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## Revision Summary

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1 Introduction

The Configuration Information Protocol allows a client to share overlapping application settings with a server. Where appropriate, it can also be used to change the configuration of a feature on the client from the server or vice versa.

Sections 1.5, 1.8, 1.9, 2, and 3 of this specification are normative. All other sections and examples in this specification are informative.

1.1 Glossary

This document uses the following terms:

- **action**: A discrete operation that is executed on an incoming **Message object** when all conditions in the same rule are TRUE. A rule contains one or more actions.

- **archive policy**: A feature that determines when items are moved into an alternate **mailbox** for archival purposes.

- **attachments table**: A Table object whose rows represent the Attachment objects that are attached to a **Message object**.

- **calendar**: A date range that shows availability, meetings, and appointments for one or more users or resources. See also **Calendar object**.

- **Calendar folder**: A Folder object that contains **Calendar objects**.

- **Calendar object**: A **Message object** that represents an event, which can be a one-time event or a recurring event. The Calendar object includes properties that specify event details such as description, organizer, date and time, and status.

- **calendar options dictionary**: A dictionary that contains calendar configuration data. It is stored in a **folder associated information (FAI)** message that is in a **Calendar special folder**.

- **Calendar special folder**: A **Calendar folder** that is in a user's **mailbox** and in which meetings are created by default.

- **category**: A subdivision of items into useful groups such as geographical regions. For example, categories that represent geographical regions could be North, South, East, and West.

- **code page**: An ordered set of characters of a specific script in which a numerical index (code-point value) is associated with each character. Code pages are a means of providing support for character sets and keyboard layouts used in different countries. Devices such as the display and keyboard can be configured to use a specific code page and to switch from one code page (such as the United States) to another (such as Portugal) at the user's request.

- **Common Views folder**: A **special folder** that contains the data for default views that are standard for a message store and can be used by any user of a client that accesses the message store.

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

- **contents table**: A Table object whose rows represent the **Message objects** that are contained in a Folder object.

- **conversation**: A single representation of a send/response series of email messages. A conversation appears in the Inbox as one unit and allows the user to view and read the series of related email messages in a single effort.
**conversation action**: A limited set of actions that a user applies to all Message objects that have the same PidTagConversationId value. The action is applied to all Message objects that are currently in the store or are delivered in the future.

**conversation ID**: A unique value that is associated with a conversation. It is assigned to each Message object that is part of a conversation and it is used to identify the conversation to which the message belongs.

**Coordinated Universal Time (UTC)**: A high-precision atomic time standard that approximately tracks Universal Time (UT). It is the basis for legal, civil time all over the Earth. Time zones around the world are expressed as positive and negative offsets from UTC. In this role, it is also referred to as Zulu time (Z) and Greenwich Mean Time (GMT). In these specifications, all references to UTC refer to the time at UTC-0 (or GMT).

**dictionary**: A collection of key/value pairs. Each pair consists of a unique key and an associated value. Values in the dictionary are retrieved by providing a key for which the dictionary returns the associated value.

**display name**: A text string that is used to identify a principal or other object in the user interface. Also referred to as title.

**distribution list**: A collection of users, computers, contacts, or other groups that is used only for email distribution, and addressed as a single recipient.

**Email object**: A Message object that represents an email message in a message store and adheres to the property descriptions that are described in [MS-OXOMSG].

**EntryID**: A sequence of bytes that is used to identify and access an object.

**FAI contents table**: A table of folder associated information (FAI) Message objects that are stored in a Folder object.

**folder associated information (FAI)**: A collection of Message objects that are stored in a Folder object and are typically hidden from view by email applications. An FAI Message object is used to store a variety of settings and auxiliary data, including forms, views, calendar options, favorites, and category lists.

**free/busy status**: A property of an appointment that indicates how an appointment on the calendar of an attendee or resource affects their availability.

**globally unique identifier (GUID)**: A term used interchangeably with universally unique identifier (UUID) in Microsoft protocol technical documents (TDs). Interchanging the usage of these terms does not imply or require a specific algorithm or mechanism to generate the value. Specifically, the use of this term does not imply or require that the algorithms described in [RFC4122] or [C706] must be used for generating the GUID. See also universally unique identifier (UUID).

**group header**: A navigation shortcut that groups other navigation shortcuts.

**handle**: Any token that can be used to identify and access an object such as a device, file, or a window.

**Inbox folder**: A special folder that is the default location for Message objects received by a user or resource.

**Internet Message Access Protocol - Version 4 (IMAP4)**: A protocol that is used for accessing email and news items from mail servers, as described in [RFC3501].

**interpersonal messaging subtree**: The root of the hierarchy of folders commonly visible in a messaging client. This includes mailbox folders (such as the Inbox folder and Outbox folder) and user-created folders, including user-created public folders.
Journal object: A Message object that represents an entry in a journal or log and adheres to the property descriptions that are described in [MS-OXOJRNL].

little-endian: Multiple-byte values that are byte-ordered with the least significant byte stored in the memory location with the lowest address.

mailbox: A message store that contains email, calendar items, and other Message objects for a single recipient.

Meeting Request object: A Message object that represents an invitation from the meeting organizer to an attendee.

Meeting Response object: A Message object that represents an attendee's response to a meeting organizer's invitation. The response indicates whether the attendee accepted, tentatively accepted, or declined the meeting request. The response can include a proposed new date or time for the meeting.

message class: A property that loosely defines the type of a message, contact, or other Personal Information Manager (PIM) object in a mailbox.

Message object: A set of properties that represents an email message, appointment, contact, or other type of personal-information-management object. In addition to its own properties, a Message object contains recipient properties that represent the addressees to which it is addressed, and an attachments table that represents any files and other Message objects that are attached to it.

message store: A unit of containment for a single hierarchy of Folder objects, such as a mailbox or public folders.

named property: A property that is identified by both a GUID and either a string name or a 32-bit identifier.

Note object: A Message object that represents a simple text note in a messaging store and that adheres to the property descriptions that are described in [MS-OXONOTE]. A Note object functions as an electronic equivalent of a paper sticky note.

permission: A rule that is associated with an object and that regulates which users can gain access to the object and in what manner. See also rights.

property ID: A 16-bit numeric identifier of a specific attribute. A property ID does not include any property type information.

property tag: A 32-bit value that contains a property type and a property ID. The low-order 16 bits represent the property type. The high-order 16 bits represent the property ID.

property type: A 16-bit quantity that specifies the data type of a property value.

public folder: A Folder object that is stored in a location that is publicly available.

recipient table: The part of a Message object that represents users to whom a message is addressed. Each row of the table is a set of properties that represents one recipient.

reminder: A generally user-visible notification that a specified time has been reached. A reminder is most commonly related to the beginning of a meeting or the due time of a task but it can be applied to any object type.

remote operation (ROP): An operation that is invoked against a server. Each ROP represents an action, such as delete, send, or query. A ROP is contained in a ROP buffer for transmission over the wire.
**restriction**: A set of conditions that an item meets to be included in the search results that are returned by a query server in response to a search query.

**retention policy**: A policy that specifies the length of time during which data, documents, and other records must be available for recovery.

**root folder**: The folder at the top of a hierarchy of folders in a list.

**ROP request**: See **ROP request buffer**.

**ROP request buffer**: A ROP buffer that a client sends to a server to be processed.

**rule**: A condition or action, or a set of conditions or actions, that performs tasks automatically based on events and values.

**search folder**: A Folder object that provides a means of querying for items that match certain criteria. The search folder includes the search folder definition message and the search folder container.

**sort order**: The order in which the rows in a Table object are requested to appear. This can involve sorting on multiple properties and sorting of categories.

**special folder**: One of a default set of Folder objects that can be used by an implementation to store and retrieve user data objects.

**stream**: A flow of data from one host to another host, or the data that flows between two hosts.

**Stream object**: A Server object that is used to read and write large string and binary properties.

**subproperty**: A binary stream property that is embedded in another property, possibly in addition to other subproperties.

**Task object**: A **Message object** that represents an assignment to be completed.

**Unicode**: A character encoding standard developed by the Unicode Consortium that represents almost all of the written languages of the world. The **Unicode** standard [UNICODE5.0.0/2007] provides three forms (UTF-8, UTF-16, and UTF-32) and seven schemes (UTF-8, UTF-16, UTF-16 BE, UTF-16 LE, UTF-32, UTF-32 LE, and UTF-32 BE).

**UTF-8**: A byte-oriented standard for encoding Unicode characters, defined in the Unicode standard. Unless specified otherwise, this term refers to the UTF-8 encoding form specified in [UNICODE5.0.0/2007] section 3.9.

**Web Distributed Authoring and Versioning Protocol (WebDAV)**: The Web Distributed Authoring and Versioning Protocol, as described in [RFC2518] or [RFC4918].

**working hours**: Times of the day that are valid for meetings to be considered for an attendee.

**XML**: The Extensible Markup Language, as described in [XML1.0].

**XML namespace**: A collection of names that is used to identify elements, types, and attributes in XML documents identified in a URI reference [RFC3986]. A combination of XML namespace and local name allows XML documents to use elements, types, and attributes that have the same names but come from different sources. For more information, see [XMLNS-2ED].

**XML namespace prefix**: An abbreviated form of an XML namespace, as described in [XML].

**XML schema**: A description of a type of XML document that is typically expressed in terms of constraints on the structure and content of documents of that type, in addition to the basic syntax constraints that are imposed by XML itself. An XML schema provides a view of a document type at a relatively high level of abstraction.
**XML schema definition (XSD):** The World Wide Web Consortium (W3C) standard language that is used in defining XML schemas. Schemas are useful for enforcing structure and constraining the types of data that can be used validly within other XML documents. XML schema definition refers to the fully specified and currently recommended standard for use in authoring XML schemas.

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

### 1.2 References

Links to a document in the Microsoft Open Specifications library point to the correct section in the most recently published version of the referenced document. However, because individual documents in the library are not updated at the same time, the section numbers in the documents may not match. You can confirm the correct section numbering by checking the Errata.

#### 1.2.1 Normative References

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

[MS-DTYP] Microsoft Corporation, "Windows Data Types".

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

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

[MS-OXCFXICS] Microsoft Corporation, "Bulk Data Transfer Protocol".

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


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


[MS-OXCTABL] Microsoft Corporation, "Table Object Protocol".


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

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

[MS-OXORMDR] Microsoft Corporation, "Reminder Settings Protocol".

[MS-OXORULE] Microsoft Corporation, "Email Rules Protocol".

[MS-OXOSFLD] Microsoft Corporation, "Special Folders Protocol".


1.3 Overview

The Configuration Information Protocol consists of the settings that are shared between clients and servers, and the manner in which the settings are shared. The protocol enables both clients and servers to implement features based on user configuration information, such as using a user's preferred working hours, to propose optimal times for new appointments. The settings are divided into the following categories, each of which uses a different mechanism for sharing:

- configuration data
- view definitions
- folder flags
- conversation actions
- navigation shortcuts

In addition to the settings included in the protocol, a client or server can store additional, non-interoperable settings for the use of the respective application in a similar way. Despite the fact that the settings use a similar storage mechanism, they are not part of the protocol when they are used by only a single application.

1.4 Relationship to Other Protocols

The Configuration Information Protocol works with the protocols shown in the following diagram.
The configuration data, view definition, and navigation shortcut components of the Configuration Information Protocol use folder associated information (FAI) messages, as described in [MS-OXCFOLD], as the transport. Clients need to sort and restrict the FAI contents table, as described in [MS-OXCTABL], to find the required FAI message. Clients need to access properties on the FAI message, as described in [MS-OXCMSG], and need to use Stream objects for certain properties, as described in [MS-OXCPRPT]. The FAI messages are sometimes contained in a special folder; therefore, these components need to use the Special Folders Protocol, as described in [MS-OXOSFLD]. The configuration data and view definitions are retrieved from properties on the FAI messages using...
the Property and Stream Object Protocol, as described in [MS-OXCPRPT]. Conversation actions are stored as FAI messages in the conversation actions settings special folder, as described in [MS-OXOSFLD].

The folder flags component uses a binary property that is stored on the folder itself. The transport for folder flags is described in [MS-OXCFOLD].

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

1.5 Prerequisites/Preconditions

The Configuration Information Protocol assumes that the client has previously logged on to the server.

1.6 Applicability Statement

Clients and servers can use the Configuration Information Protocol to share application settings when each application implements a similar feature with the same settings. Each application can also use this protocol to communicate the state of its own features, where that state affects the state of related features in the other application.

Clients can also use this protocol to synchronize application settings between multiple instances of the client that are connected to the same server.

1.7 Versioning and Capability Negotiation

Capability negotiation: The client checks the version number returned by the server in either the EcDoConnectEx method, as described in [MS-OXCRPC], or the X-ServerApplication header of the Connect request type response, as described in [MS-OXCMAPIHTTP]. If the server returns a version that is greater than or equal to 14.0.324.0, the client never deletes the conversation action FAI message, as described in section 3.1.4.8, and disables almost all processing of incoming E-mail objects, as described in section 3.1.5.1.

1.8 Vendor-Extensible Fields

A third-party application can use FAI messages to store its own settings by specifying its own custom PtypString for the value of the PidTagMessageClass property ([MS-OXCMSG] section 2.2.1.3). A centralized authority that ensures uniqueness of the PidTagMessageClass property across different applications does not exist.

1.9 Standards Assignments

None.
2 Messages

2.1 Transport

Section 2.2 specifies how Configuration Information Protocol messages use properties and streams that have been set on FAI messages or folders as the underlying transport.

Streams are further specified in [MS-OXCPRPT]. FAI messages and folders are further specified in [MS-OXCFOLD].

2.2 Message Syntax

Sections 2.2.1 through 2.2.19 specify the location and format of the property and stream buffers that are specific to the Configuration Information Protocol.

2.2.1 Namespaces

This specification defines and references various XML namespaces using the mechanisms specified in [XMLNS]. Although this specification associates a specific XML namespace prefix for each XML namespace that is used, the choice of any particular XML namespace prefix is implementation-specific and not significant for interoperability.

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Namespace URI</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>dictionary</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>WorkingHours</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>CategoryList</td>
<td></td>
</tr>
</tbody>
</table>

2.2.2 Configuration Data Properties

Configuration data consists of groups of related application settings. Each group of settings is stored in separate stream properties that are set on FAI messages.

The streams can contain a serialized dictionary of name-value pairs that allow access to individual settings by name. The dictionary is serialized using an XML schema that is common to all dictionary streams. Most simple settings use this type of stream.

For more structured data, such as the user’s preferred working hours, the streams can contain an XML document that uses an arbitrary schema that corresponds to the structure of the data. The settings that use an arbitrary XML stream include the user’s preferred working hours, which can be used by the client and server to make improved scheduling suggestions for that user, and the user’s customized category list, which allows the user to build a list of commonly used message categories and assign color values to those categories.

The properties specified in sections 2.2.2.1 through 2.2.2.3 are present on FAI messages that contain configuration data.

2.2.2.1 PidTagRoamingDatatypes Property

Type: PtypInteger32 ([MS-OXCDATA] section 2.11.1)
The `PidTagRoamingDatatypes` property ([MS-OXPROPS] section 2.937) contains a bitmask that indicates which stream properties exist on the message. The types of the streams, and thus the flags, are not mutually exclusive.

The bitmask is a bitwise OR of the following bits. Other bits MUST NOT be set and MUST be ignored if set.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x00000002</td>
<td>The FAI message contains an XML stream, which is stored in the <code>PidTagRoamingXmlStream</code> property (section 2.2.2.3).</td>
</tr>
<tr>
<td>0x00000004</td>
<td>The FAI message contains a dictionary stream, which is stored in the <code>PidTagRoamingDictionary</code> property (section 2.2.2.2). If the FAI message does not contain a dictionary stream, the application MUST treat the dictionary as having no entries.</td>
</tr>
</tbody>
</table>

### 2.2.2.2 `PidTagRoamingDictionary` Property

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

The `PidTagRoamingDictionary` property ([MS-OXPROPS] section 2.938) contains a dictionary stream that is serialized into a fixed XML schema, as specified in section 2.2.5.1.

### 2.2.2.3 `PidTagRoamingXmlStream` Property

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

The `PidTagRoamingXmlStream` property ([MS-OXPROPS] section 2.939) contains an XML stream that uses an arbitrary XML schema, as specified in section 2.2.5.2.

### 2.2.3 XML Format

The supported XML format to be read and written as configuration data, as specified in section 2.2.2, is a subset of the W3C recommendation specified in [XMLBase].

Applications MUST NOT depend on support for namespaces. Namespace support is specified in [XMLBase].

Applications MUST NOT output XML with namespaces except to declare the default namespace if specified in this protocol.

Applications MUST remove namespace prefixes from any qualified name in the default namespace.

Applications MUST escape the following special characters within quoted strings:

<table>
<thead>
<tr>
<th>Special character</th>
<th>Escape sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;</td>
<td>&quot;</td>
</tr>
<tr>
<td>&lt;</td>
<td>&lt;</td>
</tr>
<tr>
<td>&gt;</td>
<td>&gt;</td>
</tr>
<tr>
<td>&amp;</td>
<td>&amp;</td>
</tr>
</tbody>
</table>

Applications SHOULD `<1>` escape the following special characters within quoted strings:
2.2.4 Binary Format

Unless otherwise specified, the application serializes multibyte data types into binary streams using the little-endian byte order.

2.2.5 Configuration Data

The client and server SHOULD store configuration data, as specified in section 2.2.2. The format and location of the configuration data, as well as which settings this data can include, are specified in sections 2.2.5.1 through 2.2.5.2.3.

The application stores configuration data in an FAI message. The application stores the FAI message in the special folder that is specified in in the subsections of this section for each type of configuration data.

The message MUST have the PidTagMessageClass property ([MS-OXCMSG] section 2.2.1.3 set. The value of the property MUST use the prefix "IPM.Configuration." followed by a name that uniquely identifies this FAI message in that folder.

The message MUST have the PidTagRoamingDatatypes property set as specified in section 2.2.1.

2.2.5.1 Dictionaries

A message with a dictionary stream MUST have the PidTagRoamingDatatypes property (section 2.2.2.1) set. The value of the property MUST be a bitmask that includes the value 0x00000004.

The message MUST have the PidTagRoamingDictionary property (section 2.2.2.2) set. The value of the property is a binary stream that contains a Unicode XML document using UTF-8 encoding. The XML document MUST conform to the following XML schema definition (XSD) in addition to the limitations specified in section 2.2.3.

```xml
<?xml version="1.0" encoding="utf-8"?>
<xs:schema targetNamespace="dictionary.xsd"
   xmlns="dictionary.xsd"
   xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="UserConfiguration">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="Info">
          <xs:complexType>
            <xs:sequence />
          </xs:complexType>
        </xs:element>
        <xs:element name="Data">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="e" minOccurs="0" maxOccurs="unbounded">
            <xs:complexType>
              <xs:sequence>
                <xs:element name="Data"></xs:element>
              </xs:sequence>
            </xs:complexType>
          </xs:element>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```
UserConfiguration: A top-level element that MUST exist. It contains the Info and Data elements.

Info: An element that MUST exist. It contains information about the application that created the XML document in the version attribute.

version: An attribute on the Info element that specifies the name and version of the application that created the XML document. The type of this attribute MUST be VersionString.

VersionString: A simpleType based on a string. The name and version of the application that created this document is encoded in the version string.<3> The data is not validated; it is provided for future reference. The format of the version string is as follows.

<name>.<major version number>

Data: An element that MUST contain all the dictionary name-value pair entries.

e: An element of type EntryType that contains a name-value pair. There can be an unbounded number of e elements inside the top-level Data element.

EntryType: A complexType that represents a name-value pair. This type contains the following attributes:

- k: An attribute of the EntryType type that contains the name portion of the name-value pair. The type of this attribute is ValueString. The value of this attribute MUST be unique within the dictionary.
[v]: An attribute of the EntryType type that contains the value portion of the name-value pair. The type of this attribute is ValueString.

ValueString: A simpleType that is based on a string. Different value types MUST be encoded in this simpleType as a string. The format of the string MUST be as follows.

<data type> -- <string encoded value>

The data type MUST be an integer type code from the following table.

<table>
<thead>
<tr>
<th>Type</th>
<th>Type code</th>
<th>Encoding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boolean</td>
<td>3</td>
<td>&quot;True&quot; or &quot;False&quot;</td>
</tr>
<tr>
<td>32-bit signed integer</td>
<td>9</td>
<td>Decimal characters, prefixed with an optional &quot;-&quot; to denote a negative number</td>
</tr>
<tr>
<td>String</td>
<td>18</td>
<td>Unicode string</td>
</tr>
</tbody>
</table>

There is one reserved name-value pair that the client SHOULD include in every dictionary XML document. If the dictionary XML document does not include this name-value pair, the client MUST behave as though the default value were set:

- **OLPrefsVersion**
  - **Name**: (string) "OLPrefsVersion"
  - **Value**: (32-bit integer) The client uses this setting to determine whether to prefer the settings in the XML document or its own locally stored settings.
    - "0" or any negative integer: The client MUST prefer its own default or locally stored settings, and it MUST rewrite the XML document with those settings.
    - "1" or any positive integer: The client MUST prefer the settings in the XML document.
    - Default: (32-bit integer) "0"

### 2.2.5.1.1 Calendar Options

If the client or server supports configuration data as specified in section 2.2.2, it stores the settings specified in this section in a calendar options dictionary. The application stores the calendar options dictionary in an FAI message that is contained in the Calendar special folder. The format of the Calendar special folder is specified in [MS-OXOSFLD] section 2.2.8.

This message MUST have the PidTagMessageClass property ([MS-OXCMSG] section 2.2.1.3) set. The value of the property MUST be "IPM.Configuration.Calendar".

The dictionary SHOULD include the following settings.

**Note** Unless otherwise specified, any setting that is not included in the dictionary MUST revert to the default value.

- **piRemindDefault**
  - **Name**: (string) "piRemindDefault"
- Value: (32-bit integer) When creating a new appointment, the client or server SHOULD initialize the reminder time to be the start time of the appointment minus this number of minutes, as specified in [MS-OXORMDR].

- Default: (32-bit integer) "15"

piReminderUpgradeTime
- Name: (string) "piReminderUpgradeTime"
- Value: (32-bit integer) The value of this setting is specified in [MS-OXORMDR] section 2.2.3.1.
- Default: (missing) The default behavior when this setting is missing is specified in [MS-OXORMDR] section 3.1.3.1.

piAutoProcess
- Name: (string) "piAutoProcess"
- Value: (Boolean) The client SHOULD use this setting to control automatic processing of Meeting Request objects and Meeting Response objects, as specified in [MS-OXOCAL].
  - "True": The client SHOULD enable automatic processing.
  - "False": The client SHOULD disable automatic processing.
  - Default: (Boolean) "True"

AutomateProcessing
- Name: (string) "AutomateProcessing"
- Value: (32-bit integer) The server uses this setting to control automatic processing of Meeting Request objects and Meeting Response objects if it implements this feature. If the server does not implement this feature, the server MUST ignore this setting. This setting has three possible values:
  - "0": The server MUST disable automatic processing.
  - "1": The server MUST enable automatic processing, if it implements this feature.
  - "2": The server MUST enable automatic processing, if it implements this feature, treating the Calendar object as a meeting resource rather than an attendee, as specified in [MS-OXOCAL]. The client MUST NOT change the setting when it has this value.
  - Default: (32-bit integer) "1"

piAutoDeleteReceipts
- Name: (string) "piAutoDeleteReceipts"
- Value: (Boolean) The client SHOULD use this setting to control automatic deletion of Meeting Response objects, as specified in [MS-OXOCAL].
  - "True": The client enables automatic deletion.
  - "False": The client disables automatic deletion.
  - Default: (Boolean) "False"
2.2.5.2 XML Streams

The message MUST have the `PidTagRoamingDatatypes` property (section 2.2.1) set. The value of the property MUST be a bitmask that includes 0x00000002.

The message MUST have the `PidTagRoamingXmlStream` property (section 2.2.2.3) set. The value of the property MUST be a `PtypBinary` stream that contains a `Unicode XML` document that is using the UTF8 encoding.

In addition to the `XSDs` that are specified in sections 2.2.5.2.1 through 2.2.5.2.3, the XML document MUST conform to the limitations specified in section 2.2.3.

If the application encounters unknown XML elements while parsing the document, it SHOULD preserve those elements without modification and include them whenever it makes modifications to the parts of the document that it understands.

2.2.5.2.1 Working Hours

If the client or server supports configuration data, as specified in section 2.2.2, it stores the settings that are specified in this section in a working hours stream. The application stores the working hours stream in an `FAI` message contained in the `Calendar special folder`.

The message MUST have the `PidTagMessageClass` property ([MS-OXCMSG] section 2.2.1.3) set. The value of the property MUST be "IPM.Configuration.WorkHours".

The XML document that is stored in the `PidTagRoamingXmlStream` property (section 2.2.2.3) MUST conform to the following `XSD`.

```xml
<?xml version="1.0" encoding="utf-8"?>
<xs:schema targetNamespace="WorkingHours.xsd"
  xmlns="WorkingHours.xsd"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="Root">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="WorkHoursVersion1">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="TimeZone">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="Bias" type="xs:short"/>
                    <xs:element name="Standard" type="DSTTransition"/>
                    <xs:element name="DaylightSavings" type="DSTTransition"/>
                    <xs:element name="Name" minOccurs="0" maxOccurs="1" type="xs:string"/>
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
              <xs:element name="TimeSlot">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="Start" type="xs:time"/>
                    <xs:element name="End" type="xs:time"/>
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="WorkDays"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```
Root: The top-level element in the XML document. This element MUST exist. The application specifies the XML namespace on this element as "WorkingHours.XSD". This element MUST contain the WorkHoursVersion1 element.

WorkHoursVersion1: This element MUST exist and contains the TimeZone, TimeSlot, and WorkDays elements.
**TimeZone**: This element MUST exist and contains a description of the user's current time-zone settings. It contains the **Bias**, **Standard**, **DaylightSavings**, and **Name** elements.

**Bias**: This element MUST exist as a subelement of the **TimeZone** element. It contains the offset in minutes of the user's current time zone from Coordinated Universal Time (UTC).

**Standard**: This element MUST exist and contains the definition of standard time in the user's time zone. The type of this element is **DSTTransition**.

**DaylightSavings**: This element MUST exist and contains the definition of daylight-saving time in the user's time zone. The type of this element is **DSTTransition**.

**Name**: This element SHOULD exist and contains the standard name of the time zone described by the data in the **TimeZone** element. For possible values, see the **KeyName** field of the PidLidAppointmentTimeZoneDefinitionRecur property ([MS-OXOCAL] section 2.2.1.41).

**DSTTransition**: This complexType describes the differences between standard time and daylight-saving time in the user's current time zone. It contains the **Bias** and **ChangeDate** elements. The **Bias** element from the **DSTTransition** type MUST be added to the **Bias** element value contained in the **WorkHoursVersion1** element when this transition takes effect, which MUST be determined by the value of the **ChangeDate** element.

**Bias**: This element MUST exist as a subelement of the **DSTTransition** type. The **Bias** element value specified in the **DSTTransition** type MUST be added to the time zone bias after the transition.

**ChangeDate**: This element MUST exist as a subelement of the **DSTTransition** type. The value of this element determines when the transition takes place. This element contains a **Time** element, a **Date** element, and a **DayOfWeek** element.

**Time**: This element contains the time of day when the transition takes place.

**Date**: This element contains a date formatted as <yyyy/mm/dd>, where yyyy is the 4-digit year, mm is the 2-digit month, and dd is the 2-digit day of the month.

If the year is set to "0000", the application performs the transition every year. If the year is any other value, the application performs the transition only in that year.

The application performs the transition in the month that is specified.

If the year is set to "0000", the interpretation of the day of the month depends on the value of the **DayOfWeek** element, as specified in this section. If the year is any other value, the application performs the transition on the day of the month that is specified.

**DayOfWeek**: If the year portion of the **Date** element is set to "0000", this element MUST contain the day of the week when the transition takes place. The application selects the occurrence of that day of the week using the day of the month portion of the **Date** element. For example, if the **DayOfWeek** element contains the value 0, and the day of the month is 2 in the **Date** element, the application performs the transition on the second Sunday of the month. In this case, the day of the month in the **Date** element MUST be between 1 and 5, inclusive. The possible values for the **DayOfWeek** element are given in the following table.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>The application performs the transition on a Sunday.</td>
</tr>
<tr>
<td>1</td>
<td>The application performs the transition on a Monday.</td>
</tr>
<tr>
<td>2</td>
<td>The application performs the transition on a Tuesday.</td>
</tr>
<tr>
<td>3</td>
<td>The application performs the transition on a Wednesday.</td>
</tr>
</tbody>
</table>
If the year portion of the **Date** element is any other value, the application MUST ignore the **DayOfWeek** element and use the day of the month portion of the **Date** element instead.

**TimeSlot**: This element contains the **Start** and **End** elements.

**Start**: This element contains the start time for the user's work day, relative to the user's current time zone, as specified in the **TimeZone** element.

**End**: This element contains the end time for the user's work day, relative to the user's current time zone, as specified in the **TimeZone** element.

**WorkDays**: This element contains a list of strings that specify which days of the week are work days for this user. The set of strings is defined by the enumeration **restriction** on the **WorkDayType** **simpleType**. The application treats any day that is included in this element as a work day for the user.

**WorkDayType**: A **simpleType** based on a string. The possible values are given in the following table.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon</td>
<td>If this string is included in the <strong>WorkDays</strong> element list, Monday is a work day for this user.</td>
</tr>
<tr>
<td>Tue</td>
<td>If this string is included in the <strong>WorkDays</strong> element list, Tuesday is a work day for this user.</td>
</tr>
<tr>
<td>Wed</td>
<td>If this string is included in the <strong>WorkDays</strong> element list, Wednesday is a work day for this user.</td>
</tr>
<tr>
<td>Thu</td>
<td>If this string is included in the <strong>WorkDays</strong> element list, Thursday is a work day for this user.</td>
</tr>
<tr>
<td>Fri</td>
<td>If this string is included in the <strong>WorkDays</strong> element list, Friday is a work day for this user.</td>
</tr>
<tr>
<td>Sat</td>
<td>If this string is included in the <strong>WorkDays</strong> element list, Saturday is a work day for this user.</td>
</tr>
<tr>
<td>Sun</td>
<td>If this string is included in the <strong>WorkDays</strong> element list, Sunday is a work day for this user.</td>
</tr>
</tbody>
</table>

**2.2.5.2.2 Category List**

A category list is a type of configuration data, as specified in section 2.2.5, that contains a list of textual labels (or **categories**) with associated data, such as color. Other attributes of a category include a shortcut key that can be used to apply a category, a usage counter, the last time the category was applied or used by the user, and a **GUID**.

If the client or server supports configuration data, as specified in section 2.2.2, it MUST store the settings that are specified in this section in a category list **stream**. The application MUST store the category list stream in an **FAI** message that is contained in the **Calendar special folder**.

The message MUST have the **PidTagMessageClass** property ([MS-OXCMSG] section 2.2.1.3) set. The value of the property MUST be "IPM.Configuration.CategoryList".

The **XML** document that is stored in the **PidTagRoamingXmlStream** property (section 2.2.2.3) MUST conform to the following **XSD**.
<?xml version="1.0"?>
<xs:schema targetNamespace="CategoryList.xsd"
 xmlns="CategoryList.xsd"
 xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:simpleType name="colorType">
    <xs:restriction base="xs:int" />
  </xs:simpleType>
  <xs:simpleType name="keyboardShortcutType">
    <xs:restriction base="xs:unsignedInt" />
  </xs:simpleType>
  <xs:simpleType name="dateTimeRestrictedType">
    <xs:restriction base="xs:dateTime" />
  </xs:simpleType>
  <xs:simpleType name="renameOnFirstUseType">
    <xs:restriction base="xs:int">
      <xs:enumeration value="0" />
      <xs:enumeration value="1" />
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="guidType">
    <xs:restriction base="xs:string">
      <xs:pattern value="^[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}\]$" />
    </xs:restriction>
  </xs:simpleType>

  <xs:element name="categories">
    <xs:complexType>
      <xs:sequence>
        <xs:element maxOccurs="unbounded" name="category">
          <xs:complexType>
            <xs:attribute name="name" type="xs:string" use="required" />
            <xs:attribute name="color" type="colorType" use="required" />
            <xs:attribute name="keyboardShortcut" type="keyboardShortcutType" use="required" />
            <xs:attribute name="usageCount" type="xs:unsignedInt" use="optional" />
            <xs:attribute name="lastTimeUsedNotes" type="dateTimeRestrictedType" use="optional" />
            <xs:attribute name="lastTimeUsedJournal" type="dateTimeRestrictedType" use="optional" />
            <xs:attribute name="lastTimeUsedContacts" type="dateTimeRestrictedType" use="optional" />
            <xs:attribute name="lastTimeUsedTasks" type="dateTimeRestrictedType" use="optional" />
            <xs:attribute name="lastTimeUsedCalendar" type="dateTimeRestrictedType" use="optional" />
            <xs:attribute name="lastTimeUsedMail" type="dateTimeRestrictedType" use="optional" />
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
<xsd:attribute name="lastTimeUsed" type="dateTimeRestrictedType" use="required" />
<xsd:attribute name="lastSessionUsed" type="xs:int" use="required" />
<xsd:attribute name="guid" type="guidType" use="required" />
<xsd:attribute name="renameOnFirstUse" type="renameOnFirstUseType" use="optional" />
</xsd:complexType>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="default" type="xs:string" use="required" />
<xsd:attribute name="lastSavedSession" type="xs:int" use="required" />
<xsd:attribute name="lastSavedTime" type="dateTimeRestrictedType" use="required" />
</xsd:complexType>
<xsd:unique name="uniqueName">
  <xsd:selector xpath="category" />
  <xsd:field xpath="@name" />
</xsd:unique>
</xsd:element>
</xsd:schema>

**colorType**: A **simpleType** based on an integer. For possible values, see the description of the **color** attribute later in this section.

**keyboardShortcutType**: A **simpleType** based on an unsigned integer. For possible values, see the description of the **keyboardShortcut** attribute later in this section.

**dateTimeRestrictedType**: A **simpleType** based on a **dateTime** type as specified in [XMLSCHEMA2] section 3.2.7. Elements with this type have the following restrictions:

- The year MUST be between 1601 and 30827.
- The time 24:00:00 is not valid.
- Fractional seconds SHOULD have 3-digit precision (that is, milliseconds). The application can include additional digits. The application SHOULD handle any extra digits if they are included.
- The application MUST specify the time in **UTC**. The application MAY append a Z for the time zone identifier. The application MUST ignore any other time zone identifier and interpret the time using UTC.

**renameOnFirstUseType**: A **simpleType** based on an integer. For possible values, see the description of the **renameOnFirstUse** attribute later in this section.

**guidType**: A **simpleType** based on a string. For possible values, see the description of the **guid** attribute later in this section.

**categories**: The top-level element in the XML document. This element MUST exist. The application specifies the **XML namespace** on this element as "CategoryList.xsd". This element MUST contain the **category** element.
**category**: This element MUST exist and contains the **name**, **color**, **keyboardShortcut**, **usageCount**, **lastTimeUsedNotes**, **lastTimeUsedJournal**, **lastTimeUsedContacts**, **lastTimeUsedTasks**, **lastTimeUsedCalendar**, **lastTimeUsedMail**, **lastTimeUsed**, **lastSessionUsed**, **guid**, and **renameOnFirstUse** attributes.

**name**: An attribute on the **category** element that describes the name of the category. A valid category name:

- MUST be unique in the category list (case insensitive).
- MUST NOT be empty.
- MUST NOT be longer than 255 characters.
- MUST NOT contain the comma character (,).
- SHOULD NOT contain the characters (;) (\061B) (\xFE54) (\xFF1B).

It is also recommend that a category name not be in the form of the string representation of a GUID, as specified in the description of the **guid** attribute in this section.<7>

**color**: An attribute on the **category** element that describes the color of the category. The application SHOULD use a value from -1 to 24. If any other value is used, the application MUST interpret that value as if it were -1 (no color). The RGB values provided here are the basic colors for the category. Applications can choose to display the color category differently.

<table>
<thead>
<tr>
<th>Value</th>
<th>Base R,G,B</th>
<th>Color name</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>255, 255, 255</td>
<td>No color</td>
</tr>
<tr>
<td>0</td>
<td>214, 37, 46</td>
<td>Red</td>
</tr>
<tr>
<td>1</td>
<td>240, 108, 21</td>
<td>Orange</td>
</tr>
<tr>
<td>2</td>
<td>255, 202, 76</td>
<td>Peach</td>
</tr>
<tr>
<td>3</td>
<td>255, 254, 61</td>
<td>Yellow</td>
</tr>
<tr>
<td>4</td>
<td>74, 182, 63</td>
<td>Green</td>
</tr>
<tr>
<td>5</td>
<td>64, 189, 149</td>
<td>Teal</td>
</tr>
<tr>
<td>6</td>
<td>133, 154, 82</td>
<td>Olive</td>
</tr>
<tr>
<td>7</td>
<td>50, 103, 184</td>
<td>Blue</td>
</tr>
<tr>
<td>8</td>
<td>97, 61, 180</td>
<td>Purple</td>
</tr>
<tr>
<td>9</td>
<td>163, 78, 120</td>
<td>Maroon</td>
</tr>
<tr>
<td>10</td>
<td>196, 204, 221</td>
<td>Steel</td>
</tr>
<tr>
<td>11</td>
<td>140, 156, 189</td>
<td>Dark steel</td>
</tr>
<tr>
<td>12</td>
<td>196, 196, 196</td>
<td>Gray</td>
</tr>
<tr>
<td>13</td>
<td>165, 165, 165</td>
<td>Dark gray</td>
</tr>
<tr>
<td>14</td>
<td>28, 28, 28</td>
<td>Black</td>
</tr>
<tr>
<td>15</td>
<td>175, 30, 37</td>
<td>Dark red</td>
</tr>
<tr>
<td>16</td>
<td>177, 79, 13</td>
<td>Dark orange</td>
</tr>
</tbody>
</table>
### Value | Base R,G,B | Color name
--- | --- | ---
17 | 171, 123, 5 | Dark peach
18 | 153, 148, 0 | Dark yellow
19 | 53, 121, 43 | Dark green
20 | 46, 125, 100 | Dark teal
21 | 95, 108, 58 | Dark olive
22 | 42, 81, 145 | Dark blue
23 | 80, 50, 143 | Dark purple
24 | 130, 55, 95 | Dark maroon

**keyboardShortcut**: An attribute on the category element that describes the keyboard shortcut of the category. The application SHOULD use a value from 0 to 11. If any other value is used, the application MUST interpret that value as if it were 0 (no shortcut).

<table>
<thead>
<tr>
<th>Value</th>
<th>Shortcut key</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>CTRL+F2</td>
</tr>
<tr>
<td>2</td>
<td>CTRL+F3</td>
</tr>
<tr>
<td>3</td>
<td>CTRL+F4</td>
</tr>
<tr>
<td>4</td>
<td>CTRL+F5</td>
</tr>
<tr>
<td>5</td>
<td>CTRL+F6</td>
</tr>
<tr>
<td>6</td>
<td>CTRL+F7</td>
</tr>
<tr>
<td>7</td>
<td>CTRL+F8</td>
</tr>
<tr>
<td>8</td>
<td>CTRL+F9</td>
</tr>
<tr>
<td>9</td>
<td>CTRL+F10</td>
</tr>
<tr>
<td>10</td>
<td>CTRL+F11</td>
</tr>
<tr>
<td>11</td>
<td>CTRL+F12</td>
</tr>
</tbody>
</table>

**usageCount**: An attribute on the category element. Reserved. Applications can write 0. Applications MAY write the usage count and periodically apply an algorithm to reduce the usage count to facilitate creating a most frequently used list.

**lastTimeUsedNotes** (optional): An attribute on the category element. This attribute contains the last time the category was applied to a **Note object**.

**lastTimeUsedJournal** (optional): An attribute on the category element. This attribute contains the last time the category was applied to a **Journal object**.

**lastTimeUsedContacts** (optional): An attribute on the category element. This attribute contains the last time the category was applied to a **Contact object**.
lastTimeUsedTasks (optional): An attribute on the category element. This attribute contains the last time the category was applied to a Task object.

lastTimeUsedCalendar (optional): An attribute on the category element. This attribute contains the last time the category was applied to a Calendar object.

lastTimeUsedMail (optional): An attribute on the category element. This attribute contains the last time the category was applied to an E-mail object.

lastTimeUsed: An attribute on the category element. This attribute contains the last time the category was used. See section 3.1.4.2.3 for more details.

lastSessionUsed: An attribute on the category. Reserved. Applications SHOULD write 0, but can write the last session that this category was applied or changed by the user.

guid: An attribute on the category element that describes a GUID that identifies the category and does not change if the user renames the category. The GUID MUST be stored in a string in the form of "{XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX}", where X is any hexadecimal digit.

renameOnFirstUse: An attribute on the category element. If set to "1", an application SHOULD prompt the user to rename the category when it is first applied to a message, as specified in section 3.1.4.7. If the user renames the category before applying it to a message, this attribute can be set to 0. If this attribute is missing, the application MUST use a default value of 0.

default: An attribute on the categories element that specifies the name of a category in the category list that is to be applied, as specified in section 3.1.4.7, if the application provides a one-click method to apply a category.

lastSavedSession: An attribute on the categories element. Reserved. Applications SHOULD write 0 but can choose to increment this number at every new session.

lastSavedTime: An attribute on the categories element. The value MUST be set to the time in UTC when the category list was saved.

2.2.5.2.3 Retention and Archive Settings

If the client or server supports configuration data, as specified in section 2.2.2, and the retention policy or archive policy features are enabled, then it SHOULD store the settings that are specified in this section in a tags list stream. A tags list is a type of configuration data, as specified in section 2.2.5, that contains a list of settings for a retention policy or an archive policy. The application SHOULD store the tags list stream in an FAI message that is contained in the Inbox folder. The message MUST have the PidTagMessageClass property ([MS-OXCMSG] section 2.2.1.3) set. The value of the property MUST be "IPM.Configuration.MRM". The XML document that is stored in the PidTagRoamingXmlStream property (section 2.2.3) MUST conform to the following XSD.

```xml
<?xml version="1.0"?>
<xs:schema attributeFormDefault="unqualified" elementFormDefault="qualified"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="UserConfiguration">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="Info">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="Data">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="RetentionHold">
                      <xs:complexType>
                        <xs:attribute name="Enabled" type="xs:string" use="required"/>
                        <xs:attribute name="RetentionComment" type="xs:string"/>
                      </xs:complexType>
                    </xs:element>
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```
Info: The parent element of the Data element. The Info element has the following attribute.
# Attribute name | Description
---|---
version | A string that specifies the version of the policy.

**Data**: A child of the **Info** element. A container element for the other retention policy settings.

**RetentionHold**: A child of the **Data** element. Includes a series of sub-elements that describe the retention policy in effect for this user. Has the following attributes:

<table>
<thead>
<tr>
<th>Attribute name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enabled</td>
<td>Indicates whether retention is enabled for a user. If it is enabled, then the client can display specific information to indicate that messages will not expire. This value is configured by a server administrator. The value MUST be &quot;True&quot; or &quot;False&quot;.</td>
</tr>
<tr>
<td>RetentionComment</td>
<td>Contains a string used to communicate information regarding the retention policy feature to the user. This value is configured by a server administrator. The client application SHOULD display this to the user. The string length MUST be between 0 and 1,024 characters.</td>
</tr>
<tr>
<td>RetentionUrl</td>
<td>Contains a link to a Web page that contains more information about the retention policy. This value is configured by a server administrator. The client application SHOULD display this to the user. The string length MUST be between 0 and 2,048 characters.</td>
</tr>
</tbody>
</table>

**PolicyTag**: A child of the **Data** element. Stores information about the retention policy. The information is stored in the attributes defined in the following table.

<table>
<thead>
<tr>
<th>Attribute name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guid</td>
<td>A GUID value that provides a unique identity for the policy.</td>
</tr>
<tr>
<td>Name</td>
<td>The name of the policy tag. This value is configured by a server administrator. The value MUST be unique; no two policy tags or archive tags can have the same name. The string length MUST be between 1 and 264 characters.</td>
</tr>
<tr>
<td>Comment</td>
<td>A brief description of the policy tag. This value is configured by a server administrator. The string length MUST be between 1 and 264 characters.</td>
</tr>
</tbody>
</table>
| Type | The type of policy tag. This value is configured by a server administrator. The possible values are as follows:  
  - All  
  - Calendar  
  - Contacts  
  - ConversationHistory  
  - DeletedItems  
  - Drafts  
  - Inbox  
  - JunkEmail  
  - Journal |
<table>
<thead>
<tr>
<th>Attribute name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>• Notes</td>
</tr>
<tr>
<td>Outbox</td>
<td>• Outbox</td>
</tr>
<tr>
<td>Personal</td>
<td>• Personal</td>
</tr>
<tr>
<td>RssSubscriptions</td>
<td>• RssSubscriptions</td>
</tr>
<tr>
<td>SentItems</td>
<td>• SentItems</td>
</tr>
<tr>
<td>SyncIssues</td>
<td>• SyncIssues</td>
</tr>
<tr>
<td>Tasks</td>
<td>• Tasks</td>
</tr>
</tbody>
</table>

Policy tags with a type of "All" apply to all items that do not have an applicable policy tag. Policy tags of type "Personal" are applied explicitly by the user. All other tags are applied to the corresponding special folder.

**MustDisplayComment**
The client application MAY use this setting to determine whether the user can hide the retention comment. The value SHOULD be "True" or "False". If the value is "True", the client MAY NOT allow the user to hide the retention comment.

**IsVisible**
The client application MUST use this setting to determine whether the policy tag is displayed in the list of tags available to the user. The value SHOULD be "True" or "False". If the value is "True", the client MUST display the policy tag in the list of tags available to the user.

**OptedInto**
Indicates whether the user voluntarily chose this tag for the mailbox or whether it was applied to the mailbox by the server administrator. The value SHOULD be "True" or "False". A value of "True" SHOULD indicate that the user voluntarily chose this tag.

**LocalizedName**: A child of the PolicyTag element. It is also a child of the ArchiveTag and DefaultArchiveTag elements. Can contain multiple Name elements as children. Each contains the ISO language code followed by a colon (":") and the localized name of the tag. The string length MUST be between 0 and 264 characters.

**LocalizedComment**: A child of the PolicyTag element. It is also a child of the ArchiveTag and DefaultArchiveTag elements. Can contain multiple Comment elements as children. Each contains the ISO language code followed by a colon (":") and the localized comment. The string length MUST be between 0 and 264 characters.

**ContentSettings**: A child of the PolicyTag element. It is also a child of the ArchiveTag and DefaultArchiveTag elements. Stores the settings that control when items expire and the types of items that expire. The settings are stored in the following attributes.

<table>
<thead>
<tr>
<th>Attribute name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guid</td>
<td>A GUID value that provides a unique identity for the content setting.</td>
</tr>
<tr>
<td>ExpiryAgeLimit</td>
<td>The number of days after which an item SHOULD expire under this policy. This value is configured by a server administrator. The value MUST be between 0 and 24,855.</td>
</tr>
<tr>
<td>MessageClass</td>
<td>The message classes that this content setting applies to. This value is configured by a server administrator. This value can be any string that represents a message class. The value &quot;*&quot; represents any message class. The string length MUST be between 1 and 1,023 characters.</td>
</tr>
</tbody>
</table>

**ArchiveTag**: A child of the Data element. Stores information about an archive policy. The information is stored in attributes and child elements identical to those on the PolicyTag element. The value of the ArchiveTag element SHOULD NOT be displayed by the client application in the archive mailbox. It SHOULD be displayed only in the primary mailbox.
DefaultArchiveTag: A child of the Data element. Stores information about the default archive policy. The information is stored in attributes and child elements identical to those on the PolicyTag element. The value of the DefaultArchiveTag element SHOULD NOT be displayed by the client application in the archive mailbox. It SHOULD be displayed only in the primary mailbox.

2.2.6 View Definitions

The client and server MAY <15> store view settings as view definitions. The format of the view definitions, as well as which settings are included, is specified in sections 2.2.6.1 through 2.2.6.4.

View definitions can be created by the client to make view settings available to the server. These settings consist of column descriptions, including column header names and sizes, groupings, sort orders, and an optional restriction. The data is stored in several stream properties in an FAI message.

A message that contains view definitions MUST be an FAI message in the folder where the view is used. The message MUST have the following properties set on it, and the value of each property MUST meet the following criteria:

The message has the PidTagMessageClass property ([MS-OXCMSG] section 2.2.1.3) set and the value of the property is "IPM.Microsoft.FolderDesign.NamedView".

The message has the PidTagViewDescriptorVersion property (section 2.2.6.4) set and the value of the property is 0x00000008.

The message has the PidTagViewDescriptorName property (section 2.2.6.2) set and the value of the property is a non-empty string.

The view definitions MUST be stored as a binary stream in the PidTagViewDescriptorBinary property (section 2.2.6.1) of the message. The column headers are stored in the PidTagViewDescriptorStrings property (section 2.2.6.3) on the message as strings using the current code page of the client. Section 2.2.6.1 and section 2.2.6.3 specify the packet format of these two properties respectively.

2.2.6.1 PidTagViewDescriptorBinary Property

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

View definitions, as specified in section 2.2.6, MUST be stored in the PidTagViewDescriptorBinary property ([MS-OXPROPS] section 2.1056) of the message. The property is in binary format, and the packet structure is specified as follows.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserved1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>...</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Version</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ulFlags</td>
<td></td>
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</tr>
<tr>
<td>Pres</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Reserved1 (8 bytes): This field MUST exist. The application can fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

Version (4 bytes): This field MUST exist. This is a fixed value of 0x00000008.

ulFlags (4 bytes): This field MUST exist. This specifies the sort order of the sorted column. The value of this field MUST be one of the following:

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x00000000</td>
<td>Ascending sort order</td>
</tr>
<tr>
<td>0x00000002</td>
<td>Descending sort order</td>
</tr>
</tbody>
</table>

The index of the sorted column is indicated in the ivcdSort field in the packet.

Pres (4 bytes): This field MUST exist. This field is filled with arbitrary value by the client and SHOULD NOT be used by the server.

Cvcd (4 bytes): This field MUST exist. This field specifies the number of ColumnPacket structures that are contained in the ColumnInfo field.

ivcdSort (4 bytes): This field MUST exist. The value of this field MUST be one of the following:
0 through (Cvcd-1): This value is an index into the ColumnInfo fields. The table MUST be sorted by that column. The sort order, ascending or descending, MUST be specified in the ulFlags field.

0xFFFFFFFF: The table MUST be arranged by conversation.

cCat (4 bytes): This field MUST exist. This field specifies the number of "group by" columns that are stored in ColumnInfo fields. The minimum value for this field is 0. The maximum value is either 4 or the value of the Cvcd field, whichever is least.

ulCatSort (4 bytes): This field MUST exist. This field uses bit flags to specify the ascending or descending order of the "group by" columns. The flags are specified as follows. In each case, if the flag is not set, the "group by" column is in descending order.

<table>
<thead>
<tr>
<th>Flag</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x00000001</td>
<td>If this flag is set, the first &quot;group by&quot; column is in ascending order.</td>
</tr>
<tr>
<td>0x00000002</td>
<td>If this flag is set, the second &quot;group by&quot; column is in ascending order.</td>
</tr>
<tr>
<td>0x00000004</td>
<td>If this flag is set, the third &quot;group by&quot; column is in ascending order.</td>
</tr>
<tr>
<td>0x00000008</td>
<td>If this flag is set, the fourth &quot;group by&quot; column is in ascending order.</td>
</tr>
</tbody>
</table>

Reserved2 (24 bytes): This field MUST exist. The application can fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

ColumnInfo (variable): Data type: array of ColumnPacket structures, as specified in section 2.2.6.1.1. The number of ColumnPacket structures contained in this field is indicated by the Cvcd field. This field MUST exist. This is where all the column information is stored, including "blank" column, "group by" columns, "visible" columns, and "order by" column.

The columns are stored in the following sequence in the packet:

The "blank" column: This is a single column that MUST have the following settings.

<table>
<thead>
<tr>
<th>Field name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PropertyType</td>
<td>0x0001</td>
</tr>
<tr>
<td>PropertyID</td>
<td>0x0004</td>
</tr>
<tr>
<td>Cx</td>
<td>0x00000007</td>
</tr>
<tr>
<td>Flags</td>
<td>0x00000028 (VCDF_BITMAP</td>
</tr>
<tr>
<td>Kind</td>
<td>0x00000000</td>
</tr>
<tr>
<td>ID</td>
<td>0x00000004</td>
</tr>
</tbody>
</table>

The "group by" columns: The number of the "group by" columns MUST be stored in cCat field in the packet. Each bit in the ulCatSort field MUST specify whether the corresponding "group by" column is in ascending or descending order.

The "visible" columns: All columns that MUST be visible to users excluding the "group by" columns.

The "order by" column: If the sorted column is not a "group by" or "visible" column, it MUST be stored here.

RestrictionInfo (variable): Data type: RestrictionPacket structure, as specified in section 2.2.6.1.2. This field is where the restriction of the table view MUST be stored.
### 2.2.6.1.1 ColumnPacket Structure

The **ColumnPacket** structure MUST contain the information of a single column, including the property ID, **property type**, and display attributes. The **ColumnPacket** structure contains the following fields.

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 3 | 0 | 1 |
| PropertyType | PropertyID |
| Cx |
| Reserved1 |
| Flags |
| Reserved2 |
| ... |
| ... |
| Kind |
| ID |
| Guid |
| ... |
| ... |
| ... |
| BufferLength |
| Buffer (variable) |
| ... |

**PropertyType (2 bytes):** This field MUST exist. This field specifies the type of the property, as specified in section [2.2.6.1.3](#).

**PropertyID (2 bytes):** This field MUST exist. This field has the same value as the **ID** field. If the value of the **ID** field does not fit into a **WORD** ([MS-DTYP]), the value MUST be truncated and the two least significant bytes MUST be stored in this field.

**Cx (4 bytes):** This field MUST exist. This field specifies the column width in pixels.

**Reserved1 (4 bytes):** This field MUST exist. The application can fill this field with any value when writing the **stream**. The application MUST ignore the value of this field when reading the stream.
Flags (4 bytes): This field MUST exist. This field contains column descriptor flags. The bit setting and its meaning are listed in the following table.

<table>
<thead>
<tr>
<th>Flag name</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCDF_RIGHT_JUSTIFY</td>
<td>0x00000001</td>
<td>Column is right justified. This flag is mutually exclusive with the VCDF_CENTER_JUSTIFY flag.</td>
</tr>
<tr>
<td>VCDF_CENTER_JUSTIFY</td>
<td>0x00000002</td>
<td>Column is center justified. This flag is mutually exclusive with the VCDF_RIGHT_JUSTIFY flag.</td>
</tr>
<tr>
<td>VCDF_BITMAP</td>
<td>0x00000008</td>
<td>Column header is in bitmap format.</td>
</tr>
<tr>
<td>VCDF_NOT_SORTABLE</td>
<td>0x00000020</td>
<td>Column is not sortable. This flag is mutually exclusive with the VCDF_SORTDESCENDING flag and the VCDF_SORTDLG flag.</td>
</tr>
<tr>
<td>VCDF_SORTDESCENDING</td>
<td>0x00000040</td>
<td>Column is sorted in descending order. This flag is mutually exclusive with the VCDF_NOT_SORTABLE flag.</td>
</tr>
<tr>
<td>VCDF_MOVEABLE</td>
<td>0x00000100</td>
<td>Clients and servers MUST ignore this setting.</td>
</tr>
<tr>
<td>VCDF_COLUMNSDLG</td>
<td>0x00000200</td>
<td>Clients and servers MUST ignore this setting.</td>
</tr>
<tr>
<td>VCDF_SORTDLG</td>
<td>0x00000400</td>
<td>Column MUST be able to be sorted. This flag is mutually exclusive with the VCDF_NOT_SORTABLE flag.</td>
</tr>
<tr>
<td>VCDF_GROUPDLG</td>
<td>0x00000800</td>
<td>Column MUST be able to be grouped.</td>
</tr>
<tr>
<td>VCDF_NAMEDPROP</td>
<td>0x00001000</td>
<td>The optional Guid field MUST be included in the packet. If Kind is KindString, then the BufferLength and Buffer fields MUST also be included in the packet.</td>
</tr>
<tr>
<td>VCDF_RCOLUMNSDLG</td>
<td>0x00002000</td>
<td>Clients and servers MUST ignore this setting.</td>
</tr>
<tr>
<td>VCDF_MULTIVALUED</td>
<td>0x00004000</td>
<td>Specifies whether the column PropertyType field MUST include the VCDF_MULTIVALUED flag ([MS-OXCDATA] section 2.11.1.3).</td>
</tr>
</tbody>
</table>

Reserved2 (12 bytes): This field MUST exist. The application can fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

Kind (4 bytes): This field MUST exist. The field contains one of the following values.

<table>
<thead>
<tr>
<th>Value name</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>KindID</td>
<td>0x00000000</td>
<td>The property uses an integer identifier.</td>
</tr>
<tr>
<td>KindString</td>
<td>0x00000001</td>
<td>The property uses a string identifier.</td>
</tr>
</tbody>
</table>

ID (4 bytes): This field MUST exist. If the VCDF_NAMEDPROP flag is not set in the Flags field, this field contains the property ID of the column. If the VCDF_NAMEDPROP flag is set in the Flags field, and the value of the Kind field is "KindID", this field contains the integer ID that MUST be used with the RopGetPropertyIdsFromNames remote operation (ROP) ([MS-OXCROPS] section 2.2.8.1) to translate the named property into a property ID. If the VCDF_NAMEDPROP flag is set and the value of Kind is "KindString", the application can fill this field with any value when writing the stream and MUST ignore the value of this field when reading the stream.

Guid (16 bytes): If the VCDF_NAMEDPROP flag is set in the Flags field, this field contains the GUID that MUST be used with the RopGetPropertyIdsFromNames ROP to translate the named property into a property ID. If the VCDF_NAMEDPROP flag is not set, the application MUST omit this field.
BufferLength (4 bytes): If the VCDF_NAMEDPROP flag is set in the Flags field and the value of the Kind field is "KindString", this field contains the length of the Buffer field in bytes, including the Unicode terminating null character (0x0000). Otherwise, the application MUST omit this field.

Buffer (variable): If the VCDF_NAMEDPROP flag is set in the Flags field and the value of the Kind field is "KindString", this field contains the Unicode string that MUST be used with the RopGetPropertyIdsFromNames ROP to translate the named property into a proper ty ID. Otherwise, the application MUST omit this field. This field includes a Unicode terminating null character (0x0000).

2.2.6.1.2 RestrictionPacket Structure

The RestrictionPacket structure contains the restrictions that are used to evaluate the contents table of the folder. Only those rows that evaluate to a value of TRUE MUST be displayed.

The RestrictionPacket structure is recursively built up by the restriction structures that are specified in section 2.2.6.1.2.1 through section 2.2.6.1.2.11. To determine the size of the RestrictionPacket structure, the application parses each restriction structure recursively if necessary. The restrictions are stored in a special format, which is different from the format specified for restrictions in [MS-OXCDATA] section 2.12.

The RestrictionPacket structure starts with a single restriction structure. The type of the restriction determines whether other restrictions will follow each restriction, as specified in the following description.

<table>
<thead>
<tr>
<th>0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9</th>
<th>2 0 1 2 3 4 5 6 7 8 9 3 0 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>RestrictionBlocks (variable)</td>
<td>...</td>
</tr>
</tbody>
</table>

RestrictionBlocks (variable): This field contains one or more of the restriction structures that are specified in section 2.2.6.1.2.1 through section 2.2.6.1.2.11. From the restriction type, specified in the RestrictionType field of each restriction structure, the application can determine whether the restriction structure contains subrestrictions, which are stored sequentially in the RestrictionPacket structure. The server parses each restriction structure recursively, if necessary, to complete reading one sequence of restriction structures.

The following table specifies the values for the RestrictionType field and the associated restriction.

<table>
<thead>
<tr>
<th>Value of RestrictionType field</th>
<th>Numeric value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>RES_AND</td>
<td>0x00000000</td>
<td>Indicates a LogicalAndRestriction structure (section 2.2.6.1.2.1). This structure has subrestrictions that follow it.</td>
</tr>
<tr>
<td>RES_OR</td>
<td>0x00000001</td>
<td>Indicates a LogicalOrRestriction structure (section 2.2.6.1.2.2). This structure has subrestrictions that follow it.</td>
</tr>
<tr>
<td>RES_NOT</td>
<td>0x00000002</td>
<td>Indicates a LogicalNotRestriction structure (section 2.2.6.1.2.3). This structure has a single subrestriction that follows it.</td>
</tr>
<tr>
<td>RES_CONTENT</td>
<td>0x00000003</td>
<td>Indicates a ContentRestriction structure (section 2.2.6.1.2.4).</td>
</tr>
<tr>
<td>RES_PROPERTY</td>
<td>0x00000004</td>
<td>Indicates a PropertyRestriction structure (section 2.2.6.1.2.5).</td>
</tr>
</tbody>
</table>
### Value of RestrictionType field

<table>
<thead>
<tr>
<th>RestrictionType</th>
<th>Numeric value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESCOMPAREPROPS</td>
<td>0x00000005</td>
<td>Indicates a <strong>ComparePropsRestriction</strong> structure (section 2.2.6.1.2.6).</td>
</tr>
<tr>
<td>RES_BITMASK</td>
<td>0x00000006</td>
<td>Indicates a <strong>BitmaskRestriction</strong> structure (section 2.2.6.1.2.7).</td>
</tr>
<tr>
<td>RES_SIZE</td>
<td>0x00000007</td>
<td>Indicates a <strong>SizeRestriction</strong> structure (section 2.2.6.1.2.8).</td>
</tr>
<tr>
<td>RES_EXIST</td>
<td>0x00000008</td>
<td>Indicates a <strong>ExistRestriction</strong> structure (section 2.2.6.1.2.9).</td>
</tr>
<tr>
<td>RES_SUBRESTRICTION</td>
<td>0x00000009</td>
<td>Indicates a <strong>SubObjectRestriction</strong> structure (section 2.2.6.1.2.10).</td>
</tr>
<tr>
<td>RES_COMMENT</td>
<td>0x0000000A</td>
<td>Indicates a <strong>CommentRestriction</strong> structure (section 2.2.6.1.2.11).</td>
</tr>
</tbody>
</table>

### LogicalAndRestriction Structure

The **LogicalAndRestriction** structure is used to join a group of two or more subrestrictions by using a logical **AND** operation. The result of the **AND** operation is **TRUE** if all of the subrestrictions evaluate to **TRUE**. The result is **FALSE** if any subrestriction evaluates to **FALSE**.

The **LogicalAndRestriction** structure has the following format.

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| RestrictionType         |
| cRes                    |
| Reserved                |
| ...                     |
| SubCondition (variable) |
| ...                     |

**RestrictionType (4 bytes):** This field specifies the type of restriction and MUST be set to **RES_AND** (0x00000000) for the **LogicalAndRestriction** structure.

**cRes (4 bytes):** Specifies the number of subrestrictions contained in the **SubCondition** field.

**Reserved (8 bytes):** The application can fill this field with any value when writing the **stream**. The application MUST ignore the value of this field when reading the stream.

**SubCondition (variable):** This field contains the subrestrictions that make up the **LogicalAndRestriction** structure. Each subrestriction MUST be one of the structures that is specified in section 2.2.6.1.2.1 through section 2.2.6.1.2.11.
2.2.6.1.2.2 LogicalOrRestriction Structure

The LogicalOrRestriction structure is used to join a group of two or more subrestrictions by using a logical OR operation. The result of the OR operation is TRUE if any of the subrestrictions evaluates to TRUE. The result is FALSE if all subrestrictions evaluate to FALSE.

The LogicalOrRestriction structure has the following format.

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 2 0 1 2 3 4 5 6 7 8 9 3 0 1
```

- **RestrictionType (4 bytes)**: This field specifies the type of restriction and MUST be set to `RES_OR` (0x00000001) for the LogicalOrRestriction structure.

- **cRes (4 bytes)**: This field specifies the number of subrestrictions contained in the SubCondition field.

- **Reserved (8 bytes)**: The application can fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

- **SubCondition (variable)**: This field contains the subrestrictions that make up the LogicalOrRestriction structure. Each subrestriction MUST be one of the structures that is specified in section 2.2.6.1.2.1 through section 2.2.6.1.2.11.

2.2.6.1.2.3 LogicalNotRestriction Structure

The LogicalNotRestriction structure is used to apply a logical NOT operation to one subrestriction. The result is TRUE if the child condition evaluates to FALSE and FALSE otherwise.

The LogicalNotRestriction structure has the following format.

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 2 0 1 2 3 4 5 6 7 8 9 3 0 1
```

- **RestrictionType**: This field specifies the type of restriction and MUST be set to `RES_NOT` (0x00000002) for the LogicalNotRestriction structure.

- **Reserved**: The application can fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

- **SubCondition (variable)**: This field contains the subrestriction that make up the LogicalNotRestriction structure. Each subrestriction MUST be one of the structures that is specified in section 2.2.6.1.2.1 through section 2.2.6.1.2.11.
SubCondition (variable)

... 

**RestrictionType (4 bytes):** This field specifies the type of restriction and MUST be set to **RES_NOT** (0x00000002) for the **LogicalNotRestriction** structure.

**Reserved (12 bytes):** The application can fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

**SubCondition (Variable):** This field contains a single subrestriction that makes up this structure. The subrestriction MUST be one of the structures that is specified in section **2.2.6.1.2.1** through section **2.2.6.1.2.11**.

### 2.2.6.1.2.4 ContentRestriction Structure

The **ContentRestriction** structure is used to search for properties with values that match the value of a specified property.

The **ContentRestriction** structure has the following format.

```
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---------------|
| RestrictionType          |
| ulFuzzyLevel            |
| PropertyType            | PropertyID         |
| Reserved                |
| PropValueNum            |
| PropValue (variable)    |
```

**RestrictionType (4 bytes):** This field specifies the type of restriction and MUST be set to **RES_CONTENT** (0x00000003) for the **ContentRestriction** structure.

**ulFuzzyLevel (4 bytes):** This field specifies flags that control the behavior of the string comparisons that are used to evaluate the **restriction**. The lower 16 bits of the fuzzy level are mutually exclusive. All possible values for this field are listed in the following table.

<table>
<thead>
<tr>
<th>Flag name</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL_FULLSTRING</td>
<td>0x00000000</td>
<td>To match, the search string MUST be the same as the value of the property.</td>
</tr>
<tr>
<td>FL_SUBSTRING</td>
<td>0x00000001</td>
<td>To match, the search string MUST be contained anywhere within the property.</td>
</tr>
<tr>
<td>FL_PREFIX</td>
<td>0x00000002</td>
<td>To match, the search string MUST appear at the beginning of the property. The two strings MUST be compared only up to the length of the search.</td>
</tr>
</tbody>
</table>
The upper 16 bits of the fuzzy level can be set to the following values and can be combined using the logical OR operation.

<table>
<thead>
<tr>
<th>Flag name</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL_IGNORECASE</td>
<td>0x00010000</td>
<td>The comparison MUST be made without considering the case.</td>
</tr>
<tr>
<td>FL_IGNORENONSPACE</td>
<td>0x00020000</td>
<td>The comparison MUST ignore Unicode-defined nonspacing characters.</td>
</tr>
<tr>
<td>FL_LOOSE</td>
<td>0x00040000</td>
<td>The comparison can result in a match whenever possible, ignoring case and nonspacing characters. The interpretation of this flag is left at the discretion of the algorithm that implements the restriction.</td>
</tr>
</tbody>
</table>

**PropertyType (2 bytes):** This field specifies the type of the property. Valid types are specified in section 2.2.6.1.3.

**PropertyID (2 bytes):** This field specifies the property ID of the property.

**Reserved (4 bytes):** The application can fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

**PropValueNum (4 bytes):** This field MUST be set to 0x00000001.

**PropValue (variable):** A PropertyValue structure, as specified in section 2.2.6.1.4, that specifies the value to be matched.

### 2.2.6.1.2.5 PropertyRestriction Structure

The PropertyRestriction structure is used to compare the value of a property with a constant.

The PropertyRestriction structure has the following format.

```
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10| 11| 12| 13| 14| 15| 16| 17| 18| 19| 20| 21| 22| 23| 24| 25| 26| 27| 28| 29| 30| 31 |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10| 11| 12| 13| 14| 15| 16| 17| 18| 19| 20| 21| 22| 23| 24| 25| 26| 27| 28| 29| 30| 31 | 32 |
| 3 | 2 | 1 | 0 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10| 11| 12| 13| 14| 15| 16| 17| 18| 19| 20| 21| 22| 23| 24| 25| 26| 27| 28| 29| 30| 31 | 32 |
| **RestrictionType**    |             |                                                                          |
| RelOp                  |             |                                                                          |
| PropertyType           |             | PropertyID                                                              |
| Reserved               |             |                                                                          |
| PropValueNum           |             |                                                                          |
| PropValue (variable)   |             |                                                                          |
```

**RestrictionType (4 bytes):** This field specifies the type of restriction and MUST be set to RES_PROPERTY (0x00000004) for the PropertyRestriction structure.

**RelOp (4 bytes):** This field specifies the relational operator to be used in the comparison. The value MUST be one of the following.
<table>
<thead>
<tr>
<th>Relational operator name</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELOP_LT</td>
<td>0x00000000</td>
<td>The condition evaluates to TRUE if the value of the property is less than the constant value.</td>
</tr>
<tr>
<td>RELOP_LE</td>
<td>0x00000001</td>
<td>The condition evaluates to TRUE if the value of the property is less than or equal to the constant value.</td>
</tr>
<tr>
<td>RELOP_GT</td>
<td>0x00000002</td>
<td>The condition evaluates to TRUE if the value of the property is greater than the constant value.</td>
</tr>
<tr>
<td>RELOP_GE</td>
<td>0x00000003</td>
<td>The condition evaluates to TRUE if the value of the property is greater than or equal to the constant value.</td>
</tr>
<tr>
<td>RELOP_EQ</td>
<td>0x00000004</td>
<td>The condition evaluates to TRUE if the value of the property is equal to the constant value.</td>
</tr>
<tr>
<td>RELOP_NE</td>
<td>0x00000005</td>
<td>The condition evaluates to TRUE if the value of the property is not equal to the constant value.</td>
</tr>
</tbody>
</table>

**PropertyType (2 bytes):** This field specifies the type of the property. Valid types are specified in section 2.2.6.1.3.

**PropertyID (2 bytes):** This field specifies the property ID of the property.

**Reserved (4 bytes):** The application can fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

**PropValueNum (4 bytes):** This field MUST be set to 0x00000001.

**PropValue (variable):** A PropertyValue structure, as specified in section 2.2.6.1.4, that specifies the value to be compared.

### 2.2.6.1.2.6 ComparePropsRestriction Structure

The ComparePropsRestriction structure is used to compare the values of two properties by using a relational operator.

The ComparePropsRestriction structure has the following format.

```
0 1 2 3 4 5 6 7 8 9 1 0 1 2 3 4 5 6 7 8 9 2 0 1 2 3 4 5 6 7 8 9 3 0 1
```

<table>
<thead>
<tr>
<th>RestrictionType</th>
<th>RelOp</th>
<th>PropertyTypeID1</th>
<th>PropertyTypeID2</th>
</tr>
</thead>
<tbody>
<tr>
<td>PropertyTypeID1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PropertyTypeID2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**RestrictionType (4 bytes):** This field specifies the type of restriction and MUST be set to RES_COMPAREPROPS (0x00000005) for the ComparePropsRestriction structure.

**RelOp (4 bytes):** This field specifies the relational operator that is to be used in the comparison. Valid values for this field are the same as those specified for the RelOp field of the PropertyRestriction structure in section 2.2.6.1.2.5.
PropertyType1 (2 bytes): This field specifies the type of the first property. Valid types are specified in section 2.2.6.1.3.

PropertyID1 (2 bytes): This field specifies the property ID of the first property.

PropertyType2 (2 bytes): This field specifies the type of the second property. The type of the second property MUST match the type of the first property.

PropertyID2 (2 bytes): This field specifies the property ID of the second property.

2.2.6.1.2.7 BitmaskRestriction Structure

The BitmaskRestriction structure is used to perform a bitwise AND operation on the value of the property.

The BitmaskRestriction structure has the following format.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RestrictionType</td>
<td>RelOp</td>
<td>PropertyType</td>
<td>PropertyID</td>
<td>Mask</td>
<td></td>
</tr>
</tbody>
</table>

RestrictionType (4 bytes): This field specifies the type of restriction and MUST be set to RES_BITMASK (0x00000006) for the BitmaskRestriction structure.

RelOp (4 bytes): This field specifies the relational operator that is to be used in the search. The value MUST be one of the following.

<table>
<thead>
<tr>
<th>Relational operator name</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMR_EQZ</td>
<td>0x00000000</td>
<td>Perform a bitwise AND operation between the value of the Mask field and the value of the property identified by the PropertyID and PropertyType fields. The comparison returns TRUE if the result of the operation is zero.</td>
</tr>
<tr>
<td>BMR_NEZ</td>
<td>0x00000001</td>
<td>Perform a bitwise AND operation between the value of the Mask field and the value of the property identified by the PropertyID and PropertyType fields. The comparison returns TRUE if the result of the operation is not zero.</td>
</tr>
</tbody>
</table>

PropertyType (2 bytes): This field specifies the type of the property. Valid types are specified in section 2.2.6.1.3.

PropertyID (2 bytes): This field specifies the property ID of the property.

Mask (4 bytes): This field specifies the bitmask that the application MUST use in a bitwise AND operation with the value of the property when performing the search.

2.2.6.1.2.8 SizeRestriction Structure

The SizeRestriction structure is used to test the size of a property value.
The **SizeRestriction** structure has the following format.

```
<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

RestrictionType

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

RelOp

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

PropertyType

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

PropertyID

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

Size

**RestrictionType (4 bytes):** This field specifies the type of restriction and MUST be set to **RES_SIZE** (0x00000007) for the **SizeRestriction** structure.

**RelOp (4 bytes):** This field specifies the relational operator that is to be used in the search. Valid values for this field are the same as those specified for the **RelOp** field of the **PropertyRestriction** structure in section 2.2.6.1.2.5.

**PropertyType (2 bytes):** This field specifies the type of the property. Valid types are specified in section 2.2.6.1.3.

**PropertyID (2 bytes):** This field specifies the property ID of the property.

**Size (4 bytes):** This field specifies the size, in bytes, that MUST be compared with the size of the value of this property when performing the search.

### 2.2.6.1.2.9 ExistRestriction Structure

The **ExistRestriction** structure is used to test whether a particular property exists on a message.

The **ExistRestriction** structure has the following format.

```
<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

RestrictionType

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

Reserved1

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

PropertyType

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

PropertyID

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

Reserved2

**RestrictionType (4 bytes):** This field specifies the type of restriction and MUST be set to **RES_EXIST** (0x00000008) for the **ExistRestriction** structure.

**Reserved1 (4 bytes):** The application can fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

**PropertyType (2 bytes):** This field specifies the type of the property. Valid types are specified in section 2.2.6.1.3.

**PropertyID (2 bytes):** This field specifies the property ID of the property.
Reserved2 (4 bytes): The application can fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

2.2.6.1.2.10 SubObjectRestriction Structure

The SubObjectRestriction structure is used to test properties on the attachment or recipient table of a message.

The SubObjectRestriction structure has the following format.

```
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 2 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 3 | 0 | 1 |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| RestrictionType |
| SubObject |
| Reserved |
|   |
| SubCondition (variable) |
|   |
```

RestrictionType (4 bytes): This field specifies the type of restriction and MUST be set to RES_SUBRESTRICTION (0x00000009) for the SubObjectRestriction structure.

SubObject (4 bytes): The application MUST use one of the following values for this field.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x0E12000D</td>
<td>Apply the condition to the recipient table of a message.</td>
</tr>
<tr>
<td>0x0E13000D</td>
<td>Apply the condition to the attachments table of a message.</td>
</tr>
</tbody>
</table>

Reserved (8 bytes): The application can fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

SubCondition (variable): This field contains a single subrestriction that makes up this structure. The subrestriction MUST be one of the structures that is specified in section 2.2.6.1.2.1 through section 2.2.6.1.2.11.

2.2.6.1.2.11 CommentRestriction Structure

The CommentRestriction structure, unlike other restriction structures, is not evaluated and is used only for reference by the application. The comment condition is used to keep additional application-specific information with the restriction in the form of an arbitrary list of property tag and value pairs.

The CommentRestriction structure has the following format.
RestrictionType (4 bytes): This field specifies the type of restriction and MUST be set to RES_COMMENT (0x0000000A) for the CommentRestriction structure.

cValues (4 bytes): This field MUST have the same value as the PropValueNum field.

Reserved (8 bytes): The application can fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

PropValueNum (4 bytes): This field is specifies the number of structures contained in the PropTags field and the PropValues field.

PropTags (variable): An array of PropertyTag structures, each of which specifies the property tag of a property that is specified in the PropValues field. For details about the PropertyTag structure, see [MS-OXCDATA] section 2.9. The valid property types for restrictions are specified in section 2.2.6.1.3. The number of PropertyTag structures in the array is specified by the PropValueNum field.

PropValues (variable): An array of PropertyValue structures. For details about the PropertyValue structure, see section 2.2.6.1.4. The number of structures is specified by the PropValueNum field.

SubCondition (variable): This field contains a single subrestriction that makes up the CommentRestriction structure. The subrestriction MUST be one of the structures that is specified in section 2.2.6.1.2.11 through section 2.2.6.1.2.11.

### 2.2.6.1.3 Valid Property Types

```plaintext
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RestrictionType</td>
<td>This field specifies the type of restriction and MUST be set to RES_COMMENT</td>
</tr>
<tr>
<td>cValues</td>
<td>This field MUST have the same value as the PropValueNum field.</td>
</tr>
<tr>
<td>Reserved</td>
<td>The application can fill this field with any value when writing the stream.</td>
</tr>
<tr>
<td>PropValueNum</td>
<td>This field is specifies the number of structures contained in the PropTags</td>
</tr>
<tr>
<td>PropTags (variable)</td>
<td>An array of PropertyTag structures, each of which specifies the property tag of a property that is specified in the PropValues field. For details about the PropertyTag structure, see [MS-OXCDATA] section 2.9. The valid property types for restrictions are specified in section 2.2.6.1.3. The number of PropertyTag structures in the array is specified by the PropValueNum field.</td>
</tr>
<tr>
<td>PropValues (variable)</td>
<td>An array of PropertyValue structures. For details about the PropertyValue structure, see section 2.2.6.1.4. The number of structures is specified by the PropValueNum field.</td>
</tr>
<tr>
<td>SubCondition (variable)</td>
<td>This field contains a single subrestriction that makes up the CommentRestriction structure. The subrestriction MUST be one of the structures that is specified in section 2.2.6.1.2.11 through section 2.2.6.1.2.11.</td>
</tr>
</tbody>
</table>
```
The following property types are valid for a ColumnPacket structure, as specified in section 2.2.6.1.1, or for a RestrictionPacket structure, as specified in section 2.2.6.1.2, that specifies a property.

<table>
<thead>
<tr>
<th>Property data type</th>
<th>Type ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>PtypInteger16</td>
<td>0x0002</td>
</tr>
<tr>
<td>PtypInteger32</td>
<td>0x0003</td>
</tr>
<tr>
<td>PtypFloating32</td>
<td>0x0004</td>
</tr>
<tr>
<td>PtypFloating64</td>
<td>0x0005</td>
</tr>
<tr>
<td>PtypCurrency</td>
<td>0x0006</td>
</tr>
<tr>
<td>PtypFloatingTime</td>
<td>0x0007</td>
</tr>
<tr>
<td>PtypErrorCode</td>
<td>0x000A</td>
</tr>
<tr>
<td>PtypBoolean</td>
<td>0x000B</td>
</tr>
<tr>
<td>PtypInteger64</td>
<td>0x0014</td>
</tr>
<tr>
<td>PtypString</td>
<td>0x001F</td>
</tr>
<tr>
<td>PtypTime</td>
<td>0x0040</td>
</tr>
<tr>
<td>PtypGuid</td>
<td>0x0048</td>
</tr>
<tr>
<td>PtypBinary</td>
<td>0x0102</td>
</tr>
</tbody>
</table>

2.2.6.1.4 PropertyValue Structure

The PropertyValue structure specifies the value of a property in a ContentRestriction structure, as specified in section 2.2.6.1.2.4, a PropertyRestriction structure, as specified in section 2.2.6.1.2.5, or a CommentRestriction structure, as specified in section 2.2.6.1.2.11.

Data (8 bytes): The format of this field depends on the property type that is specified in the ContentRestriction, PropertyRestriction, or CommentRestriction structures. The value of this field is read from the beginning of the field. In cases where the size of the data is less than the size of the Data field, the remaining bytes MUST be ignored. The following table lists the size and format of the value by property type.
<table>
<thead>
<tr>
<th>Property type</th>
<th>Value size</th>
<th>Value format</th>
</tr>
</thead>
<tbody>
<tr>
<td>PtypInteger16</td>
<td>2 bytes</td>
<td>Signed integer</td>
</tr>
<tr>
<td>PtypInteger32</td>
<td>4 bytes</td>
<td>Signed integer</td>
</tr>
<tr>
<td>PtypFloating32</td>
<td>4 bytes</td>
<td>Floating point number</td>
</tr>
<tr>
<td>PtypFloating64</td>
<td>8 bytes</td>
<td>Floating point number</td>
</tr>
<tr>
<td>PtypCurrency</td>
<td>8 bytes</td>
<td>Signed integer</td>
</tr>
<tr>
<td>PtypFloatingTime</td>
<td>8 bytes</td>
<td>Floating point number</td>
</tr>
<tr>
<td>PtypErrorCode</td>
<td>4 bytes</td>
<td>SCODE error code</td>
</tr>
<tr>
<td>PtypBoolean</td>
<td>2 bytes</td>
<td>WORD</td>
</tr>
<tr>
<td>PtypInteger64</td>
<td>8 bytes</td>
<td>Signed integer</td>
</tr>
<tr>
<td>PtypString</td>
<td>0 bytes</td>
<td>The string value MUST be stored separately in the PidTagViewDescriptorStrings property, as specified in section 2.2.6.3. The value of the Data field MUST be ignored.</td>
</tr>
<tr>
<td>PtypTime</td>
<td>8 bytes</td>
<td>Unsigned integer</td>
</tr>
<tr>
<td>PtypGuid</td>
<td>0 bytes</td>
<td>The value of the Data field MUST be ignored.</td>
</tr>
<tr>
<td>PtypBinary</td>
<td>4 bytes</td>
<td>Unsigned integer</td>
</tr>
</tbody>
</table>

**Buffer (variable):** This field MUST exist only when the property type is PtypBinary. The Buffer field contains an arbitrary binary stream. The size, in bytes, of the stream is specified in the Data field.

### 2.2.6.2 PidTagViewDescriptorName Property

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

The PidTagViewDescriptorName property ([MS-OXPROPS] section 2.1056) contains the name of a view descriptor.<17>

### 2.2.6.3 PidTagViewDescriptorStrings Property

Type: PtypTagViewDescriptorStrings ([MS-OXCDATA] section 2.11.1)

The client MUST store the display strings referenced in the PidTagViewDescriptorBinary property (section 2.2.6.1) separately in the PidTagViewDescriptorStrings property ([MS-OXPROPS] section 2.1058).<18> The client MUST concatenate the strings in the same order in which the strings are referenced in the PidTagViewDescriptorBinary property. The first set of strings consists of the display names of each of the ColumnInfo structures, followed by the value of each restriction structure's PropValue field that uses the PtypString property type.

The client MUST use the following binary layout in the PidTagViewDescriptorStrings property.

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 2 0 1 2 3 4 5 6 7 8 9 3 0 1

String (variable)
```
String (variable): This field is an arbitrary length buffer that contains a string. Clients SHOULD format the string using the current code page of the client. The application MUST NOT include the byte value 0xA00, which corresponds to the newline character, in the string.

Terminator (2 bytes): This field contains the value 0xA00. The application MUST include a Terminator field after every String field, including the last String field in the stream.

2.2.6.4 PidTagViewDescriptorVersion Property

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

The PidTagViewDescriptorVersion property ([MS-OXPROPS] section 2.1056) contains the version of a view descriptor.<19>

2.2.7 Folder Flags

Folder flags consist of a collection of small properties packed into a single binary property on a folder. The primary purpose of the folder flags is to store Boolean flags that affect the folder's display options.

The folder flags can also be used to store additional properties, such as a unique identifier for the folder that can be used to associate it with a specific feature or with a description of that folder that has been saved elsewhere.

The PidTagExtendedFolderFlags property ([MS-OXOSRCH] section 2.2.2.1.2) can be set on a folder. If the property is set, the value of this property MUST be a binary stream that contains encoded subproperties for the folder. The format of the binary stream MUST be as follows.

| 0 1 2 3 4 5 6 7 8 9 1 0 1 2 3 4 5 6 7 8 2 0 1 2 3 4 5 6 7 8 9 3 0 1 |
|-------------------------|-------------------------|
| Sub-property1 (variable) |
| ...                     | Sub-property2 (variable) |
| ...                     |                          |
| ...                     | Sub-property3 (variable) |
| ...                     |

The binary stream is divided into variable-length subproperty fields. The subproperty fields are byte-aligned within the binary stream. Each subproperty MUST be encoded as specified in section 2.2.7.1.

2.2.7.1 Sub-property

The sub-property fields for folder flags specified in section 2.2.7.1 have the following format.

| 0 1 2 3 4 5 6 7 8 9 1 0 1 2 3 4 5 6 7 8 2 0 1 2 3 4 5 6 7 8 9 3 0 1 |
|-------------------------|-------------------------|
| Id                      | Cb                       |
| Data (variable)         |                          |
**Id (1 byte):** The subproperty ID value. The value of this field SHOULD be one of the following. All other values of the Id field are reserved and MUST be ignored by the application. If the application needs to rewrite the `PidTagExtendedFolderFlags` property ([MS-OXOSRCH] section 2.2.2.1.2) with different values for the subproperties that it does understand, it MUST preserve the values of any subproperties that it did not understand. Each valid subproperty ID MUST appear 0 to 1 times in the `PidTagExtendedFolderFlags` property. The subproperties can appear in any order within the `PidTagExtendedFolderFlags` property stream.

<table>
<thead>
<tr>
<th>Flag name</th>
<th>Value</th>
<th>Data format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invalid</td>
<td>0x00</td>
<td>As specified in section 2.2.7.1.1.</td>
</tr>
<tr>
<td>ExtendedFlags</td>
<td>0x01</td>
<td>As specified in section 2.2.7.1.2.</td>
</tr>
<tr>
<td>SearchFolderID</td>
<td>0x02</td>
<td>As specified in section 2.2.7.1.3.</td>
</tr>
<tr>
<td>SearchFolderTag</td>
<td>0x03</td>
<td>As specified in [MS-OXOSRCH].</td>
</tr>
<tr>
<td>Reserved</td>
<td>0x04</td>
<td>N/A</td>
</tr>
<tr>
<td>ToDoFolderVersion</td>
<td>0x05</td>
<td>As specified in 2.2.7.1.4.</td>
</tr>
<tr>
<td>Reserved</td>
<td>0x06</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Cb (1 byte):** This field specifies the unsigned size, in bytes, of the Data field of the subproperty.

**Data (variable):** This field contains the value of the subproperty. This field MUST be a variable-length buffer. Because the size is specified in a single unsigned byte in the Cb field, the minimum size of the buffer is 0 bytes and the maximum size is 255 bytes. The interpretation of this field is specified in the table earlier in this section.

### 2.2.7.1.1 Invalid

If the Id field is set to Invalid, the value of the Data field is invalid. The application MUST NOT use it.

### 2.2.7.1.2 ExtendedFlags

If the Id field is set to ExtendedFlags, the value of the Data field is in the following format. If the subproperty does not exist, or if the `PidTagExtendedFolderFlags` property ([MS-OXOSRCH] section 2.2.2.1.2) is not set on the folder, each flag SHOULD assume the specified default value.

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| r1 | a | r2 | b | r3 |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

**r1 (2 bits):** Reserved. The application can set these flags to any value when writing the subproperty. The application MUST ignore these flags when reading the subproperty, but it MUST preserve preexisting values if it rewrites the subproperty.

**a (1 bit):** If the folder is subject to an administrative retention policy, this flag controls whether the application displays a string that describes the policy. The possible values are listed in the following table.
<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>The application SHOULD display a policy description. This is the default value.</td>
</tr>
<tr>
<td>1</td>
<td>The application MUST NOT display a policy description.</td>
</tr>
</tbody>
</table>

**r2 (3 bits):** Reserved. The application can set these flags to any value when writing the subproperty. The application MUST ignore these flags when reading the subproperty, but it MUST preserve preexisting values if it rewrites the subproperty.

**b (2 bits):** These 2 bits control whether the application SHOULD display the total number of messages in the folder or only the number of unread messages in the folder. The possible values are listed in the following table.

<table>
<thead>
<tr>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>The application uses the default value for this folder.</td>
</tr>
<tr>
<td>01</td>
<td>The application uses the number of unread messages in the folder. This is the default value for all folders except for the Outbox, Drafts, and Junk E-mail special folders, as specified in [MS-OXOSFLD].</td>
</tr>
<tr>
<td>10</td>
<td>The application uses the total number of messages in the folder. This is the default value for the Outbox, Drafts, and Junk E-mail special folders.</td>
</tr>
<tr>
<td>11</td>
<td>This value is invalid. The application MUST NOT use it.</td>
</tr>
</tbody>
</table>

**r3 (3 bytes):** Reserved. The application can set these flags to any value when writing the subproperty. The application MUST ignore these flags when reading the subproperty, but it MUST preserve preexisting values if it rewrites the subproperty.

**2.2.7.1.3 SearchFolderID**

If the **Id** field is set to **SearchFolderID**, the value of the **Data** field is a 16-byte field. When the application creates a persistent search folder, as specified in [MS-OXOSRCH] section 2.2.1, it MUST set this field on the folder to the same value as the **PidTagSearchFolderId** property ([MS-OXOSRCH] section 2.2.1.2.1) on the message.

**2.2.7.1.4 ToDoFolderVersion**

If the **Id** field is set to **ToDoFolderVersion**, the value of the **Data** field is a 4-byte field. When the application creates the To-Do Search folder as specified in [MS-OXOSFLD] section 3.1.4.1.2, it MUST be a bitmask that indicates which stream properties exist on the message. The stream types, and thus the flags, are not mutually exclusive, which corresponds to the little-endian integer value of 0x000C0000.

<table>
<thead>
<tr>
<th>0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

**2.2.8 Conversation Actions**

Conversation actions are a limited set of actions that a user applies to all E-mail objects, currently in the message store or delivered in the future, that share the same value of the **PidTagConversationId** property ([MS-OXOMSG] section 2.2.1.2) and thus are part of the same
conversation. Unlike rules, as specified in [MS-OXORULE], at most one conversation action applies to any given E-mail object, and conversation actions can be automatically deleted after a period of disuse.

A conversation action is a combination of any of the following actions:

- Ignore
- Stop Ignoring
- Move to Folder
- Move to Store
- Stop Move
- Add Category
- Remove Category
- Clear All Categories

The client and server SHOULD persist conversation action settings in an FAI message in the conversation actions settings special folder, as specified in [MS-OXOSFLD] section 2.2.5.1. The relevant properties of a conversation action FAI message are enumerated in sections 2.2.8.1 through 2.2.8.10.

2.2.8.1 PidLidConversationActionLastAppliedTime Property

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

The PidLidConversationActionLastAppliedTime property ([MS-OXPROPS] section 2.82) SHOULD be the time (in UTC) that an E-mail object was last received in the conversation or the last time that the user modified the conversation action, whichever occurs later.

2.2.8.2 PidLidConversationActionMaxDeliveryTime Property

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

The PidLidConversationActionMaxDeliveryTime property ([MS-OXPROPS] section 2.83) SHOULD be the maximum value of the PidTagMessageDeliveryTime property ([MS-OXOMSG] section 2.2.3.9) of all the E-mail objects modified in response to the last time the user changed a conversation action on the client. If no E-mail objects were changed, this property SHOULD be set to 00:00:00 Apr 1, 1601 (UTC).

2.2.8.3 PidLidConversationActionMoveFolderEid Property

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

The PidLidConversationActionMoveFolderEid property ([MS-OXPROPS] section 2.84) SHOULD be set based on the action or actions being performed on the conversation, as shown in the following table.

<table>
<thead>
<tr>
<th>Action on the conversation</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move to Folder (move to a folder in the same message store as this FAI message)</td>
<td>The EntryID of that folder</td>
</tr>
<tr>
<td>Move to Store (move to a folder in a different message store than this FAI message)</td>
<td>The EntryID of that folder</td>
</tr>
<tr>
<td>Action on the conversation</td>
<td>Value</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Ignore</td>
<td>Byte array of size zero</td>
</tr>
<tr>
<td>None of the above</td>
<td>Not set</td>
</tr>
</tbody>
</table>

### 2.2.8.4 PidLidConversationActionMoveStoreEid Property

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

The **PidLidConversationActionMoveStoreEid** property ([MS-OXPROPS] section 2.85) SHOULD<25> be set based on the **action** or actions being performed on the **conversation**, as shown in the following table.

<table>
<thead>
<tr>
<th>Action on the conversation</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move to Folder (move to a folder in the same <strong>message store</strong> as this <strong>FAI</strong> message)</td>
<td>Not set</td>
</tr>
<tr>
<td>Move to Store (move to a folder in a different <strong>message store</strong> than this <strong>FAI</strong> message)</td>
<td>The <strong>EntryID</strong> of that <strong>message store</strong></td>
</tr>
<tr>
<td>Ignore</td>
<td>Not set</td>
</tr>
<tr>
<td>None of the above</td>
<td>Not set</td>
</tr>
</tbody>
</table>

### 2.2.8.5 PidLidConversationActionVersion Property

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

The **PidLidConversationActionVersion** property ([MS-OXPROPS] section 2.86) SHOULD<26> be set to the version of the conversation action **FAI** message, as specified in section 2.2.8. The format of the value of this property MUST be as follows.

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |

**MajorVersion (12 bits):** This field indicates the version compatibility of the conversation action **FAI** message. It MUST be set to 0x004.

**MinorVersion (20 bits):** This value is implementation-specific and can be set to any value. It SHOULD indicate the version of the client or server that last modified the conversation action **FAI** message.

### 2.2.8.6 PidLidConversationProcessed Property

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

The **PidLidConversationProcessed** property ([MS-OXPROPS] section 2.87) specifies a sequential number to be used in the processing of a **conversation action**, as specified in section 3.1.5.1.
### 2.2.8.7 PidNameKeywords Property

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

If this conversation is being categorized, the **PidNameKeywords** property ([MS-OXPROPS] section 2.451) SHOULD <27> be set to the list of categories that are being set on incoming E-mail objects in the conversation. Otherwise, this property SHOULD NOT be set.

### 2.2.8.8 PidTagConversationIndex Property

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

The **PidTagConversationIndex** property ([MS-OXPROPS] section 2.651) SHOULD <28> be set to a 22-byte array as specified below.

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 3 | 0 | 1 |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**IndexPrefix (6 bytes):** This field MUST be set to 0x010000000000.

**ConversationID (16 bytes):** This field MUST be set to the value of the **PidTagConversationId** property ([MS-OXOMSG] section 2.2.1.2) shared by all the E-mail objects in the conversation.

### 2.2.8.9 PidTagMessageClass Property

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

The **PidTagMessageClass** property ([MS-OXPROPS] section 2.788) SHOULD <29> be set to "IPM.ConversationAction".

### 2.2.8.10 PidTagSubject Property

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

The **PidTagSubject** property ([MS-OXPROPS] section 2.1034) SHOULD <30> be set to "Conv.Action: " followed by the value of the **PidTagNormalizedSubject** property (section 2.2.9.2) of an E-mail object in the conversation. This correlates the FAI message to the E-mail objects in the conversation.
2.2.9 Navigation Shortcuts

Navigation shortcuts are objects that contain identifying information to locate a folder in a message store. Clients can use navigation shortcuts to provide quick access to particular folders via the client's user interface.

Navigation shortcuts are stored as FAI messages, as specified in [MS-OXCMSG], in the Common Views folder, as specified in [MS-OXOSFLD], within a message database.

These messages possess additional properties that describe navigation shortcuts. These properties are described in sections 2.2.9.1 through 2.2.9.19.<31>

2.2.9.1 PidTagMessageClass Property

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

The PidTagMessageClass property ([MS-OXPROPS] section 2.788) identifies the message as a navigation shortcut message, as specified in section 2.2.9. The value is "IPM.Microsoft.WunderBar.Link".

2.2.9.2 PidTagNormalizedSubject Property

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

The PidTagNormalizedSubject property ([MS-OXPROPS] section 2.813) specifies the display name of the navigation shortcut, as specified in section 2.2.9.

2.2.9.3 PidTagWlinkGroupHeaderID Property

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

The PidTagWlinkGroupHeaderID property ([MS-OXPROPS] section 2.1072) specifies the ID of the navigation shortcut, as specified in section 2.2.9, that groups other navigation shortcuts. This property SHOULD be set only when the value of the PidTagWlinkType property (section 2.2.9.5) is wblHeader.

2.2.9.4 PidTagWlinkSaveStamp Property

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

The PidTagWlinkSaveStamp property ([MS-OXPROPS] section 2.1077) specifies an integer that allows a client to identify with a high probability whether the navigation shortcut, as specified in section 2.2.9, was saved by the current client session. When writing a navigation shortcut, the client writes the Session ID, as specified in section 3.1.3.1, as the value for this property.

2.2.9.5 PidTagWlinkType Property

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

The PidTagWlinkType property ([MS-OXPROPS] section 2.1080) specifies the type of navigation shortcut, as specified in section 2.2.9. The valid values of this property are as follows.

<table>
<thead>
<tr>
<th>Value</th>
<th>Value name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x00000000</td>
<td>wblNormalFolder</td>
<td>The shortcut points to a folder other than a search folder, group header shortcut, or a folder owned by a different user.</td>
</tr>
</tbody>
</table>
### 2.2.9.6 PidTagWlinkFlags Property

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

The **PidTagWlinkFlags** property ([MS-OXPROPS] section 2.1069) is a bit field in which each bit SHOULD be set to 1 if the associated condition in the following table applies and to 0 otherwise. The possible bit values are as follows.

<table>
<thead>
<tr>
<th>Value</th>
<th>Flag name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x00000001</td>
<td>sipPublicFolder</td>
<td>Shortcut points to a server public folder.</td>
</tr>
<tr>
<td>0x00000004</td>
<td>sipImapFolder</td>
<td>Shortcut points to a folder that is accessed via the Internet Message Access Protocol - Version 4 (IMAP4).</td>
</tr>
<tr>
<td>0x00000008</td>
<td>sipWebDavFolder</td>
<td>Shortcut points to a folder that is accessed via the Web Distributed Authoring and Versioning Protocol (WebDAV).</td>
</tr>
<tr>
<td>0x00000010</td>
<td>sipSharePointFolder</td>
<td>Shortcut points to a folder that is accessed via a SharePoint folder.</td>
</tr>
<tr>
<td>0x00000020</td>
<td>sipRootFolder</td>
<td>Shortcut points to a Root folder (interpersonal messaging subtree).</td>
</tr>
<tr>
<td>0x00000100</td>
<td>sipSharedOut</td>
<td>Shortcut points to a folder that has been shared with other users. This value can be used to display a visual indicator and does not set any permissions.</td>
</tr>
<tr>
<td>0x00000200</td>
<td>sipSharedIn</td>
<td>Shortcut points to a folder that is owned by another user. This value can be used to display a visual indicator and does not set any permissions.</td>
</tr>
<tr>
<td>0x00000400</td>
<td>sipPersonFolder</td>
<td>Shortcut points to a folder that belongs to another user.</td>
</tr>
<tr>
<td>0x00000800</td>
<td>sipICal</td>
<td>Shortcut points to a folder that accesses data from an iCalendar data source (see [MS-OXICAL]).</td>
</tr>
<tr>
<td>0x00001000</td>
<td>sipOverlay</td>
<td>Shortcut points to a Calendar folder. The contents of the Calendar folder, if displayed with other calendars, are merged into one calendar and the ordering determined by the PidTagWlinkOrdinal property (section 2.2.9.7). Merging is purely a display; no objects are created or moved between folders.</td>
</tr>
<tr>
<td>0x00002000</td>
<td>sipOneOffName</td>
<td>Shortcut has been renamed such that the value of the PidTagNormalizedSubject property (section 2.2.9.2) of the shortcut does not match the value of the PidTagNormalizedSubject property of the folder, or the shortcut is a group header and has been renamed from the default value.</td>
</tr>
</tbody>
</table>

All bits not specified in the above table are reserved. They MUST be ignored, but if set, they are to be preserved.
2.2.9.7 PidTagWlinkOrdinal Property

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

The PidTagWlinkOrdinal property ([MS-OXPROPS] section 2.1074) specifies a variable-length binary property that SHOULD be used to sort shortcuts lexicographically. For example, to insert a shortcut C between shortcut A with the one-byte ordinal value of 128 and shortcut B with the one-byte ordinal value of 129, shortcut C can be assigned the two-byte ordinal 128, 128. The final byte of this property MUST NOT be 0 or 255 to ensure that shortcuts can be inserted before and after other shortcuts.

2.2.9.8 PidTagWlinkEntryId Property

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

The PidTagWlinkEntryId property ([MS-OXPROPS] section 2.1068) specifies the EntryID of the folder pointed to by the shortcut.

2.2.9.9 PidTagWlinkRecordKey Property

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

The PidTagWlinkRecordKey property ([MS-OXPROPS] section 2.1075) specifies the value of the PidTagRecordKey property ([MS-OXCPRPT] section 2.2.1.8) of the folder pointed to by the shortcut.

2.2.9.10 PidTagWlinkStoreEntryId Property

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

The PidTagWlinkStoreEntryId property ([MS-OXPROPS] section 2.1079) specifies the value of the PidTagStoreEntryId property ([MS-OXPROPS] section 2.1029) of the folder pointed to by the shortcut.

2.2.9.11 PidTagWlinkFolderType Property

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

The PidTagWlinkFolderType property ([MS-OXPROPS] section 2.1070) specifies the type of folder pointed to by the shortcut. The possible values are listed in the following table.

<table>
<thead>
<tr>
<th>Value</th>
<th>Value name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>{0x00780600, 0x0000, 0x0000, {0xC0, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x46}}</code></td>
<td>CLSID_MailFolder</td>
<td>The folder is a mail folder.</td>
</tr>
<tr>
<td><code>{0x02780600, 0x0000, 0x0000, {0xC0, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x46}}</code></td>
<td>CLSID_CalendarFolder</td>
<td>The folder is a Calendar folder.</td>
</tr>
<tr>
<td><code>{0x01780600, 0x0000, 0x0000, {0xC0, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x46}}</code></td>
<td>CLSID_ContactFolder</td>
<td>The folder is a Contact folder.</td>
</tr>
<tr>
<td><code>{0x03780600, 0x0000, 0x0000, {0xC0, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x46}}</code></td>
<td>CLSID_TaskFolder</td>
<td>The folder is a Task folder.</td>
</tr>
<tr>
<td><code>{0x04780600, 0x0000, 0x0000, {0xC0, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x46}}</code></td>
<td>CLSID_NoteFolder</td>
<td>The folder is a Note folder.</td>
</tr>
<tr>
<td><code>{0x08780600, 0x0000, 0x0000, {0xC0, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x46}}</code></td>
<td>CLSID_JournalFolder</td>
<td>The folder is a Journal folder.</td>
</tr>
</tbody>
</table>
2.2.9.12  PidTagWlinkGroupClsid Property

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

The PidTagWlinkGroupClsid property ([MS-OXPROPS] section 2.1071) specifies the value of the PidTagWlinkGroupHeaderID property (section 2.2.9.3) of the group header associated with the shortcut.

2.2.9.13  PidTagWlinkGroupName Property

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

The PidTagWlinkGroupName property ([MS-OXPROPS] section 2.1073) specifies the value of the PidTagNormalizedSubject property (section 2.2.9.2) of the group header associated with the shortcut.

2.2.9.14  PidTagWlinkSection Property

Type: PtypInteger ([MS-OXCDATA] section 2.11.1)

The PidTagWlinkSection property ([MS-OXPROPS] section 2.1078) specifies the section where the shortcut can be grouped. The possible values are listed in the following table.

<table>
<thead>
<tr>
<th>Value</th>
<th>Value name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x00000001</td>
<td>wbsidMailFavorites</td>
<td>Shortcut is grouped under Mail.</td>
</tr>
<tr>
<td>0x00000002</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>0x00000003</td>
<td>wbsidCalendar</td>
<td>Shortcut is grouped under Calendar.</td>
</tr>
<tr>
<td>0x00000004</td>
<td>wbsidContacts</td>
<td>Shortcut is grouped under Contacts.</td>
</tr>
<tr>
<td>0x00000005</td>
<td>wbsidTasks</td>
<td>Shortcut is grouped under Tasks.</td>
</tr>
<tr>
<td>0x00000006</td>
<td>wbsidNotes</td>
<td>Shortcut is grouped under Notes.</td>
</tr>
<tr>
<td>0x00000007</td>
<td>wbsidJournal</td>
<td>Shortcut is grouped under Journal.</td>
</tr>
</tbody>
</table>

2.2.9.15  PidTagWlinkCalendarColor Property

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

The PidTagWlinkCalendarColor property ([MS-OXPROPS] section 2.1066) specifies the background color of the calendar. The RGB values listed in the following table can be used.

<table>
<thead>
<tr>
<th>Value</th>
<th>Color (R, G, B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>Automatic (determined by implementation)</td>
</tr>
<tr>
<td>0</td>
<td>141, 174, 217</td>
</tr>
<tr>
<td>1</td>
<td>156, 191, 139</td>
</tr>
<tr>
<td>2</td>
<td>209, 149, 170</td>
</tr>
</tbody>
</table>
### 2.2.9.16 PidTagWlinkAddressBookEID Property

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

The PidTagWlinkAddressBookEID property ([MS-OXPROPS] section 2.1064) specifies the value of the PidTagEntryId property ([MS-OXCPERM] section 2.2.4) of the user that the folder belongs to, as specified in [MS-OXOABK] section 2.2.3.2. This property SHOULD be set on calendar shortcuts.

### 2.2.9.17 PidTagWlinkAddressBookStoreEID Property

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

The PidTagWlinkAddressBookStoreEID property ([MS-OXPROPS] section 2.1065) specifies the value of the PidTagStoreEntryId property ([MS-OXPROPS] section 2.1029) of the current user (not the owner of the folder). This property SHOULD be set on calendar shortcuts.

### 2.2.9.18 PidTagWlinkClientID Property

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

The PidTagWlinkClientID property ([MS-OXPROPS] section 2.1067) specifies the Client ID that allows the client to determine whether the shortcut was created on the current machine or by the currently logged-in user via an equality test. The ID is specified in section 3.1.3.1. If this property is set, the client SHOULD compare the value of this property to the Client ID and display the shortcut only if the GUIDs match.

### 2.2.9.19 PidTagWlinkROGroupType Property

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

<table>
<thead>
<tr>
<th>Value</th>
<th>Color (R, G, B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>176, 182, 190</td>
</tr>
<tr>
<td>4</td>
<td>176, 182, 190</td>
</tr>
<tr>
<td>5</td>
<td>140, 140, 215</td>
</tr>
<tr>
<td>6</td>
<td>141, 193, 157</td>
</tr>
<tr>
<td>7</td>
<td>211, 150, 150</td>
</tr>
<tr>
<td>8</td>
<td>186, 186, 137</td>
</tr>
<tr>
<td>9</td>
<td>174, 153, 216</td>
</tr>
<tr>
<td>10</td>
<td>195, 176, 141</td>
</tr>
<tr>
<td>11</td>
<td>139, 191, 174</td>
</tr>
<tr>
<td>12</td>
<td>144, 182, 200</td>
</tr>
<tr>
<td>13</td>
<td>255, 223, 134</td>
</tr>
<tr>
<td>14</td>
<td>150, 169, 209</td>
</tr>
</tbody>
</table>
The **PidTagWlinkROGroupType** property ([MS-OXPROPS] section 2.1076) specifies the type of group header. If the property does not exist, the client SHOULD assume a value of -1. The possible values are listed in the following table.

<table>
<thead>
<tr>
<th>Value</th>
<th>Value name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>wbrogUndefined</td>
<td>None.</td>
</tr>
<tr>
<td>0</td>
<td>wbrogMyDepartment</td>
<td>Group contains shortcuts to users in his department.</td>
</tr>
<tr>
<td>1</td>
<td>wbrogOtherDepartment</td>
<td>Group contains shortcuts to users in another department.</td>
</tr>
<tr>
<td>2</td>
<td>wbrogDirectReportGroup</td>
<td>Group contains shortcuts to users in his direct reporting group.</td>
</tr>
<tr>
<td>3</td>
<td>wbrogCoworkerGroup</td>
<td>Group contains shortcuts to coworkers of the user.</td>
</tr>
<tr>
<td>4</td>
<td>wbrogDL</td>
<td>Group contains shortcuts to members of a distribution list.</td>
</tr>
</tbody>
</table>
3 Protocol Details

3.1 Client Details

3.1.1 Abstract Data Model

None.

3.1.2 Timers

None.

3.1.3 Initialization

3.1.3.1 Navigation Shortcuts

On initialization of the client, the client generates a Session ID that is valid as long as the client is running. The Session ID is of type PtypInteger32 and is a randomly generated value. This value is saved as the value of the PidTagWlinkSaveStamp property (section 2.2.9.4).

The client also generates a Client ID for the user that is valid across sessions on first-run initialization of the client. The Client ID is of type PtypBinary and is a randomly generated value. This value is saved as the value of the PidTagWlinkClientID property (section 2.2.9.18).

Navigation shortcuts are specified in section 2.2.9.

3.1.4 Higher-Layer Triggered Events

3.1.4.1 Reading Configuration Data

To read settings in a configuration data settings group, as specified in section 2.2.2, the client MUST open the special folder that contains the configuration data message. The client MUST call the RopGetContentsTable ROP ([MS-OXCROPS] section 2.2.4.14) with the Associated flag to open the FAI contents table, as specified in [MS-OXCFOLD] section 2.2.1.14.

The client MUST find all the rows in the FAI contents table that have the PidTagMessageClass property ([MS-OXCMMSG] section 2.2.1.3) specified by the configuration data message that the client is trying to open, by using steps equivalent to the following, as specified in [MS-OXCTABL]:

- Send the RopSetColumns ROP ([MS-OXCROPS] section 2.2.5.1) with the following properties:
  - PidTagFolderId ([MS-OXCFOLD] section 2.2.2.1.6)
  - PidTagMid ([MS-OXCFXICS] section 2.2.1.2)
  - PidTagMessageClass
  - PidTagRoamingDatatypes (section 2.2.1)

- Send the RopSortTable ROP ([MS-OXCROPS] section 2.2.5.2) with a sort order that includes the following properties:
  - PidTagMessageClass, followed by
  - PidTagLastModificationTime ([MS-OXCMMSG] section 2.2.2.2)
- Send the **RopFindRow** ROP ([MS-OXCROPS] section 2.2.5.13), searching for a match on the **PidTagMessageClass** property.

- Send the **RopQueryRows** ROP ([MS-OXCROPS] section 2.2.5.4) repeatedly until either the end of the table or a row with a **PidTagMessageClass** property that no longer matches the configuration data message is encountered.

- Based on the subsort by the **PidTagLastModificationTime** property, pick the message with the most recent (the greatest value) modification time that includes the bit that matches the **PidTagRoamingDatatypes** property specified by the configuration data message. If none of the messages match the **PidTagRoamingDatatypes** property of the configuration data message, the client MUST pick the most recently modified of all the messages.

If the client cannot find a row that matches the **PidTagMessageClass** and **PidTagRoamingDatatypes** properties of the configuration data message, that group of settings does not exist. When reading the settings, the client MUST use default values for those settings when the configuration data message cannot be found.

If the client found a matching row, it MUST open the existing message as specified in [MS-OXCMSG] section 2.2.3.1 by opening the message, using the **PidTagFolderId** and **PidTagMid** properties from the table row and setting the **ReadWrite** flag in the **OpenModeFlags** field, by sending the **RopOpenMessage** ROP ([MS-OXCROPS] section 2.2.6.1).

If the client found a matching message, it MUST retrieve the serialized settings stream from the property specified by the configuration data message by using steps equivalent to the following, as specified in [MS-OXCPRPT] section 2.2.14:

1. Open a **Stream object handle** on the stream property specified by the configuration data message by sending the **RopOpenStream** ROP ([MS-OXCROPS] section 2.2.9.1).

2. Read the serialized settings by using the **RopReadStream** ROP ([MS-OXCROPS] section 2.2.9.2).

If multiple configuration data messages of the same type are found, the configuration data messages are deemed in conflict and MUST be resolved. If no specific conflict resolution algorithm is available, the first matching message SHOULD be used, and the client SHOULD delete the rest of the matching configuration data messages from the message store. Regardless of the method of resolution, a client SHOULD resolve such conflicts as soon as possible and SHOULD delete any duplicates, leaving only one configuration data message that is the result of the conflict resolution.

### 3.1.4.1.1 Reading Dictionaries

The client MUST prepopulate the **dictionaries** with default name-value property pairs, as specified in section 2.2.5.1.

The client MUST read any existing settings from the configuration data message, as specified in section 3.1.4.1. If any existing settings are found, the client MUST parse the XML document, as specified in section 2.2.5.1.

If the XML document does exist, and the XML document includes one of the valid **OLPrefsVersion** attributes specified in section 2.2.5.1, the client MUST then set the name-value pairs on the dictionary, overriding any default values that were prepopulated in the dictionary with matching names.

If the XML document did not exist, a valid **OLPrefsVersion** attribute did not exist or was incorrect, or any default settings did not overlap with previously saved settings, or if the client changes a setting after reading them, the client MUST write the contents of the dictionary to the configuration data message, as specified in section 3.1.4.1.

### 3.1.4.1.2 Reading Working Hours
The client MUST read any existing settings from the configuration data message, as specified in section 3.1.4.1. If any existing settings are found, the client MUST parse the XML document, as specified in section 2.2.5.2.

If the client could not find a matching configuration data message and it used default values, <36> or if the user changes the preferred working hours through the client UI, the client MUST generate the XML document as specified in section 2.2.5.2 and save it to the configuration data message as specified in section 3.1.4.2.

When viewing the contents of another user's Calendar folders or displaying their free/busy status data, the client MUST attempt to open the other user's working hours configuration data message and translate the settings from the other user's time zone to the time zone of the client. The client MUST use the other user's preferred working hours in place of the client's settings when displaying the other user's Calendar folders.

If the client is unable to read the configuration data message from the other user's Calendar special folder (because the other user's message store is inaccessible or the client has not been granted sufficient permissions to access the special folder), the client MUST treat all times as being within the other user's preferred working hours.

### 3.1.4.1.3 Reading Category List

A category list configuration data message, as specified in section 2.2.2, is saved as an FAI message in the user's default Calendar folder. A client can read the category list, as specified in section 2.2.5.2.2, at any time.

When clients encounter unknown tags or attributes, they SHOULD ignore them, but they SHOULD also rewrite them as-is when they rewrite the category list back to the configuration data message.

All times are to be stored relative to UTC. When a category is applied to a message, as specified in section 3.1.4.7, or the user-visible properties of the category are changed (such as color or shortcut key), the client SHOULD update the lastTimeUsed attribute and, depending on whether the client separates different message types (Mail, Calendar, Contacts, Tasks, Notes, Journal), SHOULD update the appropriate time stamp attribute as specified in section 2.2.5.2.2 with the current time.

When viewing the contents of another user's folders, the client MUST try to open the other user's category list configuration data message. If the client is able to read the configuration data message from the other user's Calendar special folder, the client MUST use the other user's category list settings, including color assignments, in place of the client's settings when it displays the other user's folders.

If the client is unable to read the configuration data message from the other user's Calendar special folder (because the other user's message store is inaccessible or the client has not been granted sufficient permissions to access the special folder), the client MUST fall back to its own category list settings.

### 3.1.4.2 Writing Configuration Data

To write settings in a configuration data settings group, as specified in section 2.2.2, the client MUST first look for a preexisting configuration data message with preexisting settings, as specified in section 3.1.4.1.

If the client found a matching message or created a new one, it MUST retrieve the serialized settings stream from the property specified by the configuration data message by using steps equivalent to the following, as specified in [MS-OXCPRPT] section 2.2.15:

1. Open a Stream object handle on the stream property specified by the configuration data message by sending the RopOpenStream ROP ([MS-OXCROPS] section 2.2.9.1).
2. Read the serialized settings by using the **RopReadStream** ROP ([MS-OXCROPS] section 2.2.9.2).

If the message does not exist, the client MUST create the message, as specified in [MS-OXCMSG] section 2.2.3.2, by sending the **RopCreateMessage** ROP ([MS-OXCROPS] section 2.2.6.2) on the folder and passing the **Associated** flag.

If the client found a matching message or created a new one, it MUST save the serialized settings stream into the property specified by the configuration data message by using steps equivalent to the following, as specified in [MS-OXCPRPT] section 2.2.16:

1. Open a Stream object handle on the stream property specified by the configuration data message by sending the **RopOpenStream** ROP.
2. Write the serialized settings by using the **RopWriteStream** ROP ([MS-OXCROPS] section 2.2.9.3).
3. Persist the stream back to the property by sending the **RopRelease** ROP ([MS-OXCROPS] section 2.2.15.3).
4. Persist changes to the message by sending the **RopSaveChangesMessage** ROP ([MS-OXCROPS] section 2.2.6.3).

### 3.1.4.2.1 Writing Dictionaries

The client MUST read any existing settings from the configuration data message, as specified in section 3.1.4.1. If any existing settings are found, the client MUST parse the **XML** document, as specified in section 2.2.5.1.

The client MUST write the contents of the **dictionary** to the configuration data message, as specified in section 3.1.4.2.

### 3.1.4.2.2 Writing Working Hours

The client MUST read any existing settings from the configuration data message, as specified in section 3.1.4.1. If any existing settings are found, the client MUST parse the **XML** document, as specified in section 2.2.5.2.

The client MUST generate the XML document as specified in section 2.2.5.2 and save it to the configuration data message as specified in section 3.1.4.2.

### 3.1.4.2.3 Writing Category List

The client MUST read any existing settings from the configuration data message, as specified in section 3.1.4.1. If any existing settings are found, the client MUST parse the **XML** document, as specified in section 2.2.5.2.

When clients encounter unknown tags or attributes, they SHOULD ignore them, but they SHOULD also rewrite them as-is when they rewrite the category list back to the configuration data message.

The client MUST generate the XML document as specified in section 2.2.5.2 and save it to the configuration data message as specified in section 3.1.4.2.

Each **category** in the category list, as specified in section 2.2.5.2.2, contains the following attributes:

- **lastTimeUsed**
- **lastTimeUsedMail**
- **lastTimeUsedCalendar**
- lastTimeUsedContacts
- lastTimeUsedTasks
- lastTimeUsedNotes
- lastTimeUsedJournal

The **lastTimeUsed** attribute MUST be set on all categories. All others are optional and depend on whether the client shows different message types in separate windows or panes.

All times MUST be stored relative to **UTC**. When a category is applied to a message, as specified in section 3.1.4.7, or the user visible properties of the category are changed (such as color or shortcut key), the client SHOULD update the **lastTimeUsed** attribute and, depending on whether the client separates different message types, SHOULD replace the appropriate type-specific time stamp with the current time.

### 3.1.4.3 Reading View Definitions

To read the list of available view definitions for a folder, as specified in section 2.2.6, the client MUST enumerate all of the view definition **FAI** messages in the folders, searching for a match on the **PidTagMessageClass** property ([MS-OXCMSG] section 2.2.1.3) and the **PidTagViewDescriptorVersion** property (section 2.2.6.4) as specified in section 2.2.6.

After the client has built the list of view definition messages, it can select one of them by using the **PidTagViewDescriptorName** property (section 2.2.6.2). After it has selected a view definition message, the client MUST read the settings from the **PidTagViewDescriptorBinary** property (section 2.2.6.1) and the **PidTagViewDescriptorStrings** property (section 2.2.6.3) on the message.

### 3.1.4.4 Writing View Definitions

To write settings in a view definition, as specified in section 2.2.6, the client MUST open the folder that contains the view definition message. The client MUST save the view definition message in the folder that will display that view.

The client MUST call the **RopGetContentsTable ROP** ([MS-OXCROPS] section 2.2.4.14) with the **Associated** flag to open the **FAI** contents table, as specified in [MS-OXCFOLD] section 2.2.1.14.

If a view definition message already exists with the same **PidTagViewDescriptorName** property (section 2.2.6.2) in the same folder, the client MUST open that message and save the view definition there. The client MUST search for a matching row in the **FAI** contents table by using steps equivalent to the following, as specified in [MS-OXCTABL] section 2.2.2:

1. Send the **RopSetColumns ROP** ([MS-OXCROPS] section 2.2.5.1) with the following properties:
   - **PidTagFolderId** ([MS-OXCFOLD] section 2.2.2.1.6)
   - **PidTagMid** ([MS-OXPROPS] section 2.802)
   - **PidTagMessageClass** ([MS-OXCMSG] section 2.2.1.3)
   - **PidTagViewDescriptorVersion** (section 2.2.6.4)
   - **PidTagViewDescriptorName** (section 2.2.6.2)

2. Send the **RopSortTable ROP** ([MS-OXCROPS] section 2.2.5.2) with a **sort order** that includes the following properties:
   - **PidTagMessageClass**, followed by
- **PidTagViewDescriptorVersion**

- **PidTagViewDescriptorName**

3. Send the **RopFindRow** ROP ([MS-OXCROPS] section 2.2.5.13), searching for a match on the **PidTagMessageClass**, **PidTagViewDescriptorVersion**, and **PidTagViewDescriptorName** properties, as specified in section 2.2.6.

4. Send the **RopQueryRows** ROP ([MS-OXCROPS] section 2.2.5.4) to retrieve a single row and get the **PidTagFolderId** and **PidTagMid** properties of the matching message from the row.

If the message does not exist, the client MUST create the message as specified in [MS-OXCMSG] section 2.2.3.2 by sending the **RopCreateMessage** ROP ([MS-OXCROPS] section 2.2.6.2) on the folder, and passing the Associated flag.

If the client found a matching row, it MUST send the **RopOpenMessage** ROP ([MS-OXCROPS] section 2.2.6.1) to open the message, using the **PidTagFolderId** and **PidTagMid** properties from the table row and setting the ReadWrite flag in the OpenModeFlags field, as specified in [MS-OXCMSG] section 2.2.3.1.

If the client found a matching message or created a new one, it MUST save the serialized settings streams on the properties specified in section 2.2.6 by using steps equivalent to the following, as specified in [MS-OXCPRPT] section 2.2.16:

1. Send the **RopOpenStream** ROP ([MS-OXCROPS] section 2.2.9.1) to open Stream object handles on the **PidTagViewDescriptorBinary** property (section 2.2.6.1) and the **PidTagViewDescriptorStrings** property (section 2.2.6.3).

2. Write the serialized settings by using the **RopWriteStream** ROP ([MS-OXCROPS] section 2.2.9.3).

3. Persist the stream back to the property by sending the **RopRelease** ROP ([MS-OXCROPS] section 2.2.15.3).

4. Persist changes to the message by sending the **RopSaveChangesMessage** ROP ([MS-OXCROPS] section 2.2.6.3).

### 3.1.4.5 Reading Folder Flags

To read folder flags on a folder, as specified in section 2.2.7, the client MUST obtain a handle to the folder using the **RopOpenFolder** ROP ([MS-OXCROPS] section 2.2.4.1), as specified in [MS-OXCFOLD] section 3.1.4.1. The client MUST then retrieve the data for the folder flags by sending the **RopGetPropertiesSpecific** ROP ([MS-OXCROPS] section 2.2.8.3) with the **PidTagExtendedFolderFlags** property ([MS-OXOSRCH] section 2.2.2.1.2) in the **PropertyTags** field of the request buffer ([MS-OXCROPS] section 2.2.8.3.1). The binary data MUST be interpreted as specified in section 2.2.7. Reading and writing each of the subproperties in the folder flags are triggered by different events.

#### 3.1.4.5.1 Reading ExtendedFolderFlags

The client MUST read the bit flags in the **ExtendedFolderFlags** subproperty before it can display the folder in the UI.

#### 3.1.4.5.2 Reading SearchFolderID

The client MUST read the value of the **SearchFolderID** subproperty from every search folder, as specified in [MS-OXOSRCH], in the Finder special folder. Any search folder that has this subproperty is a persistent search folder, and the client SHOULD display the search folder as such in
the UI. Searches with the Finder special folder are further specified in [MS-OXOSRCH] section 3.1.4.1.2. For more details about the Finder special folder, see [MS-OXOSFLD].

3.1.4.5.3 Reading ToDoFolderVersion

The client MUST read the value of the ToDoFolderVersion subproperty from the To-Do Search folder before it displays the contents of that folder. If the To-Do Search folder does not exist, does not contain this subproperty, or does not contain the required value as defined in section 2.2.7, then the client MUST re-create the To-Do Search folder, as specified in [MS-OXOSFLD] section 3.1.4.1.2, or reset the criteria of the search folder.

3.1.4.6 Writing Folder Flags

To write folder flags on a folder, as specified in section 2.2.7, the client MUST obtain a handle to the folder using the RopOpenFolder ROP ([MS-OXCROPS] section 2.2.4.1), as specified in [MS-OXCFOLD] section 3.1.4.1. The client MUST then format the binary data as specified in section 2.2.7. The client MUST then write the data for the folder flags by sending the RopSetProperties ROP ([MS-OXCROPS] section 2.2.8.6) with the PidTagExtendedFolderFlags property ([MS-OXOSRCH] section 2.2.2.1.2) and the value in the PropertyValues field of the RopSetProperties ROP request buffer ([MS-OXCROPS] section 2.2.8.6.1). In each case where the client needs to write a new value of one of the subproperties to the folder, it MUST preserve the values of any other unmodified subproperties on the folder, as specified in section 2.2.7.

3.1.4.6.1 Writing ExtendedFolderFlags

Any time the user changes one of the display options for a folder, the client MUST rewrite the subproperty to the folder.

3.1.4.6.2 Writing SearchFolderID

The client MUST write the SearchFolderID subproperty on any new persistent search folders that it creates.

3.1.4.6.3 Writing ToDoFolderVersion

When the client re-creates or resets the criteria on the To-Do Search folder, it MUST set the ToDoFolderVersion subproperty on the folder.

3.1.4.7 Applying a Category to a Message

A message can have a list of categories stored in the PidNameKeywords property (section 2.2.8.7). To apply a new category to a message, the client MUST read the current value of the PidNameKeywords property from the message and check to see whether the current value already contains the name of the new category. If the current value does not include the name of the new category, the client MUST insert the name of the category in the list and set the new value of PidNameKeywords property on the message.

3.1.4.8 Performing a Conversation Action

The following user actions performed on a conversation SHOULD modify the conversation actions, as specified in section 2.2.8, on a conversation and trigger special handling logic:

- Ignore
- Stop Ignoring
- Move to Folder
- Stop Move
- Add Category
- Remove Category
- Clear All Categories

When the user performs one of these actions on a conversation, the client SHOULD identify all unique values of the `PidTagConversationId` property ([MS-OXOMSG] section 2.2.1.2) on the E-mail objects and do the following for each conversation ID:

1. The client SHOULD locate the conversation action FAI message in the Conversation Actions Settings special folder with bytes 6-21 of the `PidTagConversationIndex` property (section 2.2.8.8) corresponding to the given conversation ID. If no such FAI message exists, proceed to step 4.

2. If the user is performing a Stop Ignoring action and the FAI message does not indicate that there is an Ignore conversation action (as specified in sections 2.2.8.3 and 2.2.8.4), the client SHOULD NOT perform the Stop Ignoring action for this conversation ID.

3. If the user is performing a Stop Move action and the FAI message does not indicate that there is a Move to Folder conversation action (as specified in sections 2.2.8.3 and 2.2.8.4), the client SHOULD NOT perform the Stop Move action for this conversation ID.

4. If no existing FAI message is found, a new FAI message SHOULD be created with the properties specified in section 2.2.8.

5. The client SHOULD locate all E-mail objects on the message store with a `PidTagConversationId` property value matching the given conversation ID. If the operation cannot be done in a timely fashion, the client can proceed as though no E-mail objects were found.

6. The client SHOULD perform the appropriate action on all located E-mail objects, as specified in the second column of the table following this procedure.

7. The client SHOULD set the latest value of the `PidTagMessageDeliveryTime` property ([MS-OXOMSG] section 2.2.3.9) from the located E-mail objects as the `PidLidConversationActionMaxDeliveryTime` property (section 2.2.8.2) on the FAI message. If no messages were found, the `PidLidConversationActionMaxDeliveryTime` property SHOULD be set to 00:00:00 (UTC) April 1, 1601.

8. The client SHOULD set the current time (in UTC) as the `PidLidConversationActionLastAppliedTime` property (section 2.2.8.1) on the FAI message.

9. The client SHOULD perform the appropriate action on the FAI message, as specified in the third column of the table following this procedure.

10. If the server returned a version less than 14.0.324.0, as described in section 1.7, and the `PidLidConversationActionMoveFolderEid` (section 2.2.8.3) and `PidNameKeywords` (section 2.2.8.7) properties are both not set, the client SHOULD delete the FAI message.

Appropriate actions for the client to perform for each user action are specified in the following table.

<table>
<thead>
<tr>
<th>User action</th>
<th>Action to perform on each E-mail object</th>
<th>Action to perform on the FAI message object</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignore</td>
<td>If the E-mail object is not in the Sent Items special folder, move the E-mail object to the Deleted Items special folder.</td>
<td>Set the <code>PidLidConversationActionMoveFolderEid</code> property to an array of size 0. Delete the value of the</td>
</tr>
</tbody>
</table>
User action | Action to perform on each E-mail object | Action to perform on the FAI message object
--- | --- | ---
Stop Ignoring | If the E-mail object is in the Deleted Items special folder, move the E-mail object to the Inbox folder. | Delete the value of PidLidConversationActionMoveFolderEid property and of the PidLidConversationActionMoveStoreEid property.
Move to Folder | If the E-mail object is not in the Sent Items special folder, move the E-mail object to the user-specified folder. | Set the PidLidConversationActionMoveFolderEid property to the EntryID of the user-specified folder. If the user-specified folder is in the same message store as the FAI message, delete the value of the PidLidConversionActionMoveStoreEid property. Otherwise, set the PidLidConversationActionMoveStoreEid property to the EntryID of the user-specified message store.
Stop Move | None. | Delete the value of the PidLidConversationActionMoveFolderEid property and the PidLidConversationActionMoveStoreEid property.
Add Category | Append the user-specified category to the PidNameKeywords property of each E-mail object. | Append the user-specified category to the PidNameKeywords property of the FAI message.
Remove Category | Remove the user-specified category from the PidNameKeywords property of each E-mail object. If this operation would leave the PidNameKeywords property empty, delete the PidNameKeywords property instead. | Remove the user-specified category from the PidNameKeywords property of the FAI message. If this operation would leave the PidNameKeywords property empty, delete the PidNameKeywords property instead.
Clear All Categories | Delete the PidNameKeywords property from each E-mail object. | Delete the value of the PidNameKeywords property from the FAI message.

3.1.4.9 Reading Navigation Shortcuts

Navigation shortcuts, as specified in section 2.2.9, are stored as FAI messages in the Common Views folder, as specified in [MS-OXOSFLD] section 2.2, within a message database. Clients open this folder and process all messages where the value of the PidTagMessageClass property ([MS-OXCMSG] section 2.2.1.3) is "IPM.Microsoft.WunderBar.Link". Clients SHOULD advise for notifications on this folder to process changes to this table by other clients.

3.1.4.10 Writing Navigation Shortcuts

To write settings in a navigation shortcut, as specified in section 2.2.9, the client MUST open the Common Views folder, as specified in [MS-OXOSFLD] section 2.2. The client MUST save the navigation shortcut message in the Common Views folder.

If the client is creating a new navigation shortcut, the client MUST create a new message by sending the RopCreateMessage ROP ([MS-OXCROPS] section 2.2.6.2) on the folder, passing the
**Associated** flag. If the client is modifying an existing navigation shortcut, the client MUST open the message for the navigation shortcut by sending the **RopOpenMessage** ROP ([MS-OXCROPS] section 2.2.6.1) with the **ReadWrite** flag in the **OpenModeFlags** field.

The client MUST then send the **RopSetProperties** ROP ([MS-OXCROPS] section 2.2.8.6) with the relevant properties, as specified in sections 3.1.4.10.1 and 3.1.4.10.2.

The client MUST then send the **RopSaveChangesMessage** ROP ([MS-OXCROPS] section 2.2.6.3) to persist changes to the message.

### 3.1.4.10.1 Group Headers

**Group headers** are shortcuts that group other non-group header shortcuts together. Group headers have the following properties:

- **PidTagWlinkGroupHeaderValue** (section 2.2.9.3)
- **PidTagWlinkSaveStamp** (section 2.2.9.4)
- **PidTagWlinkType** (section 2.2.9.5)
- **PidTagWlinkFlags** (section 2.2.9.6)
- **PidTagWlinkOrdinal** (section 2.2.9.7)
- **PidTagWlinkFolderType** (section 2.2.9.8)
- **PidTagWlinkSection** (section 2.2.9.14)

### 3.1.4.10.2 Shortcuts

Shortcuts have the following properties:

- **PidTagWlinkSaveStamp** (section 2.2.9.4)
- **PidTagWlinkType** (section 2.2.9.5)
- **PidTagWlinkFlags** (section 2.2.9.6)
- **PidTagWlinkOrdinal** (section 2.2.9.7)
- **PidTagWlinkEntryId** (section 2.2.9.8)
- **PidTagWlinkRecordKey** (section 2.2.9.9)
- **PidTagWlinkStoreEntryId** (section 2.2.9.10)
- **PidTagWlinkFolderType** (section 2.2.9.11)
- **PidTagWlinkGroupClsid** (section 2.2.9.12)
- **PidTagWlinkGroupName** (section 2.2.9.13)
- **PidTagWlinkSection** (section 2.2.9.14)

Shortcuts with the value of the **PidTagWlinkSection** property set to **wbsidCalendar** SHOULD have the following properties set:

- **PidTagWlinkCalendarColor** (section 2.2.9.15)
- **PidTagWlinkAddressBookEID** (section 2.2.9.16)
Shortcuts have the following property available to limit the visibility of a shortcut to a single machine:
  - PidTagWlinkClientID (section 2.2.9.18)

3.1.5 Message Processing Events and Sequencing Rules

3.1.5.1 Processing a Conversation Action on Incoming E-mail Objects

When a new E-mail object arrives in a message store, the client SHOULD perform the following steps:

1. The client SHOULD locate the FAI message for the conversation action, as specified in section 2.2.8, in the Conversation Actions Settings special folder with bytes 6-21 of the PidTagConversationIndex property (section 2.2.8.8), corresponding to the PidTagConversationId property (MS-OXOMSG section 2.2.1.2) of the incoming E-mail object. If no FAI message is found, the client SHOULD NOT process any conversation actions on the incoming E-mail object.

2. If the PidLidConversationProcessed property (section 2.2.8.6) is set on the incoming E-mail object, the client SHOULD execute duplicate detection (as specified in section 3.1.5.1.1) and SHOULD NOT process any conversation actions on the incoming E-mail object.

3. The client SHOULD perform the appropriate actions on the incoming E-mail object based on the properties of the FAI message, as specified in the table that follows these steps. Note that more than one property can apply to a given FAI message.

4. If the server returned a version less than 14.0.324.0 and if step 3 did not encounter an error opening the message store, the PidLidConversationProcessed property SHOULD be set to a random number on the incoming E-mail object.

5. The client SHOULD set the current time (in UTC) as the value of the PidLidConversationActionLastAppliedTime property (section 2.2.8.1) on the FAI message.

The conversation actions to be performed on the incoming E-mail object based on the properties of the FAI message are specified in the following table.

<table>
<thead>
<tr>
<th>Properties on the FAI message</th>
<th>Action to perform on the incoming E-mail object</th>
</tr>
</thead>
<tbody>
<tr>
<td>The PidNameKeywords property (section 2.2.8.7) is set.</td>
<td>If the server returned a version less than 14.0.324.0, as described in section 1.7, the categories in the FAI message SHOULD be appended to the PidNameKeywords property of the incoming E-mail object.</td>
</tr>
<tr>
<td>The PidLidConversationActionMoveStoreEid property (section 2.2.8.4) is not set and the value of the PidLidConversationActionMoveFolderEid property (section 2.2.8.3) is not an array of size zero.</td>
<td>If the server returned a version less than 14.0.324.0, the client SHOULD move the incoming E-mail object to the folder with an EntryID equal to the PidLidConversationActionMoveFolderEid property on the FAI message.</td>
</tr>
<tr>
<td>The PidLidConversationActionMoveStoreEid property is not set and the value of the PidLidConversationActionMoveFolderEid property is an array of size zero.</td>
<td>If the server returned a version less than 14.0.324.0, the client SHOULD move the incoming E-mail object to the Deleted Items special folder.</td>
</tr>
<tr>
<td>The PidLidConversationActionMoveStoreEid</td>
<td>(Note that this case is not conditioned on the server)</td>
</tr>
</tbody>
</table>
### Properties on the FAI message

<table>
<thead>
<tr>
<th>Property</th>
<th>Action to perform on the incoming E-mail object</th>
</tr>
</thead>
<tbody>
<tr>
<td>PidLidConversationActionMoveFolderEid property is set and the value of the PidLidConversationActionMoveFolderEid property is not an array of size zero.</td>
<td>The client SHOULD move the incoming E-mail object to the folder and message store identified by the PidLidConversationActionMoveFolderEid and PidLidConversationActionMoveStoreEid properties, respectively.</td>
</tr>
<tr>
<td>PidLidConversationActionMoveStoreEid property is set and the value of the PidLidConversationActionMoveFolderEid property is an array of size zero.</td>
<td>The client SHOULD NOT move the incoming E-mail object.</td>
</tr>
</tbody>
</table>

### 3.1.5.1.1 Duplicate Detection for Conversation Action Processing

**E-mail objects** can be duplicated if two clients process a Move to Folder conversation action, as specified in section 2.2.8, on an incoming E-mail object simultaneously. If the server returned a version less than 14.0.324.0, as described in section 1.7, the client SHOULD perform duplicate detection on incoming E-mail objects.

The client SHOULD compare the PidTagSearchKey property ([MS-OXCPRPT] section 2.2.1.9) on the incoming E-mail object to the PidTagSearchKey property of all recently delivered E-mail objects in the same folder.

If a matching E-mail object was found, the client SHOULD compare the unsigned values of the PidLidConversationProcessed property (section 2.2.8.6) on both E-mail objects and delete the E-mail object with the smaller unsigned value, doing nothing if the unsigned values are equal.

### 3.1.5.2 Processing a Conversation Action on Outgoing E-mail Objects

When the client saves a copy of an outgoing E-mail object, the client SHOULD perform additional processing on the copy of the E-mail object in the Sent Items special folder.

As specified in section 2.2.8.8, the client SHOULD locate the conversation action FAI message, as specified in section 2.2.8, in the conversation actions Settings special folder with bytes 6-21 of the PidTagConversationIndex property (section 2.2.8.8) corresponding to the PidTagConversationId property ([MS-OXOMSG] section 2.2.1.2) of the sent E-mail object. If no FAI message is found, the client SHOULD NOT process any conversation actions on the sent E-mail object.

If the PidNameKeywords property (section 2.2.8.7) is set on the FAI message, the categories in the FAI message SHOULD be appended to the PidNameKeywords property of the sent E-mail object.

### 3.1.6 Timer Events

#### 3.1.6.1 Expiration of Conversation Actions

If the server returned a version less than 14.0.324.0, as described in section 1.7, and the elapsed time between the value of the PidLidConversationActionLastAppliedTime property (section 2.2.8.1) of the FAI message and the current time is greater than a client-specific duration, the client SHOULD delete the FAI message.

### 3.1.7 Other Local Events

None.
3.2 Server Details

Clients operate on folders and messages using the protocols specified in [MS-OXCFOLD] and [MS-OXCMSG]. How a server operates on folders and messages is implementation-dependent, but the results of any such operations MUST be exposed to clients in a manner that is consistent with the Configuration Information Protocol.

3.2.1 Abstract Data Model

None.

3.2.2 Timers

None.

3.2.3 Initialization

None.

3.2.4 Higher-Layer Triggered Events

3.2.4.1 Reading Configuration Data

If multiple configuration data messages, as specified in section 2.2.2, of the same type are found, the configuration data messages are deemed in conflict and MUST be resolved. If no specific conflict resolution algorithm is available, the server SHOULD pick the message with the earliest creation time stored in the PidTagCreationTime property ([MS-OXCMSG] section 2.2.2.3) when opening the configuration data message, and the rest of the configuration data messages SHOULD be deleted from the message store.

3.2.4.1.1 Reading Working Hours

The server is responsible for enforcing permissions that the user grants to the Calendar special folder. If the client tries to access the configuration data message, as specified in section 2.2.2, without the necessary permissions, the server MUST deny access to the message.

3.2.4.1.2 Reading Category List

The server SHOULD limit the size of the XML document that it will parse to 512 kilobytes.

The server is responsible for enforcing permissions that the user grants to the Calendar special folder. If the client tries to access the configuration data message, as specified in section 2.2.2, without the necessary permissions, the server MUST deny access to the message.

3.2.4.2 Writing Configuration Data

If multiple configuration data messages, as specified in section 2.2.2, of the same type are found, the configuration data messages are deemed in conflict and MUST be resolved. If no specific conflict resolution algorithm is available, the server SHOULD pick the message with the earliest modification time stored in the PidTagLastModificationTime property ([MS-OXCMSG] section 2.2.2.2) when saving the configuration data message, and the rest of the configuration data messages SHOULD be deleted from the message store.
3.2.4.3 Reading View Definitions

To read the list of available view definitions for a folder as specified in section 2.2.6, the server MUST enumerate all of the view definition FAI messages in the folders, searching for a match on the PidTagMessageClass property ([MS-OXCMSG] section 2.2.1.3) and the PidTagViewDescriptorVersion property (section 2.2.6.4) as specified in section 2.2.6.

After the server has built the list of view definition messages, it can select one of them by using the PidTagViewDescriptorName property (section 2.2.6.2). After it has selected a view definition message, the server MUST read the settings from the PidTagViewDescriptorBinary property (section 2.2.1.1) and the PidTagViewDescriptorStrings property (section 2.2.6.3) on the message.

3.2.4.4 Reading Folder Flags

Reading and writing each of the subproperties in the folder flags, as specified in section 2.2.7, are triggered by different events.

3.2.4.4.1 Reading ExtendedFolderFlags

The server MUST read the bit flags in the ExtendedFolderFlags subproperty before it can display the folder in the UI.

3.2.4.4.2 Reading SearchFolderID

The server MUST read the value of the SearchFolderID subproperty from every search folder, as specified in [MS-OXOSRCH] section 2.2.4, in the Finder special folder. Any search folder that has this subproperty is a persistent search folder, and the server SHOULD display the search folder as such in the UI. Searches with the Finder special folder are further specified in [MS-OXOSRCH] section 3.1.4.1.2. For more details about the Finder special folder, see [MS-OXOSFLD].

3.2.4.5 Writing Folder Flags

In each case where the server needs to write a new value of one of the subproperties to the folder, it MUST preserve the values of any other unmodified subproperties on the folder, as specified in section 2.2.7.

Folder flags are defined in section 2.2.7.

3.2.4.5.1 Writing ExtendedFolderFlags

Any time the user changes one of the display options for a folder, the server MUST rewrite the ExtendedFolderFlags subproperty to that folder.

3.2.4.5.2 Writing ToDoFolderVersion

When the server re-creates or resets the criteria on the To-Do Search folder, it MUST set the ToDoFolderVersion subproperty on the folder. For more details about the To-Do Search folder, see [MS-OXOSFLD] section 3.1.1.2 and [MS-OXOSFLD] section 3.1.4.1.2.

3.2.4.6 Applying a Category to a Message

The server MUST store any new categories assigned to the PidNameKeywords property (section 2.2.8.7).
3.2.5 Message Processing Events and Sequencing Rules

3.2.5.1 Processing a Change to a Conversation Action FAI Message

As specified in section 2.2.8.8, the client locates all E-mail objects in the message store that have a PidTagConversationId property ([MS-OXOMSG] section 2.2.1.2) matching bytes 6-21 of the PidTagConversationIndex property (section 2.2.8.8) on the FAI message and that have a PidTagMessageDeliveryTime property ([MS-OXOMSG] section 2.2.3.9) value greater than the value of the PidLidConversationActionMaxDeliveryTime property (section 2.2.8.2) on the FAI message.

When the client uploads a change to a conversation action FAI message, as specified in section 2.2.8, the server SHOULD perform the appropriate action on all located E-mail objects, based on the changes to the FAI message, as specified in the following table (more than one action can apply to a given change).

<table>
<thead>
<tr>
<th>FAI message change</th>
<th>Action to apply on the E-mail object</th>
</tr>
</thead>
<tbody>
<tr>
<td>The value of the PidLidConversationActionMoveFolderEid property (section 2.2.8.3) is changed to an array of size 0.</td>
<td>If the E-mail object is not in the Sent Items special folder, move the E-mail object to the Deleted Items special folder.</td>
</tr>
<tr>
<td>The value of the PidLidConversationActionMoveFolderEid property was an array of size 0, now unset.</td>
<td>If the E-mail object is in the Deleted Items special folder, move the E-mail object to the Inbox folder.</td>
</tr>
<tr>
<td>The value of the PidLidConversationActionMoveFolderEid property changed to a non-empty array.</td>
<td>If the PidLidConversationActionMoveStoreEid property (section 2.2.8.4) is unset and if the E-mail object is not in the Sent Items special folder, move the E-mail object to the folder with an EntryID equal to the new PidLidConversationActionMoveFolderEid property on the FAI message. If the PidLidConversationActionMoveStoreEid property is set, do nothing.</td>
</tr>
<tr>
<td>The value of the PidLidConversationActionMoveFolderEid property was a non-empty array, now unset.</td>
<td>None.</td>
</tr>
<tr>
<td>The PidNameKeywords property (section 2.2.8.7) is unset, set, or modified.</td>
<td>For all categories added in this change, append the category to the PidNameKeywords property of each E-mail object. For all categories removed in this change, remove the category from the PidNameKeywords property of each E-mail object.</td>
</tr>
</tbody>
</table>

3.2.5.2 Processing a Conversation Action on Incoming E-mail Objects

When a new E-mail object arrives in a message store, the server SHOULD do the following.

1. As specified in section 2.2.8.8, locate the conversation action FAI message, as specified in section 2.2.8, in the conversation actions Settings special folder with bytes 6-21 of PidTagConversationIndex property (section 2.2.8.8) corresponding to the PidTagConversationId property ([MS-OXOMSG] section 2.2.1.2) of the incoming E-mail object. If no FAI message is found, the server SHOULD NOT process any conversation actions on the incoming E-mail object.
2. Perform the appropriate actions on the incoming E-mail object based on the properties of the FAI message, as specified in the following table (more than one property can apply to a given FAI message).

<table>
<thead>
<tr>
<th>Properties on the FAI message</th>
<th>Action to perform on the incoming E-mail object</th>
</tr>
</thead>
<tbody>
<tr>
<td>The PidNameKeywords property (section 2.2.8.7) is set.</td>
<td>The categories in the FAI message SHOULD be appended to the PidNameKeywords property of the incoming E-mail object.</td>
</tr>
<tr>
<td>The PidLidConversationActionMoveStoreEid property (section 2.2.8.4) is not set and the value of the PidLidConversationActionMoveFolderEid property (section 2.2.8.3) is not an array of size zero.</td>
<td>The server SHOULD move the incoming E-mail object to the folder with an EntryID equal to the PidLidConversationActionMoveFolderEid property on the FAI message.</td>
</tr>
<tr>
<td>The PidLidConversationActionMoveStoreEid property is not set and the value of the PidLidConversationActionMoveFolderEid property is an array of size zero.</td>
<td>The server SHOULD move the incoming E-mail object to the Deleted Items special folder.</td>
</tr>
<tr>
<td>The PidLidConversationActionMoveStoreEid property is set.</td>
<td>The server SHOULD NOT move the incoming E-mail object.</td>
</tr>
</tbody>
</table>

### 3.2.5.3 Processing a Conversation Action on Outgoing E-mail Objects

When the server saves a copy of an outgoing E-mail object, it SHOULD perform the following additional processing on the copy of the E-mail object in the Sent Items special folder.

1. As specified in section 2.2.8.8, the server SHOULD locate the conversation action FAI message, as specified in section 2.2.8, in the conversation actions Settings special folder with bytes 6-21 of the PidTagConversationIndex property (section 2.2.8.8) corresponding to the PidTagConversationId property ([MS-OXOMSG] section 2.2.1.2) of the sent E-mail object. If no FAI message is found, the server SHOULD NOT process any conversation actions on the sent E-mail object.

2. If the PidNameKeywords property (section 2.2.8.7) is set on the FAI message, the categories in the FAI message SHOULD be appended to the PidNameKeywords property of the sent E-mail object.

### 3.2.6 Timer Events

None.

### 3.2.7 Other Local Events

None.
4 Protocol Examples

4.1 Configuration Data

4.1.1 Dictionaries

The following is a sample XML document stored in the PidTagRoamingDictionary property (section 2.2.2.2) on a configuration data message, as described in section 2.2.5.1.

```xml
<?xml version="1.0"?>
<Xml version="1.0">
<UserConfiguration>
<Info version="Outlook.12"/>
<Data>
  <e k="18-piAutoProcess" v="3-True"/>
  <e k="18-piRemindDefault" v="9-15"/>
  <e k="18-piReminderUpgradeTime" v="9-212864507"/>
  <e k="18-OLPrefsVersion" v="9-1"/>
</Data>
</UserConfiguration>
```

4.1.2 Working Hours

The following is a sample XML document stored in the PidTagRoamingXmlStream property (section 2.2.2.3) on a configuration data message, as described in section 2.2.5.2.1.

```xml
<?xml version="1.0"?>
<Root xmlns="WorkingHours.xsd">
  <WorkHoursVersion1>
    <TimeZone>
      <Bias>480</Bias>
      <Standard>
        <Bias>0</Bias>
        <ChangeDate>
          <Time>02:00:00</Time>
          <Date>0000/11/01</Date>
          <DayOfWeek>0</DayOfWeek>
        </ChangeDate>
        <DaylightSavings>
          <Bias>-60</Bias>
          <ChangeDate>
            <Time>02:00:00</Time>
            <Date>0000/03/02</Date>
            <DayOfWeek>0</DayOfWeek>
          </ChangeDate>
        </DaylightSavings>
        <Name>Pacific Standard Time</Name>
      </Standard>
      <TimeZone>
        <TimeSlot>
          <Start>09:00:00</Start>
          <End>17:00:00</End>
        </TimeSlot>
        <WorkDays>Monday Tuesday Wednesday Thursday Friday</WorkDays>
      </TimeZone>
    </TimeZone>
  </WorkHoursVersion1>
</Root>
```
4.1.3 Category List

The following is a sample XML document stored in the PidTagRoamingXmlStream property (section 2.2.2.3) on a configuration data message, as described in section 2.2.5.2.2.

```xml
<categories default="Red Category"
lastSavedSession="5"
lastSavedTime="2007-12-28T03:01:50.429"
xmlns="CategoryList.xsd">
<category name="Red Category"
color="0"
keyboardShortcut="0"
usageCount="7"
lastTimeUsedNotes="1601-01-01T00:00:00.000"
lastTimeUsedJournal="1601-01-01T00:00:00.000"
lastTimeUsedContacts="1601-01-01T00:00:00.000"
lastTimeUsedTasks="1601-01-01T00:00:00.000"
lastTimeUsedCalendar="2007-11-28T20:05:04.703"
lastTimeUsedMail="1601-01-01T00:00:00.000"
lastTimeUsed="2007-11-28T20:05:04.703"
lastSessionUsed="3"
guid="{2B7FC69C-7046-44A2-8FF3-007D7467DC82}"/>
<category name="Blue Category"
color="7"
keyboardShortcut="0"
usageCount="6"
lastTimeUsedNotes="1601-01-01T00:00:00.000"
lastTimeUsedJournal="1601-01-01T00:00:00.000"
lastTimeUsedContacts="1601-01-01T00:00:00.000"
lastTimeUsedTasks="1601-01-01T00:00:00.000"
lastTimeUsedCalendar="2007-12-28T03:00:07.102"
lastTimeUsedMail="1601-01-01T00:00:00.000"
lastTimeUsed="2007-12-28T03:00:07.102"
lastSessionUsed="5"
guid="{33A1EAEE-8E5E-4912-9580-69FC764F3A5}"/>
<category name="Purple Category"
color="8"
keyboardShortcut="0"
usageCount="7"
lastTimeUsedNotes="1601-01-01T00:00:00.000"
lastTimeUsedJournal="1601-01-01T00:00:00.000"
lastTimeUsedContacts="1601-01-01T00:00:00.000"
lastTimeUsedTasks="1601-01-01T00:00:00.000"
lastTimeUsedCalendar="2007-11-28T20:03:06.018"
lastTimeUsedMail="1601-01-01T00:00:00.000"
lastTimeUsed="2007-11-28T20:03:06.018"
lastSessionUsed="3"
guid="{58AB89B9-0B05-428A-BBD2-F1C9396C144}"/>
<category name="Green Category"
color="4"
keyboardShortcut="0"
usageCount="7"
lastTimeUsedNotes="1601-01-01T00:00:00.000"
lastTimeUsedJournal="1601-01-01T00:00:00.000"
lastTimeUsedContacts="1601-01-01T00:00:00.000"
lastTimeUsedTasks="1601-01-01T00:00:00.000"
lastTimeUsedCalendar="2007-11-28T20:05:19.468"
lastTimeUsedMail="1601-01-01T00:00:00.000"
lastTimeUsed="2007-11-28T20:05:19.468"
lastSessionUsed="3"
guid="{B60A1A8C-EC3-4573-9CD8-842C284DCA59}"/>
<category name="Orange Category"
color="1"
keyboardShortcut="0"
usageCount="2"
lastTimeUsedNotes="1601-01-01T00:00:00.000"
lastTimeUsedJournal="1601-01-01T00:00:00.000"
```
4.2 View Definitions

In this example, a client creates a new table view that includes the following 10 columns:

- Importance
- Reminder
- Icon
- Flag Status
- Attachment
- From
- Subject
- Received
- Size
- Categories

When this new view is applied and transported to the server, the \texttt{PidTagViewDescriptorBinary} property (section 2.2.6.1) stores the column description data and the \texttt{PidTagViewDescriptorStrings} property (section 2.2.6.3) stores the column headers.
4.2.1 PidTagViewDescriptorBinary

The following is the value of the **PidTagViewDescriptorBinary** property (section 2.2.6.1) that represents the view described in section 4.2.

```
0000: 00 00 00 00 00 00 00 00
0010: 00 00 00 00 08 00 00 00
0020: 00 00 00 00 00 00 00 00
0030: 00 00 00 00 00 00 00 00
0040: 00 00 00 00 00 00 00 00
0050: 00 00 00 00 00 00 00 00
0060: 00 00 00 00 00 00 00 00
0070: 00 00 00 00 00 00 00 00
0080: 00 00 00 00 00 00 00 00
0090: 40 00 00 00 00 00 00 00
00a0: 00 00 00 00 00 00 00 00
00b0: C0 00 00 00 00 00 00 00
00c0: 00 00 00 00 00 00 00 00
00d0: 00 00 00 00 00 00 00 00
00e0: 12 00 00 00 00 00 00 00
00f0: 00 00 00 00 00 00 00 00
0100: 0B 00 00 00 00 00 00 00
0110: 00 00 00 00 00 00 00 00
0120: 1B 00 00 00 00 00 00 00
0130: 00 00 00 00 00 00 00 00
0140: 00 00 00 00 00 00 00 00
0150: 00 00 00 00 00 00 00 00
0160: 00 00 00 00 00 00 00 00
0170: 10 00 00 00 00 00 00 00
0180: 00 00 00 00 00 00 00 00
0190: 03 00 00 00 00 00 00 00
01a0: 00 00 00 00 00 00 00 00
01b0: 08 00 00 00 00 00 00 00
01c0: 00 00 00 00 00 00 00 00
01d0: 01 00 00 00 00 00 00 00
01e0: 00 00 00 00 00 00 00 00
01f0: 79 00 00 00 00 00 00 00
```

The first 8 bytes are reserved:

```
0000: 00 00 00 00 00 00 00 00
```

The next four bytes specify the **Version** field. After the **Version** field is the value for the **ulFlags** field.

```
0008: 08 00 00 00 02 00 00 00
```

**Version**: 0x00000008

**ulFlags**: 0x00000002 (VDF_SORTDESCENDING)

The value of this **ulFlags** field means that the view is sorted by descending order.

Next are the **pres** and **cvcd** fields.

```
0010: 00 00 00 00 00 00 00 00
```

The value 0x0B in the cvcd field means 11 columns (including the blank column) are stored in this packet.

Next are the ivcdSort and cCat fields.

0018: 08 00 00 00 00 00 00 00

ivcdSort: 0x08

These values for the ivcdSort and cCat fields mean that the view is sorted by column "Received" and the sort order is descending (as specified by the ulFlags field).

cCat is zero; this means that the table is not grouped.

Next is the ulCatSort field:

0020: 00 00 00 00

ulCatSort: 0x0

Because the table is not grouped, the value of the ulCatSort field is zero.

The next 24 bytes are reserved.

0024-003b

reserved

All column information starts from address 003C. Because this view has not defined restriction, the buffer does not store any restriction values.

4.2.1.1 Blank Column

The first column is Blank column. The column uses buffer address between 003C and 005F.

PropertyType: 0x0001

0030: 01 00 04 00

PropertyID: 0x0004

0030: 01 00
4.2.1.2 Column "Importance"

Next in the buffer is the description of the "Importance" column.

PropertyType: 0x0003

PropertyID: 0x0017 (PidTagImportance ([MS-OXCMSG] section 2.2.1.11))
4.2.1.3 Column "Reminder"

Next in the buffer is the description of the "Reminder" column.

```
0080: 0B 00 03 85-12 00 00 00 00 00 00 00 00
0090: 40 3F 00 00 00 00 00 00 00-00 00 00 00 34 01 9A 11
00a0: 00 00 00 00 03 85 00 00-08 20 06 00 00 00 00 00
00b0: C0 00 00 00 00 00 00 00 00 46
```

PropertyType: 0x000B
PropertyID: 0x8503 (PidLidReminderSet ([MS-OXORMDR] section 2.2.1.1))

0080: 03 85

Cx: 0x00000012

0080: 12 00 00 00

Reserved1: 0x00000000

0080: 00 00 00 00

Flags: 0x00003F40, or (VCDF_NAMEDPROP | VCDF_SORTDESCENDING | VCDF-RCOLUMNSDLG | VCDF_SORTDLG | VCDF_GROUPDLG | VCDF_MOVEABLE | VCDF_COLUMNSDLG)

0090: 40 3F 00 00

Reserved2: 0x119A0134000000000000000000000000

0090: 00 00 00 00 00 00 00 00 34 01 9A 11

Kind: 0x00000000

00a0: 00 00 00 00

ID: 0x00008503

00a0: 03 85 00 00

Guid: {00062008-0000-0000-C000-000000000046}

00a0: 08 20 06 00 00 00 00 00 00 00 00 00 00 01 9A 11

4.2.1.4 Column "Icon"

Next in the buffer is the description of the "Icon" column.

00b0: 1E 00 1A 00 12 00 00 00
00c0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00d0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00e0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00f0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
PropertyType: 001E
PropertyID: 0x001A (PidTagMessageClass ([MS-OXCMSG] section 2.2.1.3))
Cx: 0x00000012
Flags: 0x0000270A
Kind: 0x00000000
ID: 0x00000001A

### 4.2.1.5 Column "Flag Status"
Next in the buffer is the description of the "Flag Status" column.

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>cx</td>
<td>0x00000012</td>
</tr>
<tr>
<td>flags</td>
<td>0x0000270A</td>
</tr>
<tr>
<td>kind</td>
<td>0x00000000</td>
</tr>
<tr>
<td>id</td>
<td>0x00000001A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Offset</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>00d0</td>
<td>03 00 90 10</td>
</tr>
<tr>
<td>00e0</td>
<td>12 00 00 00 00 00 00 00-4A 2F 00 00 00 00 00 00</td>
</tr>
<tr>
<td>00f0</td>
<td>00 00 00 00 00 00 00 00 00-00 00 00 00 90 10 00 00</td>
</tr>
</tbody>
</table>

PropertyType: 0x0003
PropertyID: 0x1090 (PidTagFlagStatus ([MS-OXOFLAG] section 2.2.1.1))
Cx: 0x00000012
Flags: 0x00002F4A
Kind: 0x00000000
ID: 0x00001090

### 4.2.1.6 Column "Attachment"
Next in the buffer is the description of the "Attachment" column.

<table>
<thead>
<tr>
<th>Offset</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100</td>
<td>0B 00 1B 0E 12 00 00 00-00 00 00 00 4A 2F 00 00</td>
</tr>
<tr>
<td>0110</td>
<td>00 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00</td>
</tr>
<tr>
<td>0120</td>
<td>1B 0E 00 00</td>
</tr>
</tbody>
</table>

PropertyType: 0x000B
PropertyID: 0x0E1B (PidTagHasAttachments ([MS-OXCMSG] section 2.2.1.2))
Cx: 0x00000012
Flags: 0x00002F4A
Kind: 0x00000000
ID: 0x00000E1B

### 4.2.1.7 Column "From"
Next in the buffer is the description of the "From" column.

<table>
<thead>
<tr>
<th>Offset</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0120</td>
<td>1E 00 42 00-0C 00 00 00 00 00 00 00 00 00 00 00</td>
</tr>
<tr>
<td>0130</td>
<td>00 2F 00 00 00 00 00 00 00-00 00 00 00 00 00 00</td>
</tr>
</tbody>
</table>
PropertyType: 0x001E
PropertyID: 0x0042 (PidTagSentRepresentingName ([MS-OXOMSG] section 2.1.57))
Cx: 0x0000000C
Flags: 0x00002F00
Kind: 0x00000000
ID: 0x00000042

4.2.1.8 Column "Subject"
Next in the buffer is the description of the "Subject" column.

PropertyType: 0x001E
PropertyID: 0x0037 (PidTagSubject (section 2.2.8.10))
Cx: 0x00000011
Flags: 0x00002F00
Kind: 0x00000000
ID: 0x00000037

4.2.1.9 Column "Received"
Next in the buffer is the description of column "Received".

PropertyType: 0x0040
PropertyID: 0x0E06 (PidTagMessageDeliveryTime ([MS-OXOMSG] section 2.2.3.9))
Cx: 0x00000010
Flags: 0x00002F40
Kind: 0x00000000
ID: 0x000000E6
4.2.1.10 Column "Size"

Next in the buffer is the description of the "Size" column.

```
0190: 03 00 08 0E 0C 00 00 00-00 00 00 00 40 27 00 00
01a0: 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
01b0: 08 0E 00 00
```

PropertyType: 0x0003

PropertyID: 0x0E08 (PidTagMessageSize ([MS-OXCOLD] section 2.2.2.1.10))

Cx: 0x0000000C

Flags: 0x00002740

Kind: 0x00000000

ID: 0x00000E08

4.2.1.11 Column "Categories"

Next in the buffer is the description of the "categories" column. This is a column that has the named property PidNameKeywords (section 2.2.8.7).

```
01b0:               1E 10 00 00-12 00 00 00 00 00 00 00 00
01c0: 20 7B 00 00 00 00 00 00-00 00 00 00 34 01 9A 11
01d0: 01 00 00 00 64 A7 22 00-29 03 02 00 00 00 00 00
01e0: C0 00 00 00 00 00 00 00 46-12 00 00 00 4B 00 65 00
01f0: 79 00 77 00 6F 00 72 00-64 00 73 00 00 00
```

PropertyType: 0x101E

PropertyID: 0x0000

Cx: 0x00000012

Flags: 0x00007B20

Kind: 0x00000001

Guid: {00020329-0000-0000-C000-000000000046}

BufferLength: 0x00000012

Buffer: "Keywords"

4.2.2 PidTagViewDescriptorStrings

In this example, the PidTagViewDescriptorStrings property (section 2.2.6.3) contains all the column headers delimited by "\n".

```
\nImportance\nReminder\nIcon\nFlag
Status\nAttachment\nFrom\nSubject\nReceived\nSize\nCategories\n```

Note The value of the PidTagViewDescriptorStrings property begins with "\n" because the first string value in this example is an empty string.
4.3 Conversation Actions

4.3.1 A Categorized and Moved Conversation Action

In this example, a user has a conversation entitled "Solidifying our proposal to Fabrikam, Inc." in which the last E-mail object was delivered at 3:31 PM on 2/17/2009, Pacific Standard Time (11:31 PM on 2/17/2009, UTC). The E-mail objects in this conversation share the same value of the PidTagConversationId property ([MS-OXOMSG] section 2.2.1.2).

0000: B7 A2 B5 C4 AA 65 1C F2-D3 8C 62 8C 0E AF 56 C4

Around 3:50 PM, the user adds the categories "Fabrikam" and "Business Proposals" to the conversation. At 3:51 PM, the user moves the conversation to a folder, "FY09 Archive", that has the following EntryID.

0000: 00 00 00 00 0C 99 F4 ED-A2 F1 E4 41 B1 5B 9B 25
0010: 10 91 3E 9D 02 81 00 00

The resulting FAI message in the conversation action Settings special folder will have the following properties.

<table>
<thead>
<tr>
<th>Property name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PidLidConversationActionLastAppliedTime (section 2.2.8.1)</td>
<td>23:51:11 2/17/2009</td>
</tr>
<tr>
<td>PidLidConversationActionMaxDeliveryTime (section 2.2.8.2)</td>
<td>23:31:42 2/17/2009</td>
</tr>
<tr>
<td>PidLidConversationActionMoveFolderEid (section 2.2.8.3)</td>
<td>0000: 00 00 00 00 0C 99 F4 ED-A2 F1 E4 41 B1 5B 9B 25 0010: 10 91 3E 9D 02 81 00 00</td>
</tr>
<tr>
<td>PidLidConversationActionMoveStoreEid (section 2.2.8.4)</td>
<td>0000: 00 00 00 00 38 A1 BB 10-05 E5 10 1A A1 BB 08 00 0010: 2B 2A 56 C2 00 00 6D 73-70 73 74 2E 64 6C 6C 00</td>
</tr>
<tr>
<td>Property name</td>
<td>Value</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Property name</strong></td>
<td><strong>Value</strong></td>
</tr>
<tr>
<td>0020: 00 00 00 00 4E 49 54 41-F9 BF B8 01 00 AA 00 37</td>
<td></td>
</tr>
<tr>
<td>0030: D9 6E 00 00 00 00 43 00-3A 00 5C 00 44 00 6F 00</td>
<td></td>
</tr>
<tr>
<td>0040: 63 00 75 00 6D 00 65 00-6E 00 74 00 73 00 20 00</td>
<td></td>
</tr>
<tr>
<td>0050: 61 00 6E 00 64 00 20 00-53 00 65 00 74 00 74 00</td>
<td></td>
</tr>
<tr>
<td>0060: 69 00 6E 00 67 00 73 00-5C 00 61 00 6A 00 61 00</td>
<td></td>
</tr>
<tr>
<td>0070: 6D 00 65 00 73 00 5C 00-4C 00 6F 00 63 00 61 00</td>
<td></td>
</tr>
<tr>
<td>0080: 6C 00 20 00 53 00 65 00-74 00 74 00 69 00 6E 00</td>
<td></td>
</tr>
<tr>
<td>0090: 67 00 73 00 5C 00 41 00-70 00 70 00 6C 00 69 00</td>
<td></td>
</tr>
<tr>
<td>00a0: 63 00 61 00 74 00 69 00-6F 00 6E 00 20 00 44 00</td>
<td></td>
</tr>
<tr>
<td>00b0: 61 00 74 00 61 00 5C 00-4D 00 69 00 63 00 72 00</td>
<td></td>
</tr>
<tr>
<td>00c0: 6F 00 73 00 6F 00 66 00-74 00 5C 00 4F 00 75 00</td>
<td></td>
</tr>
<tr>
<td>00d0: 74 00 6C 00 6F 00 6F 00-6B 00 5C 00 41 00 72 00</td>
<td></td>
</tr>
<tr>
<td>00e0: 63 00 68 00 69 00 76 00-65 00 64 00 20 00 4D 00</td>
<td></td>
</tr>
<tr>
<td>00f0: 61 00 69 00 6C 00 2E 00-70 00 73 00 74 00 00 00</td>
<td></td>
</tr>
<tr>
<td><strong>PidLidConversationActionVersion</strong> (section 2.2.8.5)</td>
<td>0x003CCCCC</td>
</tr>
<tr>
<td><strong>PidNameKeywords</strong> (section 2.2.8.7)</td>
<td>{&quot;Fabrikam&quot;, &quot;Business Proposals&quot;}</td>
</tr>
<tr>
<td><strong>PidTagConversationIndex</strong> (section 2.2.8.8)</td>
<td>0000: 01 00 00 00 00 00 B7 A2- B5 C4 AA 65 1C F2 D3 8C</td>
</tr>
<tr>
<td></td>
<td>0000: 62 8C 0E AF 56 C4</td>
</tr>
<tr>
<td><strong>PidTagMessageClass</strong> (section 2.2.8.9)</td>
<td>&quot;IPM.ConversationAction&quot;</td>
</tr>
<tr>
<td><strong>PidTagSubject</strong> (section 2.2.8.10)</td>
<td>&quot;Conv.Action: Solidifying our proposal to Fabrikam, Inc.&quot;</td>
</tr>
</tbody>
</table>

### 4.4 Navigation Shortcut

#### 4.4.1 Group Header

Ryan Gregg creates a new group header named "My Work Calendars" to group his shortcuts in his e-mail client application.

The client sends a RopCreateMessage ROP request ([MS-OXCROPS] section 2.2.6.2) that has a value for the FolderId field set to the ID of the Common Views folder and the Associated flag set to 1 and then waits for the server to respond. The server response contains a handle to the Message object.
The client uses the Session ID 0x12345678 (generated at random on initialization) and generates a **GUID** for this shortcut: 5BA943D8DAAA462CA63E9136F65C8681.

The client then sends a **RopSetProperties** ROP request ([MS-OXCROPS] section 2.2.8.6) to set the following properties. The property data types are all defined in ([MS-OXCDATA] section 2.11.1).

<table>
<thead>
<tr>
<th>Property name</th>
<th>PropertyID</th>
<th>Property type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PidTagMessageClass ([MS-OXCMSG] section 2.2.1.3)</td>
<td>0x001A</td>
<td>0x001F (PtypString)</td>
<td>&quot;IPM.Microsoft.WunderBar.Link&quot;</td>
</tr>
<tr>
<td>PidTagNormalizedSubject (section 2.2.9.2)</td>
<td>0x0E1D</td>
<td>0x001F (PtypString)</td>
<td>&quot;My Work Calendars&quot;</td>
</tr>
<tr>
<td>PidTagWlinkGroupHeaderID (section 2.2.9.3)</td>
<td>0x6842</td>
<td>0x0048 (PtypGuid)</td>
<td>5BA943D8DAAA462CA63E9136F65C8681</td>
</tr>
<tr>
<td>PidTagWlinkSaveStamp (section 2.2.9.4)</td>
<td>0x6847</td>
<td>0x0003 (PtypInteger32)</td>
<td>0x12345678</td>
</tr>
<tr>
<td>PidTagWlinkType (section 2.2.9.5)</td>
<td>0x6849</td>
<td>0x0003 (PtypInteger32)</td>
<td>0x00000004</td>
</tr>
<tr>
<td>PidTagWlinkFlags (section 2.2.9.6)</td>
<td>0x684A</td>
<td>0x0003 (PtypInteger32)</td>
<td>0x00000000</td>
</tr>
<tr>
<td>PidTagWlinkOrdinal (section 2.2.9.7)</td>
<td>0x684B</td>
<td>0x0102 (PtypBinary)</td>
<td>0x80</td>
</tr>
<tr>
<td>PidTagWlinkFolderType (section 2.2.9.11)</td>
<td>0x684F</td>
<td>0x0048 (PtypGuid)</td>
<td>02780600000000000000 C000000000000046</td>
</tr>
<tr>
<td>PidTagWlinkSection (section 2.2.9.14)</td>
<td>0x6852</td>
<td>0x0003 (PtypInteger32)</td>
<td>0x000000003</td>
</tr>
</tbody>
</table>

The client then sends a **RopSaveChangesMessage** ROP request ([MS-OXCROPS] section 2.2.6.3) to persist the object on the server, and a **RopRelease** ROP request ([MS-OXCROPS] section 2.2.15.3) to release the object.

### 4.4.2 Navigation Shortcut

Ryan creates a new shortcut to his folder "Meetings" and wants to group it under the new "My Work Calendars" group he created in the example in section 4.4.1.

The client sends a **RopCreateMessage** ROP request ([MS-OXCROPS] section 2.2.6.2) that has the FolderId set to the ID of the Common Views folder and the Associated flag set to 1 and then waits for the server to respond. The server response contains a handle to the Message object.

The client then sends a **RopSetProperties** ROP request ([MS-OXCROPS] section 2.2.8.6) to set the following properties. The property data types are all defined in ([MS-OXCDATA] section 2.11.1).

<table>
<thead>
<tr>
<th>Property name</th>
<th>PropertyID</th>
<th>Property type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PidTagMessageClass ([MS-OXCMSG] section 2.2.1.3)</td>
<td>0x001A</td>
<td>0x001F (PtypString)</td>
<td>&quot;IPM.Microsoft.WunderBar.Link&quot;</td>
</tr>
<tr>
<td>PidTagNormalizedSubject (section 2.2.9.2)</td>
<td>0x0E1D</td>
<td>0x001F (PtypString)</td>
<td>&quot;Meetings&quot;</td>
</tr>
<tr>
<td>PidTagWlinkSaveStamp (section 2.2.9.4)</td>
<td>0x6847</td>
<td>0x0003 (PtypInteger32)</td>
<td>0x12345678</td>
</tr>
<tr>
<td>Property name</td>
<td>PropertyID</td>
<td>Property type</td>
<td>Value</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------</td>
<td>----------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>PidTagWlinkType (section 2.2.9.5)</td>
<td>0x6849</td>
<td>0x0003 (PtypInteger32)</td>
<td>0x00000000</td>
</tr>
<tr>
<td>PidTagWlinkFlags (section 2.2.9.6)</td>
<td>0x684A</td>
<td>0x0003 (PtypInteger32)</td>
<td>0x00000000</td>
</tr>
<tr>
<td>PidTagWlinkOrdinal (section 2.2.9.7)</td>
<td>0x684B</td>
<td>0x0102 (PtypBinary)</td>
<td>0x80</td>
</tr>
<tr>
<td>PidTagWlinkEntryId (section 2.2.9.8)</td>
<td>0x684C</td>
<td>0x0102 (PtypBinary)</td>
<td>See explanation following this table</td>
</tr>
<tr>
<td>PidTagWlinkRecordKey (section 2.2.9.9)</td>
<td>0x684D</td>
<td>0x0102 (PtypBinary)</td>
<td>See explanation following this table</td>
</tr>
<tr>
<td>PidTagWlinkStoreEntryId (section 2.2.9.10)</td>
<td>0x684E</td>
<td>0x0102 (PtypBinary)</td>
<td>See explanation following this table</td>
</tr>
<tr>
<td>PidTagWlinkFolderType (section 2.2.9.11)</td>
<td>0x684F</td>
<td>0x0048 (PtypGuid)</td>
<td>027806000000000000 C000000000000046</td>
</tr>
<tr>
<td>PidTagWlinkGroupClsid (section 2.2.9.12)</td>
<td>0x6850</td>
<td>0x0048 (PtypGuid)</td>
<td>5BA943D8DAAA462C A63E9136F65C8681</td>
</tr>
<tr>
<td>PidTagWlinkGroupName (section 2.2.9.13)</td>
<td>0x6851</td>
<td>0x001F (PtypString)</td>
<td>&quot;My Work Calendars&quot;</td>
</tr>
<tr>
<td>PidTagWlinkSection (section 2.2.9.14)</td>
<td>0x6852</td>
<td>0x0003 (PtypInteger32)</td>
<td>0x00000003</td>
</tr>
</tbody>
</table>

The values of the PidTagWlinkEntryId, PidTagWlinkRecordKey, and PidTagWlinkStoreEntryId properties are copied directly from the corresponding properties of the actual Calendar folder as described in section 2.2.9.8, section 2.2.9.9, and section 2.2.9.10.

The client then sends a RopSaveChangesMessage ROP request ([MS-OXCROPS] section 2.2.6.3) to persist the object on the server and a RopRelease ROP request ([MS-OXCROPS] section 2.2.15.3) to release the object.
5 Security

5.1 Security Considerations for Implementers

There are no special security considerations specific to the Configuration Information protocol. General security considerations pertaining to the underlying transport apply and are described in [MS-OXCMSG].

5.2 Index of Security Parameters

None.
Appendix A: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include updates to those products.

- Microsoft Exchange Server 2003
- Microsoft Exchange Server 2007
- Microsoft Exchange Server 2010
- Microsoft Exchange Server 2013
- Microsoft Exchange Server 2016
- Microsoft Exchange Server 2019
- Microsoft Office Outlook 2003
- Microsoft Office Outlook 2007
- Microsoft Outlook 2010
- Microsoft Outlook 2013
- Microsoft Outlook 2016
- Microsoft Outlook 2019
- Microsoft Outlook 2021
- Microsoft Outlook 2024 Preview

Exceptions, if any, are noted in this section. If an update version, service pack or Knowledge Base (KB) number appears with a product name, the behavior changed in that update. The new behavior also applies to subsequent updates unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

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

<1> Section 2.2.3: When Office Outlook 2007, Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 are in Cached Mode and the local cached copy of the category list is in conflict with the copy on the server, Office Outlook 2007, Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 do not escape the single quote character.

<2> Section 2.2.5: Exchange 2003 and Office Outlook 2003 do not read or write configuration data FAI messages.


<4> Section 2.2.5.1.1: Office Outlook 2003 and Office Outlook 2007 do not support the piAutoDeleteReceipts property.
<5> **Section 2.2.5.2.1**: Exchange 2003, Exchange 2007, Office Outlook 2003, and Office Outlook 2007 neither read nor write the **Name** element.

<6> **Section 2.2.5.2.2**: Office Outlook 2007, Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 ignore any digits after the first 3, which means that the maximum precision of elements of the **dateTimeRestrictedType** is milliseconds.

<7> **Section 2.2.5.2.2**: This **restriction** on the category name is supported only by Exchange 2003.

<8> **Section 2.2.5.2.2**: Exchange 2003 does not use the **keyboardShortcut** attribute data.

<9> **Section 2.2.5.2.2**: Office Outlook 2007, Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 write the usage count as indicated. However, the most frequently used list is not implemented, and the **usageCount** attribute is not used.

<10> **Section 2.2.5.2.2**: Office Outlook 2007, Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 will write the last session that this **category** was applied or changed by the user, but this value is not used.

<11> **Section 2.2.5.2.2**: Exchange 2003 and Microsoft Office Outlook 2003 Service Pack 3 (SP3) do not support renaming categories.

<12> **Section 2.2.5.2.2**: Exchange 2003, Exchange 2007, Office Outlook 2003, and Office Outlook 2007 do not store the settings defined in this section.

<13> **Section 2.2.5.2.2**: Exchange 2010, Exchange 2013, Exchange 2016, and Exchange 2019 set the value of the **OptedInto** attribute to "False".

<14> **Section 2.2.5.2.2**: Exchange 2010, Exchange 2013, Exchange 2016, and Exchange 2019 do not store the **OptedInto** attribute to "False".

<15> **Section 2.2.6**: View definitions are used only by Office Outlook 2003 and Office Outlook 2007.

<16> **Section 2.2.6.1**: Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 do not read or write the **PidTagViewDescriptorBinary** property ([MS-OXPROPS] section 2.1056).

<17> **Section 2.2.6.2**: Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 do not read or write the **PidTagViewDescriptorName** property.

<18> **Section 2.2.6.3**: Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 do not read or write the **PidTagViewDescriptorStrings** property ([MS-OXPROPS] section 2.1058).

<19> **Section 2.2.6.4**: Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 do not read or write the **PidTagViewDescriptorVersion** property.

<20> **Section 2.2.7.1.2**: Exchange 2003 and Office Outlook 2003 do not support displaying the policy description.

<21> **Section 2.2.8**: Conversation actions are not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.

<22> **Section 2.2.8.1**: The **PidLidConversationActionLastAppliedTime** property is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.

<23> **Section 2.2.8.2**: The **PidLidConversationActionMaxDeliveryTime** property is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.

<24> **Section 2.2.8.3**: The **PidLidConversationActionMoveFolderEid** property is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.
<25> **Section 2.2.8.4:** The **PidLidConversationActionMoveStoreEid** property is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.

<26> **Section 2.2.8.5:** Exchange 2003, Exchange 2007, Office Outlook 2003, and Office Outlook 2007 do not set the **PidLidConversationActionVersion** property and ignore it if it is set.

<27> **Section 2.2.8.7:** Exchange 2003, Exchange 2007, Office Outlook 2003, and Office Outlook 2007 do not set the **PidNameKeywords** property for conversation actions.

<28> **Section 2.2.8.8:** Exchange 2003, Exchange 2007, Office Outlook 2003, and Office Outlook 2007 do not set the **PidTagConversationIndex** property for conversation actions.

<29> **Section 2.2.8.9:** Exchange 2003, Exchange 2007, Office Outlook 2003, and Office Outlook 2007 do not set the **PidTagMessageClass** property to "IPM.ConversationAction".

<30> **Section 2.2.8.10:** Exchange 2003, Exchange 2007, Office Outlook 2003, and Office Outlook 2007 do not set the **PidTagSubject** property for conversation actions.

<31> **Section 2.2.9:** Navigation shortcuts are not supported by Exchange 2003, Exchange 2007, or Office Outlook 2003.

<32> **Section 2.2.9.16:** The **PidTagWlinkAddressBookEID** property is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007. Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 set the **PidTagWlinkAddressBookEID** property on calendar shortcuts only.

<33> **Section 2.2.9.17:** The **PidTagWlinkAddressBookStoreEID** property is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007. Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 set the **PidTagWlinkAddressBookStoreEID** property on calendar shortcuts only.

<34> **Section 2.2.9.18:** The shortcut behavior is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.

<35> **Section 2.2.9.19:** The **PidTagWlinkROGroupType** property is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.

<36> **Section 3.1.4.1.2:** Office Outlook 2007, Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 use the default values of working from 8 A.M. to 5 P.M., Monday – Friday, in the user’s current system time zone.

<37> **Section 3.1.4.8:** Performing conversation actions is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.

<38> **Section 3.1.4.8:** Exchange 2003, Exchange 2007, Office Outlook 2003, and Office Outlook 2007 do not support finding matching E-mail objects related to a conversation. When connected to an online-mode server and performing an Ignore, Stop Ignoring, Move to Folder, or Stop Move conversation action, Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 will not attempt to locate matching E-mail objects. For all other scenarios, Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 will attempt to locate matching E-mail objects.

<39> **Section 3.1.4.10.2:** Setting the properties specified in this section is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007. Whether Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 set the **PidTagWlinkCalendarColor** property (section 2.2.9.15), the **PidTagWlinkAddressBookEID** property (section 2.2.9.16), the **PidTagWlinkAddressBookStoreEID** property (section 2.2.9.17), and the **PidTagWlinkROGroupType** property (section 2.2.9.19) depends upon configuration or administrative settings.
<40> Section 3.1.5.1: Performing conversation actions on incoming messages is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.

<41> Section 3.1.5.1.1: Duplicate detection on incoming E-mail objects is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.

<42> Section 3.1.5.1.1: Comparing the value of the PidTagSearchKey property ([MS-OXPROPS] section 2.998) on incoming E-mail objects is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007. Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 maintain a cache of all E-mail objects received in the past 15 minutes.

<43> Section 3.1.5.2: Performing additional processing on the copy of the E-mail object in the Sent Items special folder is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.

<44> Section 3.1.6.1: Office Outlook 2003, Office Outlook 2007, Outlook 2010, Outlook 2013, Outlook 2016, and Outlook 2019 have the default duration of 336 hours (14 days).


<47> Section 3.2.5.1: Processing in response to a client uploading changes to a conversation action FAI message is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.

<48> Section 3.2.5.2: Exchange 2003, Exchange 2007, Office Outlook 2003, and Office Outlook 2007 do not support processing conversation actions on incoming E-mail objects.

<49> Section 3.2.5.3: The additional processing on the copy of the E-mail object in the Sent Items special folder specified in this section is not supported by Exchange 2003, Exchange 2007, Office Outlook 2003, or Office Outlook 2007.
7 Change Tracking

This section identifies changes that were made to this document since the last release. Changes are classified as Major, Minor, or None.

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

- A document revision that incorporates changes to interoperability requirements.
- A document revision that captures changes to protocol functionality.

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

The revision class **None** means that no new technical changes were introduced. Minor editorial and formatting changes may have been made, but the relevant technical content is identical to the last released version.

The changes made to this document are listed in the following table. For more information, please contact [dochelp@microsoft.com](mailto:dochelp@microsoft.com).

<table>
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<th>Section</th>
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<th>Revision class</th>
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<td>Appendix A: Product Behavior</td>
<td>Updated list of supported products.</td>
<td>Major</td>
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