 00<br>61 00 6d 00 62 00 6f 00 72 00<br>67 00 00 00 53 00 4d 00 54 00<br>50 00 00 00 75 00 73 00 65 00<br>72 00 31 00 40 00 65 00 78 00<br>61 00 6d 00 70 00 6c 00 65 00<br>2e 00 63 00 6f 00 6d 00 00 00<br><br>5b 00<br>00 00 00 00 c0 91 ad d3 51 9d<br>cf 11 a4 a9 00 aa 00 47 fa a4<br>c3 00 00 00 00 c2 42 42 82 60<br>00 16 47 ad a9 5c 07 77 b7 4b<br>e2 07 00 61 2a 7b ab 49 f6 4e<br>4b 9c 52 db fb 5a 53 aa 1c 00<br>00 00 f0 4e a6 00 00 61 2a 7b<br>ab 49 f6 4e 4b 9c 52 db fb 5a<br>53 aa 1c 00 00 00 f0 d5 b0 00<br>00 | 2 binary large objects (BLOBs) to follow<br>BLOB1 Size: 100 bytes<br>.....+..<br>.....n..<br>..T.....<br>T.h.o.m.<br>a.s. .H.<br>a.m.b.o.<br>r.g...S.<br>M.T.P...<br>u.s.e.r.<br>1.@.e.x.<br>a.m.p.l.<br>e...c.o.<br>m...<br><br>BLOB2 Size:91 bytes<br>........<br>Q.......<br>.G......<br>..BB.`..<br>G..\.w.K<br>...a*{.I<br>.NK.R..Z<br>S......N<br>...a*{.I<br>.NK.R..Z<br>S.......<br>... |
| **PidLidDistributionListOneOffMembers** | **PtypMultipleBinary** | 02 00 00 00<br>64 00<br>00 00 00 00 81 2b 1f a4 be a3<br>10 19 9d 6e 00 dd<br>01 0f 54 02 00 00 01 80<br>54 00 68 00 6f 00 6d 00<br>61 00 73 00 20 00 48 00<br>61 00 6d 00 62 00 6f 00<br>72 00 67 00 00 00 53 00 | 2 BLOBs to follow<br>BLOB1 Size: 100 bytes<br>.....+..<br>.....n..<br>..T.....<br>T.h.o.m.<br>a.s. .H.<br>a.m.b.o.<br>r.g...S. |

| Property | Property type | Data | Meaning |
|---|---|---|---|
| | | 4d 00 54 00 50 00 00 00<br>75 00 73 00 65 00 72 00<br>31 00 40 00 65 00 78 00<br>61 00 6d 00 70 00 6c 00<br>65 00 2e 00 63 00 6f 00<br>6d 00 00 00<br><br>ac 00<br>00 00 00 00 81 2b 1f a4<br>be a3 10 19 9d 6e 00 dd<br>01 0f 54 02 00 00 01 80<br>75 00 73 00 65 00 72 00<br>31 00 30 00 20 00 28 00<br>75 00 73 00 65 00 72 00<br>31 00 30 00 40 00 73 00<br>7a 00 66 00 6b 00 75 00<br>6b 00 2d 00 64 00 6f 00<br>6d 00 2e 00 65 00 78 00<br>6a 00 6d 00 70 00 6c 00<br>65 00 2e 00 63 00 6f 00 6d 00<br>29 00 00 00 53 00 4d 00 54 00<br>50 00 00 00 75 00 73 00 65 00<br>72 00 31 00 30 00 40 00 73 00<br>7a 00 66 00 6b 00 75 00 6b 00<br>2d 00 64 00 6f 00 6d 00 2e 00<br>65 00 78 00 6a 00 6d 00 70 00<br>6c 00 65 00 2e 00 63 00 6f 00<br>6d 00 00 00 | M.T.P...<br>u.s.e.r.<br>1.@.e.x.<br>a.m.p.l.<br>e...c.o.<br>m...<br><br>BLOB2 Size: 172 bytes<br>.....+..<br>.....n..<br>..T.....<br>u.s.e.r.<br>1.0. .(.<br>u.s.e.r.<br>1.0.@.s.<br>z.f.k.u.<br>k.-.d.o.<br>m...e.x.<br>a.m.p.l.<br>e...c.o.<br>m.)...S.<br>M.T.P...<br>u.s.e.r.<br>1.0.@.s.<br>z.f.k.u.<br>k.-.d.o.<br>m...e.x.<br>a.m.p.l.<br>e...c.o.<br>m... |
| **PidTagMessageClass** | **PtypString** | 49 00 50 00 4d 00 2e 00 44 00<br>69 00 73 00 74 00 4c 00 69 00<br>73 00 74 00 00 00 | "IPM.DistList" |
| **PidTagIconIndex** | **PtypInteger32** | 0x00000202 | 514 |
| **PidTagSubjectPrefix** | **PtypString** | 00 00 | "" |
| **PidTagSubject** | **PtypString** | 46 00 72 00 69 00 65 00 6e 00<br>64 00 73 00 00 00 | "Friends" |

When the user is ready to save his or her changes, the client uses **RopSaveChanges** to commit the **properties** on the server.

The values of some properties will change during the execution of **RopSaveChanges**; however, none of the properties that change are specified contact properties.

# 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 specified in [MS-OXCMSG] and [MS-OXCPRPT].

### *5.2 Index of Security Parameters*

None.

# 6 Appendix A: Office/Exchange Behavior

The information in this specification is applicable to the following versions of Office/Exchange:

- Office 2003 with Service Pack 3 applied
- Exchange 2003 with Service Pack 2 applied
- Office 2007 with Service Pack 1 applied
- Exchange 2007 with Service Pack 1 applied

Exceptions, if any, are noted below. Unless otherwise specified, any statement of optional behavior in this specification prescribed using the terms SHOULD or SHOULD NOT implies Office/Exchange behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies Office/Exchange does not follow the prescription.

---

<1> Section 2.2: Outlook 2003 SP3 and Outlook 2007 SP1 set the following **properties** regardless of user input; their values have no meaning in the context of this protocol.

**PidLidAgingDontAgeMe, PidLidCurrentVersion, PidLidCurrentVersionName, PidLidValidFlagStringProof, PidTagAlternateRecipientAllowed, PidTagclientSubmitTime, PidTagDeleteAfterSubmit, PidTagImportance, PidTagMessageDeliveryTime, PidTagMessageLocaleID, PidTagOriginatorDeliveryReportRequested, PidLidSideEffects, PidTagPriority, PidTagReadReceiptRequested, PidTagSensitivity**

<2> Section 2.2: Outlook 2007 SP1 sets the following **properties** regardless of user input; their values have no meaning in the context of this protocol: **PidLidReminderSet, PidLidTaskActualEffort, PidLidTaskComplete, PidLidTaskAssigner, PidLidTaskAcceptanceState, PidLidTaskEstimatedEffort, PidLidTaskFFixOffline, PidLidTaskFRecurring, PidLidTaskMode, PidLidTaskNoCompute, PidLidTaskOrdinal, PidLidTaskOwnership, PidLidTaskRole, PidLidTaskState, PidLidTaskStatus, PidLidTaskVersion**, and **PidLidTeamTask**.

<3> Section 2.2: Outlook 2003 SP3 and Outlook 2007 SP1 sometimes set the following **properties**; they SHOULD be ignored by the client and the server: **PidLidEmail1RichTextFormat**, **PidLidEmail2RichTextFormat**, **PidLidEmail3RichTextFormat**, and **PidLidReferredBy**.

<4> Section 2.2.1.1.12: This table shows the format that the **PtypString** property **PidLidFileUnder** SHOULD be in, if all of the **properties** are present. If a **property** is not present, the separator characters surrounding it MAY be removed by the application.

In cases where the format string shows **PidTagSurname** before **PidTagGivenName,** Outlook 2003 SP3 and Outlook 2007 SP1 move portions of **PidTagSurname** such as "van " or "de " so that they immediately follow **PidTagMiddleName** if that property is present and part of the format string, or so that they immediately follow **PidTagGivenName**, if that property is present and part of the format string.

<5> Section 2.2.1.1.13: The **PidLidFileUnderList** property is set by Outlook 2003 SP3 and Outlook 2007 SP1, but it is never used by either Outlook 2003 SP3 and Outlook 2007 SP1, or Exchange Server 2007 SP1 or Exchange Server 2003 SP2.

<6> Section 2.2.1.2: Outlook 2003 SP3 and Outlook 2007 SP1 set the **PidLidAddressBookProviderEmailList** and **PidLidddressBookProviderArrayType** and **Primary Fax**, **Business Fax**, or **Home Fax** properties only if they are able to interpret the value of the **PidTagPrimaryFaxNumber**, **PidTagBusinessFaxNumber**, or **PidTagHomeFaxNumber** property, respectively, as an actual fax phone number.

Exchange 2007 SP1 sets the **PidLidAddressBookProviderEmailList** and **PidLidAddressBookProviderArrayType** properties whenever the **FaxNumber string** property is set.

Exchange 2003 SP2 always sets the **PidLidAddressBookProviderArrayType** property to "0x00000000" and never sets the **PidLidAddressBookProviderEmailList** property unless an e-mail address is defined for the contact.

<7> Section 2.2.1.2.2: Common **address types** used by Outlook and Exchange are "SMTP" and "EX", but can be any of the strings returned from **RopAddressTypes**, or even a third-party defined string.

<8> Section 2.2.1.2.3: Each **address type** has a specific format. The format of "EX" e-mail addresses is specified in [RFC2247]. The format of "SMTP" e-mail addresses is specified in [RFC821]. The e-mail type string is intended to provide an avenue for various third-party delivery mechanisms to define their own e-mail format. A **Contact object** is simply used as storage for these values, and e-mail types and e-mail addresses have no special meaning in the context of this protocol.

<9> Section 2.2.1.2.11: Outlook 2003 SP3 and Outlook 2007 SP1 set this multi-valued LONG **property** to contain the three values "0x0008080", "0x00008090", and "0x000080A0" whenever one e-mail address is defined. Exchange 2003 SP2 and Exchange 2007 SP1 do not set this property.

<10> Section 2.2.1.2.12: The fact that there are two properties (**PidLidAddressBookProviderEmailList** and **PidLidAddressBookProviderArrayType**) containing similar information is an application optimization.

<11> Section 2.2.1.3.1: Outlook 2003 SP3, Outlook 2007 SP1, Exchange 2003 SP2, and Exchange 2007 SP1 also use this **property** to store the post office box part of the address, if it exists.

<12> Section 2.2.1.3.7: Outlook 2003 SP3, Outlook 2007 SP1, Exchange 2003 SP2 and Exchange 2007 SP1 do not use the post office box **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.

<13> Section 2.2.1.6.4: Outlook 2003 SP3 and Outlook 2007 SP1 always set this **property** to an empty string.

<14> Section 2.2.1.7: The business card **properties** are only implemented in Outlook 2007 SP1 and are ignored by Outlook 2003 SP3 and the server.

<15> Section 2.2.1.7.1.1.1: Outlook 2007 SP1 sets the MajorVersion to “0x03” and the MinorVersion to “0x00”.

<16> Section 2.2.1.8: **Contact Photo** properties are only used by Outlook 2003 SP3, Outlook 2007 SP1, and Exchange 2007 SP1.

<17> Section 2.2.1.8.2: If there is more than one attachment that has this property set, the application is free to pick any of the marked attachments as the contact photo.

<18> Section 2.2.1.9.1: This **property** can be used to detect when a **Message object** is a copy of an earlier original (when the value of **PidLidReferenceEID** is not the same as the EntryId of the Contact object).

<19> Section 2.2.1.9.11:The value of this **property** is not used by either the client or the server.

<20> Section 2.2.1.9.16:The value of this **property** is not used by either the client or the server.

<21> Section 2.2.1.9.18: For US English, Outlook 2003 SP3 and Outlook 2007 SP1 set this value to the more generic “0x00000100”, denoting a “Western” character set. Exchange 2003 SP2 and Exchange 2007 SP1 do not set or use this **property**.

<22> Section 2.2.1.10.1: Outlook 2003 SP3 and Outlook 2007 SP1use the value of the **PidTagNormalizedSubject** property as the caption of the window displaying information about this contact. The value of the very similar **PidTagDisplayName** property might contain characters that cannot be displayed as a window caption.

<23> Section 2.2.2.1.2: For a newly-created distribution list without a name at all, Outlook 2003 SP3 and Outlook 2007 SP1 do not set the property **PidLidDistributionListName** to any value. In the same scenario, Outlook 2003 SP3 and Outlook 2007 SP1 set **PidTagDisplayName** to the string containing just a terminating NULL character. In every other case, Outlook 2003 SP3 and Outlook 2007 SP1 keep these two **properties** the same.

Exchange 2003 SP2 and Exchange 2007 SP1 never set this **property**.

<24> Section 2.2.2.1.4: Exchange 2007 SP1 sets this **property** to 0 when it creates a distribution list.

<25> Section 2.2.2.2.2: Exchange 2003 SP2 does not set or update this **property.**

<26> Section 2.2.2.2.3: Exchange 2003 SP2 and Exchange 2007 SP1 do not set or update this **property**.

<27> Section 2.2.2.2.4: **PidLidDistributionListStream** is only supported and understood by Outlook 2007 SP2. All versions of Exchange and earlier versions of Outlook do not set or read this property. They will always ignore this property if set, and will instead read the information from **PidLidDistributionListMembers**, **PidLidDistributionListOneOffMembers**, and **PidLidDistributionListChecksum.**

<28> Section 2.2.2.2.4.3: The ranges specified for **ExtraInfoID** are reserved for future use. Currently Outlook and Exchange do not use the **ExtraMemberInfoData** field.

<29> Section 2.2.2.3.1: Exchange 2003 SP2 and Exchange 2007 SP1 do not set this **property**.

<30> Section 3.1.4.1.3.1: Not all **properties** will need to be updated every time. Applications MUST use the specifications in section 2.2.1.1 to determine whether an update is required.

<31> Section 3.1.4.1.3.2: Not all **properties** will need to be updated every time. Applications MUST use the specifications in section 2.2.1.3 to determine whether an update is required.

<32> Section 3.1.4.1.3.3: Not all **properties** will need to be updated every time. Applications MUST use the specifications in section 2.2.1.2 to determine whether an update is required.

<33> Section 3.1.4.1.3.4: Not all **properties** will need to be updated every time. Applications MUST use the specifications in section 2.2.1.2 to determine whether an update is required.

<34> Section 3.1.4.1.3.5: Not all **properties** will need to be updated every time. Applications MUST use the specifications in section 2.2.1.5 to determine whether an update is required.

<35> Section 3.1.4.2.3.4: Exchange 2003 SP2 and Server 2007 SP1 do not update this **property**.

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