

[MS-OXOCFG]: Configuration Information Protocol Specification

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Preliminary

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Preliminary

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]:

code page

folder

folder associated information (FAI)

little-endian

message

Non-Unicode

property

special folder

store

table

Unicode

Universal Time Coordinated (UTC)

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

Boolean

Byte

ULONG

WORD

The following terms are specific to this document:

Configuration Data: A collection of application settings.

Folder Flags: Settings which are stored as properties on a **folder** that affect the way that the **folder** is treated by the application.

Sub-property: A binary stream property that is embedded in another **property**, possibly along with other sub-properties.

View Definition: A collection of settings describing the set of columns, the sort order, and optionally a filter which can be used to display the contents of a **folder** in the UI.

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

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

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

[MS-OXGLOS] Microsoft Corporation, "Office Exchange Protocols Master Glossary", 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-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, "Office Exchange Protocols Master Property List Specification", April 2008.

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

[XMLBase] W3C, "XML Base", June 2001, <http://www.w3.org/TR/xmlbase/>.

1.2.2 Informative References

None.

1.3 Protocol Overview (Synopsis)

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 pick 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 once. Storing the state of the client's 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, and the manner in which they are shared between the client and servers. They are broken down into the following categories, each of which uses a different mechanism to share the settings:

- Configuration Data
- View Definitions
- Folder Flags

Besides the settings defined in the Configuration Information Protocol, either the client or server might store additional, non-interoperable settings for the sole use of the respective application in a similar fashion. Despite using a similar storage mechanism, such settings 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 which allow access to individual settings by name. The dictionary is serialized using an XML schema which 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 corresponding to the structure of the data. The settings which 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 which 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 which has been saved elsewhere.

1.4 Relationship to Other Protocols

The Configuration Information Protocol works with folders (see [MS-OXCFOLD]), messages (see [MS-OXCMSG]), **special folders** (see [MS-OXOSFLD]), and **tables** (see [MS-OXCTABL]).

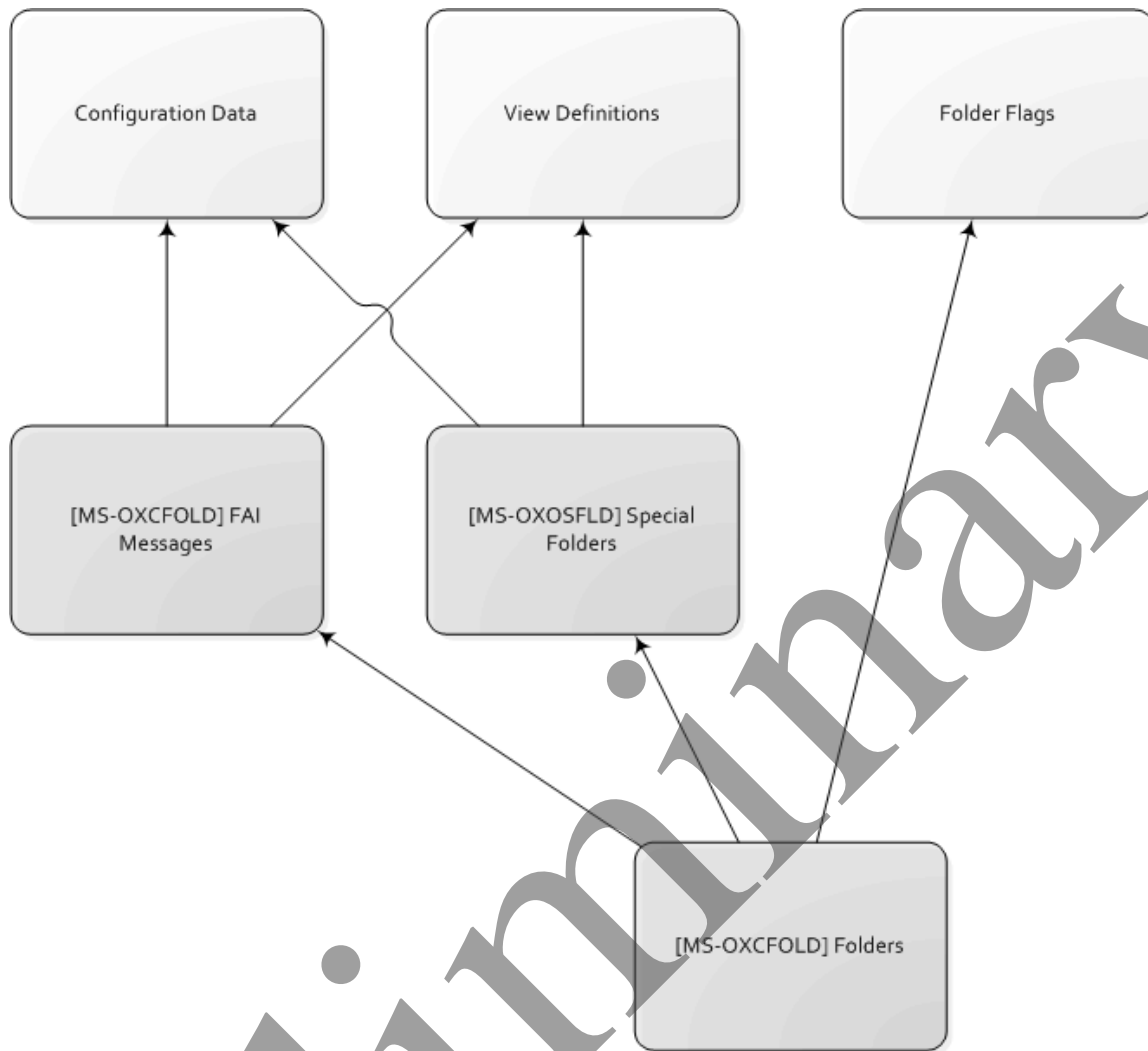


Figure 1: Protocol Stack

The Configuration Data and View Definitions components of the Configuration Information Protocol use FAI messages [MS-OXCFOLD] as the transport. The FAI messages are sometimes contained in a special folder, so these components need to use the Special Folders Protocol [MS-OXOSFLD].

The Folder Flags component uses a binary property stored on the folder itself. The transport for Folder Flags is defined entirely in the Folders Protocol [MS-OXCFOLD].

1.5 Prerequisites/Preconditions

The Configuration Information Protocol specification assumes 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 connected to the same server.

1.7 Versioning and Capability Negotiation

None.

1.8 Vendor-Extensible Fields

A third-party application can store its own settings using FAI messages by specifying its own custom string for the value of the PidTagMessageClass string property. There is no centralized authority that ensures uniqueness of the PidTagMessageClass string property across different applications.

1.9 Standards Assignments

None.

2 Messages

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 [XML Base].

Applications **MUST NOT** depend on support for namespaces [XML Base].

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
"	"
<	<
>	>
&	&

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

Special Character	Escape Sequence
'	'

2.2.2 Binary Format

Unless otherwise specified, the application **MUST** serialize 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 sub-sections.

The application **MUST** store Configuration Data in an FAI message. The application **MUST** store the FAI message in the special folder defined in the following sections for each type of Configuration Data.

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

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

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

- a:** 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:** If this bit is set, the FAI message MUST contain an XML stream stored in the PidTagRoamingXmlstream stream property which uses an arbitrary XML schema. These streams are defined in section 2.2.3.2.
- c:** 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 ULONG property set on it. The value of the ULONG property MUST be a bitmask which includes 0x00000004.

The message MUST have the PidTagRoamingDictionary stream property set on it. The value of the property MUST be a binary stream which 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:complexType>
        </xs:element>
        <xs:element name="Data">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="e"
                minOccurs="0"
                maxOccurs="unbounded"
                type="EntryType" />
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:unique name="uniqueKey"
          <xs:selector xpath="e" />
        </xs:unique>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

```

        <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>

```

Info: A top-level element that **MUST** exist. It **MUST** contain information about the application that created the XML document in the **version** attribute.

version: An attribute on the **Info** element which **MUST** specify 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** be encoded in the version string. There is no validation of the data, it is provided for future reference. The format of the version string is:

```
<name>.<major version number>
```

Data: A top-level element which **MUST** contain all of the Dictionary name-value pair entries.

e: An element which **MUST** contain a name-value pair. There can be an unbounded number of **e** elements inside of the top-level **Data** element.

k: An attribute on the **e** element which **MUST** contain 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 on the **e** element which **MUST** contain the value portion of the name-value pair. The type of this attribute is **ValueString**.

ValueString: A simpleType 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 MUST use 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 re-write 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 MUST store the settings defined below in a Calendar Options Dictionary. The application MUST store the Calendar Options Dictionary in an FAI message contained in the Calendar special folder.

This Dictionary MUST have the PidTagMessageClass string property set on it. The value of the property MUST be "IPM.Configuration.Calendar".

The Dictionary SHOULD include the following settings. Unless otherwise specified, any setting which 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 Requests and Meeting Responses, 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 MUST use this setting to control automatic processing of Meeting Requests and Meeting Responses, as specified in [MS-OXOCAL], if it implements this feature. If the server does not implement this feature, the server MUST ignore this setting. This setting has 3 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 as a Meeting Resource rather than a Meeting Attendee, as specified in [MS-OXOCAL]. The client MUST NOT change the setting when it has this value.
 - Default: (32-bit integer) "1"

2.2.3.2 XML Streams

The message MUST have the PidTagRoamingDatatypes ULONG property set on it. The value of the property MUST be a bitmask which includes 0x00000002.

The message MUST have the PidTagRoamingXmlstream stream property set on it. The value of the property MUST be a binary stream which contains a Unicode XML document using the UTF8 encoding.

In addition to the XSD schemas specified in the following sub-sections, 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 MUST store the settings defined below in a Working Hours stream. The application MUST store the Working Hours stream in an FAI message contained in the Calendar special folder.

The message MUST have the PidTagMessageClass string property set on it. The value of the property MUST be "IPM.Configuration.WorkHours".

The XML document 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: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:restriction>
              </xs:simpleType>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>

```

```

        <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 which MUST exist. The application MUST specify the XML namespace on this element as "WorkingHours.xsd". This element MUST contain the **WorkHoursVersion1** element.

WorkHoursVersion1: This element MUST exist and contain the **TimeZone**, **TimeSlot**, and **WorkDays** elements.

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

Bias: This element MUST exist and contain the offset in minutes of the user's current time-zone from UTC.

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

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

DSTTransition: This is a complexType describing the differences between standard time and daylight saving time in the user's current time-zone. It MUST contain 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.

ChangeDate: This element determines when the transition takes place. The **Bias** specified in the **DSTTransition** MUST be added to the time-zone bias after the transition. This element MUST contain a **Time**, **Date**, and **DayOfWeek** element.

Time: This element MUST contain the time of day when the transition takes place.

Date: This element MUST contain 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 MUST perform the transition every year. If the year is any other value, the application MUST perform the transition only in that year.

The application MUST perform 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 below. If the year is any other value, the application MUST perform 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 MUST select the occurrence of that day of the week using the day of the month portion of the **Date** element. For instance, if the **DayOfWeek** element contains the value 0, and the day of the month is 2 in the **Date** element, the application MUST perform the transition on the 2nd Sunday of the month. The possible values are:

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

6	The application MUST perform 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 **MUST** contain the **Start**, and **End** elements.

Start: This element **MUST** contain 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 **MUST** contain 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 **MUST** contain a list of strings specifying 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 **MUST** treat any day that is included in this element as a work day for the user.

WorkDayType: A simpleType based on a string. The possible values are:

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 defined below in a Category List stream. The application MUST store the Category List stream in an FAI message contained in the Calendar special folder.

The message MUST have the PidTagMessageClass string property set on it. The value of the property MUST be "IPM.Configuration.CategoryList".

The XML document 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:simpleType>
```

```

    </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>

```

name: 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 below<4>.

color: 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 MAY choose to display the color category differently. <5>

Value	Base R,G,B	Name
-1	255,255,255	No Color

Value	Base R,G,B	Name
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

Value	Base R,G,B	Name
22	42, 81, 145	Dark Blue
23	80, 50, 143	Dark Purple
24	130, 55, 95	Dark Maroon

keyboardShortcut: 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).
<6>

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

usageCount: Reserved. Applications SHOULD write 0 <7>.

lastTimeUsed, lastTimeUsedMail, lastTimeUsedCalendar, lastTimeUsedContacts, lastTimeUsedTasks, lastTimeUsedNotes, and lastTimeUsedJournal: See section 3.1.4.2.3 for a definition of these elements.

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 MAY include additional digits. The application SHOULD handle any extra digits if they are included<8>.

The application MUST specify the time in UTC. The application MAY append a Z for the time-zone identifier. The application MUST ignore any other time-zone identifier and interpret the time using UTC.

lastSessionUsed: Reserved. Applications SHOULD write 0 <9>.

guid: 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: If set to "1", an application MAY prompt the user to rename the category when it is first applied to a message (specified in section 3.1.4.6) <10>. If the user renames the category before applying it to a message, this attribute MAY be set to "0". If this attribute is missing, the application MUST use a default value of "0".

default: The name of a category in the Category List that is to be applied (specified in section 3.1.4.6) if the application provides a one click method to apply a category.

lastSavedSession: Reserved. Applications SHOULD write 0 <11>.

lastSavedTime: The value MUST be set to the time in UTC when the Category List was saved.

2.2.4 View Definitions

The client and server SHOULD store certain settings as View Definitions<12>. The format and location of the View Definitions, as well as which settings are included are defined in the following sub-sections.

A message containing View Definitions MUST be an FAI message. The message MUST have the following properties set on it and the value of each property MUST meet the following criteria:

The message MUST have the PidTagMessageClass string property set on it and the value of the property MUST be "IPM.Microsoft.FolderDesign.NamedView".

The message MUST have the PidTagVdVersion ULONG property set on it and the value of the property MUST be 0x00000008.

The message MUST have the PidTagVdName string property set on it and the value of the property MUST be a non-empty string.

The View Definitions MUST be stored as a binary stream in the stream property PidTagVdBinary of the message. The column headers are stored in the PidTagVdStrings stream property on the message as non-Unicode strings using the current code page of the

client. In the following sections we will specify the packet format of these two properties respectively.

2.2.4.1 PidTagVdBinary

View Definitions MUST be stored in stream property PidTagVdBinary of the above mentioned message. It is in binary format and the packet structure is specified as below:

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	
Reserved1...																																
...Reserved1																																
Version																																
ulFlags																																
Pres																																
Cvcd																																
ivcdSort																																
cCat																																
ulCatSort																																
Reserved2...																																
...Reserved2...																																
...Reserved2...																																
...Reserved2...																																
...Reserved2...																																
...Reserved2																																
...ColumnInfo (variable)...																																
RestrictionInfo (optional, variable)																																

Reserved1

Size: 8 bytes

This field **MUST** exist. The application **MAY** fill this field with any value when writing the stream. The application **MUST** ignore the value of this field when reading the stream.

Version

Data type: ULONG

This field **MUST** exist. This **MUST** be fixed value of 0x00000008.

ulFlags

Data type: ULONG

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

Data type: ULONG

This field **MUST** exist. This field is filled with arbitrary value by client and **SHOULD NOT** be used by server.

Cvcd

Data type: ULONG

This field **MUST** exist. It specifies the number of ColumnInfo fields stored in this packet.

ivcdSort

Data type: ULONG

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

Data type: ULONG

This field MUST exist. This field MUST specify the number of “group by” columns 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

Data type: ULONG

This field MUST exist. This field MUST use bit flags to specify the ascending or descending order of the “group by” columns. The flags are defined below. In each case, if the flag is not set, the “group by” column MUST be in descending order.

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

Reserved2

Size: 24 bytes

This field MUST exist. The application MAY fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

ColumnInfo

Data type: ColumnPacket structure, as specified in section 2.2.4.1.3.

This field MUST exist. This is where all of 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 Cxcd field in the packet.

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

The “blank” column: This is a single column which MUST have the following settings, as defined in section 2.2.4.1.3:

Field	Value
Vcids	0x00040001
Cx	0x00000007
Flags	0x00000028 (VCDF_BITMAP VCDF_NOT_SORTABLE)
Kind	0x00000000
IID	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 isn’t a “group by” or “visible” column, it MUST be stored here.

RestrictionInfo

Data type: RestrictionPacket structure, as specified in section 2.2.4.1.1.

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 identifier, property type, and display attributes. The structure of the packet MUST be:

0	1	2	3	4	5	6	7	8	9	1	0	1	2	3	4	5	6	7	8	9	2	0	1	2	3	4	5	6	7	8	9	3	0	1
PropertyType										PropertyID																								
Cx																																		

Reserved1
Flags
Reserved2...
...Reserved2...
...Reserved2
Kind
ID
Guid (optional)
BufferLength (optional)
Buffer (optional, variable)...

PropertyType

Data type: WORD

This field **MUST** exist. This field **MUST** specify the type of the property, as specified in section 2.2.4.1.2.1.

PropertyID

Data type: WORD

This field **MUST** exist. This field **MUST** have 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 2 least significant bytes **MUST** be stored in this field.

Cx

Data type: ULONG

This field **MUST** exist. This **MUST** specify the column width in pixels.

Reserved1

Size: 4 bytes

This field MUST exist. The application MAY fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

Flags

Data type: ULONG

This field MUST exist. This field MUST contain column descriptor flags. The bit setting and its meaning are listed in the following table:

Name	Value	Description
VCDF_LEFT_JUSTIFY	0x00000000	Column MUST be left justified
VCDF_RIGHT_JUSTIFY	0x00000001	Column MUST be right justified
VCDF_CENTER_JUSTIFY	0x00000002	Column MUST be center justified
VCDF_BITMAP	0x00000008	Column header MUST be in bitmap format
VCDF_NOT_SORTABLE	0x00000020	Column MUST NOT be sortable
VCDF_SORTDESCENDING	0x00000040	Column is sorted in descending order
VCDF_MOVEABLE	0x00000100	Deprecated
VCDF_COLUMNSDLG	0x00000200	Deprecated
VCDF_SORTDLG	0x00000400	Column MUST be able to be sorted
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	Deprecated
VCDF_MULTIVALUED	0x00004000	Indicates whether the column PropertyType field MUST include the MV_FLAG flag

Reserved2

Size: 12 bytes

This field **MUST** exist. The application **MAY** fill this field with any value when writing the stream. The application **MUST** ignore the value of this field when reading the stream.

Kind

Data type: ULONG

This field **MUST** exist. The value of this field **MUST** be one of the following:

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

ID

Data type: ULONG

This field **MUST** exist. If the `VCDF_NAMEDPROP` flag is not set in the Flags field, this field **MUST** contain 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 **MAY** fill this field with any value when writing the stream and **MUST** ignore the value of this field when reading the stream.

Guid

Data type: GUID

If the `VCDF_NAMEDPROP` flag is set in the Flags field, this field **MUST** contain 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

Data type: ULONG

If the `VCDF_NAMEDPROP` flag is set in the Flags field, and the value of the Kind field is `KindString`, this field **MUST** contain the length of the Buffer field in bytes,

including the Unicode NULL terminator character (0x0000). Otherwise, the application MUST omit this field.

Buffer

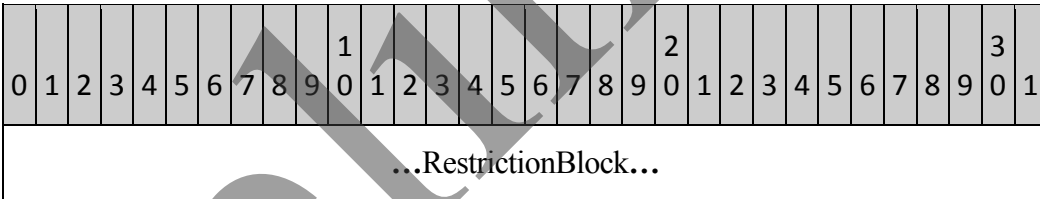
Data type: Unicode String

If the VCDF_NAMEDPROP flag is set in the Flags field, and the value of the Kind field is KindString, this field MUST contain 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 MUST be used to evaluate content table of the folder. Only those rows with TRUE result of the evaluation MUST be displayed.

The restrictions MUST be 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. A **RestrictionBlock** buffer MUST consist of a restriction type, a restriction data record, a number indicating property tag and value pairs, and a list of the property tag and value pair. When the restriction type indicates a compositional condition, like AND or OR for example, more restriction blocks MUST follow after the current restriction block. So a restriction is a packet recursively built up by **RestrictionBlock**. In order to determine the size of the restriction, the application MUST parse each **RestrictionBlock** recursively if necessary.



RestrictionBlock

Data type: RestrictionBlock structure, as specified in 2.2.4.1.2.

It contains the restriction type. From the restriction type we can determine whether it contains sub restrictions and the number of sub restrictions. The server MUST parse 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 we can determine the data record, property tags and property values. If the type is AND, OR, NOT, Sub Object and Comment, more sub restrictions MUST follow this restriction block.

0	1	2	3	4	5	6	7	8	9	1	0	1	2	3	4	5	6	7	8	9	2	0	1	2	3	4	5	6	7	8	9	3	0	1
RestrictionType																																		
RestrictionData																																		
PropValueNum (optional)																																		
PropValue (optional)...																																		
...PropValue (optional)...																																		
...PropValue (optional)																																		
PropValue (optional)...																																		
...PropValue (optional)...																																		
...PropValue (optional)																																		
PropValue (optional)...																																		
...																																		

RestrictionType

Data type: ULONG

It specifies which condition is in use. The following table specifies all available restriction types:

Name	Value	Description
RES_AND	0x00000000	Specifies a LogicalAND condition.
RES_OR	0x00000001	Specifies a Logical OR condition

Name	Value	Description
RES_NOT	0x00000002	Specifies a Logical NOT condition
RES_CONTENT	0x00000003	Content condition
RES_PROPERTY	0x00000004	Specifies a Property condition
RES_COMPAREPROPS	0x00000005	Specifies a Compare Properties condition
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

Size: 12 Bytes

This field **MUST** specify the actual data record associated with the restriction type. The content of this structure varies on the restriction type. Each of the restriction type and its corresponding data structure will be specified in the following sections.

PropValueNum

Data type: ULONG

This field **MAY** be present, depending upon the restriction type. If it is present, it specifies the number of **PropValue**'s followed. See the following sections for details. This field **SHOULD NOT** exist unless otherwise specified for each restriction type.

PropValue

Data type: PropValue structure, as specified in section 2.2.4.1.2.1.

The PropValue field **MAY** 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 MAY contain 1 or more PropValue fields. The PropValue field MUST use the following format:

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
PropertyType																PropertyID															
Reserved																															
Data...																															
...Data																															
Buffer (Optional)...																															

PropertyType

Data Type: WORD

This field specifies the type of the property. The property type MUST be one of the following:

Type Name	Type ID
PtypInteger16	0x0002
PtypInteger32	0x0003
PtypFloating32	0x0004
PtypFloating64	0x0005
PtypCurrency	0x0006
PtypFloatingTime	0x0007
PtypErrorCode	0x000A
PtypBoolean	0x000B
PtypInteger64	0x0014
PtypString8	0x001E

TypeName	Type ID
PtypTime	0x0040
PtypGuid	0x0048
PtypBinary	0x0102

PropertyID

Data Type: WORD

This field **MUST** specify the ID of the property.

Reserved

Size: 4 bytes

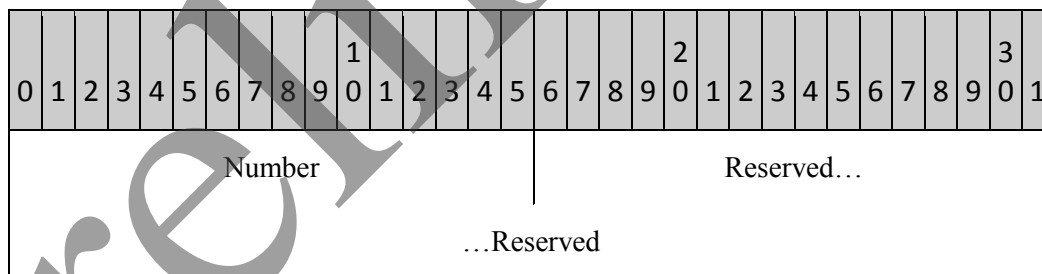
The application **MAY** fill this field with any value when writing the stream. The application **MUST** ignore the value of this field when reading the stream.

Data

Size: 8 bytes

The format of this field depends on the property type specified in the PropertyType field:

PtypInteger16: The Data field **MUST** contain a 2-byte signed integer:



Number

Size: 2 bytes

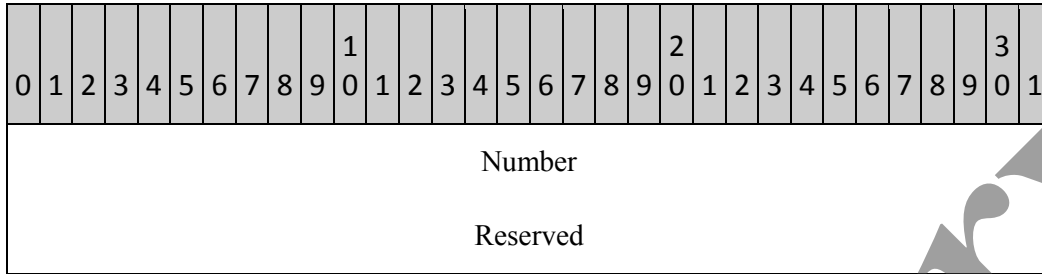
This field **MUST** contain a signed integer.

Reserved

Size: 6 bytes

The application MAY fill this field with values of 0 when writing the stream. The application MUST ignore the value of this field when reading the stream.

PtypInteger32: The Data field MUST contain a 4-byte signed integer:



Number

Size: 4 bytes

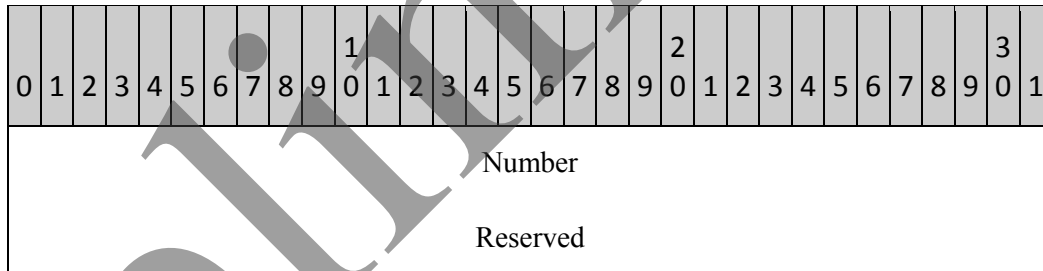
This field MUST contain a signed integer.

Reserved

Size: 4 bytes

The application MAY fill this field with values of 0 when writing the stream. The application MUST ignore the value of this field when reading the stream.

PtypFloating32: The Data field MUST contain a 4-byte floating point number:



Number

Size: 4 bytes

This field MUST contain a floating point number.

Reserved

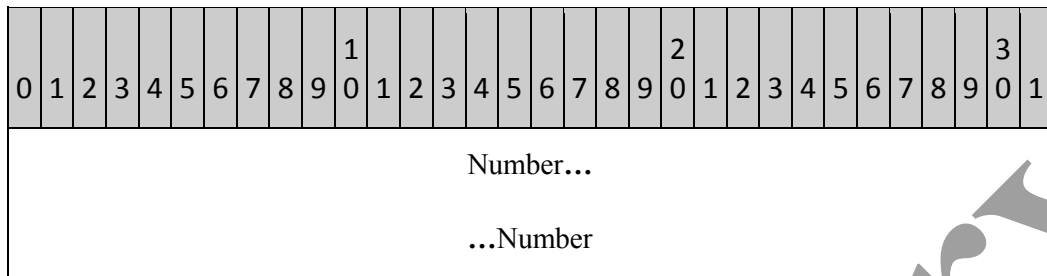
Size: 4 bytes

The application MAY fill this field with values of 0 when writing the stream. The application MUST ignore the value of this field when reading the stream.

PtypFloating64: See PtypFloatingTime below.

PtypCurrency: See PtypInteger64 below.

PtypFloatingTime: The Data field MUST contain an 8 byte floating point number:

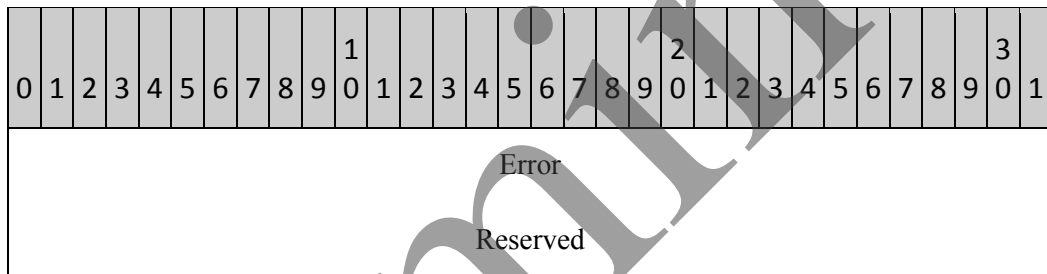


Number

Size: 8 bytes

This field MUST contain a floating point number.

PtypErrorCode: The Data field MUST contain a 4-byte SCODE error code:



Error

Size: 4 bytes

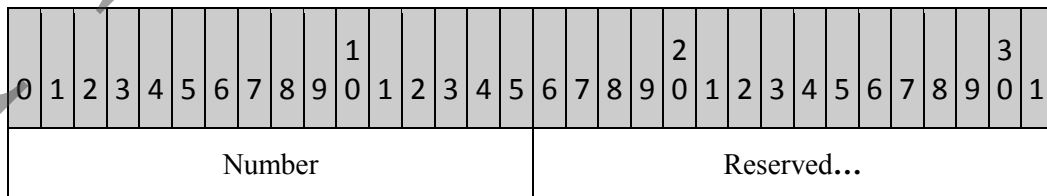
This field MUST contain an SCODE error code.

Reserved

Size: 4 bytes

The application MAY fill this field with values of 0 when writing the stream.
The application MUST ignore the value of this field when reading the stream.

PtypBoolean: The Data field MUST contain a WORD:





Number

Size: 2 bytes

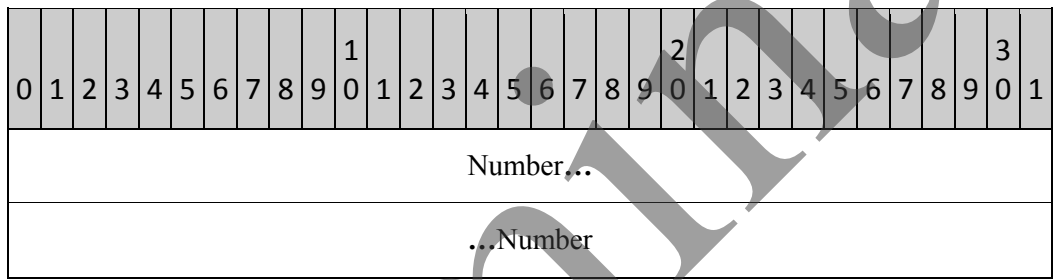
This field MUST contain an unsigned integer.

Reserved

Size: 6 bytes

The application MAY fill this field with values of 0 when writing the stream.
 The application MUST ignore the value of this field when reading the stream.

PtypInteger64: The Data field MUST contain an 8 byte signed integer:



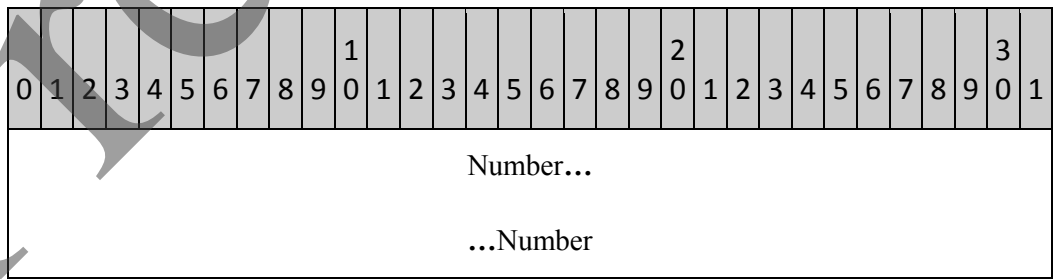
Number

Size: 8 bytes

This field MUST contain a signed integer.

PtypString8: See PtypGuid below. The application MUST store the string value separately in PidTagVdStrings, as specified in section 2.2.4.2.

PtypTime: The Data field MUST contain an 8 byte unsigned integer:



Number

Size: 8 bytes

This field MUST contain an unsigned integer.

PtypGuid: The Data field is reserved:

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
Reserved...																															
...Reserved																															

Reserved

Size: 8 bytes

The application MAY fill this field with values of 0 when writing the stream.
The application MUST ignore the value of this field when reading the stream.

PtypBinary: The Data field MUST contain a 4-byte unsigned integer.

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
Size																															
Reserved																															

Size

Size: 4 bytes

This field MUST contain an unsigned integer.

Reserved

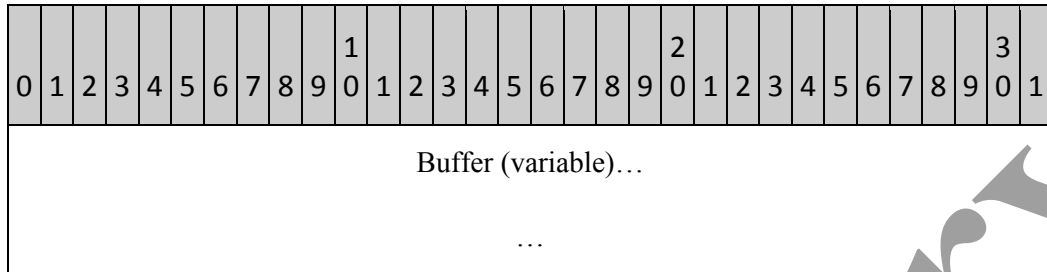
Size: 4 bytes

The application MAY fill this field with values of 0 when writing the stream.
The application MUST ignore the value of this field when reading the stream.

Buffer

Size: Variable length

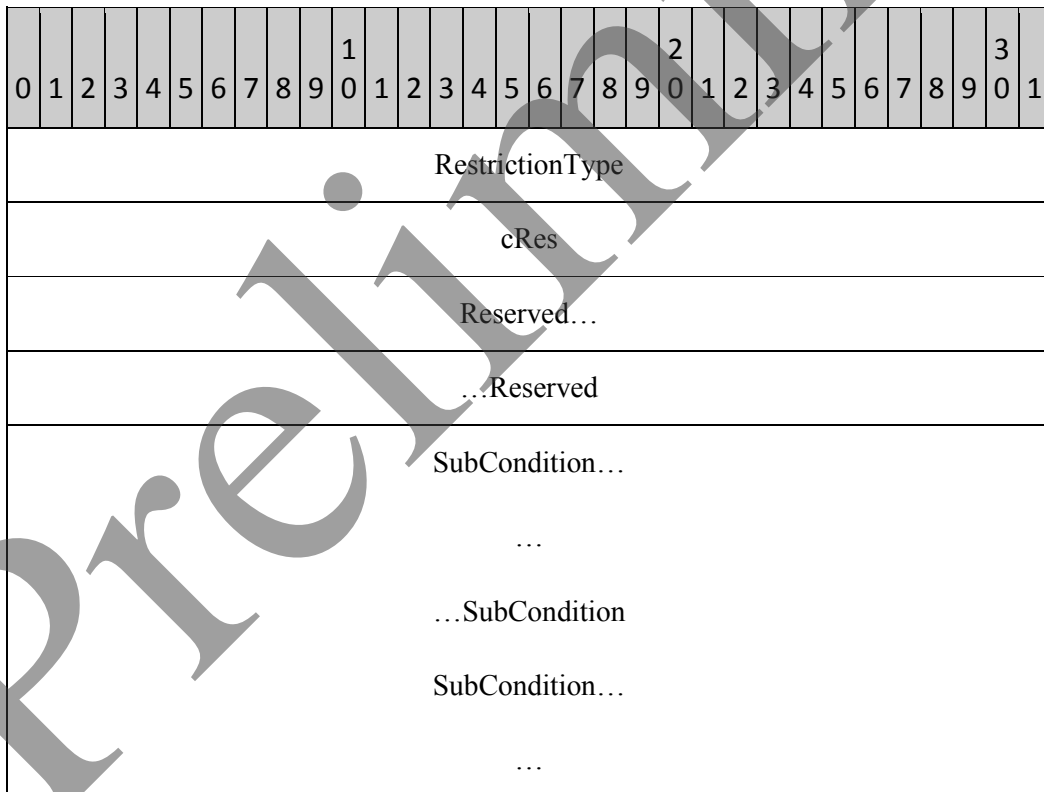
This field **MUST** exist only when the property type encoded in PropertyType is PtypBinary. The Buffer field **MUST** contain an arbitrary binary stream. The size of the stream is specified as a number of bytes in the Size field within Data.



2.2.4.1.3.2 Logical AND Condition

The Logical **AND** condition is used to join a group of conditions by using a logical **AND** operation. Two or more conditions **SHOULD** participate in an **AND** condition. 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:



RestrictionType: RES_AND

cRes

Data type: ULONG

Specifies the number of conditions making up the AND condition. Each sub condition is stored in a RestrictionBlock and all sub conditions are stored sequentially in the packet.

Reserved

Size: 8 bytes

The application MAY fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

SubCondition

Data type: RestrictionBlock, as specified in 2.2.4.1.2.

It specifies sub-conditions making up the AND condition.

2.2.4.1.3.3 Logical OR Condition

The Logical **OR** condition is used to join a group of conditions by using a logical **OR** operation. Two or more conditions SHOULD participate in an OR condition. 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	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
RestrictionType																															
cRes																															
Reserved...																															
...Reserved																															
SubCondition...																															
...																															
...SubCondition																															

SubCondition...
...

RestrictionType: RES_OR

cRes

Data type: ULONG

It specifies the number of conditions making up the OR condition.

Reserved

Size: 8 bytes

The application MAY fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

SubCondition

Data type: RestrictionBlock, as specified in 2.2.4.1.2.

It specifies sub-conditions making 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	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
RestrictionType																															
Reserved...																															
...Reserved...																															
...Reserved																															
SubCondition...																															
...																															

...SubCondition

RestrictionType: RES_NOT

Reserved

Size: 12 bytes

The application MAY fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

SubCondition

Data type: RestrictionBlock, as specified in 2.2.4.1.2.

It specifies a single sub-condition making up the NOT condition.

2.2.4.1.3.5 Content Condition

The Content condition is used to search properties with 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	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
RestrictionType																															
ulFuzzyLevel																															
PropertyType																PropertyID															
Reserved																															
PropValueNum																															
PropValue																															

RestrictionType: RES_CONTENT

ulFuzzyLevel:

Data type: ULONG

This field specifies flags which control the behavior of the string comparisons used to evaluate the restriction. The lower 16 bits of the fuzzy level are mutually exclusive:

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 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 following values, as shown in the following table, and MAY 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 non-spacing characters.
FL_LOOSE	0x00040000	The comparison MAY result in a match whenever possible, ignoring case and non-spacing characters. The interpretation of this flag is left at the discretion of the algorithm implementing the restriction.

PropertyType

Data type: WORD

This field specifies the type of the property, as specified in section 2.2.4.1.2.1.

PropertyID

Data type: WORD

This field specifies the ID of the property, as specified in section 2.2.4.1.2.1.

Reserved

Size: 4 bytes

The application MAY fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

PropValueNum

Data type: ULONG

This field is documented in section 2.2.4.1.2. This field MUST exist in this type of restriction, and the value MUST be 0x00000001.

PropValue

Data type: PropValue structure, as specified in section 2.2.4.1.2.1.

This field MUST exist and it MUST appear once in this type of restriction.

2.2.4.1.3.6 Property Condition

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

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

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
RestrictionType																															
RelOp																															
PropertyType																PropertyID															
Reserved																															
PropValueNum																															
PropValue																															

RestrictionType: RES_PROPERTY

RelOp

Data type: ULONG

It 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

Data type: WORD

This field specifies the type of the property, as specified in section 2.2.4.1.2.1.

PropertyID

Data type: WORD

This field specifies the ID of the property, as specified in section 2.2.4.1.2.1.

Reserved

Size: 4 bytes

The application MAY fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

PropValueNum

Data type: ULONG

This field is documented in section 2.2.4.1.2. This field MUST exist in this type of restriction, and the value MUST be 0x00000001.

PropValue

Data type: PropValue structure, as specified in section 2.2.4.1.2.1.

This field **MUST** exist and it **MUST** appear once in this type of restriction.

2.2.4.1.3.7 Compare Properties Condition

The Compare Properties condition is used to describe a condition that tests two properties by using a relational operator.

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

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

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
RestrictionType																															
RelOp																															
PropertyType1																PropertyID1															
PropertyType2																PropertyID2															

RestrictionType: RES_COMPAREPROPS

RelOp

Data type: ULONG

It specifies the relational operator to be used in the search, as specified in section 2.2.4.1.2.6.

PropertyType1

Data type: WORD

This field specifies the type of the first property, as specified in section 2.2.4.1.2.1.

PropertyID1

Data type: WORD

This field specifies the ID of the first property, as specified in section 2.2.4.1.2.1.

PropertyType2

Data type: WORD

This field specifies the type of the second property, as specified in section 2.2.4.1.2.1.

The type of the second property **MUST** match the type of the first property.

PropertyID2

Data type: WORD

This field specifies the ID of the second property, as specified in section 2.2.4.1.2.1.

2.2.4.1.3.8 Bit Mask Condition

The Bit Mask condition is used to perform a bitwise **AND** operation upon 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:

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
RestrictionType																															
RelOp																															
PropertyType																PropertyID															
Mask																															

RestrictionType: RES_BITMASK

RelOp

Data type: ULONG

It specifies the relational operator to be used in the search. The value **MUST** be one of the following:

Name	Value	Description
BMR_EQZ	0x00	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. <i>The comparison returns TRUE if the result of the operation is zero.</i>
BMR_NEZ	0x01	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. <i>The comparison returns TRUE if the result of the operation is not zero.</i>

PropertyType

Data type: WORD

This field specifies the type of the property, as specified in section 2.2.4.1.2.1.

PropertyID

Data type: WORD

This field specifies the ID of the property, as specified in section 2.2.4.1.2.1.

Mask

Data type: ULONG

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:

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
RestrictionType																															
RelOp																															
PropertyType																PropertyID															
Size																															

RestrictionType: RES_SIZE

RelOp

Data type: ULONG

It specifies the relational operator to be used in the search, as specified in section 2.2.4.1.2.6.

PropertyType

Data type: WORD

This field specifies the type of the property, as specified in section 2.2.4.1.2.1.

PropertyID

Data type: WORD

This field specifies the ID of the property, as specified in section 2.2.4.1.2.1.

Size

Data type: ULONG

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 or not a particular property exists on a message.

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

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
RestrictionType																															
Reserved1																															
PropertyType																PropertyID															
Reserved2																															

RestrictionType: RES_EXIST

Reserved1

Size: 4 bytes

The application **MAY** fill this field with any value when writing the stream. The application **MUST** ignore the value of this field when reading the stream.

PropertyType

Data type: WORD

This field specifies the type of the property, as specified in section 2.2.4.1.2.1.

PropertyID

Data type: WORD

This field specifies the ID of the property, as specified in section 2.2.4.1.2.1.

Reserved2

Size: 4 bytes

The application MAY 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 Sub-Object Condition

The Sub-Object condition is used to test properties on a message's attachment or recipient table.

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

0	1	2	3	4	5	6	7	8	9	1	0	1	2	3	4	5	6	7	8	9	2	0	1	2	3	4	5	6	7	8	9	3	0	1
RestrictionType																																		
SubObject																																		
Reserved...																																		
...Reserved																																		
SubCondition...																																		
...																																		
...SubCondition																																		

RestrictionType: RES_SUBRESTRICTION

SubObject

Data type: ULONG

The application MUST use one of the following values for this field:

Value	Description
0xE12000D	Apply the condition to a message's recipient table

Value	Description
0xE1300D	Apply the condition to a message's attachment table

Reserved

Size: 8 bytes

The application MAY fill this field with any value when writing the stream. The application MUST ignore the value of this field when reading the stream.

SubCondition

Data type: RestrictionBlock, as specified in 2.2.4.1.2.

It specifies a single sub-condition making up the sub-object 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	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
RestrictionType																															
cValues																															
Reserved...																															
...Reserved																															
PropValueNum																															
PropValue...																															
...																															
...PropValue																															

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

RestrictionType: RES_COMMENT

cValues

Data type: ULONG

This field **MUST** have the same value as the PropValueNum field.

Reserved

Size: 8 bytes

The application **MAY** fill this field with any value when writing the stream. The application **MUST** ignore the value of this field when reading the stream.

PropValueNum

Data type: ULONG

This field is documented in section 2.2.4.1.2. This field **MUST** exist in this type of restriction.

PropValue

Data type: PropValue structure, as specified in section 2.2.4.1.2.1.

This field **MUST** occur the number of times specified in the PropValueNum field, as specified in section 2.2.4.1.2.2.

SubCondition

Data type: RestrictionBlock, as specified in 2.2.4.1.2.

It specifies a single sub-condition making up the comment condition.

2.2.4.2 PidTagVdStrings

The client MUST store the display strings referenced in PidTagVdBinary separately in the PidTagVdStrings property. The client MUST concatenate the strings in the same order as the strings are referenced in PidTagVdBinary. The first set of strings consists of the display names of each of the ColumnInfo structures, followed by the value of each PropValue structure which uses the PtypString8 property type.

The client MUST use the following binary layout in PidTagVdStrings:

										1										2										3									
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9
String (variable)...																																							
...String (variable)																				Terminator										String (variable)...									
...String (variable)...																																							
...String (variable)																				Terminator																			
...																																							

String

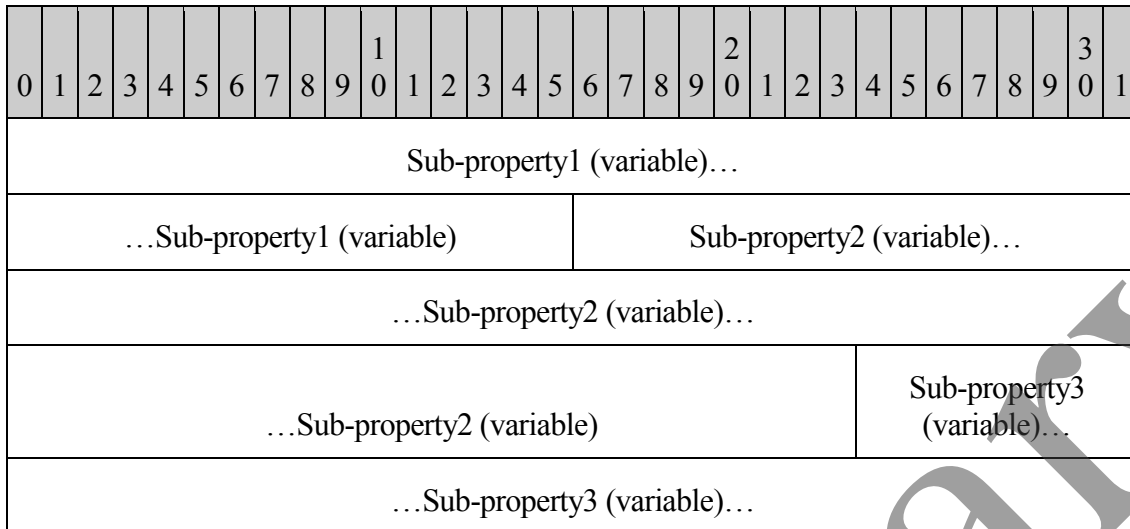
This field is an arbitrary length buffer which specifies the non-Unicode string using the current code page of the client. The application MUST NOT include the byte value 0x0A, which corresponds to the ASCII newline character, in the String.

Terminator

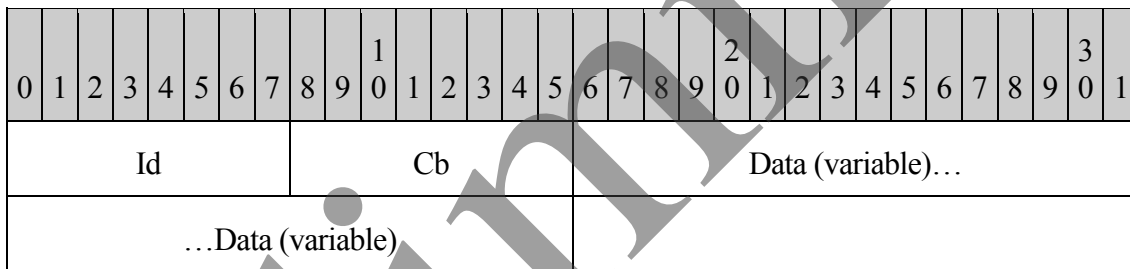
This is a single byte containing the value 0x0A, which corresponds to the ASCII newline character. The application MUST include a Terminator after every String, including the last String in the stream.

2.2.5 Folder Flags

The PidTagExtendedFolderFlags stream property MAY be set on a Folder. If the property is set, the value of this property MUST be a binary stream containing encoded sub-properties for the folder. The format of the binary stream MUST be as follows:



The binary stream is divided into variable-length sub-property fields. The sub-property fields are byte-aligned within the binary stream. Each sub-property MUST be encoded in the following format:



Id

The sub-property ID value. This field uses a fixed size of 1 byte. 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 sub-properties that it does understand, it MUST preserve the values of any sub-properties that it did not understand. Each valid sub-property Id MUST appear 0 - 1 times in PidTagExtendedFolderFlags. The sub-properties MAY appear in any order within the PidTagExtendedFolderFlags stream.

Name	Value
Invalid	0x00

ExtendedFlags	0x01
SearchFolderID	0x02
ToDoFolderVersion	0x05

Cb

This field **MUST** specify the unsigned size in bytes of the sub-property's **Data** buffer. This field **MUST** use a fixed size of 1 byte.

Data

This field **MUST** contain the sub-property's value. 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 **MUST** be 0 bytes and the maximum size **MUST** be 255 bytes.

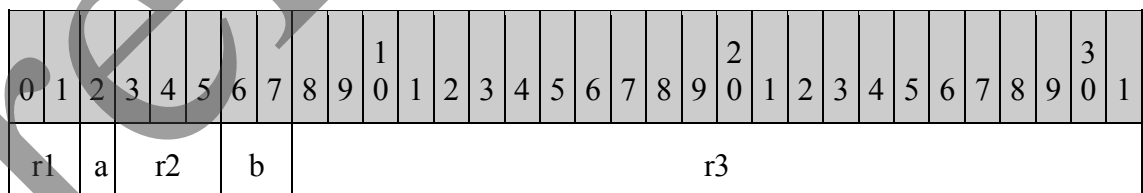
The meaning of the sub-property depends on the value of the **Id** field. The **Id** field **SHOULD** have one of the following values:

Invalid

This value is invalid. The application **MUST NOT** use it.

ExtendedFlags

The Data field is a 4 byte field consisting of 32 bit flags. If the sub-property does not exist, or if the PidTagExtendedFolderFlags property is not set on the folder, each flag **SHOULD** assume the specified default value. The layout of the flags in the buffer **MUST** be as follows:



r1

Reserved. The application **MAY** set these flags to any value when writing the sub-property. The application **MUST** ignore these flags

when reading the sub-property, but it MUST preserve pre-existing values if it rewrites the sub-property.

a

If the folder is subject to an administrative retention policy, this flag controls whether or not the application SHOULD display a string describing the policy<13>.

0: The application SHOULD display a policy description.

1: The application MUST NOT display a policy description.

Default: 0

r2

Reserved. The application MAY set these flags to any value when writing the sub-property. The application MUST ignore these flags when reading the sub-property, but it MUST preserve pre-existing values if it rewrites the sub-property.

b

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<14>.

00: The application SHOULD use the default value for this folder.

01: The application SHOULD use the number of unread Messages in the folder.

10: The application SHOULD use the total number of messages in the folder.

11: This value is invalid. The application MUST NOT use it.

Default: The default value for the Outbox, Drafts, and Junk E-mail special folders as defined in [MS-OXOSFLD] is 10 (show the total number of messages). For every other folder, the default value is 01 (show the number of unread messages).

r3

Reserved. The application MAY set these flags to any value when writing the sub-property. The application MUST ignore these flags when reading the sub-property, but it MUST preserve pre-existing values if it rewrites the sub-property.

SearchFolderID

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 Search Folder Message.

ToDoFolderVersion

The Data field is a 4 byte field. When the application creates the To-Do Search Folder as defined in [MS-OXOSFLD], it MUST set the value of this field on the folder with the following layout, which corresponds to the little-endian integer value of 0x000c0000:

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

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.

3.1.1.1 Configuration Data

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

Dictionaries: A type of Configuration Data consisting of a table of name-value property pairs. Each setting has a unique name property within the table.

Working Hours: A type of Configuration Data consisting of structured data which 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 time and any rules describing a Daylight Saving Time transition.

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.

3.1.1.2 View Definitions

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

View Definitions: 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 which the application uses to split the rows into groups with collapsible header rows on each group,
- The set of Properties which the application uses to sub-sort the rows within any groups that are included,
- A Restriction which the application uses to filter the set of rows in the table.

3.1.1.3 Folder Flags

Folder Flags: A collection of sub-properties on a folder which are stored together in a single Property. This requires that all of the sub-properties are always read or written together.

3.1.2 Timers

None.

3.1.3 Initialization

None.

3.1.4 Higher-Layer Triggered Events

3.1.4.1 Reading Configuration Data

To read settings in a Configuration Data settings group, the application **MUST** open the special folder containing the Configuration Data Message, as defined in [MS-OXOSFLD]. The application **MUST** call RopGetContentsTable with the AssociatedFlag flag to open the FAI Contents Table, as defined in [MS-OXCFOLD].

The application **MUST** find all of the rows in the FAI Contents Table which have the PidTagMessageClass string property specified by the Configuration Data Message that the application is attempting to open using steps equivalent to the following, as specified in [MS-OXCTABL]:

- Send RopSetColumns with a column set that includes the following properties:
 - PidTagFID

- 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 string property.
- Send RopQueryRows repeatedly until encountering either the end of the table or a row with a PidTagMessageClass string property that no longer matches the Configuration Data Message.
- Based on the sub-sort by PidTagLastModificationTime, pick the message with the most recent (the greatest value) modification time that includes the bit that matches the PidTagRoamingDatatypes ULONG property specified by the Configuration Data Message. If none of the messages match the PidTagRoamingDatatypes ULONG property of the Configuration Data Message, the application MUST pick the most recently modified of all of the messages.

If the application 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 application MUST use default values for those settings when the Configuration Data Message cannot be found.

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

- Send RopOpenMessage to open the message, using the PidTagFID and PidTagMID properties from the table row and setting the ReadWrite flag in the OpenModeFlag parameter.

If the application found a matching message, it MUST retrieve the serialized settings stream from the property specified by the Configuration Data Message 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 using RopReadStream.

If multiple Configuration Messages of the same type are found, the Configuration 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 Messages from the message store. Regardless of

the method of resolution, an application SHOULD resolve such conflicts as soon as possible, and SHOULD delete any duplicates, leaving only one Configuration Message that is the result of the conflict resolution.

3.1.4.1.1 Reading Dictionaries

The client MUST pre-populate 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 3.1.4.2. 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 pre-populated 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 3.1.4.2.

3.1.4.1.2 Reading Working Hours

The client MUST read any existing settings from the Configuration Data Message, as specified in section 3.1.4.2. 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<15>, 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 client's time-zone. 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 Message is saved as an FAI message in the user's default Calendar folder [MS-OXOSFLD]. An application can choose to read the Category List at any time it needs.

When encountering unknown tags or attributes, applications SHOULD ignore them, but they SHOULD also re-write them as-is when they re-write the Category List back to the Configuration Message.

All times are to be stored relative to UTC. When a category is applied to a message (specified in section 3.1.4.6), or the user visible properties of the category are changed (such as color or shortcut key), the application SHOULD update the lastTimeUsed timestamp, and depending on whether the application 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 attempt 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 displaying 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 application MUST first look for a pre-existing Configuration Data Message with pre-existing settings, as specified in section 3.1.4.1.

If the application 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 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 using RopReadStream.

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

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

If the application 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 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.

3.1.4.2.1 Writing Dictionaries

The client **MUST** read any existing settings from the Configuration Data Message, as specified in section 3.1.4.2. 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 3.1.4.2. If any existing settings are found, the client **MUST** parse the XML document, as specified in section 2.2.3.2.1.

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 3.1.4.2. If any existing settings are found, the client **MUST** parse the XML document, as specified in section 2.2.3.2.2.

When encountering unknown tags or attributes, applications **SHOULD** ignore them, but they **SHOULD** also re-write them as-is when they re-write the Category List back to the Configuration 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 several 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 application 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 3.1.4.6), or the user visible properties of the category are changed (such as color or shortcut key), the application **SHOULD** update the lastTimeUsed timestamp, and

depending on whether the application separates different message types, the appropriate timestamp (Mail, Calendar, Contacts, Tasks, Notes, Journal), with the current time.

3.1.4.3 Writing View Definitions

To write settings in a View Definition, the client MUST open the folder containing 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 PidTagVdName 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 using steps equivalent to the following, as specified in [MS-OXCTABL]:

- Send RopSetColumns with a column set that includes the following properties:
 - PidTagFID
 - PidTagMID
 - PidTagMessageClass
 - PidTagVdVersion
 - PidTagVdName
- Send RopSortTable with a sort order that includes the following properties:
 - PidTagMessageClass, followed by
 - PidTagVdVersion
 - PidTagVdName
- Send RopFindRow, searching for a match on the PidTagMessageClass, PidTagVdVersion, and PidTagVdName properties as defined in section 2.2.4.
- Send RopQueryRows to retrieve a single row and get the PidTagFID and PidTagMID properties of the matching message from the row.

If the message does not exist, the client MUST create the message 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 PidTagFID and PidTagMID properties from the table row and setting the ReadWrite flag in the OpenModeFlag 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, using steps equivalent to the following, as specified in [MS-OXCFOLD]:

- Send RopOpenStream to open stream object handles on the PidTagVdBinary and PidTagVdStrings properties.
- Write the serialized settings using RopWriteStream.

3.1.4.4 Reading Folder Flags

Reading and writing each of the sub-properties in the Folder Flags are triggered by different events.

3.1.4.4.1 Reading ExtendedFolderFlags

The client MUST read the bit flags in this sub-property before it can display the folder in the UI.

3.1.4.4.2 Reading SearchFolderID

The client MUST read this value from every Search Folder [MS-OXOSRCH] in the Finders Special Folder [MS-OXOSFLD]. Any search folder that has this sub-property is a persistent Search Folder, and the client SHOULD display the search folder as such in the UI.

3.1.4.4.3 Reading ToDoFolderVersion

The client MUST read this value from the To-Do Search Folder [MS-OXOSFLD] before displaying the contents of that folder. If the To-Do Search Folder does not exist, it does not contain this sub-property, 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].

3.1.4.5 Writing Folder Flags

In each case where the client needs to write a new value of one of the sub-properties to the folder, it MUST preserve the values of any other unmodified sub-properties on the folder, as specified in section 2.2.5.

3.1.4.5.1 Writing ExtendedFolderFlags

Anytime the user changes one of the display options for this folder, the client MUST re-write the sub-property to the folder.

3.1.4.5.2 Writing SearchFolderID

The client MUST write this sub-property on any new persistent Search Folders that it creates.

3.1.4.5.3 Writing ToDoFolderVersion

When the client recreates or resets the criteria on the To-Do Search Folder, it MUST set this sub-property on the folder.

3.1.4.6 Applying a category to a Message

A message MAY have a list of categories stored in the PidNameKeywords multi-value string property. To apply a new category to a message, the application 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 application MUST insert the name of the category in the list and set the new value of PidNameKeywords on the message.

3.1.5 Message Processing Events and Sequencing Rules

None.

3.1.6 Timer Events

None.

3.1.7 Other Local Events

None.

3.2 Server Details

Clients operate on folder and messages using the [MS-OXPROPS] protocol. How a server operates on folder 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 is the same.

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 Messages of the same type are found, the Configuration 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 Message, and the rest of the Configuration 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 attempts 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 MAY place limits on the size of the XML document that it will parse<16>.

The server is responsible for enforcing permissions that the user grants to the Calendar Special Folder [MS-OXOSFLD]. If the client attempts 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 Messages of the same type are found, the Configuration 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 Message, and the rest of the Configuration 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 PidTagVdVersion properties as defined in section 2.2.4.

Once the server has built the list of View Definition Messages, it MAY select one of them using the PidTagVdName property. Once it has selected a View Definition Message, the server MUST read the settings from the PidTagVdBinary and PidTagVdStrings properties on the message.

3.2.4.4 Reading Folder Flags

Reading and writing each of the sub-properties 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 sub-property 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 [MS-OXOSRCH] in the Finders Special Folder [MS-OXOSFLD]. Any search folder that has this sub-property 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 sub-properties to the folder, it MUST preserve the values of any other unmodified sub-properties on the folder, as specified in section 2.2.5.

3.2.4.5.1 Writing ExtendedFolderFlags

Anytime the user changes one of the display options for this folder, the server MUST re-write the sub-property 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 sub-property 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 3.1.4.6.

3.2.5 Message Processing Events and Sequencing Rules

None.

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:

```

<?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>
    </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, client creates a new table view which includes following 10 columns:

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

- Categories

When this new view is applied and transported to server, the PidTagVdBinary property stores the column description data and the PidTagVdStrings property stores the column headers.

4.2.1 PidTagVdBinary

The complete buffer:

```

0000: 00 00 00 00 00 00 00 00 00-08 00 00 00 02 00 00 00
0010: 00 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 00
0030: 00 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 00-28 00 00 00 00 00 00 00
0050: 00 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 00 4A 2F 00 00
0070: 00 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 00
0090: 40 3F 00 00 00 00 00 00 00-00 00 00 00 34 01 9A 11
00a0: 00 00 00 00 03 85 00 00 00-08 20 06 00 00 00 00 00
00b0: C0 00 00 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 00
00d0: 00 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 00-4A 2F 00 00 00 00 00 00
00f0: 00 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 00 4A 2F 00 00
0110: 00 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 00
0140: 00 00 00 00 42 00 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 00
0160: 00 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 00-40 2F 00 00 00 00 00 00
0180: 00 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 00 40 27 00 00
01a0: 00 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 00-12 00 00 00 00 00 00 00
01c0: 20 7B 00 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 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 4 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 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 there are 11 columns (including the blank column) stored in this packet.

Next are the ivcdSort and cCat fields:

```
0018: 08 00 00 00 00 00 00 00
```

ivcdSort: 0x08

cCat: 0

It means the view is sorted by column "Received" and the sort order is descending (specified by the ulFlags field).

cCat is zero means the table is not grouped.

Next is the ulCatSort field:

```
0020: 00 00 00 00
```

ulCatSort: 0

Since 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. Since this view hasn't defined restrictions, the buffer doesn't 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
```

Vcds: 0x00040001

```
0030:                                01 00 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
```

IID: 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
```

Vcds: 0x00170003, or PidTagImportance

```
0060: 03 00 17 00
```

Cx: 0x00000012

0060: 12 00 00 00

Reserved1:

0060: 00 00 00 00

Flags: 0x0004A2F, 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

IID: 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

Vcids: 0x8503000B, or PidLidReminderSet

0080: 0B 00 03 85

Cx: 0x00000012

0080: 12 00 00 00

Reserved1:

0080: 00 00 00 00

Flags: 0x0003F40, or (VCDF_NAMEDPROP | VCDF_SORTDESCENDING | VCDF-RCOLUMNSDLG | VCDF_SORTDLG | VCDF_GROUPDLG | VCDF_MOVEABLE)

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

IID: 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

Vcids: 0x001A001E, or PidTagMessageClass

Cx: 0x00000012

Flags: 0x000270A

Kind: 0x00000000

IID: 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
```

Vcids: 0x10900003, or PidTagFlagStatus

Cx: 0x00000012

Flags: 0x0002F4A

Kind: 0x00000000

IID: 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
```

Vcids: 0x0E1B000B, or PidTagHasAttach

Cx: 0x00000012

Flags: 0x0002F4A

Kind: 0x00000000

IID: 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 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
```

Vcids: 0x0042001E, or PidTagSentRepresentingName

Cx: 0x0000000C

Flags: 0x0002F00

Kind: 0x00000000

IID: 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 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
```

Vcbs: 0x0037001E, or PidTagSubject

Cx: 0x00000011

Flags: 0x0002F00

Kind: 0x00000000

IID: 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
```

Vcbs: 0x0E060040, or PidTagMessageDeliveryTime

Cx: 0x00000010

Flags: 0x0002F40

Kind: 0x00000000

IID: 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
```

Vcbs: 0x0E080003, or PidTagMessageSize

Cx: 0x0000000C

Flags: 0x0002740

Kind: 0x00000000

IID: 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 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 00
```

Vcids: 0x0000101E, or PidNameKeywords

Cx: 0x00000012

Flags: 0x0007B20

Kind: 0x00000001

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

BufferLength: 0x00000012

Buffer: "Keywords"

4.2.2 PidTagVdStrings

In this example, PidTagVdStrings contains all the column headers delimited by '\n':

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

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 (see [MS-OXCMSG]).

5.2 Index of Security Parameters

None.

6 Appendix A: Office/Exchange Behavior

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

- Office 2003 with Service Pack 3 applied

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

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

- <1> Section 2.2: In Outlook 2007 Cached Mode, when the local cached copy of the Category List is in conflict with the copy on the server, Outlook 2007 sometimes does not escape the single quote character.
- <2> Section 2.2.3.1: This is only supported in Outlook 2007 or a later version and Exchange 2007 or a later version. Prior versions 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.
- <4> Section 2.2.3.2.2: Exchange 2007 does not enforce this restriction on the category name.
- <5> Section 2.2.3.2.2: Outlook paints color categories with a lighter to darker gradient in a rounded rectangle instead of a solid color.
- <6> Section 2.2.3.2.2: Exchange does not use this attribute data.
- <7> Section 2.2.3.2.2: Outlook 2007 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.
- <8> Section 2.2.3.2.2: Outlook 2007 ignores any digits after the first 3, which means its maximum precision is milliseconds.
- <9> Section 2.2.3.2.2: Outlook 2007 will write the last session that this category was applied or changed by the user, but this value is not used.
- <10> Section 2.2.3.2.2: Exchange and versions of Outlook prior to Outlook 2007 do not support renaming categories.
- <11> Section 2.2.3.2.2: Outlook 2007 will increment this number on every session. A new session occurs when the user boots Outlook 2007, or when not less than 12 hours has elapsed since the previous session.
- <12> Section 2.2.4: This is only supported in Outlook 2007 or earlier versions and Exchange 2003. Later versions do not interoperate using View Definitions.

<13> Section 2.2.5: Outlook 2007 and Exchange 2007 support displaying this description. Previous versions do not.

<14> Section 2.2.5: Outlook and Exchange display this number after the folder name in the list of folders.

<15> Section 3.1.4.2.2: Outlook 2007 uses the default values of working from 8 A.M. to 5 P.M., Monday – Friday, in the user’s current system time-zone.

<16> Section 3.2.4.1.3: Exchange 2007 will stop reading the XML document beyond 512 KB.

Preliminary

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