[MS-OXOCFG]:
Configuration Information Protocol Specification

Revision Summary

Date	Revision History	Revision Class	Comments
04/04/2008	0.1	Major	Initial Availability.
04/25/2008	0.2	Minor	Revised and updated property names and other technical content.
06/27/2008	1.0	Major	Initial Release.
08/06/2008	1.0.1	Editorial	Revised and edited technical content.
09/03/2008	1.0.2	Editorial	Revised and edited technical content.
12/03/2008	1.0.3	Editorial	Revised and edited technical content.
04/10/2009	2.0	Major	Updated technical content for new product releases.
07/15/2009	3.0	Major	Revised and edited for technical content.
11/04/2009	3.1.0	Minor	Updated the technical content.
02/10/2010	3.2.0	Minor	Updated the technical content.
05/05/2010	3.3.0	Minor	Updated the technical content.

Table of Contents

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.

1.1 Glossary

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

actions
appointment
Archive Policy
ASCII
attendee
Calendar object
code page
collection
condition
Contact object
conversation action
Coordinated Universal Time (UTC)
dictionary
E-mail object
EntryID
FAI contents table
folder
folder associated information (FAI)
Free/busy
Group header
GUID
handle
Inbox folder
IPM
little-endian
Journal object
Meeting Request object
Meeting Response object
message
navigation shortcut
non-Unicode
Note object
permissions
property
property ID
restriction
Retention Policy
Root folder
row
rule
special folder
state
store
Stream object

subobject
table
Task object
Unicode
WebDAV
XML

The following terms are specific to this document:

Category List: A type of configuration data that contains a list of textual labels with associated data such as color. Other attributes of a category include a shortcut key that can be used to quickly apply a category, a usage counter, the last time the category was applied or used by the user, and a GUID.

Configuration Data: A group of application settings. Each group is uniquely identified by the folder that contains the group, the name of the group, and whether the group is contained in the dictionary or XML stream.

Folder Flags: A collection of subproperties on a folder that are stored together in a single property. This requires that all the subproperties are always read or written together.

Subproperty: A binary stream property that is embedded in another property, possibly along with other subproperties.

Tags list: A type of **configuration data** that contains a list of settings for a **Retention Policy** or **Archive Policy**.

View: A UI mechanism that displays a table of the messages in a folder.

View definition: A collection of parameters for a view. These parameters include the display names of the columns and the properties that they contain. These parameters include any of the following:

- The set of properties that the client uses to split the rows into groups with collapsible header rows on each group.
- The set of properties that the client uses to sub-sort the rows within any groups that are included.
- A restriction that the client uses to filter the set of rows in the table.

Working hours: A type of configuration data that consists of structured data that describes the user's preferred working hour pattern. The structure includes the start time, end time, and days of the week of the user's working hours. To enable translation between time zones, the structure also includes a description of the user's home time zone, including the offset from UTC and any rules that describe a daylight saving time transition

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

1.2 References

1.2.1 Normative References

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

will assist you in finding the relevant information. Please check the archive site, http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624, as an additional source.

[MS-DTYP] Microsoft Corporation, "Windows Data Types", March 2007, http://go.microsoft.com/fwlink/?LinkId=111558

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

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

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

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

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

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

[MS-OXCRPC] Microsoft Corporation, "Wire Format Protocol Specification", April 2008.

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

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

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

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

[MS-OXOFLAG] Microsoft Corporation, "Informational Flagging Protocol Specification", April 2008.

[MS-OXORMDR] Microsoft Corporation, "Reminder Settings Protocol Specification", April 2008.

[MS-OXORULE] Microsoft Corporation, "E-Mail Rules Protocol Specification", April 2008.

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

[MS-OXOSRCH] Microsoft Corporation, "Search Folder List Configuration Protocol Specification", April 2008.

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

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

[XMLBase] Marsh, J., and Tobin, R., Eds., "XML Base (Second Edition)", W3C Recommendation, January 2009, http://www.w3.org/TR/xmlbase/

1.2.2 Informative References

None.

1.3 Overview

Clients and servers might need to share some settings with one another. For example, if a user has configured a client with his preferred **working hours**, both the client and the server might use those settings to help choose optimal times for new **appointments** on the user's schedule.

Other settings can be used by the client to change the behavior of a server feature, and vice versa. An example of this would be when the server and clients have mutually exclusive features, and only one of them can be enabled at a time. Storing the state of the client feature in a shared location would allow the server to disable its corresponding feature, and vice versa.

The Configuration Information protocol specifies the settings that are shared between clients and servers, and the manner in which the settings are shared. 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 that are defined in the Configuration Information protocol, the client or server might 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 Configuration Information protocol when they are only used by a single application.

1.3.1 Configuration Data

Configuration data consists of groups of related application settings. Each group of settings is stored together 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.

1.3.2 View Definitions

View definitions can be created by the client to make additional, user-defined **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.

1.3.3 Folder Flags

Folder Flags consist of a **collection** of small properties. These properties are packed into a single binary property on a **folder**. The primary purpose of the folder flags is to store Boolean flags that affect the way that the folder can be displayed.

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.

1.3.4 Conversation Actions

Conversation actions are a limited set of **actions** that a user applies to all **E-mail objects**, currently in the **store** or delivered in the future, that share the same PidTagConversationId. Unlike **rules** (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 certain period of disuse.

A conversation action can be a combination of any of the following actions:

- Ignore
- Move to folder
- Categorize

1.3.5 Navigation Shortcuts

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

1.4 Relationship to Other Protocols

The Configuration Information protocol works with the Folder Object protocol [MS-OXCFOLD], the Message and Attachment object protocol [MS-OXCMSG], the Special Folders protocol [MS-OXOSFLD], the Property and Stream Object protocol [MS-OXCPRPT], and the Table Object protocol [MS-OXCTABL]. Figure 1 shows the relationship between these protocols.

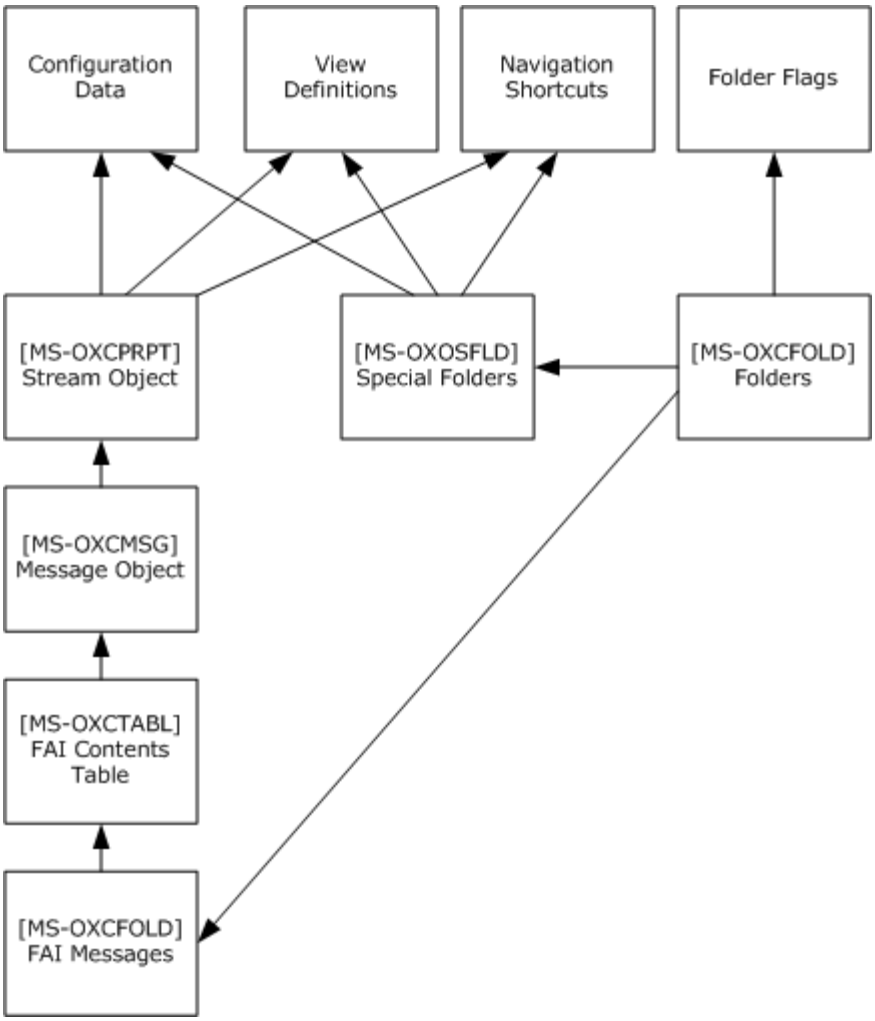


Figure 1: Protocol Stack

The configuration data, view definitions, and navigation shortcut components of the Configuration Information protocol use FAI messages [MS-OXCFOLD] as the transport. Clients need to sort and restrict the **FAI contents table** ([MS-OXCTABL]) to find the required FAI message. Clients need to access properties on the FAI message ([MS-OXCMSG]), and need to use **Stream object** for certain properties ([MS-OXCPRPT]). The FAI messages are sometimes contained in a **special folder**; therefore, these components need to use the special folders protocol [MS-OXOSFLD]. The configuration data and view definitions are retrieved from properties on the FAI messages using [MS-OXCPRPT].

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

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

This document specifies versioning issues in the following areas:

- Capability negotiation -The client first checks the version number returned by the server in the results from **EcDoConnectEx**, as specified in [MS-OXCRPC]. If the server returns a version that is greater than or equal to 14.0.324.0, then the client never deletes the conversation action FAI message (section 3.1.4.8) and disables almost all processing of incoming E-mail objects (see section 3.1.5.1).

1.8 Vendor-Extensible Fields

A third-party application can store its own settings using FAI messages by specifying its own custom **PtypString** for the value of the PidTagMessageClass **PtypString** property. A centralized authority that ensures uniqueness of the PidTagMessageClass **PtypString** property across different applications does not exist.

1.9 Standards Assignments

None.

2 Messages

The following data types are specified in [MS-DTYP]:

ULONG

WORD

The following data types are specified in [MS-OXCDATA] section 2.12.1:

PtypBinary

PtypBoolean

PtypCurrency

PtypErrorCode

PtypFloating64

PtypFloatingTime

PtypGuid

PtypInteger16

PtypInteger32

PtypString

PtypString8

PtypTime

2.1 Transport

The following sections specify how Configuration Information protocol messages use properties and streams [MS-OXCPRPT] that have been set on FAI messages or folders [MS-OXCFOLD] as the underlying transport.

2.2 Message Syntax

The following sections specify the location and format of the property and stream buffers that are specific to the Configuration Information protocol.

2.2.1 XML Format

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

Applications MUST NOT depend on support for namespaces [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:

Special Character	Escape Sequence
"	&quot;
<	&lt;
>	&gt;
&	&amp;

Applications SHOULD escape the following special characters within quoted strings: <1>

Special Character	Escape Sequence
'	&apos;

2.2.2 Binary Format

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

2.2.3 Configuration Data

The client and server SHOULD store certain settings as **configuration data**.<2> The format and location of the **configuration data**, as well as which settings it can include, are defined in the following subsections.

The application stores **configuration data** in an FAI message. The application stores the FAI message in the special folder that is defined in the following sections for each type of **configuration data**.

The message MUST have the PidTagMessageClass **PtypString** **property 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 **PtypInteger32** property set. The value of the property MUST be a bitmask that indicates which stream properties exist on the message. The streams types, and thus the flags, are not mutually exclusive. The bitmasks are as follows:

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Reserved																													a	b	c

Reserved (29 bits): These bits are unused. They SHOULD be set to 0. The client and server MUST ignore these bits if they are set.

a (1 bit): If this bit is set, the FAI message SHOULD contain a dictionary stream, serialized into a fixed **XML schema** and stored in the PidTagRoamingDictionary stream property. These streams are defined in section 2.2.3.1. If the FAI message does not contain a dictionary stream, the application MUST treat the dictionary as having no entries.

b (1 bit): If this bit is set, the FAI message contains an XML stream stored in the PidTagRoamingXmlStream stream property that uses an arbitrary XML schema. These streams are defined in section 2.2.3.2.

c (1 bit): This bit is unused. It SHOULD be set to 0. The client and server MUST ignore this flag if it is set.

2.2.3.1 Dictionaries

A message with a dictionary stream MUST have the PidTagRoamingDatatypes **PtypInteger32** property set. The value of the property MUST be a bitmask that includes 0x00000004.

The message MUST have the PidTagRoamingDictionary stream property set. The value of the property is a binary stream that contains a **Unicode** XML document using the UTF8 encoding. The XML document MUST conform to the following **XSD** schema, in addition to the limitations specified in section 2.2.1.

```
<?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:attribute name="version"
                          type="VersionString">
            </xs:attribute>
          </xs:complexType>
        </xs:element>
        <xs:element name="Data">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="e"
                          minOccurs="0"
                          maxOccurs="unbounded"
                          type="EntryType">
              </xs:element>
            </xs:sequence>
          </xs:complexType>
          <xs:unique name="uniqueKey">
            <xs:selector xpath="e" />
            <xs:field xpath="@k" />
          </xs:unique>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:simpleType name="VersionString">
    <xs:annotation>
      <xs:documentation xml:lang="en-us">
```

```
        The name and version of the application that created this
        document can be encoded in the version string. There is
        no validation of this information, it is just provided for
        future reference. The format of the version string is:

          &lt;name&gt;.&lt;major version number&gt;
      </xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
      <xs:pattern value=".+\.\d+" />
    </xs:restriction>
  </xs:simpleType>
  <xs:complexType name="EntryType">
    <xs:sequence />
    <xs:attribute name="k"
                  type="ValueString" />
    <xs:attribute name="v"
                  type="ValueString" />
  </xs:complexType>
  <xs:simpleType name="ValueString">
    <xs:annotation>
      <xs:documentation xml:lang="en-us">
        Different value types are all encoded in this simpleType as a
        string. The format of the string is:

          &lt;data type&gt;-&lt;string encoded value&gt;

        The data type is an integer type code from the following
        list:
          3: Boolean
          9: 32-bit signed integer
          18: String (0 or more Unicode characters)

        The encoding of the string encoded value depends on the data
        type:
          3 (Boolean): "True" or "False"
          9 (32-bit signed integer): Decimal characters, prefixed
            with an optional "-" to denote a negative number.
          18 (String): Unicode string
      </xs:documentation>
    </xs:annotation>
    <xs:restriction>
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:pattern value="\d+\-.*" />
        </xs:restriction>
      </xs:simpleType>
    </xs:restriction>
  </xs:simpleType>
</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 SHOULD <3>be encoded in the version string. The data is not validated; it is provided for future reference. The format of the version string is:

```
<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:

```
<data type>-<string encoded value>
```

The data type MUST be an integer type code from the following list:

Type	Type Code	Encoding
Boolean	3	"True" or "False"
32-bit signed integer	9	Decimal characters, prefixed with an optional "-" to denote a negative number.
String	18	Unicode string

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": The client MUST prefer its own default or locally stored settings, and it MUST rewrite the XML document with those settings.
- "1": The client MUST prefer the settings in the XML document.

- Default: (32-bit integer) "0"

2.2.3.1.1 Calendar Options

If the client or server supports configuration data, it stores the settings defined 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.

This message MUST have the PidTagMessageClass **PtypString** property 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].
  - Default: (missing) The default behavior when this setting is missing is specified in [MS-OXORMDR].
- **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 <4> 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"

2.2.3.2 XML Streams

The message MUST have the PidTagRoamingDatatypes **PtypInteger32 property** set. The value of the property MUST be a bitmask that includes 0x00000002.

The message MUST have the PidTagRoamingXmlStream stream **property** 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 XSD schemas that are specified in the following subsections, the XML document MUST conform to the limitations specified in section 2.2.1.

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.

2.2.3.2.1 Working Hours

If the client or server supports configuration data, it stores the settings that are defined 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 PtypString property set. The value of the property MUST be "IPM.Configuration.WorkHours".

The XML document that is stored in PidTagRoamingXmlStream MUST conform to the following XSD schema.

```
<?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:element name="WorkDays"
                          type="WorkDaysList" />
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:complexType name="DSTTransition">
    <xs:sequence>
      <xs:element name="Bias"
                  type="xs:short" />
      <xs:element name="ChangeDate">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="Time"
                        type="xs:time" />
            <xs:element name="Date">
              <xs:simpleType>
                <xs:restriction base="xs:string">
                  <xs:annotation>
                    <xs:documentation xml:lang="en-us">
                      The Date element is 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.
                  </xs:documentation>
                </xs:annotation>
                <xs:pattern value="\d{4}/\d{2}/\d{2}"/>
              </xs:restriction>
            </xs:simpleType>
          </xs:element>
          <xs:element name="DayOfWeek">
            <xs:simpleType>
              <xs:restriction base="xs:unsignedByte">
                <xs:minInclusive value="0"/>
                <xs:maxInclusive value="7"/>
              </xs:restriction>
            </xs:simpleType>
          </xs:element>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
 </xs:complexType>
 <xs:simpleType name="WorkDaysList">
  <xs:list itemType="WorkDayType"/>
 </xs:simpleType>
 <xs:simpleType name="WorkDayType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Monday"/>
    <xs:enumeration value="Tuesday"/>
    <xs:enumeration value="Wednesday"/>
    <xs:enumeration value="Thursday"/>
    <xs:enumeration value="Friday"/>
    <xs:enumeration value="Saturday"/>
    <xs:enumeration value="Sunday"/>
  </xs:restriction>
 </xs:simpleType>
</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 **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 <5> exist and contains the standard name of the time zone described by the data in **TimeZone**. See the KeyName field of the PidLidAppointmentTimeZoneDefinitionRecur property described in [MS-OXOCAL] for possible values.

DSTTransition: This is a **complexType** that 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> from the **DSTTransition** type MUST be added to the <Bias> contained in the <WorkHoursVersion1> element when this transition takes effect, which MUST be determined by the <ChangeDate> element.

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

ChangeDate: This element MUST exist as a subelement of the **DSTTransition** type. This element determines when the transition takes place. This element contains a <Time>, <Date>, and <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 defined in this section. If the year is any other value, the application performs the transition of 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 2nd Sunday of the month. In this case, the day of the month in the <Date> element must be between 1 and 5, inclusive. The following are the possible values:

Value	Description
0	The application performs the transition on a Sunday.
1	The application performs the transition on a Monday.
2	The application performs the transition on a Tuesday.
3	The application performs the transition on a Wednesday.
4	The application performs the transition on a Thursday.
5	The application performs the transition on a Friday.
6	The application performs the transition on a Saturday.

If the year portion of the <Date> element is any other value, the application MUST ignore this 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 following are the possible values:

Value	Description
Monday	If this string is included in the WorkDays list, Monday is a work day for this user.
Tuesday	If this string is included in the WorkDays list, Tuesday is a work day for this user.
Wednesday	If this string is included in the WorkDays list, Wednesday is a work day for this user.
Thursday	If this string is included in the WorkDays list, Thursday is a work day for this user.
Friday	If this string is included in the WorkDays list, Friday is a work day for this user.
Saturday	If this string is included in the WorkDays list, Saturday is a work day for this user.
Sunday	If this string is included in the WorkDays list, Sunday is a work day for this user.

2.2.3.2.2 Category List

If the client or server supports **configuration data**, it MUST store the settings that are defined 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 **PtypString** property set. The value of the property MUST be "IPM.Configuration.CategoryList".

The XML document that is stored in PidTagRoamingXmlStream MUST conform to the following XSD schema.

```
<?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:annotation>
      <xs:documentation>
        Only values 0-24 map to a color. Applications SHOULD use the
        value -1 for no color, any other value SHOULD also map to no
        color.
      </xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:int">
    </xs:restriction>
```

```
  </xs:simpleType>

  <xs:simpleType name="keyboardShortcutType">
    <xs:annotation>
      <xs:documentation>
        Only values 1-11 map to a shortcut key. Applications SHOULD
        use the value 0 for no shortcut key, any other value SHOULD
        also map to no shortcut key.
      </xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:unsignedInt">
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="dateTimeRestrictedType">
    <xs:annotation>
      <xs:documentation>
        dateTime type used in this XSD has the following additional
        restrictions:

          The year MUST be between 1601 and 30827.

          The time 24:00:00 is not valid.

          Fractional seconds SHOULD have 3 digit precision (i.e.
          milliseconds). The application MAY 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 timezone identifier. The
          application MUST ignore any other timezone specifier and
          interpret the time using UTC.
      </xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:dateTime">
    </xs:restriction>
  </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:attribute name="lastTimeUsed"
                          type="dateTimeRestrictedType"
                          use="required" />
            <xs:attribute name="lastSessionUsed"
                          type="xs:int"
                          use="required" />
            <xs:attribute name="guid"
                          type="guidType"
                          use="required" />
            <xs:attribute name="renameOnFirstUse"
                          type="renameOnFirstUseType"
                          use="optional" />
          </xs:complexType>
        </xs:element>
      </xs:sequence>
      <xs:attribute name="default"
                    type="xs:string"
                    use="required" />
      <xs:attribute name="lastSavedSession"
                    type="xs:int"
                    use="required" />
      <xs:attribute name="lastSavedTime"
                    type="dateTimeRestrictedType"
                    use="required" />
    </xs:complexType>
    <xs:unique name="uniqueName">
      <xs:selector xpath="category" />
      <xs:field xpath="@name" />
    </xs:unique>
```

```
    </xs:element>
  </xs:schema>
```

colorType: A **simpleType** based on an integer. See description of **color** below for possible values.

keyboardShortcutType: A **simpleType** based on an unsigned integer. See description of **keyboardShortcut** below for possible values.

dateTimeRestrictedType: A **simpleType** based on a dateTime. 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 <6>
- The application MUST specify the time in UTC. The application can 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. See description of **renameOnFirstUse** below for possible values.

guidType: A **simpleType** based on a string. See description of **guid** below for possible values.

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 catgory. 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 (;) (\x061B) (\xFE54) (\xFF1B).
- SHOULD NOT be in the form of the string representation of a **GUID**, as specified in the GUID field 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.

Value	Base R,G,B	Name
-1	255,255,255	No Color
0	214, 37, 46	Red
1	240, 108, 21	Orange
2	255, 202, 76	Peach
3	255, 254, 61	Yellow
4	74, 182, 63	Green
5	64, 189, 149	Teal
6	133, 154, 82	Olive
7	50, 103, 184	Blue
8	97, 61, 180	Purple
9	163, 78, 120	Maroon
10	196, 204, 221	Steel
11	140, 156, 189	Dark Steel
12	196, 196, 196	Gray
13	165, 165, 165	Dark Gray
14	28, 28, 28	Black
15	175, 30, 37	Dark Red
16	177, 79, 13	Dark Orange
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). <8>

Value	Shortcut-Key
0	None
1	CTRL+F2
2	CTRL+F3
3	CTRL+F4
4	CTRL+F5
5	CTRL+F6
6	CTRL+F7
7	CTRL+F8
8	CTRL+F9
9	CTRL+F10
10	CTRL+F11
11	CTRL+F12

usageCount: An attribute on the <category> element. Reserved. Applications SHOULD write 0 <9>

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.

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

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

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**.

lastSessionUsed: An attribute on the <category>. Reserved. Applications SHOULD write 0 <10>

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 can prompt the user to rename the category when it is first applied to a message (as specified in section

3.1.4.7)<11> 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 <12>

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

2.2.3.2.3 Retention and Archive Settings

If the client or server supports configuration data, and the **Retention Policy** or **Archive Policy** features are enabled, then it SHOULD store the settings that are defined in this section in a **tags list** stream. The application SHOULD store the tags list stream in an FAI message that is contained in the **Inbox folder**. <13> The message MUST have the **PidTagMessageClass** **PtypString** property set. The value of the property MUST be "IPM.Configuration.MRM". The XML document that is stored in **PidTagRoamingXmlStream** MUST conform to the following XSD schema.

```
<?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:attribute name="RetentionUrl" type="xs:string" />
                      </xs:complexType>
                    </xs:element>
                    <xs:element maxOccurs="unbounded" name="PolicyTag">
                      <xs:complexType>
                        <xs:sequence minOccurs="0">
                          <xs:element minOccurs="0" name="LocalizedName">
                            <xs:complexType>
                              <xs:sequence>
                                <xs:element maxOccurs="unbounded" name="Name"
type="xs:string" />
                              </xs:sequence>
                            </xs:complexType>
                          </xs:element>
                          <xs:element minOccurs="0" name="LocalizedComment">
                            <xs:complexType>
                              <xs:sequence>
                                <xs:element maxOccurs="unbounded" name="Comment"
type="xs:string" />
```

```
                        </xs:sequence>
                      </xs:complexType>
                    </xs:element>
                    <xs:element minOccurs="0" name="ContentSettings">
                      <xs:complexType>
                        <xs:attribute name="Guid" type="xs:string" use="required" />
                        <xs:attribute name="ExpiryAgeLimit" type="xs:unsignedShort"
use="required" />
                        <xs:attribute name="MessageClass" type="xs:string"
use="required" />
                      </xs:complexType>
                    </xs:element>
                  </xs:sequence>
                  <xs:attribute name="Guid" type="xs:string" use="required" />
                  <xs:attribute name="Name" type="xs:string" use="required" />
                  <xs:attribute name="Comment" type="xs:string" />
                  <xs:attribute name="Type" type="xs:string" use="required" />
                  <xs:attribute name="MustDisplayComment" type="xs:string"
use="required" />
                  <xs:attribute name="IsVisible" type="xs:string" use="required" />
                  <xs:attribute name="OptedInto" type="xs:string" use="required" />
                </xs:complexType>
              </xs:element>
              <xs:element maxOccurs="unbounded" name="ArchiveTag">
                <xs:complexType>
                  <xs:sequence minOccurs="0">
                    <xs:element minOccurs="0" name="LocalizedName">
                      <xs:complexType>
                        <xs:sequence>
                          <xs:element maxOccurs="unbounded" name="Name"
type="xs:string" />
                        </xs:sequence>
                      </xs:complexType>
                    </xs:element>
                    <xs:element minOccurs="0" name="LocalizedComment">
                      <xs:complexType>
                        <xs:sequence>
                          <xs:element maxOccurs="unbounded" name="Comment"
type="xs:string" />
                        </xs:sequence>
                      </xs:complexType>
                    </xs:element>
                    <xs:element minOccurs="0" name="ContentSettings">
                      <xs:complexType>
                        <xs:attribute name="Guid" type="xs:string" use="required" />
                        <xs:attribute name="ExpiryAgeLimit" type="xs:unsignedShort"
use="required" />
                        <xs:attribute name="MessageClass" type="xs:string"
use="required" />
                      </xs:complexType>
                    </xs:element>
                  </xs:sequence>
                  <xs:attribute name="Guid" type="xs:string" use="required" />
                  <xs:attribute name="Name" type="xs:string" use="required" />
                  <xs:attribute name="Comment" type="xs:string" />
                  <xs:attribute name="Type" type="xs:string" use="required" />
                  <xs:attribute name="MustDisplayComment" type="xs:string"
use="required" />
                  <xs:attribute name="IsVisible" type="xs:string" use="required" />
                  <xs:attribute name="OptedInto" type="xs:string" use="required" />
```

```
                    </xs:complexType>
                  </xs:element>
                  <xs:element maxOccurs="1" name="DefaultArchiveTag">
                    <xs:complexType>
                      <xs:sequence minOccurs="0">
                        <xs:element minOccurs="0" name="LocalizedName">
                          <xs:complexType>
                            <xs:sequence>
                              <xs:element maxOccurs="unbounded" name="Name"
type="xs:string" />
                            </xs:sequence>
                          </xs:complexType>
                        </xs:element>
                        <xs:element minOccurs="0" name="LocalizedComment">
                          <xs:complexType>
                            <xs:sequence>
                              <xs:element maxOccurs="unbounded" name="Comment"
type="xs:string" />
                            </xs:sequence>
                          </xs:complexType>
                        </xs:element>
                        <xs:element minOccurs="0" name="ContentSettings">
                          <xs:complexType>
                            <xs:attribute name="Guid" type="xs:string" use="required" />
                            <xs:attribute name="ExpiryAgeLimit" type="xs:unsignedShort"
use="required" />
                            <xs:attribute name="MessageClass" type="xs:string"
use="required" />
                          </xs:complexType>
                        </xs:element>
                      </xs:sequence>
                      <xs:attribute name="Guid" type="xs:string" use="required" />
                      <xs:attribute name="Name" type="xs:string" use="required" />
                      <xs:attribute name="Comment" type="xs:string" />
                      <xs:attribute name="Type" type="xs:string" use="required" />
                      <xs:attribute name="MustDisplayComment" type="xs:string"
use="required" />
                      <xs:attribute name="IsVisible" type="xs:string" use="required" />
                      <xs:attribute name="OptedInto" type="xs:string" use="required" />
                    </xs:complexType>
                  </xs:element>
                </xs:sequence>
              </xs:complexType>
            </xs:element>
          </xs:sequence>
          <xs:attribute name="version" type="xs:string" use="required" />
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
</xs:schema>
```

Enabled: Indicates whether retention is enabled for a user. If 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 'True' or 'False'.

RetentionComment: 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 1024 characters.

RetentionUrl: 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 2048 characters.

LocalizedName: Can contain multiple 'Name' sub-elements. 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: Can contain multiple 'Comment' sub-elements. 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: Stores the settings that control when items expire and the types of items that expire. The settings are stored in the following attributes:

Attribute	Description
Guid	A GUID value that provides a unique identity for the content setting.
ExpiryAgeLimit	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 24855.
MessageClass	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 '*' represents any message class. The string length MUST be between 1 and 1023 characters.

PolicyTag: Stores information about the Retention Policy. The information is stored in the following attributes:

Attribute	Description
Guid	A GUID value that provides a unique identity for the policy.
Name	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.
Comment	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.
Type	The type of policy tag. This value is configured by a server administrator. The possible values are: ▪ All ▪ Calendar ▪ Contacts ▪ ConversationHistory ▪ DeletedItems

Attribute	Description
	▪ Drafts ▪ Inbox ▪ JunkEmail ▪ Journal ▪ Notes ▪ Outbox ▪ Personal ▪ RssSubscriptions ▪ SentItems ▪ SyncIssues ▪ Tasks 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', then 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', then 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' indicates that the user voluntarily chose this tag. <14>

ArchiveTag: Stores information about an Archive Policy. The information is stored in attributes identical to **PolicyTag**. **ArchiveTag** SHOULD NOT be displayed by the client application in the archive mailbox. It SHOULD be displayed only in the primary mailbox.

DefaultArchiveTag: Stores information about the default Archive Policy. The information is stored in attributes identical to **PolicyTag**. **DefaultArchiveTag** SHOULD NOT be displayed by the client application in the archive mailbox. It SHOULD be displayed only in the primary mailbox.

2.2.4 View Definitions

The client and server SHOULD store certain settings as view definitions. <15> The format of the view definitions, as well as which settings are included, are defined in the following subsections.

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 **PtypString** property set and the value of the property is "IPM.Microsoft.FolderDesign.NamedView".

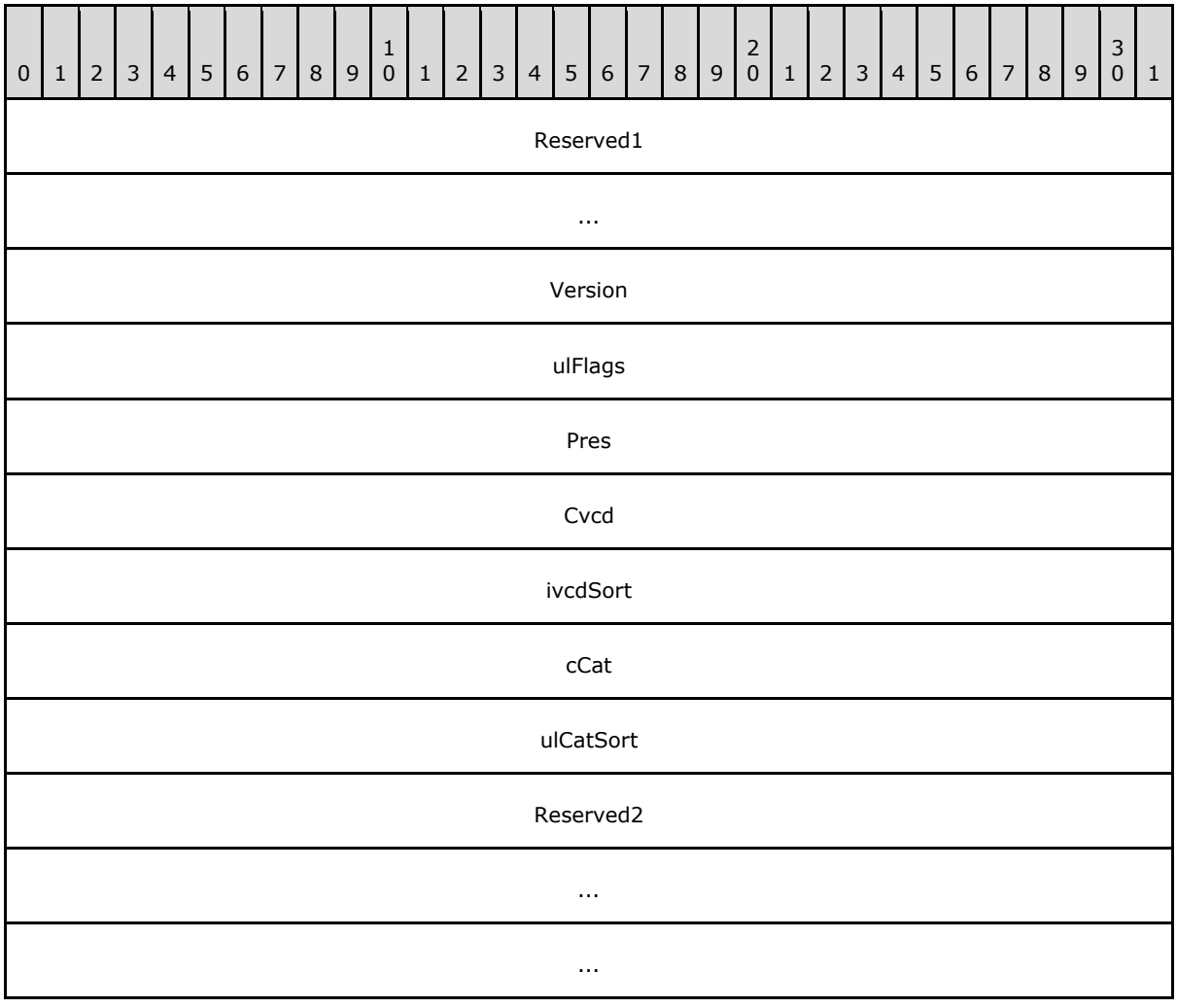
The message has the PidTagViewDescriptorVersion **PtypInteger32** property set and the value of the property is 0x00000008.

The message has the PidTagViewDescriptorName **PtypString** property set and the value of the property is a non-empty string.

The view definitions MUST be stored as a binary stream in the stream property PidTagViewDescriptorBinary of the message. The column headers are stored in the PidTagViewDescriptorStrings stream property on the message as strings using the current **code page** of the client. The following sections specify the packet format of these two properties respectively.

2.2.4.1 PidTagViewDescriptorBinary

View definitions MUST be stored in stream property PidTagViewDescriptorBinary of the message. It is in binary format and the packet structure is specified as follows:



...
...
...
ColumnInfo (variable)
...
RestrictionInfo (variable)
...

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:

Value	Meaning
0x00000000	Ascending sort order
0x00000002	Descending sort order

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

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

Cvcd (4 bytes): This field MUST exist. It specifies the number of **ColumnInfo** fields that are stored in this packet.

ivcdSort (4 bytes): This field MUST exist. The value of this field MUST be one of the following:

0 through (Cvcd-1): This 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 **ulFlags**.

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 **Cvcd**, 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 defined as follows. In each case, if the flag is not set, the "group by" column is in descending order.

Flag	Description
0x00000001	If this flag is set, the first "group by" column is in ascending order.
0x00000002	If this flag is set, the second "group by" column is in ascending order.
0x00000004	If this flag is set, the third "group by" column is in ascending order.
0x00000008	If this flag is set, the fourth "group by" column is in ascending order.

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: **ColumnPacket** structure, as specified in section 2.2.4.1.1.

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 count of the columns is specified by the **Cvcd** field in the packet.

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:

Field	Value
PropertyType	0x0001
PropertyID	0x0004
Cx	0x00000007
Flags	0x00000028 (VCDF_BITMAP | VCDF_NOT_SORTABLE)
Kind	0x00000000
ID	0x00000004

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.

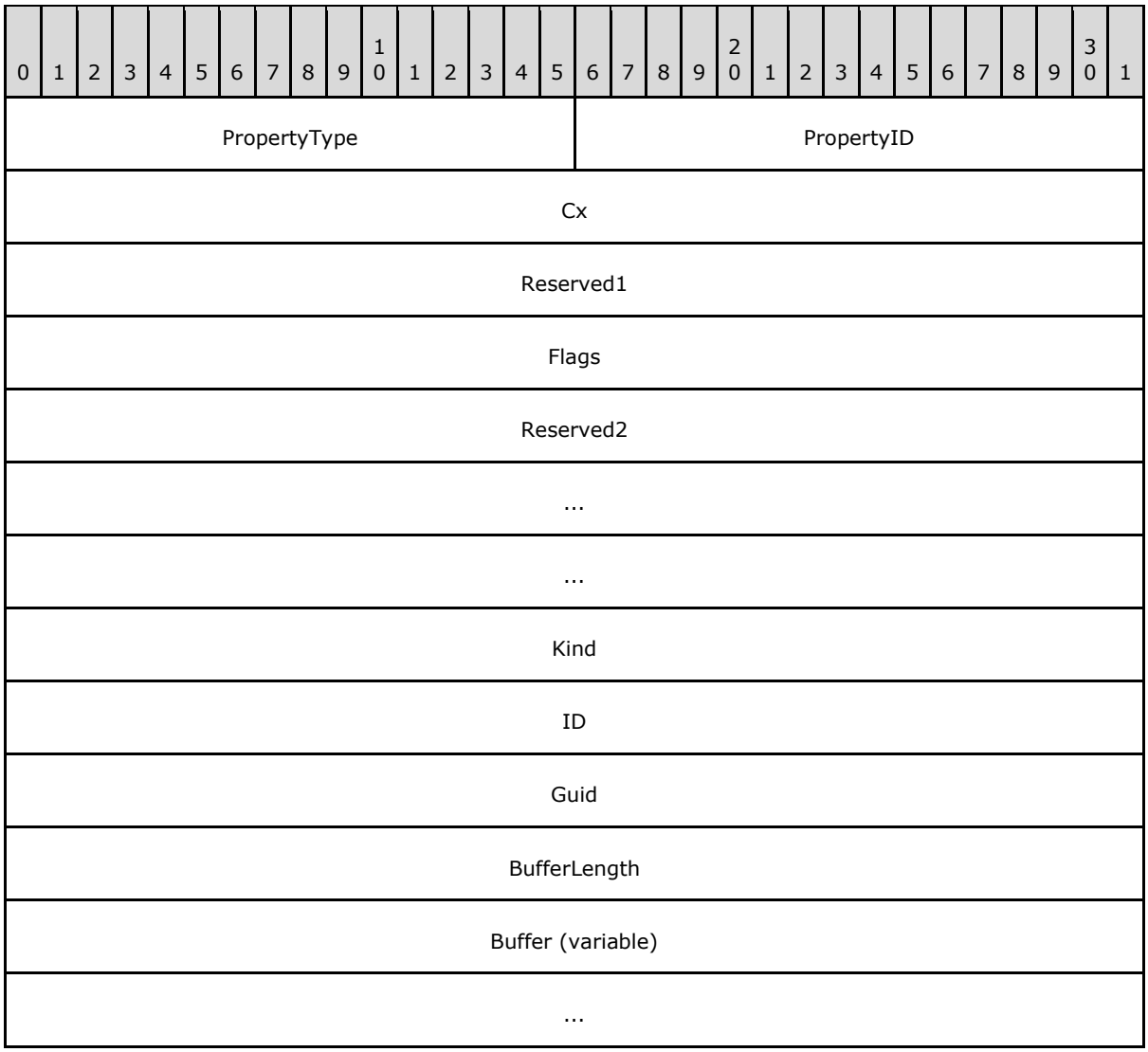
The "order by" column: If the sorted column is not a "group by" or "visible" column, it MUST be stored here.

RestrictionInfo (variable): Data type: **RestrictionPacket** structure, as specified in section 2.2.4.1.2.

This is where the restriction of the table view MUST be stored.

2.2.4.1.1 ColumnPacket

The ColumnPacket packet MUST contain the information of a single column including the **property ID**, **property type**, and display attributes. The structure of the packet MUST be as follows:



PropertyType (2 bytes): This field MUST exist. This field specifies the type of the property, as specified in section 2.2.4.1.3.1.

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**, 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 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.

Name	Value	Description
VCDF_RIGHT_JUSTIFY	0x00000001	Column is right justified. This flag is mutually exclusive with VCDF_CENTER_JUSTIFY.
VCDF_CENTER_JUSTIFY	0x00000002	Column is center justified. This flag is mutually exclusive with VCDF_RIGHT_JUSTIFY.
VCDF_BITMAP	0x00000008	Column **header** is in bitmap format.
VCDF_NOT_SORTABLE	0x00000020	Column is not sortable. This flag is mutually exclusive with VCDF_SORTDESCENDING and VCDF_SORTDLG.
VCDF_SORTDESCENDING	0x00000040	Column is sorted in descending order. This flag is mutually exclusive with VCDF_NOT_SORTABLE.
VCDF_MOVEABLE	0x00000100	Clients and servers MUST ignore this setting.
VCDF_COLUMNSDLG	0x00000200	Clients and servers MUST ignore this setting.
VCDF_SORTDLG	0x00000400	Column MUST be able to be sorted. This flag is mutually exclusive with VCDF_NOT_SORTABLE.
VCDF_GROUPDLG	0x00000800	Column MUST be able to be grouped.
VCDF_NAMEDPROP	0x00001000	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.
VCDF_RCOLUMNSDLG	0x00002000	Clients and servers MUST ignore this setting.
VCDF_MULTIVALUED	0x00004000	Indicates whether the column PropertyType field MUST include the **Multivalue** flag ([MS-OXCDATA] section 2.12.1.2).

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:

Name	Value	Description
KindID	0x00000000	The property uses an integer identifier.
KindString	0x00000001	The property uses a string identifier.

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 RopGetPropertyIdsFromNames ([MS-OXCROPS]) 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 (4 bytes): If the VCDF_NAMEDPROP flag is set in the **Flags** field, this field contains the GUID that MUST be used with RopGetPropertyIdsFromNames to translate the named property

into a property ID. If the VCDF_NAMEDPROP flag is not set, the application MUST omit this field.

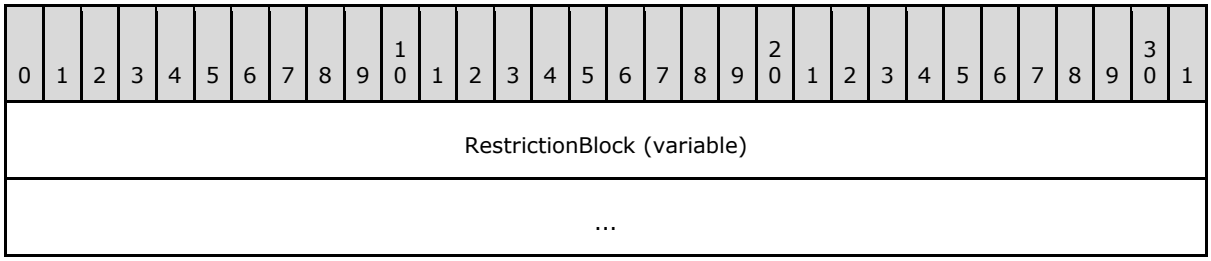
BufferLength (4 bytes): If the VCDF_NAMEDPROP flag is set in the **Flags** field, and the value of the **Kind** field is KindString, this field contains the length of the **Buffer** field in bytes, including the Unicode NULL terminator character (0x0000). Otherwise, the application MUST omit this field.

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 RopGetPropertyIdsFromNames to translate the named property into a property ID. Otherwise, the application MUST omit this field. This field includes a Unicode NULL terminator character (0x0000) at the end.

2.2.4.1.2 RestrictionPacket

Restrictions are used to evaluate the content table of the folder. Only those rows with TRUE result of the evaluation MUST be displayed.

The restrictions are stored using a special format, which is different from the format specified for restrictions in [MS-OXCDATA]. The packet starts from a single **RestrictionBlock** buffer. When the restriction type indicates a compositional **condition**, for example AND or OR, more restriction blocks MUST follow after the current restriction block. A restriction is a packet recursively built up by **RestrictionBlock**. To determine the size of the restriction, the application parses each **RestrictionBlock** recursively if necessary.

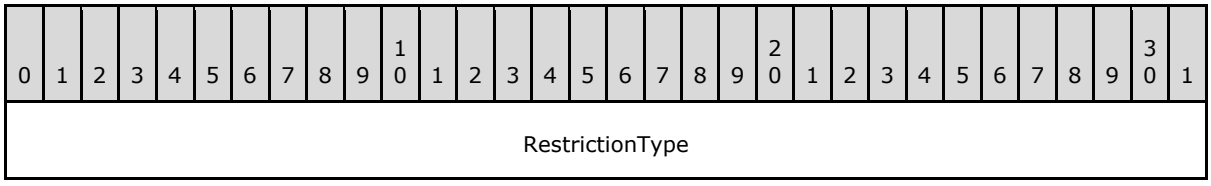


RestrictionBlock (variable): Data type: **RestrictionBlock** structure, as specified in section 2.2.4.1.3.

This field contains the restriction type. From the restriction type it can be determined whether it contains subrestrictions and the number of subrestrictions that it contains. The server parses each **RestrictionBlock** recursively, if necessary, to complete reading one restriction block.

2.2.4.1.3 RestrictionBlock

Each restriction block MUST contain the type of condition. Based on the type, the data record, **property tags**, and property values can be determined. If the type is AND, OR, NOT, **SubObject**, and Comment, more subrestrictions MUST follow this restriction block.



RestrictionData
...
...
PropValueNum
PropValue (variable)
...

RestrictionType (4 bytes): This field specifies which condition is in use. The following table specifies all available restriction types.

Name	Value	Description
RES_AND	0x00000000	Specifies a Logical AND condition.
RES_OR	0x00000001	Specifies a Logical OR condition.
RES_NOT	0x00000002	Specifies a Logical NOT condition.
RES_CONTENT	0x00000003	Content condition.
RES_PROPERTY	0x00000004	Specifies a propertycondition.
RES_COMPAREPROPS	0x00000005	Specifies a Compare propertiescondition.
RES_BITMASK	0x00000006	Specifies a Bit Mask condition.
RES_SIZE	0x00000007	Specifies a Size condition.
RES_EXIST	0x00000008	Specifies an Exist condition.
RES_SUBRESTRICTION	0x00000009	Specifies a Sub Object condition.
RES_COMMENT	0x0000000A	Specifies a Comment condition.

RestrictionData (12 bytes): This field specifies the actual data record that is associated with the restriction type. The content of this structure varies based on the restriction type. Each restriction type and its corresponding data structure is specified in the following sections.

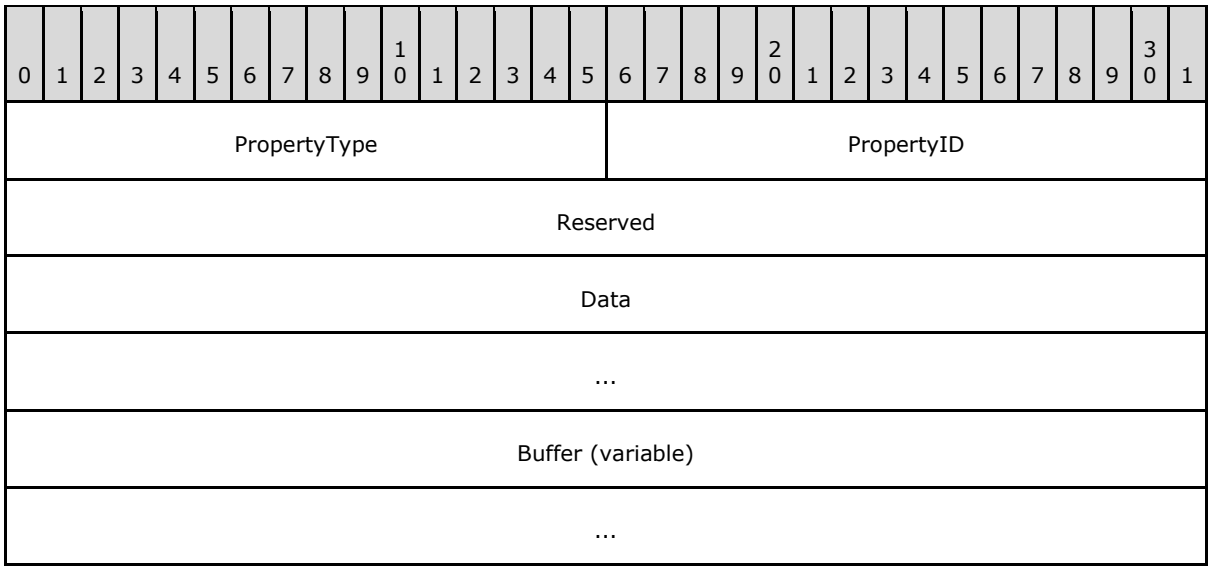
PropValueNum (4 bytes): This field can be present, depending on the restriction type. If it is present, it specifies the number of **PropValues** that follow. See the following sections for details. This field SHOULD NOT exist unless otherwise specified for each restriction type.

PropValue (variable): Data type: **PropValue** structure, as specified in section 2.2.4.1.3.1.

The **PropValue** field can be present, depending on the restriction type. If it is present, this field MUST appear the number of times specified in the **PropValueNum** field. This field SHOULD NOT exist unless otherwise specified for each restriction type.

2.2.4.1.3.1 PropValue

Each **RestrictionBlock** can contain one or more **PropValue** fields. The **PropValue** field MUST use the following format:



PropertyType (2 bytes): This field specifies the type of the property. The property type MUST be one of the following:

TypeName	Type ID
PtypInteger16	0x0002
PtypInteger32	0x0003
PtypFloating32	0x0004
PtypFloating64	0x0005
PtypCurrency	0x0006
PtypFloatingTime	0x0007
PtypErrorCode	0x000A
PtypBoolean	0x000B
PtypInteger64	0x0014
PtypString8	0x001E
PtypTime	0x0040
PtypGuid	0x0048
PtypBinary	0x0102

PropertyID (2 bytes): This field specifies the 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.

Data (8 bytes): The format of this field depends on the property type specified in the **PropertyType** field. The value 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 bits MUST be ignored. The following table lists the size and format of the value by property type.

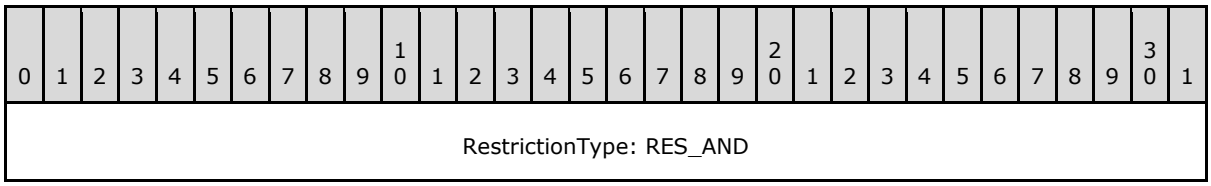
Property Type	Value Size	Value Format
PtypInteger16	2 bytes	Signed integer
PtypInteger32	4 bytes	Signed integer
PtypFloating32	4 bytes	Floating point number
PtypFloating64	8 bytes	Floating point number
PtypCurrency	8 bytes	Signed integer
PtypFloatingTime	8 bytes	Floating point number
PtypErrorCode	4 bytes	SCODE error code
PtypBoolean	2 bytes	WORD
PtypInteger64	8 bytes	Signed integer
PtypString8	0 bytes	**Note**: The application MUST store the string value separately in PidTagViewDescriptorStrings, as specified in section 2.2.4.2.
PtypTime	8 bytes	Unsigned integer
PtypGuid	0 bytes	
PtypBinary	4 bytes	Unsigned integer

Buffer (variable): This field MUST exist only when the property type encoded in **PropertyType** is **PtypBinary**. The **Buffer** field contains an arbitrary binary stream. The size of the stream is specified as a number of bytes in the **Size** field within **Data**.

2.2.4.1.3.2 Logical AND Condition

The Logical AND condition is used to join a group of two or more conditions by using a logical AND operation. The result of the AND condition is TRUE if all of the child conditions evaluate to TRUE. The result is FALSE if any child condition evaluates to FALSE.

The **RestrictionBlock** of this restriction type MUST use the following format:



cRes
Reserved
...
SubCondition
...
...
SubCondition
...

RestrictionType: RES_AND (4 bytes): RES_AND

cRes (4 bytes): Specifies the number of conditions that make up the **AND** condition. Each subcondition is stored in a **RestrictionBlock** and all subconditions are stored sequentially in the packet.

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 (12 bytes): Data type: **RestrictionBlock**, as specified in section 2.2.4.1.3.

This field specifies subconditions that make up the AND condition.

SubCondition (8 bytes): Data type: **RestrictionBlock**, as specified in section 2.2.4.1.3.

This field specifies subconditions that make up the AND condition.

2.2.4.1.3.3 Logical OR Condition

The Logical OR condition is used to join a group of two or more conditions by using a logical OR operation. The result of the OR condition is TRUE if any of the child conditions evaluates to TRUE. The result is FALSE if all child conditions evaluate to FALSE.

The **RestrictionBlock** of this restriction type MUST use the following format:

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
RestrictionType																															
cRes																															

Reserved
...
SubCondition
...
...
SubCondition
...

RestrictionType (4 bytes): RES_OR. It specifies the number of conditions that make up the **OR** condition.

cRes (4 bytes): It specifies the number of conditions that make up the **OR** condition.

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 (12 bytes): Data type: **RestrictionBlock**, as specified in section 2.2.4.1.3.

This field specifies subconditions that make up the **OR** condition.

SubCondition (8 bytes): Data type: **RestrictionBlock**, as specified in section 2.2.4.1.3.

This field specifies subconditions that make up the **OR** condition.

2.2.4.1.3.4 Logical NOT Condition

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

The **RestrictionBlock** of this restriction type MUST use the following format:

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
RestrictionType																															
Reserved																															
...																															
...																															

SubCondition
...
...

RestrictionType (4 bytes): RES_NOT

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 (12 bytes): Data type: **RestrictionBlock**, as specified in section 2.2.4.1.3.

It specifies a single subcondition that makes up the **NOT** condition.

2.2.4.1.3.5 Content Condition

The Content condition is used to search properties that have contents that match a search string.

The **RestrictionBlock** of this restriction type MUST use the following format:

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
RestrictionType																															
ulFuzzyLevel																															
PropertyType																PropertyID															
Reserved																															
PropValueNum																															
PropValue																															

RestrictionType (4 bytes): RES_CONTENT

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. The following table lists all possible values for this field.

Name	Values	Description
FL_FULLSTRING	0x00000000	To match, the search string MUST be the same as the value of the property.
FL_SUBSTRING	0x00000001	To match, the search string MUST be contained anywhere within

Name	Values	Description
		the property.
FL_PREFIX	0x00000002	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.

The upper 16 bits of the fuzzy level can be set to the following values, and can be combined using the logical **OR** operation.

Name	Values	Description
FL_IGNORECASE	0x00010000	The comparison MUST be made without considering the case.
FL_IGNORENONSPACE	0x00020000	The comparison MUST ignore Unicode-defined nonspacing characters.
FL_LOOSE	0x00040000	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.

PropertyType (2 bytes): This field specifies the type of the property, as specified in section 2.2.4.1.3.

PropertyID (2 bytes): This field specifies the ID of the property, as specified in section 2.2.4.1.3.

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 is specified in section 2.2.4.1.3. This field MUST exist in this type of restriction, and the value MUST be 0x00000001.

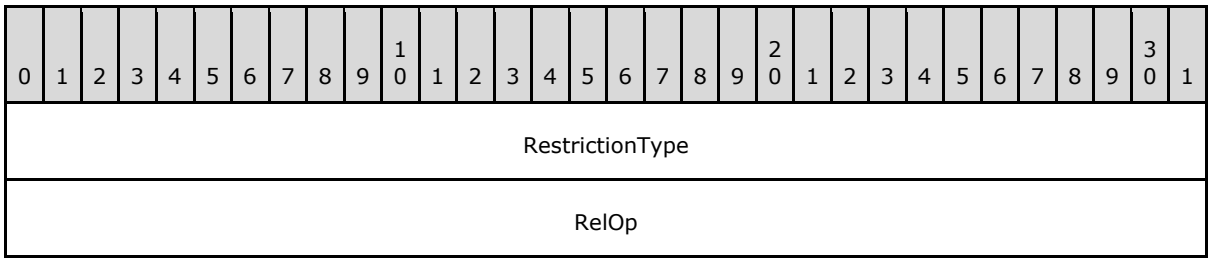
PropValue (4 bytes): Data type: **PropValue** structure, as specified in section 2.2.4.1.3.

This field appears exactly once in this type of restriction.

2.2.4.1.3.6 Property Condition

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

The **RestrictionBlock** of this restriction type MUST use the following format:



PropertyType	PropertyID
Reserved	
PropValueNum	
PropValue	

RestrictionType (4 bytes): RES_PROPERTY

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

Name	Values	Description
RELOP_LT	0x00000000	The condition evaluates to **TRUE** if the value of the property is less than the constant value.
RELOP_LE	0x00000001	The condition evaluates to **TRUE** if the value of the property is less than or equal to the constant value.
RELOP_GT	0x00000002	The condition evaluates to **TRUE** if the value of the property is greater than the constant value.
RELOP_GE	0x00000003	The condition evaluates to **TRUE** if the value of the property is greater than or equal to the constant value.
RELOP_EQ	0x00000004	The condition evaluates to **TRUE** if the value of the property is equal to the constant value.
RELOP_NE	0x00000005	The condition evaluates to **TRUE** if the value of the property is not equal to the constant value.

PropertyType (2 bytes): This field specifies the type of the property, as specified in section 2.2.4.1.3.

PropertyID (2 bytes): This field specifies the ID of the property, as specified in section 2.2.4.1.3.

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 is specified in section 2.2.4.1.3. This field MUST exist in this type of restriction, and the value MUST be 0x00000001.

PropValue (4 bytes): Data type: **PropValue** structure, as specified in section 2.2.4.1.3.

This field appears exactly once in this type of restriction.

2.2.4.1.3.7 Compare Properties Condition

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

The **RestrictionBlock** of this restriction type MUST use the following format:

RestrictionType (4 bytes): RES_COMPAREPROPS

RelOp (4 bytes): This field specifies the relational operator that is to be used in the search, as specified in section 2.2.4.1.3.6.

PropertyType1 (2 bytes): This field specifies the type of the first property, as specified in section 2.2.4.1.3.1.

PropertyID1 (2 bytes): This field specifies the ID of the first property, as specified in section 2.2.4.1.3.1.

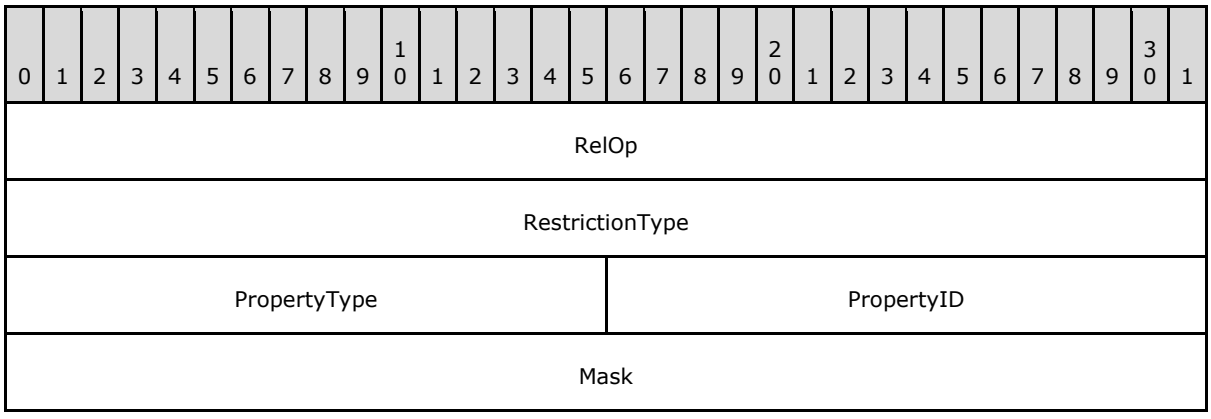
PropertyType2 (2 bytes): This field specifies the type of the second property, as specified in section 2.2.4.1.3.1. The type of the second property MUST match the type of the first property.

PropertyID2 (2 bytes): This field specifies the ID of the second property, as specified in section 2.2.4.1.3.1.

2.2.4.1.3.8 Bit Mask Condition

The Bit Mask condition is used to perform a bitwise AND operation on the value of the property and to test the result produced by the operation.

The **RestrictionBlock** of this restriction type MUST use the following format:



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:

Name	Value	Description
BMR_EQZ	0x00000000	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.
BMR_NEZ	0x00000001	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.

RestrictionType (4 bytes): RES_BITMASK.

PropertyType (2 bytes): This field specifies the type of the property, as specified in section 2.2.4.1.3.1.

PropertyID (2 bytes): This field specifies the ID of the property, as specified in section 2.2.4.1.3.1.

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

2.2.4.1.3.9 Size Condition

The Size condition is used to test the size of a property value.

The **RestrictionBlock** of this restriction type MUST use the following format:

RestrictionType (4 bytes): RES_SIZE

RelOp (4 bytes): This field specifies the relational operator that is to be used in the search, as specified in section 2.2.4.1.3.6.

PropertyType (2 bytes): This field specifies the type of the property, as specified in section 2.2.4.1.3.1.

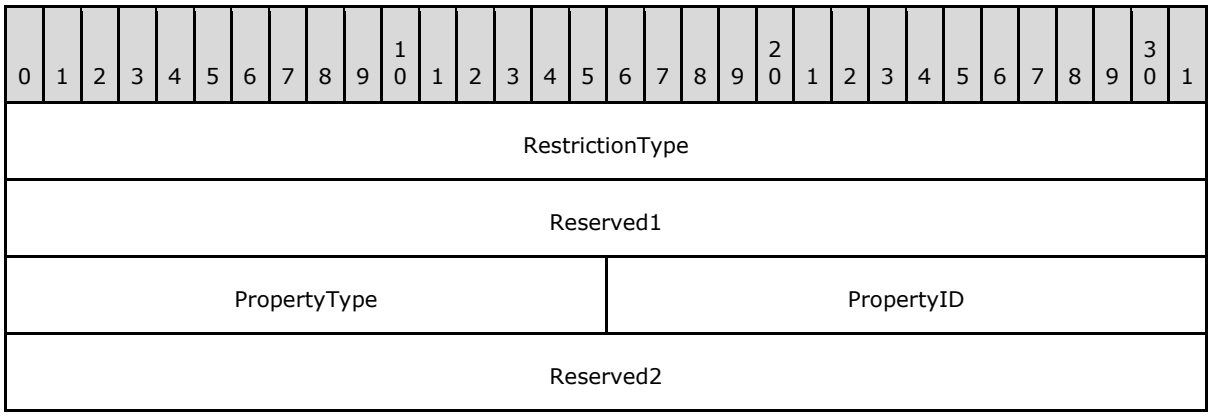
PropertyID (2 bytes): This field specifies the ID of the property, as specified in section 2.2.4.1.3.1.

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.

2.2.4.1.3.10 Exist Condition

The Exist condition is used to test whether a particular property exists on a message.

The **RestrictionBlock** of this restriction type MUST use the following format:



RestrictionType (4 bytes): RES_EXIST

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, as specified in section 2.2.4.1.3.1.

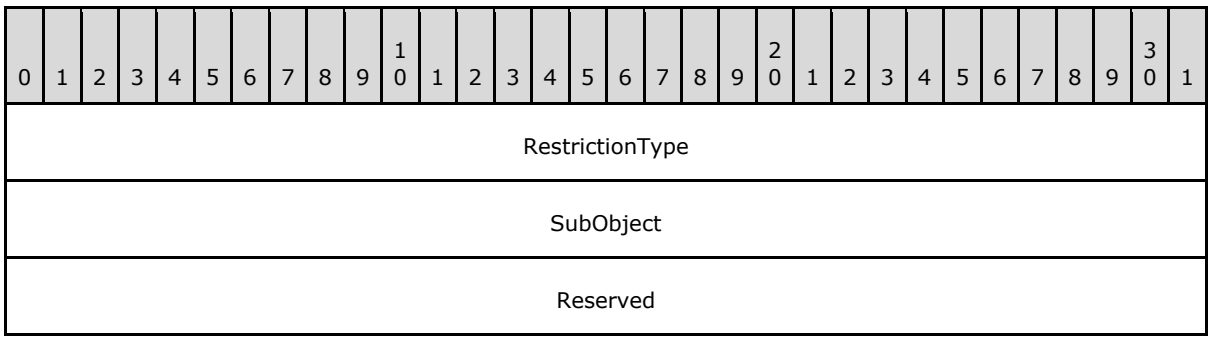
PropertyID (2 bytes): This field specifies the ID of the property, as specified in section 2.2.4.1.3.1.

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.

2.2.4.1.3.11 SubObject Condition

The SubObject condition is used to test properties on the **attachment** or **recipient table** of a message.

The **RestrictionBlock** of this restriction type MUST use the following format:



...
SubCondition
...
...

RestrictionType (4 bytes): RES_SUBCONDITION.

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

Value	Description
0x0E12000D	Apply the condition to the recipient table of a message.
0x0E13000D	Apply the condition to the **attachment table** of a message.

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 (12 bytes): Data type: **RestrictionBlock**, as specified in section 2.2.4.1.3.

This field specifies a single subcondition that makes up the SubObject condition.

2.2.4.1.3.12 Comment Condition

Comment conditions are unlike other conditions because the conditions are not evaluated, but are only used 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 **RestrictionBlock** of this restriction type MUST use the following format:

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
RestrictionType																															
cValues																															
Reserved																															
...																															
PropValueNum																															

PropValue
...
...
PropValue
...
...
...
SubCondition
...
...

RestrictionType (4 bytes): RES_COMMENT

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 specified in section 2.2.4.1.3. This field MUST exist in this type of restriction.

PropValue (12 bytes): Data type: **PropValue** structure, as specified in section 2.2.4.1.3.This field occurs the number of times specified in the **PropValueNum** field, as specified in section 2.2.4.1.3.

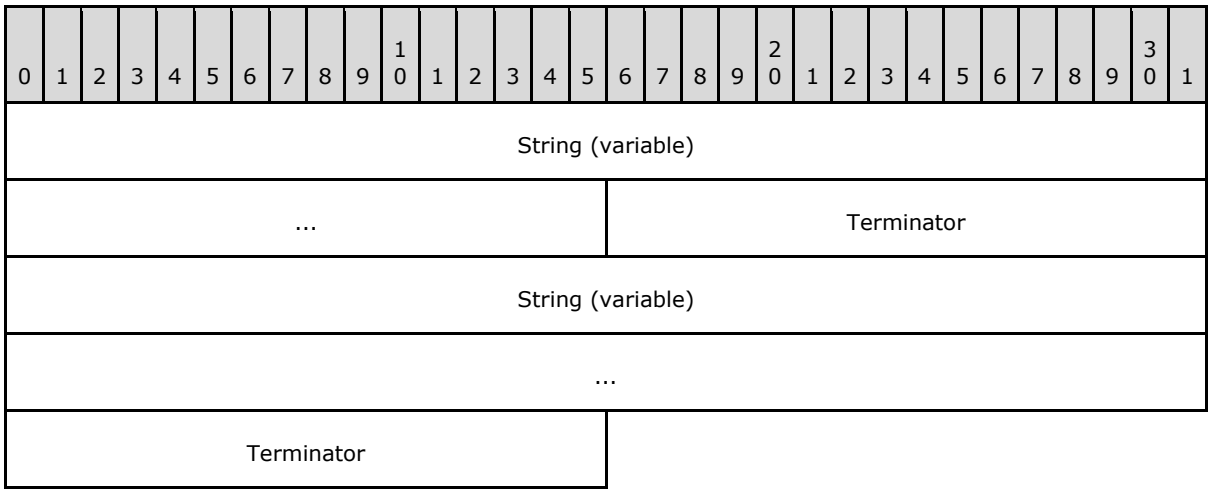
PropValue (16 bytes): Data type: **PropValue** structure, as specified in section 2.2.4.1.3.This field occurs the number of times specified in the **PropValueNum** field, as specified in section 2.2.4.1.3.

SubCondition (12 bytes): Data type: **RestrictionBlock**, as specified in section 2.2.4.1.1.This field specifies a single subcondition that makes up the comment condition.

2.2.4.2 PidTagViewDescriptorStrings

The client MUST store the display strings referenced in PidTagViewDescriptorBinary separately in the PidTagViewDescriptorStrings property. The client MUST concatenate the strings in the same order in which the strings are referenced in PidTagViewDescriptorBinary. The first set of strings consists of the display names of each of the **ColumnInfo** structures, followed by the value of each **PropValue** structure that uses the **PtypString** property type.

The client MUST use the following binary layout in PidTagViewDescriptorStrings:

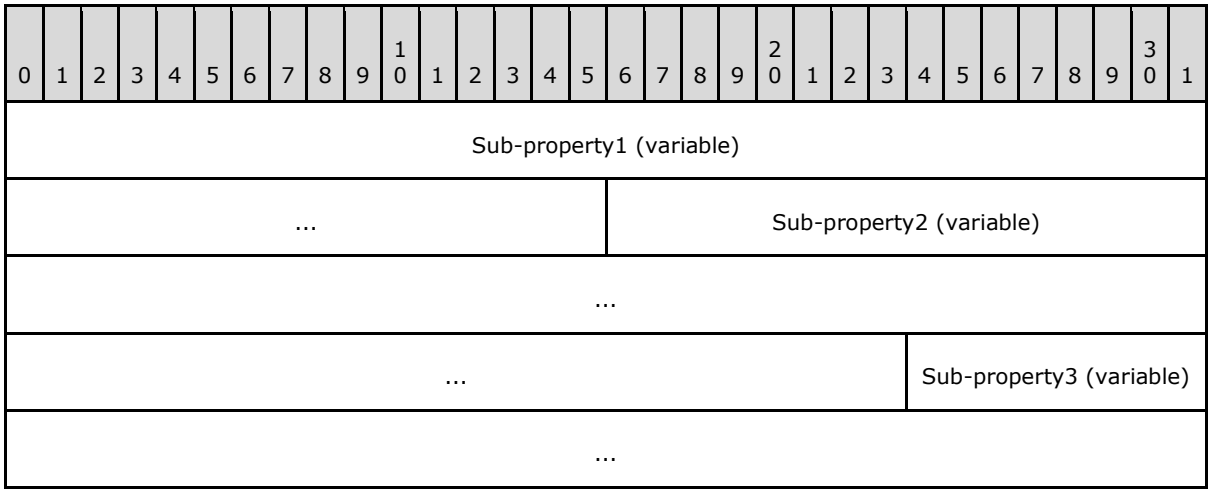


String (variable): This field is an arbitrary length buffer that contains a string. Clients SHOULD format the string using the current code page of the client. The application MUST NOT include the byte value 0x0A00, which corresponds to the newline character, in the string.

Terminator (2 bytes): This field contains the value 0x0A00. The application MUST include a **Terminator** after every **String**, including the last **String** in the stream.

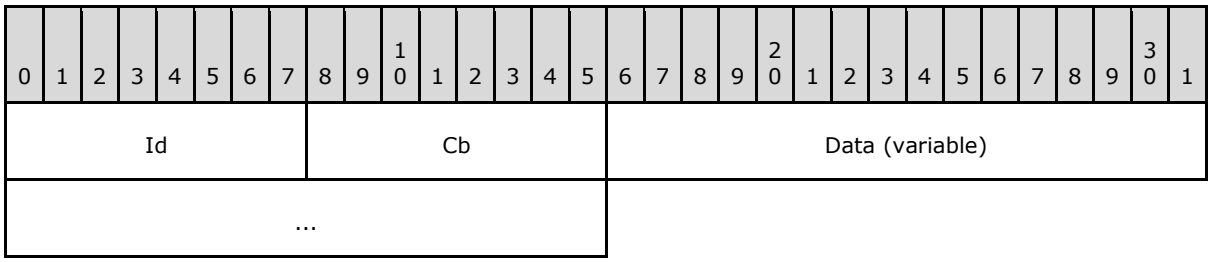
2.2.5 Folder Flags

The PidTagExtendedFolderFlags stream property 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:



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 2.2.5.1.

2.2.5.1 Sub-property



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 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 - 1 times in PidTagExtendedFolderFlags. The subproperties can appear in any order within the PidTagExtendedFolderFlags stream.

Name	Value	Data Format
Invalid	0x00	As specified in section 2.2.5.1.1.
ExtendedFlags	0x01	As specified in section 2.2.5.1.2.
SearchFolderID	0x02	As specified in section 2.2.5.1.3.
SearchFolderTag	0x03	As specified in [MS-OXOSRCH].
Reserved	0x04	N/A
ToDoFolderVersion	0x05	As specified in section 2.2.5.1.4.
Reserved	0x06	N/A

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

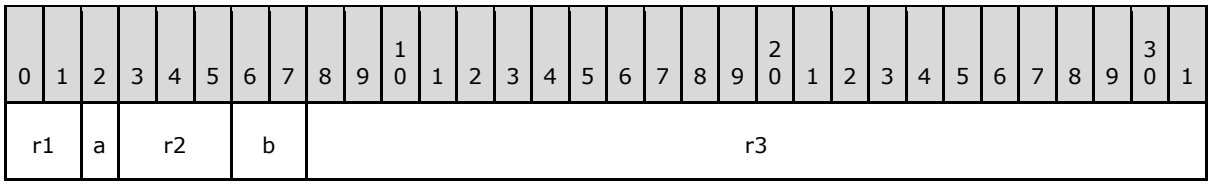
Data (variable): This field contains the value of the subproperty. This field MUST be a variable-length buffer. Because the size is specified in a single unsigned byte in the **Cb** field, the minimum size of the buffer is 0 bytes and the maximum size is 255 bytes. The interpretation of this field is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

2.2.5.1.1 Invalid

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

2.2.5.1.2 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 is not set on the folder, each flag SHOULD assume the specified default value.



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 following table lists the possible values:

Value	Description
0	The application SHOULD <16> display a policy description. This is the default value.
1	The application MUST NOT display a policy description.

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 following table lists the possible values:

Value	Description
00	The application uses the default value for this folder.
01	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 defined in [MS-OXOSFLD].
10	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.
11	This value is invalid. The application MUST NOT use it.

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.

2.2.5.1.3 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 defined in [MS-OXOSRCH], it MUST set this field on the folder to the same value as the PidTagSearchFolderId binary property on the message.

2.2.5.1.4 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 defined in [MS-OXOSFLD], 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:

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2.2.6 Conversation Actions

The client and server SHOULD <17> persist conversation action settings in an FAI message in the conversation actions settings special folder as defined in [MS-OXOSFLD]. The following subsections enumerate the relevant properties of a conversation action FAI message <18>.

2.2.6.1 PidLidConversationActionLastAppliedTime

Type: **PtypTime**

This property SHOULD <19> 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.

2.2.6.2 PidLidConversationActionMaxDeliveryTime

Type: **PtypTime**

This property SHOULD <20> be the maximum value of PidTagMessageDeliveryTime 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).

2.2.6.3 PidLidConversationActionMoveFolderEid

Type: **PtypBinary**

This property SHOULD <21> be set based on the action(s) being performed on the conversation:

Action on the Conversation	Value
Move to a folder in the same store as this FAI Message	The **entry ID** of that folder
Move to a folder in a different store than this FAI Message	The entry ID of that folder
Ignore	Byte array of size zero
None of the above	Not set

2.2.6.4 PidLidConversationActionMoveStoreEid

Type: **PtypBinary**

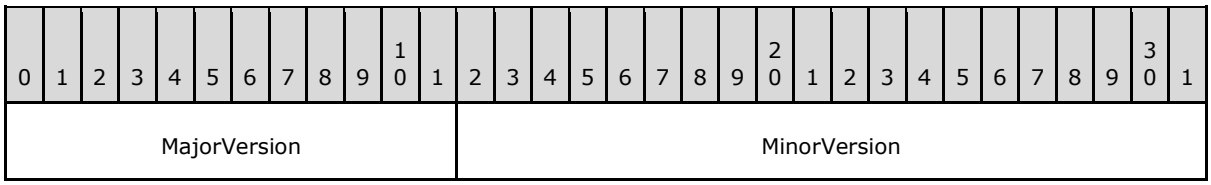
This property SHOULD <22> be set based on the action(s) being performed on the conversation:

Action on the Conversation	Value
Move to a folder in the same store as this FAI message	Not set
Move to a folder in a different store than this FAI message	The entry ID of that store
Ignore	Not set
None of the above	Not set

2.2.6.5 PidLidConversationActionVersion

Type: **PtypInteger32**

This property SHOULD be set to the version of the conversation action FAI message. <23>



MajorVersion (12 bits): Indicates the version compatibility of the conversation action FAI message. 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.

2.2.6.6 PidNameKeywords

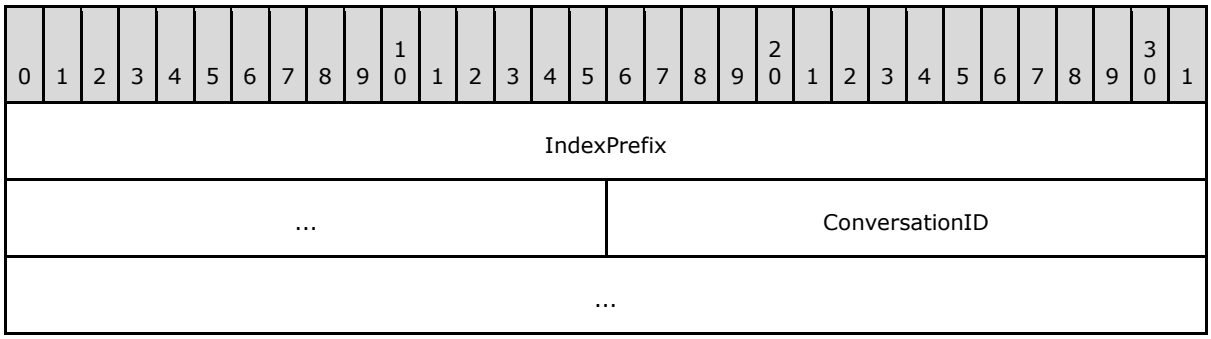
Type: **PtypMultipleString**

If this conversation is being categorized, this property SHOULD <24> 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.

2.2.6.7 PidTagConversationIndex

Type: **PtypBinary**

This property SHOULD <25> be set to a 22-byte array as specified below.



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

ConversationID (16 bytes): This field MUST be set to the PidTagConversationId shared by all the E-mail objects in the conversation.

2.2.6.8 PidTagMessageClass

Type: **PtypString**

This property SHOULD <26> be "IPM.ConversationAction".

2.2.6.9 PidTagSubject

Type: **PtypString**

This property SHOULD <27> be set and can be set to a human-readable value to help correlate this FAI message to the E-mail objects in the conversation <28>.

2.2.7 Navigation Shortcuts

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 the following subsections. <29>

2.2.7.1 PidTagMessageClass

Type: **PtypString**

Identifies the message as a navigation shortcut message. The value is "IPM.Microsoft.WunderBar.Link"

2.2.7.2 PidTagNormalizedSubject

Type: **PtypString**

Specifies the display name of the navigation shortcut.

2.2.7.3 PidTagWlinkGroupHeaderID

Type: **PtypGuid**

Specifies the ID of the navigation shortcut which groups other navigation shortcuts. This property SHOULD only be set when the value of PidTagWlinkType is **wblHeader**.

2.2.7.4 PidTagWlinkSaveStamp

Type: **PtypInteger32**

Specifies an integer that allows a client to identify with a high probability whether the navigation shortcut was saved by the current client session. When writing a navigation shortcut, the client writes the Session ID (described in section 3.1.3.1) as the value for this property.

2.2.7.5 PidTagWlinkType

Type: **PtypInteger32**

Specifies the type of navigation shortcut

Value	Name	Description
0x00000000	wblNormalFolder	The shortcut points to a folder other than those listed below.
0x00000001	wblSearchFolder	The shortcut points to a search folder
0x00000002	wblSharedFolder	The shortcut points to a folder that is owned by a different user.
0x00000004	wblHeader	The shortcut points to the **group header** shortcut.

2.2.7.6 PidTagWlinkFlags

Type: **PtypInteger32**

A bit field in which each bit SHOULD be set to 1 if the associated condition in the table below applies and 0 otherwise. The possible bit values are as follows.

Value	Name	Description
0x00000001	sipPublicFolder	Shortcut points to a server **public folder**
0x00000004	sipImapFolder	Shortcut points to a folder accessed via IMAP
0x00000008	sipWebDavFolder	Shortcut points to a folder accessed via **WebDAV**
0x00000010	sipSharePointFolder	Shortcut points to a folder accessed via SharePoint
0x00000020	sipRootFolder	Shortcut points to a **Root folder** (**IPM subtree**)
0x00000100	sipSharedOut	Shortcut points to a folder that has been shared out to other users. This value can be used to display a visual indicator and does not actually set any **permissions**.
0x00000200	sipSharedIn	Shortcut points to a folder that is owned by another user. This value can be used to display a visual indicator and does not actually set any permissions.
0x00000400	sipPersonFolder	Shortcut points to a folder belonging to another user.
0x00000800	sipiCal	Shortcut points to a folder that accesses data from an iCalendar data source (see [MS-OXCICAL]).
0x00001000	sipOverlay	Shortcut points to a **Calendar folder**. The contents of the Calendar folder, if displayed with other calendars, are merged into one

Value	Name	Description
		calendar and the ordering determined by PidTagWlinkOrdinal. Merging is purely a display – no objects are created or moved between folders.
0x00002000	sipOneOffName	Shortcut has been renamed such that the value of PidTagNormalizedSubject of the shortcut does not match the value of PidTagNormalizedSubject of the folder, or the Shortcut is a group header and has been renamed from the default value.

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

2.2.7.7 PidTagWlinkOrdinal

Type: **PtypBinary**

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 shortcuts can always be inserted before and after other shortcuts.

2.2.7.8 PidTagWlinkEntryId

Type: **PtypBinary**

Specifies the **EntryID** of the folder pointed to by the shortcut.

2.2.7.9 PidTagWlinkRecordKey

Type: **PtypBinary**

Specifies the value of PidTagRecordKey of the folder pointed to by the shortcut.

2.2.7.10 PidTagWlinkStoreEntryId

Type: **PtypBinary**

Specifies the value of PidTagStoreEntryId of the folder pointed to by the shortcut.

2.2.7.11 PidTagWlinkFolderType

Type: **PtypGuid**

Specifies the type of folder pointed to by the shortcut. The possible values are as follows:

Value	Name	Description
{0x0C780600, 0x0000, 0x0000, {0xC0, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x46}}	CLSID_MailFolder	The folder is a mail folder
{0x02780600, 0x0000, 0x0000, {0xC0, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x46}}	CLSID_CalendarFolder	The folder is a Calendar folder

Value	Name	Description
{0x01780600, 0x0000, 0x0000, {0xC0, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x46}}	CLSID_ContactFolder	The folder is a **contact** folder
{0x03780600, 0x0000, 0x0000, {0xC0, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x46}}	CLSID_TaskFolder	The folder is a task folder
{0x04780600, 0x0000, 0x0000, {0xC0, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x46}}	CLSID_NoteFolder	The folder is a note folder
{0x08780600, 0x0000, 0x0000, {0xC0, 0x00, 0x00, 0x00, 0x00, 0x00, 0x 00, 0x00, 0x46}}	CLSID_JournalFolder	The folder is a **journal** folder

2.2.7.12 PidTagWlinkGroupClsid

Type: **PtypGuid**

Specifies the value of PidTagWlinkGroupHeaderID of the group header associated with the shortcut.

2.2.7.13 PidTagWlinkGroupName

Type: **PtypString**

Specifies the value of PidTagNormalizedSubject of the group header associated with the shortcut.

2.2.7.14 PidTagWlinkSection

Type: **PtypInteger32**

Specifies the section where the shortcut should be grouped. The possible values are as follows:

Value	Name	Description
0x00000001	wbsidMailFavorites	Shortcut is grouped under Mail
0x00000002	NA	NA
0x00000003	wbsidCalendar	Shortcut is grouped under Calendar
0x00000004	wbsidContacts	Shortcut is grouped under Contacts
0x00000005	wbsidTasks	Shortcut is grouped under Tasks
0x00000006	wbsidNotes	Shortcut is grouped under Notes
0x00000007	wbsidJournal	Shortcut is grouped under Journal

2.2.7.15 PidTagWlinkCalendarColor

Type: **PtypInteger32**

Specifies the background color of the calendar. The RGB values listed below can be used:

Value	Color (R, G, B)
-1	Automatic (Determined by implementation)
0	141, 174, 217
1	156, 191, 139
2	209, 149, 170
3	176, 182, 190
4	176, 182, 190
5	140, 140, 215
6	141, 193, 157
7	211, 150, 150
8	186, 186, 137
9	174, 153, 216
10	195, 176, 141
11	139, 191, 174
12	144, 182, 200
13	255, 223, 134
14	150, 169, 209

2.2.7.16 PidTagWlinkAddressBookEID

Type: **PtypBinary**

Specifies the value of PidTagEntryId of the user that the folder belongs to (see [MS-OXOABK]). This property SHOULD <30> be set on calendar shortcuts.

2.2.7.17 PidTagWlinkAddressBookStoreEID

Type: **PtypBinary**

Specifies the value of PidTagStoreEntryId of the current user (not the owner of the folder). This property SHOULD <31> be set on calendar shortcuts.

2.2.7.18 PidTagWlinkClientID

Type: **PtypGuid**

Specifies the Client ID that allows the client to determine whether the shortcut was created on the current machine/user via an equality test. The ID is specified in section 3.1.3.1. If this property is set, then the client compares the value of this property to the Client ID and only display the shortcut if the GUIDs match <32>.

2.2.7.19 PidTagWlinkROGroupType

Type: **PtypInteger32**

Specifies the type of group header. If the property does not exist, the client should assume a value of -1<33>. The possible values are as follows.

Value	Name	Description
-1	wbrogUndefined	None
0	wbrogMyDepartment	Group contains shortcuts to users in his department
1	wbrogOtherDepartment	Group contains shortcuts to users in another department
2	wbrogDirectReportGroup	Group contains shortcuts to users in his direct reporting group
3	wbrogCoworkerGroup	Group contains shortcuts to coworkers of the user
4	wbrogDL	Group contains shortcuts to members of a **distribution list**.

3 Protocol Details

3.1 Client Details

3.1.1 Abstract Data Model

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

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.

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 PtypGuid, and is a randomly generated value.

3.1.4 Higher-Layer Triggered Events

3.1.4.1 Reading Configuration Data

To read settings in a configuration data settings group, the client MUST open the special folder that contains the configuration data message, as defined in [MS-OXOSFLD]. The client MUST call RopGetContentsTable with the AssociatedFlag flag to open the FAI contents table, as defined in [MS-OXCFOLD].

The client MUST find all the **rows** in the FAI contents table that have the PidTagMessageClass PtypString property 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 RopSetColumns with the following properties:
  - PidTagFolderId
  - PidTagMid
  - PidTagMessageClass
  - PidTagRoamingDatatypes
- Send RopSortTable with a sort order that includes the following properties:
  - PidTagMessageClass, followed by
  - PidTagLastModificationTime

- Send RopFindRow, searching for a match on the PidTagMessageClass PtypString property.
- Send RopQueryRows repeatedly until either the end of the table or a row with a PidTagMessageClass PtypString property that no longer matches the configuration data message is encountered.
- Based on the subsort by PidTagLastModificationTime, pick the message with the most recent (the greatest value) modification time that includes the bit that matches the PidTagRoamingDatatypes PtypInteger32 property specified by the configuration data message. If none of the messages match the PidTagRoamingDatatypes PtypInteger32 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 by using steps equivalent to the following, as specified in [MS-OXCMSG]:

- Send RopOpenMessage to open the message, using the PidTagFolderId and PidTagMid properties from the table row and setting the ReadWrite flag in the *OpenModeFlags* parameter.

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]:

- Send RopOpenStream to open a Stream object **handle** on the stream property specified by the configuration data message.
- Read the serialized settings by using RopReadStream.

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 message that was picked above 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, an 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 2.2.3.1.

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 2.2.3.1.

If the XML document does exist, and the XML document includes a valid **OLPrefsVersion** setting specified in section 2.2.3.1, 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, the **OLPrefsVersion** settings did not exist or was incorrect, 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 2.2.3.2.

If the client could not find a matching configuration data message and it used default values <34>, or if the user changes the preferred working hours through the client UI, the client MUST generate the XML document as specified in section 2.2.3.2 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** data [MS-OXOCAL], 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 [MS-OXOSFLD] (because the other user's 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 is saved as an FAI message in the user's default Calendar folder [MS-OXOSFLD]. An client can choose to read the category list 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 (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 timestamp, and depending on whether the client separates different message types, the appropriate timestamp (Mail, Calendar, Contacts, Tasks, Notes, Journal), with the current time.

When viewing the contents of another user's folders [MS-OXOCAL], 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 [MS-OXOSFLD], 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 store is inaccessible or the client has not been granted sufficient permissions to access the special folder), the client MUST fall back to use its own category list settings.

3.1.4.2 Writing Configuration Data

To write settings in a configuration data settings group, 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]:

- Send RopOpenStream to open a Stream object handle on the stream property specified by the configuration data message.
- Read the serialized settings by using RopReadStream.

If the message does not exist, the client MUST create the message by using steps equivalent to the following, as specified in [MS-OXCMSG]:

- Send RopCreateMessage on the folder, passing the AssociatedFlag 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]:

- Send RopOpenStream to open a Stream object handle on the stream property specified by the configuration data message.
- Write the serialized settings using RopWriteStream.
- Send RopRelease to persist the streamback to the property.
- Send RopSaveChangesMessage to persist changes to the message.

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 2.2.3.1.

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 2.2.3.2.

The client MUST generate the XML document as specified in section 2.2.3.2 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 2.2.3.2.

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 2.2.3.2 and save it to the configuration data message as specified in section 3.1.4.2.

Each category in the category list contains the following timestamps:

- **lastTimeUsed**

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

The **lastTimeUsed** timestamp 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 (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 timestamp, and depending on whether the client separates different message types, the appropriate type-specific timestamp, with the current time.

3.1.4.3 Reading View Definitions

To read the list of available view definitions for a folder, the client MUST enumerate all of the view definition FAI messages in the folders, searching for a match on the PidTagMessageClass and PidTagViewDescriptorVersion properties as defined in section 2.2.4.

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

3.1.4.4 Writing View Definitions

To write settings in a view definition, 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 RopGetContentsTable with the AssociatedFlag flag to open the FAI contents table, as defined in [MS-OXCFOLD].

If a view definition message already exists with the same PidTagViewDescriptorName 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]:

- Send RopSetColumns with the following properties:
  - PidTagFolderId
  - PidTagMid
  - PidTagMessageClass
  - PidTagViewDescriptorVersion
  - PidTagViewDescriptorName

- Send RopSortTable with a **sort order** that includes the following properties:
  - PidTagMessageClass, followed by
  - PidTagViewDescriptorVersion
  - PidTagViewDescriptorName
- Send RopFindRow, searching for a match on the PidTagMessageClass, PidTagViewDescriptorVersion, and PidTagViewDescriptorName properties as defined in 2.2.4.
- Send RopQueryRows 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 by using steps equivalent to the following, as specified in [MS-OXCFOLD]:

- Send RopCreateMessage on the folder, passing the AssociatedFlag flag.

If the client found a matching row, it MUST open the existing message using steps equivalent to the following, as specified in [MS-OXCFOLD]:

- Send RopOpenMessage to open the message, using the PidTagFolderId and PidTagMid properties from the table row and setting the ReadWrite flag in the OpenModeFlags parameter.

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 2.2.4, by using steps equivalent to the following, as specified in [MS-OXCFOLD]:

- Send RopOpenStream to open Stream object handles on the PidTagViewDescriptorBinary and PidTagViewDescriptorStrings properties.
- Write the serialized settings by using RopWriteStream.
- Send RopRelease to persist the streamback to the property.
- Send RopSaveChangesMessage to persist changes to the message.

3.1.4.5 Reading Folder Flags

To read folder flags on a folder, the client MUST obtain a handle to the folder using RopOpenFolder, as specified in [MS-OXCFOLD] section 3.1.4.1. The client MUST then retrieve the data for the folder flags by sending RopGetPropertiesSpecific with PidTagExtendedFolderFlags in the **PropertyTags** field of the request buffer ([MS-OXCROPS] section 2.2.7.3.1). The binary data MUST be interepreted as specified in section 2.2.5. 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 this subproperty before it can display the folder in the UI.

3.1.4.5.2 Reading SearchFolderID

The client MUST read this value from every Search folder (as specified in [MS-OXOSRCH]) in the Finders special folder (as specified in [MS-OXOSFLD]). 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.

3.1.4.5.3 Reading ToDoFolderVersion

The client MUST read this value from the To-Do Search folder (as specified in [MS-OXOSFLD]) before it displays the contents of that folder. If the **To-Do Search folder** does not exist, it does not contain this subproperty, or it does not contain the required value as defined in section 2.2.5, the client MUST recreate the **To-Do Search folder** or reset the criteria of the search folder, as specified in [MS-OXOFLAG].

3.1.4.6 Writing Folder Flags

To write folder flags on a folder, the client MUST obtain a handle to the folder using RopOpenFolder, as specified in [MS-OXCFOLD] section 3.1.4.1. The client MUST then format the binary data as specified in section 2.2.5 The client MUST then write the data for the folder flags by sending RopSetProperties with PidTagExtendedFolderFlags and the value in the **PropertyValues** field of the request buffer ([MS-OXCROPS] section 2.2.7.6.1). 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 2.2.5.

3.1.4.6.1 Writing ExtendedFolderFlags

Any time the user changes one of the display options for this folder, the client MUST re-write the subproperty to the folder.

3.1.4.6.2 Writing SearchFolderID

The client MUST write this subproperty on any new persistent Search folders that it creates.

3.1.4.6.3 Writing ToDoFolderVersion

When the client recreates or resets the criteria on the To-Do Search folder, it MUST set this 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 multi-value **PtypMultipleString** property. To apply a new category to a message, the client MUST read the current value of PidNameKeywords from the message and check to see if 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 on the message.

3.1.4.8 Performing a Conversation Action

Certain user actions performed on a conversation SHOULD <35> modify the conversation actions on a conversation and trigger special handling logic:

- Ignore
- Unignore
- Move to folder
- Stop moving to folder
- 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 PidTagConversationId 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 PidTagConversationIndex (see section 2.2.6.7) corresponding to the given conversation ID. If no such FAI message exists, proceed to step 4.
2. If the user is performing an Unignore action and the FAI message does not indicate that there is an Ignore conversation action (as specified in sections 2.2.6.3 and 2.2.6.4), the client SHOULD NOT perform the Unignore action for this conversation ID.
3. If the user is performing a Stop moving to folder action and the FAI message does not indicate that there is a Move to folder conversation action (as specified in sections 2.2.6.3 and 2.2.6.4), the client SHOULD NOT perform the Stop moving to folder 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 2.2.6.
5. The client SHOULD locate all E-mail objects on the store with a PidTagConversationId matching the given conversation ID. If the operation cannot be done in a timely fashion, the client can <36> 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 following table.

User Action	Action to perform on each E-mail object
Ignore	If the E-mail object is not in the Sent Items special folder, move the E-mail object to the Deleted Items special folder.
Unignore	If the E-mail object is in the Deleted Items special folder, move the E-mail object to the Inbox special folder.
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.
Stop moving to folder	None
Add category	Append the user-specified category to the PidNameKeywords property of each E-mail object
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.
Clear all categories	Delete the PidNameKeywords property from each E-mail object

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

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

9. The client SHOULD perform the appropriate action on the FAI message, as specified in the following table.

User Action	Action to perform on the FAI message object
Ignore	Set PidLidConversationActionMoveFolderEid to an array of size 0. Delete PidLidConversationActionMoveStoreEid.
Unignore	Delete PidLidConversationActionMoveFolderEid and PidLidConversationActionMoveStoreEid.
Move to folder	Set PidLidConversationActionMoveFolderEid to the entry ID of the user-specified folder. If the user-specified folder is in the same store as the FAI message, delete the PidLidConversationActionMoveStoreEid. Otherwise, set PidLidConversationActionMoveStoreEid to the entry ID of the user-specified store.
Stop moving to folder	Delete PidLidConversationActionMoveFolderEid and PidLidConversationActionMoveStoreEid.
Add category	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 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 the FAI message.

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

3.1.4.9 Reading Navigation Shortcuts

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. Clients open this folder, and process all messages where the value of PidTagMessageClass 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**, the client MUST open the Common Views folder ([MS-OXOSFLD]). 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 RopCreateMessage ([MS-OXCROPS] section 2.2.5.2) on the folder, passing the AssociatedFlag flag. If the client is modifying an existing **navigation shortcut**, the client MUST open the message for the **navigation shortcut** by sending RopOpenMessage ([MS-OXCROPS] section 2.2.5.1) with the ReadWrite flag in the **OpenModeFlags** field.

The client MUST then send RopSetProperties ([MS-OXCROPS] section 2.2.7.6) with the relevant properties. Relevant properties are specified in sections 3.1.4.10.1 and 3.1.4.10.2.

The client MUST then send RopSaveChangesMessage ([MS-OXCROPS] section 2.2.5.3) 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:

- PidTagWlinkGroupHeaderID
- PidTagWlinkSaveStamp
- PidTagWlinkType
- PidTagWlinkFlags
- PidTagWlinkOrdinal
- PidTagWlinkFolderType
- PidTagWlinkSection

3.1.4.10.2 Shortcuts

Shortcuts have the following properties:

- PidTagWlinkSaveStamp
- PidTagWlinkType
- PidTagWlinkFlags
- PidTagWlinkOrdinal
- PidTagWlinkEntryId
- PidTagWlinkRecordKey
- PidTagWlinkStoreEntryId
- PidTagWlinkFolderType
- PidTagWlinkGroupClsid
- PidTagWlinkGroupName
- PidTagWlinkSection

Shortcuts with the value of PidTagWlinkSection set to wbsidCalendar SHOULD <37> have the following properties if needed or appropriate:

- PidTagWlinkCalendarColor
- PidTagWlinkAddressBookEID
- PidTagWlinkAddressBookStoreEID

- PidTagWlinkROGroupType

Shortcuts have the following available to limit the visibility of a shortcut to a single machine:

- PidTagWlinkClientID

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 store, the client SHOULD <38> perform the following actions:

1. The client SHOULD locate the conversation action FAI message in the conversation actions Settings special folder with bytes 6-21 of PidTagConversationIndex (see section 2.2.6.7) corresponding to the PidTagConversationId 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 PidLidConversationProcessed 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 below (more than one property can apply to a given FAI message):

Properties on the FAI message	Action to perform on the incoming E-mail Object
PidNameKeywords is set	If the server returned a version less than 14.0.324.0 (as specified in section 1.7), the categories in the FAI message SHOULD be appended to PidNameKeywords of the incoming E-mail object.
PidLidConversationActionMoveStoreEid is not set and PidLidConversationActionMoveFolderEid is not an array of size zero	If the server returned a version less than 14.0.324.0 (as specified in section 1.7), then the client SHOULD move the incoming E-mail object to the folder with an entry ID equal to the PidLidConversationActionMoveFolderEid on the FAI message.
PidLidConversationActionMoveStoreEid is not set and PidLidConversationActionMoveFolderEid is an array of size zero	If the server returned a version less than 14.0.324.0 (as specified in section 1.7), then the client SHOULD move the incoming E-mail object to the Deleted Items special folder.
PidLidConversationActionMoveStoreEid is set and PidLidConversationActionMoveFolderEid is not an array of size zero	(Note that this case is not conditioned on the server version) The client SHOULD move the incoming E-mail object to the folder and store identified by the PidLidConversationActionMoveFolderEid and PidLidConversationActionMoveStoreEid, respectively.
PidLidConversationActionMoveStoreEid is set and PidLidConversationActionMoveFolderEid is	The client SHOULD NOT move the incoming E-mail object.

Properties on the FAI message	Action to perform on the incoming E-mail Object
an array of size zero	

4. If the server returned a version less than 14.0.324.0 (as specified in section 1.7) and if step 3 did not encounter an error opening the store, PidLidConversationProcessed SHOULD be set to a random number on the incoming E-mail object.

5. The client SHOULD set the current time (in UTC) as PidLidConversationActionLastAppliedTime on the FAI message.

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 on an incoming E-mail object simultaneously. If the server returned a version less than 14.0.324.0 (as specified in section 1.7), the client SHOULD <39>perform duplicate detection on incoming E-mail objects:

The client SHOULD compare PidTagSearchKey property on the incoming E-mail object to the PidTagSearchKey of all recently delivered E-mail objects in the same folder <40>

If a matching E-mail object was found, the client SHOULD compare the unsigned values of the PidLidConversationProcessed property 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 <41> perform additional processing on the copy of the E-mail object in the Sent Items special folder.

The client SHOULD locate the conversation action FAI message in the conversation actions Settings special folder with bytes 6-21 of PidTagConversationIndex (see section 2.2.6.7) corresponding to the PidTagConversationId 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 PidNameKeywords is set on the FAI message, the categories in the FAI message SHOULD be appended to PidNameKeywords 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 specified in section 1.7) and the elapsed time between the PidLidConversationActionLastAppliedTime of the FAI message and the current time is greater than a client-specific duration<42>, the client SHOULD <43> delete the FAI message.

3.1.7 Other Local Events

None.

3.2 Server Details

Clients operate on folders and messages using the [MS-OXPROPS] protocol. 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

The Abstract Data Model for the server and client roles are the same. See section 3.1.1.

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 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 PidTagCreationTime 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 ([MS-OXOSFLD]). If the client tries to access the configuration data message without the necessary permissions, the server MUST deny access to the message.

3.2.4.1.2 Reading Category List

The server can place limits on the size of the XML document that it will parse <44>.

The server is responsible for enforcing permissions that the user grants to the calendar special folder ([MS-OXOSFLD]). If the client tries to access the configuration data message without the necessary permissions, the server MUST deny access to the message.

3.2.4.2 Writing Configuration Data

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 server SHOULD pick the message with the earliest modification time stored in PidTagLastModificationTime 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, the server MUST enumerate all of the view definition FAI messages in the folders, searching for a match on the PidTagMessageClass and PidTagViewDescriptorVersion properties as defined in section 2.2.4.

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

3.2.4.4 Reading Folder Flags

Reading and writing each of the subproperties in the folder flags are triggered by different events.

3.2.4.4.1 Reading ExtendedFolderFlags

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

3.2.4.4.2 Reading SearchFolderID

The server MUST read this value from every search folder (as specified in [MS-OXOSRCH]) in the Finders special folder (as specified in [MS-OXOSFLD]). 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.

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 2.2.5.

3.2.4.5.1 Writing ExtendedFolderFlags

Any time the user changes one of the display options for this folder, the server MUST re-write the subproperty to the folder.

3.2.4.5.2 Writing ToDoFolderVersion

When the server recreates or resets the criteria [MS-OXOFLAG] on the **To-Do Search folder** [MS-OXOSFLD], it MUST set this subproperty on the folder.

3.2.4.6 Applying a category to a Message

The server handles this **event** the same way that the client handles it, as specified in section 3.1.4.7.

3.2.5 Message Processing Events and Sequencing Rules

3.2.5.1 Processing a Change to a Conversation Action FAI Message

When the client **uploads** a change to a conversation action FAI message, the server <45>:

Locate all E-mail objects in the store that have a PidTagConversationId matching bytes 6-21 of the PidTagConversationIndex (see section 2.2.6.7) on the FAI message and that have a

PidTagMessageDeliveryTime greater than the PidLidConversationActionMaxDeliveryTime on the FAI message.

Perform the appropriate action on all located E-mail objects, based on the changes to the FAI message, as specified in the table below (more than one action can apply to a given change):

FAI Message Change	Action to apply on the E-mail Object
PidLidConversationActionMoveFolderEid changed to an array of size 0	If the E-mail object is not in the Sent Items special folder, move the E-mail object to the Deleted Items special folder.
PidLidConversationActionMoveFolderEid was an array of size 0, now unset	If the E-mail object is in the Deleted Items special folder, move the E-mail object to the Inbox special folder.
PidLidConversationActionMoveFolderEid changed to a non-empty array	If PidLidConversationActionMoveStoreEid 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 entry ID equal to the new PidLidConversationActionMoveFolderEid on the FAI message. If PidLidConversationActionMoveStoreEid is set, do nothing.
PidLidConversationActionMoveFolderEid was a non-empty array, now unset	None
PidNameKeywords unset, set, or modified	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.

3.2.5.2 Processing a Conversation Action on Incoming E-mail Objects

When a new E-mail object arrives in a store, the server SHOULD <46>:

Locate the conversation action FAI message in the conversation actions settings special folder with bytes 6-21 of PidTagConversationIndex (see section 2.2.6.7) corresponding to the PidTagConversationId 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.

Perform the appropriate actions on the incoming E-mail object based on the properties of the FAI message, as specified below (more than one property can apply to a given FAI message):

Properties on the FAI Message	Action to perform on the incoming E-mail Object
PidNameKeywords is set	The categories in the FAI message SHOULD be appended to PidNameKeywords of the incoming E-mail object.
PidLidConversationActionMoveStoreEid is not set and PidLidConversationActionMoveFolderEid is not an array of size zero	The server SHOULD move the incoming E-mail object to the folder with an entry ID equal to the PidLidConversationActionMoveFolderEid on the FAI message.
PidLidConversationActionMoveStoreEid is not set and PidLidConversationActionMoveFolderEid is an array of size zero	The server SHOULD move the incoming E-mail object to the Deleted Items special folder.

Properties on the FAI Message	Action to perform on the incoming E-mail Object
PidLidConversationActionMoveStoreEid is set	The server SHOULD NOT move the incoming E-mail object.

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 <47> perform additional processing on the copy of the E-mail object in the Sent Items special folder:

The server SHOULD locate the conversation action FAI message in the conversation actions settings special folder with bytes 6-21 of PidTagConversationIndex (see section 2.2.6.7) corresponding to the PidTagConversationId 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.

If PidNameKeywords is set on the FAI message, the categories in the FAI message SHOULD be appended to PidNameKeywords 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 on a configuration data message, as specified in section 2.2.3.1:

```
<?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 on a configuration data message, as specified in section 2.2.3.2.1:

```
<?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>
</Standard>
<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>
</TimeZone>
<TimeSlot>
<Start>09:00:00</Start>
<End>17:00:00</End>
</TimeSlot>
<WorkDays>Monday Tuesday Wednesday Thursday Friday</WorkDays>
</WorkHoursVersion1>
</Root>
```

4.1.3 Category List

The following is a sample XML document stored in the PidTagRoamingXmlStream property on a configuration data message, as specified in section 2.2.3.2.2:

```
<?xml version="1.0"?>
<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="{33A1EAE3-8E5E-4912-9580-69FC764FEA35}"/>
  <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="{58AB8B90-BB05-428A-B8D2-F1C93968C144}"/>
  <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-ECA3-4573-9CD8-842C284DCA59}"/>
  <category name="Orange Category"
            color="1"
            keyboardShortcut="0"
            usageCount="2"
            lastTimeUsedNotes="1601-01-01T00:00:00.000"
            lastTimeUsedJournal="1601-01-01T00:00:00.000"
            lastTimeUsedContacts="1601-01-01T00:00:00.000"
            lastTimeUsedTasks="1601-01-01T00:00:00.000"
            lastTimeUsedCalendar="1601-01-01T00:00:00.000"
            lastTimeUsedMail="1601-01-01T00:00:00.000"
            lastTimeUsed="2007-11-21T00:07:48.517"
            lastSessionUsed="0"
            guid="{F5F57BF3-A188-48D5-A096-863ACACB2D36}"
            renameOnFirstUse="1"/>
  <category name="Yellow Category"
            color="3"
            keyboardShortcut="0"
            usageCount="5"
            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="2007-11-21T01:04:25.048"
            lastTimeUsedMail="1601-01-01T00:00:00.000"
            lastTimeUsed="2007-11-21T01:04:25.048"
            lastSessionUsed="2"
            guid="{CA791DEF-676C-4177-A839-CAF8878258F0}"/>
  <category name="Black Category"
            color="14"
            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="2007-12-14T02:43:30.719"
            lastTimeUsedMail="1601-01-01T00:00:00.000"
            lastTimeUsed="2007-12-14T02:43:30.719"
            lastSessionUsed="4"
            guid="{77EA6484-D31F-496E-AA07-DC4839D4327A}"/>
</categories>
```

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 PidTagViewDescriptorBinary property stores the column description data and the PidTagViewDescriptorStrings property stores the column headers.

4.2.1 PidTagViewDescriptorBinary

The following is the complete buffer:

```
0000: 00 00 00 00 00 00 00 00-08 00 00 00 02 00 00 00
0010: 00 00 00 00 0B 00 00 00-08 00 00 00 00 00 00 00
0020: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
0030: 00 00 00 00 00 00 00 00-00 00 00 00 01 00 04 00
0040: 07 00 00 00 00 00 00 00-28 00 00 00 00 00 00 00
0050: 00 00 00 00 00 00 00 00-00 00 00 00 04 00 00 00
0060: 03 00 17 00 12 00 00 00-00 00 00 00 4A 2F 00 00
0070: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
0080: 17 00 00 00 0B 00 03 85-12 00 00 00 00 00 00 00
0090: 40 3F 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 46-1E 00 1A 00 12 00 00 00
00c0: 00 00 00 00 0A 27 00 00-00 00 00 00 00 00 00 00
00d0: 00 00 00 00 00 00 00 00-1A 00 00 00 03 00 90 10
00e0: 12 00 00 00 00 00 00 00-4A 2F 00 00 00 00 00 00
00f0: 00 00 00 00 00 00 00 00-00 00 00 00 90 10 00 00
0100: 0B 00 1B 0E 12 00 00 00-00 00 00 00 4A 2F 00 00
0110: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
0120: 1B 0E 00 00 1E 00 42 00-0C 00 00 00 00 00 00 00
0130: 00 2F 00 00 00 00 00 00-00 00 00 00 00 00 00 00
0140: 00 00 00 00 42 00 00 00-1E 00 37 00 11 00 00 00
0150: 00 00 00 00 00 2F 00 00-00 00 00 00 00 00 00 00
0160: 00 00 00 00 00 00 00 00-37 00 00 00 40 00 06 0E
0170: 10 00 00 00 00 00 00 00-40 2F 00 00 00 00 00 00
0180: 00 00 00 00 00 00 00 00-00 00 00 00 06 0E 00 00
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 00
01b0: 08 0E 00 00 1E 10 00 00-12 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 46-12 00 00 00 4B 00 65 00
01f0: 79 00 77 00 6F 00 72 00-64 00 73 00 00 00
```

The first 8 bytes are reserved:

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

The next four bytes specify **Version**. After Version it is the ulFlags value:

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

Version: 0x00000008

ulFlags: 0x00000002 (VDF_SORTDESCENDING)

This **ulFlags** means that the view is sorted by descending order.

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

```
0010: 00 00 00 00 0B 00 00 00
```

pres: NULL

cvcd: 0x0B

cvcd = 0x0B 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

cCat: 0

This means 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: 0

Because the table is not grouped, this 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 restrictions, 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:

```
0030:                                     01 00 04 00
0040: 07 00 00 00 00 00 00 00-28 00 00 00 00 00 00 00
0050: 00 00 00 00 00 00 00 00-00 00 00 00 04 00 00 00
```

PropertyType: 0x0001

```
0030:                                     01 00
```

PropertyID: 0x0004

```
0030:                                           04 00
```

Cx: 0x00000007

```
0040: 07 00 00 00
```

Reserved1:

```
0040:             00 00 00 00
```

Flags: 0x00000028, or (VCDF_BITMAP | VCDF_NOT_SORTABLE)

```
0040:                         28 00 00 00
```

Reserved2:

```
0040:                                     00 00 00 00
0050: 00 00 00 00 00 00 00 00
```

Kind: 0x00000000

```
0050:                         00 00 00 00
```

ID: 0x00000004

```
0050:                                     04 00 00 00
```

4.2.1.2 Column "Importance"

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

```
0060: 03 00 17 00 12 00 00 00-00 00 00 00 4A 2F 00 00
0070: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
0080: 17 00 00 00
```

PropertyType: 0x0003

```
0060: 03 00
```

PropertyID: 0x0017 (PidTagImportance)

```
0060:       17 00
```

Cx: 0x00000012

```
0060:             12 00 00 00
```

Reserved1:

```
0060:                         00 00 00 00
```

Flags: 0x00002F4A, or (VCDF_BITMAP | VCDF_CENTER_JUSTIFY | VCDF_SORTDLG | VCDF_GROUPDLG | VCDF_SORTDESCENDING | VCDF_RCOLUMNSDLG | VCDF_MOVEABLE | VCDF_COLUMNSDLG)

```
 0060:                                     4A 2F 00 00
```

Reserved2:

```
0070: 00 00 00 00 00 00 00 00-00 00 00 00
```

Kind: 0x00000000

```
0070:                                     00 00 00 00
```

ID: 0x00000017

```
0080: 17 00 00 00
```

4.2.1.3 Column "Reminder"

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

```
0080:             0B 00 03 85-12 00 00 00 00 00 00 00
0090: 40 3F 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 46
```

PropertyType: 0x000B

```
0080:             0B 00
```

PropertyID: 0x8503 (PidLidReminderSet)

```
0080:                   03 85
```

Cx: 0x00000012

```
0080:                         12 00 00 00
```

Reserved1:

```
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:

```
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
00b0: C0 00 00 00 00 00 00 46
```

4.2.1.4 Column "Icon"

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

```
00b0:                         1E 00 1A 00 12 00 00 00
00c0: 00 00 00 00 0A 27 00 00-00 00 00 00 00 00 00 00
00d0: 00 00 00 00 00 00 00 00-1A 00 00 00
```

PropertyType: 001E

PropertyID: 0x001A (PidTagMessageClass)

Cx: 0x00000012

Flags: 0x0000270A

Kind: 0x00000000

ID: 0x0000001A

4.2.1.5 Column "Flag Status"

Next in the buffer is the description of column "Flag Status":

```
00d0:                                     03 00 90 10
00e0: 12 00 00 00 00 00 00 00-4A 2F 00 00 00 00 00 00
00f0: 00 00 00 00 00 00 00 00-00 00 00 00 90 10 00 00
```

PropertyType: 0x0003

PropertyID: 0x1090 (PidTagFlagStatus)

Cx: 0x00000012

Flags: 0x00002F4A

Kind: 0x00000000

ID: 0x00001090

4.2.1.6 Column "Attachment"

Next in the buffer is the description of column "attachment":

```
0100: 0B 00 1B 0E 12 00 00 00-00 00 00 00 4A 2F 00 00
0110: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
0120: 1B 0E 00 00
```

PropertyType: 0x000B

PropertyID: 0x0E1B (PidTagHasAttachments)

Cx: 0x00000012

Flags: 0x00002F4A

Kind: 0x00000000

ID: 0x00000E1B

4.2.1.7 Column "From"

Next in the buffer is the description of column "From":

```
0120:             1E 00 42 00-0C 00 00 00 00 00 00 00
0130: 00 2F 00 00 00 00 00 00-00 00 00 00 00 00 00 00
0140: 00 00 00 00 42 00 00 00
```

PropertyType: 0x001E

PropertyID: 0x0042 (PidTagSentRepresentingName)

Cx: 0x0000000C

Flags: 0x00002F00

Kind: 0x00000000

ID: 0x00000042

4.2.1.8 Column "Subject"

Next in the buffer is the description of column "Subject":

```
0140:                         1E 00 37 00 11 00 00 00
0150: 00 00 00 00 00 2F 00 00-00 00 00 00 00 00 00 00
0160: 00 00 00 00 00 00 00 00-37 00 00 00
```

PropertyType: 0x001E

PropertyID: 0x0037 (PidTagSubject)

Cx: 0x00000011

Flags: 0x00002F00

Kind: 0x00000000

ID: 0x00000037

4.2.1.9 Column "Received"

Next in the buffer is the description of column "Received":

```
0160:                                     40 00 06 0E
0170: 10 00 00 00 00 00 00 00-40 2F 00 00 00 00 00 00
0180: 00 00 00 00 00 00 00 00-00 00 00 00 06 0E 00 00
```

PropertyType: 0x0040

PropertyID: 0x0E06 (PidTagMessageDeliveryTime)

Cx: 0x00000010

Flags: 0x00002F40

Kind: 0x00000000

ID: 0x00000E06

4.2.1.10 Column "Size"

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

```
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 00
01b0: 08 0E 00 00
```

PropertyType: 0x0003

PropertyID: 0x0E08 (PidTagMessageSize)

Cx: 0x0000000C

Flags: 0x00002740

Kind: 0x00000000

ID: 0x00000E08

4.2.1.11 Column "Categories"

Next in the buffer is the description of column "categories". This is a column with named property PidNameKeywords :

```
01b0:             1E 10 00 00-12 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 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, PidTagViewDescriptorStrings contains all the column headers delimited by '\n':

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

Note: The value of PidTagViewDescriptorStrings 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

Suppose that 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 PidTagConversationId:

```
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 then moves the conversation to a folder, "FY09 Archive", with an entry ID of:

```
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
```

in a store, "Archived Mail", with an entry ID of:

```
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
0020: 00 00 00 00 4E 49 54 41-F9 BF B8 01 00 AA 00 37
0030: D9 6E 00 00 00 00 43 00-3A 00 5C 00 44 00 6F 00
0040: 63 00 75 00 6D 00 65 00-6E 00 74 00 73 00 20 00
0050: 61 00 6E 00 64 00 20 00-53 00 65 00 74 00 74 00
```

```
0060: 69 00 6E 00 67 00 73 00-5C 00 61 00 6A 00 61 00
0070: 6D 00 65 00 73 00 5C 00-4C 00 6F 00 63 00 61 00
0080: 6C 00 20 00 53 00 65 00-74 00 74 00 69 00 6E 00
0090: 67 00 73 00 5C 00 41 00-70 00 70 00 6C 00 69 00
00a0: 63 00 61 00 74 00 69 00-6F 00 6E 00 20 00 44 00
00b0: 61 00 74 00 61 00 5C 00-4D 00 69 00 63 00 72 00
00c0: 6F 00 73 00 6F 00 66 00-74 00 5C 00 4F 00 75 00
00d0: 74 00 6C 00 6F 00 6F 00-6B 00 5C 00 41 00 72 00
00e0: 63 00 68 00 69 00 76 00-65 00 64 00 20 00 4D 00
00f0: 61 00 69 00 6C 00 2E 00-70 00 73 00 74 00 00 00
```

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

Property	Value
PidLidConversationActionLastAppliedTime	23:51:11 2/17/2009
PidLidConversationActionMaxDeliveryTime	23:31:42 2/17/2009
PidLidConversationActionMoveFolderEid	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
PidLidConversationActionMoveStoreEid	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 0020: 00 00 00 00 4E 49 54 41-F9 BF B8 01 00 AA 00 37 0030: D9 6E 00 00 00 00 43 00-3A 00 5C 00 44 00 6F 00 0040: 63 00 75 00 6D 00 65 00-6E 00 74 00 73 00 20 00 0050: 61 00 6E 00 64 00 20 00-53 00 65 00 74 00 74 00 0060: 69 00 6E 00 67 00 73 00-5C 00 61 00 6A 00 61 00 0070: 6D 00 65 00 73 00 5C 00-4C 00 6F 00 63 00 61 00 0080: 6C 00 20 00 53 00 65 00-74 00 74 00 69 00 6E 00 0090: 67 00 73 00 5C 00 41 00-70 00 70 00 6C 00 69 00 00a0: 63 00 61 00 74 00 69 00-6F 00 6E 00 20 00 44 00 00b0: 61 00 74 00 61 00 5C 00-4D 00 69 00 63 00 72 00 00c0: 6F 00 73 00 6F 00 66 00-74 00 5C 00 4F 00 75 00 00d0: 74 00 6C 00 6F 00 6F 00-6B 00 5C 00 41 00 72 00 00e0: 63 00 68 00 69 00 76 00-65 00 64 00 20 00 4D 00 00f0: 61 00 69 00 6C 00 2E 00-70 00 73 00 74 00 00 00
PidLidConversationActionVersion	0x003CCCCC
PidNameKeywords	{"Fabrikam", "Business Proposals"}
PidTagConversationIndex	0000: 01 00 00 00 00 00 B7 A2- B5 C4 AA 65 1C F2 D3 8C 0000: 62 8C 0E AF 56 C4
PidTagMessageClass	"IPM.ConversationAction"
PidTagSubject	"Conv.Action: Solidifying our proposal to Fabrikam, Inc."

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 the calendar section.

The client sends a RopCreateMessage request with the FolderId set to the Id of the **Common Views folder** and the Associated Flag set to 1, and 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 request to set the following properties:

Property	PropertyID	Property Type	Value
PidTagMessageClass	0x001A	0x001F (PtypString)	"IPM.Microsoft.WunderBar.Link"
PidTagNormalizedSubject	0x0E1D	0x001F (PtypString)	"My Work Calendars"
PidTagWlinkGroupHeaderID	0x6842	0x0048 (PtypGuid)	5BA943D8DAAA462C A63E9136F65C8681
PidTagWlinkSaveStamp	0x6847	0x0003 (PtypInteger32)	0x12345678
PidTagWlinkType	0x6849	0x0003 (PtypInteger32)	0x00000004
PidTagWlinkFlags	0x684A	0x0003 (PtypInteger32)	0x00000000
PidTagWlinkOrdinal	0x684B	0x0102 (PtypBinary)	0x80
PidTagWlinkFolderType	0x684F	0x0048 (PtypGuid)	0278060000000000 C000000000000046
PidTagWlinkSection	0x6852	0x0003 (PtypInteger32)	0x00000003

The client then sends a RopSaveChangesMessage request to persist the object on the server, and a RopRelease request 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 section 4.4.1.

The client sends a RopCreateMessage request with the FolderId set to the Id of the Common Views folder and the Associated Flag set to 1, and waits for the server to respond. The server response contains a handle to the Message object.

The client then sends a RopSetProperties request to set the following properties:

Property	PropertyID	Property Type	Value
PidTagMessageClass	0x001A	0x001F (PtypString)	"IPM.Microsoft.WunderBar.Link"

Property	PropertyID	Property Type	Value
PidTagNormalizedSubject	0x0E1D	0x001F (PtypString)	"Meetings"
PidTagWlinkSaveStamp	0x6847	0x0003 (PtypInteger32)	0x12345678
PidTagWlinkType	0x6849	0x0003 (PtypInteger32)	0x00000000
PidTagWlinkFlags	0x684A	0x0003 (PtypInteger32)	0x00000000
PidTagWlinkOrdinal	0x684B	0x0102 (PtypBinary)	0x80
PidTagWlinkEntryId	0x684C	0x0102 (PtypBinary)	See below
PidTagWlinkRecordKey	0x684D	0x0102 (PtypBinary)	See below
PidTagWlinkStoreEntryId	0x684E	0x0102 (PtypBinary)	See below
PidTagWlinkFolderType	0x684F	0x0048 (PtypGuid)	0278060000000000 C000000000000046
PidTagWlinkGroupClsid	0x6850	0x0048 (PtypGuid)	5BA943D8DAAA462C A63E9136F65C8681
PidTagWlinkGroupName	0x6851	0x001F (PtypString)	"My Work Calendars"
PidTagWlinkSection	0x6852	0x0003 (PtypInteger32)	0x00000003

The value of PidTagWlinkEntryId, PidTagWlinkRecordKey, and PidTagWlinkStoreEntryId are copied directly from the corresponding properties of the actual Calendar folder as described in section 2.2.7.8, section 2.2.7.9, and section 2.2.7.10.

The client then sends a RopSaveChangesMessage request to persist the object on the server, and a RopRelease request 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 (for details, see [MS-OXCMSG]).

5.2 Index of Security Parameters

None.

6 Appendix A: Product Behavior

The information in this specification is applicable to the following product versions. References to product versions include released service packs.

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

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

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

<1> Section 2.2.1: In Outlook 2007 and Outlook 2010 Cached Mode, when the local cached copy of the category list is in conflict with the copy on the server, Outlook 2007 and Outlook 2010 sometimes does not escape the single quote character.

<2> Section 2.2.3: Outlook 2003 and Exchange 2003 do not read or write **configuration data** FAI messages.

<3> Section 2.2.3.1: Exchange 2007 uses the string "Exchange.12" and Outlook 2007 uses the string "Outlook.12" for the version attribute. Exchange 2010 uses the string "Exchange.14" and Outlook 2010 uses the string "Outlook.14" for the version attribute

<4> Section 2.2.3.1.1: Outlook 2003 and Outlook 2007 do not support the piAutoDeleteReceipts property.

<5> Section 2.2.3.2.1: Outlook 2003, Outlook 2007, Exchange 2003, and Exchange 2007 do not read nor write this element.

<6> Section 2.2.3.2.2: Outlook 2007 and Outlook 2010 ignores any digits after the first 3, which means its maximum precision is milliseconds.

<7> Section 2.2.3.2.2: This restriction on the category name is supported only by Exchange 2003.

<8> Section 2.2.3.2.2: Exchange 2003 do not use this attribute data.

<9> Section 2.2.3.2.2: Outlook 2007 and Outlook 2010 will write the usage count, and periodically apply an algorithm to reduce the usage count to facilitate creating a most frequently used list. However, the MFU list is not implemented, and this attribute is not used.

<10> Section 2.2.3.2.2: Outlook 2007 and Outlook 2010 will write the last session that this category was applied or changed by the user, but this value is not used.

<11> Section 2.2.3.2.2: Exchange 2003 and Outlook 2003 SP3 do not support renaming categories.

<12> Section 2.2.3.2.2: Outlook 2007 and Outlook 2010 will increment this number on every session. A new session occurs when the user boots Outlook 2007 or Outlook 2010, or when not less than 12 hours has elapsed since the previous session.

<13> Section 2.2.3.2.3: Outlook 2003, Outlook 2007, Exchange 2003, and Exchange 2007 do not store the settings defined in this section.

<14> Section 2.2.3.2.3: Exchange 2010 always sets the value of **OptedInto** to 'False'.

<15> Section 2.2.4: View definitions are only supported in Outlook 2003.

<16> Section 2.2.5.1.2: Outlook 2003 and Exchange 2003 do not support displaying this description

<17> Section 2.2.6: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<18> Section 2.2.6: Conversation actions are not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<19> Section 2.2.6.1: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<20> Section 2.2.6.2: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<21> Section 2.2.6.3: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<22> Section 2.2.6.4: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<23> Section 2.2.6.5: Outlook 2003, Outlook 2007, Exchange 2003, and Exchange 2007 do not set this property and ignore it if it is set.

<24> Section 2.2.6.6: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<25> Section 2.2.6.7: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<26> Section 2.2.6.8: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<27> Section 2.2.6.9: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<28> Section 2.2.6.9: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010. Outlook 2010 sets PidTagSubject on the FAI message to a concatenated string, "Conv.Action: " followed by the PidTagNormalizedSubject on an E-mail object in the conversation.

<29> Section 2.2.7: Navigation shortcuts are not supported by Outlook 2003, Exchange 2003, or Exchange 2007.

<30> Section 2.2.7.16: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010. Outlook 2010 sets the PidTagWlinkAddressBookEID property on calendar shortcuts only

<31> Section 2.2.7.17: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010. Outlook 2010 sets the PidTagWlinkAddressBookStoreEID property on calendar shortcuts only.

<32> Section 2.2.7.18: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<33> Section 2.2.7.19: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<34> Section 3.1.4.1.2: Outlook 2007 and Outlook 2010 use the default values of working from 8 A.M. to 5 P.M., Monday – Friday, in the user's current system time zone.

<35> Section 3.1.4.8: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<36> Section 3.1.4.8: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, Exchange 2007, or Exchange 2010. When connected to an online-mode server and performing an "Ignore", "Unignore", "Move to folder", or "Stop moving to folder" conversation action, Outlook 2010 will not attempt to locate matching E-mail objects. For all other scenarios, Outlook 2010 will attempt to locate matching E-mail objects.

<37> Section 3.1.4.10.2: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010. Whether Outlook 2010 sets the PidTagWlinkCalendarColor, PidTagWlinkAddressBookEID, PidTagWlinkAddressBookStoreEID, and PidTagWlinkROGroupType is dependent upon configuration or administrative settings.

<38> Section 3.1.5.1: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<39> Section 3.1.5.1.1: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<40> Section 3.1.5.1.1: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010. Outlook 2010 maintains a cache of all E-mail objects received in the past 15 minutes.

<41> Section 3.1.5.2: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<42> Section 3.1.6.1: Outlook 2003, Outlook 2007, and Outlook 2010 have the default duration of 336 hours (14 days).

<43> Section 3.1.6.1: Outlook 2003, Outlook 2007, and Outlook 2010 implement conversation action expiration without timers. Instead, every time an algorithm calls for a FAI message to be located, Outlook 2003, Outlook 2007, and Outlook 2010 run the expiration logic before proceeding with the original algorithm.

<44> Section 3.2.4.1.2: Exchange 2007 and Exchange 2010 will stop reading the XML document beyond 512 KB.

<45> Section 3.2.5.1: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<46> Section 3.2.5.2: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

<47> Section 3.2.5.3: Not supported by Outlook 2003, Outlook 2007, Exchange 2003, or Exchange 2010.

7 Change Tracking

This section identifies changes made to [MS-OXOCFG] protocol documentation between February 2010 and May 2010 releases. Changes are classed as major, minor, or editorial.

Major changes affect protocol interoperability or implementation. Examples of major changes are:

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

Minor changes do not affect protocol interoperability or implementation. Examples are updates to fix technical accuracy or ambiguity at the sentence, paragraph, or table level.

Editorial changes apply to grammatical, formatting, and style issues.

No changes means that the document is identical to its last release.

Major and minor changes can be described further using the following revision types:

- New content added.
- Content update.
- Content removed.
- New product behavior note added.
- Product behavior note updated.
- Product behavior note removed.
- New protocol syntax added.
- Protocol syntax updated.
- Protocol syntax removed.
- New content added due to protocol revision.
- Content updated due to protocol revision.
- Content removed due to protocol revision.
- New protocol syntax added due to protocol revision.
- Protocol syntax updated due to protocol revision.
- Protocol syntax removed due to protocol revision.
- New content added for template compliance.
- Content updated for template compliance.

- Content removed for template compliance.
- Obsolete document removed.

Editorial changes always have the revision type "Editorially updated."

Some important terms used in revision type descriptions are defined as follows:

Protocol syntax refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.

Protocol revision refers to changes made to a protocol that affect the bits that are sent over the wire.

Changes are listed in the following table. If you need further information, please contact protocol@microsoft.com.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Revision Type
1.3 Overview	Updated the section title.	N	Content updated for template compliance.
1.4 Relationship to Other Protocols	48324 Added a detail about the relationship to [MS-OXCTABL], [MS-OXCMSG], and [MS-OXCPRPT].	N	Content update.
1.4 Relationship to Other Protocols	51543 Added navigation shortcuts information.	N	Content update.
2.2.4 View Definitions	55182 Revised description of PidTagViewDescriptorStrings.	N	Content update.
2.2.4.2 PidTagViewDescriptorStrings	55182 Revised descriptions of "String" and "Terminator" fields.	N	Content update.
3.1.4.5 Reading Folder Flags	51337 Added specific ROP information.	N	Content update.
3.1.4.6 Writing Folder Flags	51337 Added specific ROP information.	N	Content update.
3.1.4.10 Writing Navigation Shortcuts	51337 Added specific ROP information.	N	Content update.

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