

# [MS-OXCDATA]: Data Structures

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## Revision Summary

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# 1 Introduction

Certain structures and data types are common to **remote operations (ROPs)** and properties used by clients and servers. These structures include Ids, property tags, and property data types, and are used by client protocols for messaging and storage.

Sections 1.7 and 2 of this specification are normative and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in [RFC2119](#). All other sections and examples in this specification are informative.

## 1.1 Glossary

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

- access control list (ACL)**
- action**
- address book**
- Address Book object**
- ASCII**
- attachments table**
- Augmented Backus-Naur Form (ABNF)**
- base64 encoding**
- big-endian**
- binary large object (BLOB)**
- character set**
- code page**
- Component Object Model (COM)**
- contact**
- Contact object**
- database**
- database object**
- Deleted Items folder**
- distribution list**
- Distribution List object**
- Drafts folder**
- email address**
- EntryID**
- extended rule**
- flags**
- Folder object**
- GUID**
- handle**
- Hypertext Markup Language (HTML)**
- Junk Email folder**
- little-endian**
- long ID (LID)**
- mail user**
- mailbox**
- message body**
- message class**
- Message object**
- message store**
- meta-property**
- multibyte character set (MBCS)**

Multipurpose Internet Mail Extensions (MIME)  
multivalue property  
named property  
NTFS  
Outbox folder  
Personal Distribution List object  
Personal Information Manager (PIM)  
plain text  
plain text message body  
property ID  
property set  
property tag  
property type  
public folder  
Receive folder  
recipient  
recipient table  
remote operation (ROP)  
remote procedure call (RPC)  
replica  
restriction  
ROP buffer  
ROP request  
ROP response  
ROP response buffer  
rule  
search criteria  
search folder  
search folder definition message  
search key  
Server object  
server-side rule  
session  
special folder  
Store object  
subobject  
Transport Neutral Encapsulation Format (TNEF)  
Unicode  
Uniform Resource Identifier (URI)  
universally unique identifier (UUID)  
UTF-16  
UTF-16LE  
Web Distributed Authoring and Versioning Protocol (WebDAV)  
X500 DN  
XML

The following terms are specific to this document:

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



## 1.2 References

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

### 1.2.1 Normative References

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

[ISO-8601] International Organization for Standardization, "Data Elements and Interchange Formats - Information Interchange - Representation of Dates and Times", ISO/IEC 8601:2004, December 2004,

<http://www.iso.org/iso/en/CatalogueDetailPage.CatalogueDetail?CSNUMBER=40874&ICS1=1&ICS2=140&ICS3=30>

**Note** There is a charge to download the specification.

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

[MS-NSPI] Microsoft Corporation, "[Name Service Provider Interface \(NSPI\) Protocol](#)".

[MS-OAUT] Microsoft Corporation, "[OLE Automation Protocol](#)".

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

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

[MS-OXCMAIL] Microsoft Corporation, "[RFC 2822 and MIME to Email Object Conversion Algorithm](#)".

[MS-OXCMAPIHTTP] Microsoft Corporation, "[Messaging Application Programming Interface \(MAPI\) Extensions for HTTP](#)".

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

[MS-OXCPERM] Microsoft Corporation, "[Exchange Access and Operation Permissions Protocol](#)".

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

[MS-OXCRPC] Microsoft Corporation, "[Wire Format Protocol](#)".

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

[MS-OXOAB] Microsoft Corporation, "[Offline Address Book \(OAB\) File Format and Schema](#)".

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

[MS-OXOCNTC] Microsoft Corporation, "[Contact Object Protocol](#)".

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

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

[MS-OXOSRCH] Microsoft Corporation, "[Search Folder List Configuration Protocol](#)".

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

[RFC1123] Braden, R., "Requirements for Internet Hosts - Application and Support", RFC 1123, October 1989, <http://www.ietf.org/rfc/rfc1123.txt>

[RFC2045] Freed, N., and Borenstein, N., "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies", RFC 2045, November 1996, <http://www.rfc-editor.org/rfc/rfc2045.txt>

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

[RFC3986] Berners-Lee, T., Fielding, R., and Masinter, L., "Uniform Resource Identifier (URI): Generic Syntax", STD 66, RFC 3986, January 2005, <http://www.ietf.org/rfc/rfc3986.txt>

[RFC4122] Leach, P., Mealling, M., and Salz, R., "A Universally Unique Identifier (UUID) URN Namespace", RFC 4122, July 2005, <http://www.ietf.org/rfc/rfc4122.txt>

[RFC5234] Crocker, D., Ed., and Overell, P., "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, January 2008, <http://www.rfc-editor.org/rfc/rfc5234.txt>

[XMLSCHEMA2/2] Biron, P., and Malhotra, A., Eds., "XML Schema Part 2: Datatypes Second Edition", W3C Recommendation, October 2004, <http://www.w3.org/TR/2004/REC-xmlschema-2-20041028/>

### 1.2.2 Informative References

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

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

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

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

[MS-EXPROTO] Microsoft Corporation, "[Exchange Server Protocols System Overview](#)".

### 1.3 Overview

Data structures are used in properties, **Folder object** and **Message object** identifiers, remote operations (ROPs), and folder queries.

Apparent redundancies occur in the data structures because information is formatted differently in different contexts. For example, **storeEntryIDs** are formatted differently in the context of a ROP than in the context of a binary property value created by clients.

As a rule, integers in the data structures are transmitted in **little-endian** byte order, with the least significant byte first. But when individual bits within a byte field are specified, they are numbered starting with the most significant bit. Therefore, in a 1-byte field, bit 0 is the 0x80 bit, bit 1 is the 0x40 bit, and bit 7 is the 0x01 bit. Also, where field values are described as "b'x'", where x is either 0 (zero) or 1, the value is a binary value. For example, b'1110' is a 4-bit value where the first three bits are set and the last is not.

### 1.4 Relationship to Protocols and Other Structures

The data structures are used by ROPs as described in [\[MS-OXCROPS\]](#) and by more than one of the **Personal Information Manager (PIM)** object type protocols, such as the Email Object Protocol described in [\[MS-EXOMSG\]](#) and the protocols that extend it.

The descriptions and list of properties in [\[MS-OXPROPS\]](#) provide context for many of the data structures.

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

## **1.5 Applicability Statement**

The data structures specified apply to communication between clients and **mailbox** or **public folder** servers via the Remote Operations (ROP) List and Encoding Protocol as described in [\[MS-OXCROPS\]](#).

## **1.6 Versioning and Localization**

None.

## **1.7 Vendor-Extensible Fields**

None.

## 2 Structures

### 2.1 AddressList Structures

In the context of a ROP, addressees or **recipients** (2) of a Message object are represented either by a set of property values or by a **RecipientRow** structure, as specified in section 2.8.3. In other contexts, such as in saved **search folder** (2) criteria, addressees are represented less compactly by using **AddressList** structures which contain **property tags** and values.

#### 2.1.1 AddressEntry Structure

An **AddressEntry** structure is a set of properties representing one addressee.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
PropertyCount																															
Values (variable)																															
...																															

**PropertyCount (4 bytes):** An unsigned integer whose value is equal to the number of associated **TaggedPropertyValue** structures, as specified in section 2.11.4.

**Values (variable):** A set of **TaggedPropertyValue** structures representing one addressee. The number of structures is indicated by the **PropertyCount** field.

#### 2.1.2 AddressList Structure

An **AddressList** structure contains a set of **AddressEntry** structures. Each **AddressEntry** structure represents one addressee.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
AddressCount																															
Addresses (variable)																															
...																															

**AddressCount (4 bytes):** An unsigned integer whose value is equal to the number of associated addressees.

**Addresses (variable):** An array of **AddressEntry** structures. The number of structures is indicated by the **AddressCount** field.

## 2.2 EntryID and Related Types

**EntryID** is an abstraction of an identifier for many different types of objects, including folders, messages, recipients (2), address book entries, and **message stores**, whose structure and fields depend on the context in which the EntryID is used.

For most ROPs, identifiers are used, such as a **Folder ID** structure, as specified in section [2.2.1.1](#), or a **Message ID** structure, as specified in section [2.2.1.2](#). However, in many cases, EntryIDs are stored as part or all of a binary property value; for example:

- Address book IDs are stored in the **PidTagSentRepresentingEntryId** property ([\[MS-OXOMSG\]](#) section 2.2.1.56) of a Message object.
- Address book and one-off EntryIDs, as specified in section [2.2.5.1](#), are stored in the **PidTagEntryId** property ([\[MS-OXCPERM\]](#) section 2.2.4) of a recipient (2).
- **Contact** (3) address EntryIDs are stored in the **PidLidDistributionListMembers** property ([\[MS-OXOCNTC\]](#) section 2.2.2.2.1) of a contact **distribution list**.

This section first describes the compact **Folder ID**, **Message ID**, and **Global Identifier** structures, then the general **EntryID** structure, followed by the **Folder EntryID**, **Message EntryID**, and **Store Object EntryID** structures, and finally the recipient EntryID structures.

### 2.2.1 Folder ID, Message ID, and Global Identifier Structures

In ROPs where the **Store object** context of the objects that an identifier refers to is known, the following compact structures are used:

- **Folder ID**, as specified in section [2.2.1.1](#)
- **Message ID**, as specified in section [2.2.1.2](#)
- **Global Identifier**, as specified in section [2.2.1.3](#)

#### 2.2.1.1 Folder ID Structure

A **Folder ID** structure uniquely identifies a folder in the context of a logon to a Store object. The **Folder ID** structure is used in the context of a ROP, such as the **RopOpenFolder** ROP ([\[MS-OXCROPS\]](#) section 2.2.4.1), where the Store object context is already established. It is an 8-byte structure.

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

**ReplicaId (2 bytes):** An unsigned integer identifying a Store object.

**GlobalCounter (6 bytes):** An unsigned integer identifying the folder within its Store object.

### 2.2.1.2 Message ID Structure

A **Message ID** structure uniquely identifies a message in the context of a logon to a Store object. The **Message ID** structure is serialized compactly in the context of a ROP, such as the **RepOpenMessage** ROP ([\[MS-OXCROPS\]](#) section 2.2.6.1), where the Store object context is already established. It is an 8-byte structure.

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

**ReplicaId (2 bytes):** An unsigned integer identifying a Store object.

**GlobalCounter (6 bytes):** An unsigned integer identifying the message within its Store object.

### 2.2.1.3 Global Identifier Structure

A **Global Identifier** structure identifies a folder or message in a Store object. It differs from a **Folder ID** structure, as specified in section [2.2.1.1](#), or **Message ID** structure, as specified in section [2.2.1.2](#), in that the **ReplicaId** field is replaced by the corresponding Store object's **GUID**. The last fields of a **Folder ID** structure or **message EntryID** structure, as specified in section [2.2.4.2](#) are effectively a **Global Identifier** structure.

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
DatabaseGuid																															
...																															
...																															
...																															
GlobalCounter																															
...																															

**DatabaseGuid (16 bytes):** A GUID identifying a Store object.

**GlobalCounter (6 bytes):** An unsigned integer identifying the folder or message within its Store object.

### 2.2.1.3.1 LongTermID Structure

A **LongTermID** structure is a **Global Identifier** structure, as specified in section [2.2.1.3](#), plus a 2-byte **Pad** field that has the value 0x0000. The total length of the **LongTermID** structure is 24 bytes.

**LongTermID** structures can be generated from the **Message ID** structure, as specified in section [2.2.1.2](#), or **Folder ID** structure, as specified in section [2.2.1.1](#), by using the **RopLongTermIdFromId** ROP ([\[MS-OXCROPS\]](#) section 2.2.3.8). **Message ID** structures and **Folder ID** structures can be generated from their associated **LongTermID** structures by using the **RopIdFromLongTermId** ROP ([\[MS-OXCROPS\]](#) section 2.2.3.9).

### 2.2.2 NNTP Newsgroup Folder EntryID Structure

The **NNTP Newsgroup Folder EntryID** structure identifies a newsgroup folder in a public message store. [<1>](#)

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Flags																															
ProviderUID																															
...																															
...																															
...																															
FolderType																NewsgroupName (variable)															
...																															

**Flags (4 bytes):** This value MUST be set to 0x00000000. Bits in this field indicate under what circumstances a short-term EntryID is valid. However, in any EntryID stored in a property value, these 4 bytes MUST be zero indicating a long-term EntryID.

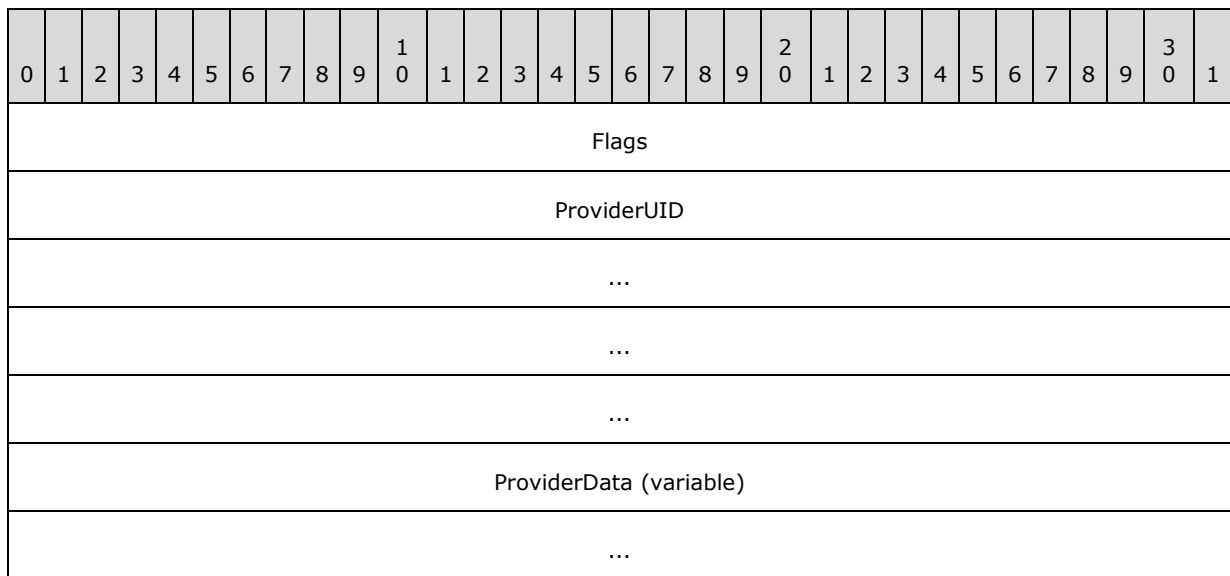
**ProviderUID (16 bytes):** The identifier for the provider that created the EntryID. The value is used to route EntryIDs to the correct provider and MUST be set to %x38.A1.BB.10.05.E5.10.1A.A1.BB.08.00.2B.2A.56.C2.

**FolderType (2 bytes):** Folder is a public newsgroup folder. This value MUST be set to 0x000C.

**NewsgroupName (variable):** The name of the newsgroup formatted as a null-terminated string of 8-bit characters.

### 2.2.3 General EntryID Structure

A **General EntryID** structure is used to identify and access an object. Note that the length of an EntryID is specified externally, not in the structure itself.



**Flags (4 bytes):** This value is set to 0x00000000. Bits in this field indicate under what circumstances a short-term EntryID is valid. However, in any EntryID stored in a property value, these 4 bytes are zero, indicating a long-term EntryID.

**ProviderUID (16 bytes):** The identifier for the provider that created the EntryID. This value is used to route EntryIDs to the correct provider. Values for this field appear in the following table.

EntryID UID type	ProviderUID value
Object in private message store	Is set to the <b>MailboxGuid</b> field value provided in the <b>RopLogon ROP response buffer</b> ( <a href="#">[MS-OXCROPS]</a> section 2.2.3.1.2).
Object in public message store	%x1A. 44.73.90.AA.66.11.CD.9B.C8.00.AA.00.2F.C4.5A
Address book recipient (1)	%xDC.A7.40.C8.C0.42.10.1A.B4.B9.08.00.2B.2F.E1.82
One-off recipient (1)	%x81.2B.1F.A4.BE.A3.10.19.9D.6E.00.DD.01.0F.54.02
Contact (3) address or personal distribution list recipient	%xFE.42.AA.0A.18.C7.1A.10.E8.85.0B.65.1C.24.00.00

**ProviderData (variable):** Provider-specific data further specified in section [2.2.4.1](#), section [2.2.4.2](#), and section [2.2.4.3](#).

## 2.2.4 Messaging Object EntryIDs Structures

A **Messaging Object EntryID** structure specifies a set of data that identifies the type of object pointed to. (EntryIDs for objects in a Store object include, at the beginning of the **ProviderData** field, a 16-bit unsigned integer indicating the type of object to which the EntryID corresponds.) The format of the **ProviderData** field is specified in the following diagram.



0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
ObjectType																Data (variable)															
...																															

**ObjectType (2 bytes):** An unsigned integer indicating the type of Store object to which the EntryID corresponds. The object types and their associated values are specified in the following table.

Store object type (alternate name)	Hexadecimal value
PrivateFolder (eitLTPrivateFolder)	0x0001 %x01.00
PublicFolder (eitLTPublicFolder)	0x0003 %x03.00
MappedPublicFolder<2> (eitLTWackyFolder)	0x0005 %x05.00
PrivateMessage (eitLTPrivateMessage)	0x0007 %x07.00
PublicMessage (eitLTPublicMessage)	0x0009 %x09.00
MappedPublicMessage<3> (eitLTWackyMessage)	0x000B %x0B.00
PublicNewsgroupFolder (eitLTPublicFolderByName)	0x000C %x0C.00

**Data (variable):** Type-specific data. The format of this data is specified in sections [2.2.4.1](#), [2.2.4.2](#), and [2.2.4.3](#).

### 2.2.4.1 Folder EntryID Structure

A **Folder EntryID** structure specifies a set of data that identify a Store object. The format and information of **Folder EntryID** structures differ from that of **EntryIDs** used in ROPs. For folders, the **ReplicaId** field, as specified in section [2.2.1.1](#), is mapped to a **DatabaseGuid** by using the **RopLongTermIdFromId** ROP ([\[MS-OXCROPS\]](#) section 2.2.3.8). This less compact format is necessary because no assumptions can be made about the Store object context in which a **Folder EntryID** structure is used.

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

Provider UID	
...	
...	
...	
FolderType	DatabaseGuid
...	
...	
...	
...	GlobalCounter
...	
Pad	

**Flags (4 bytes):** This value MUST be set to 0x00000000. Bits in this field indicate under what circumstances a short-term EntryID is valid. However, in any EntryID stored in a property value, these 4 bytes MUST be zero, indicating a long-term EntryID.

**Provider UID (16 bytes):** The value of this field is determined by where the folder is located. For a folder in a private mailbox, this value MUST be set to value of the **MailboxGuid** field from the **RopLogon** ROP response buffer ([\[MS-OXCROPS\]](#) section 2.2.3.1.2). For a folder in the public message store, this value MUST be set to %x1A.44.73.90.AA.66.11.CD.9B.C8.00.AA.00.2F.C4.5A.

**FolderType (2 bytes):** One of several Store object types specified in the table in section [2.2.4](#).

**DatabaseGuid (16 bytes):** A GUID associated with the Store object and corresponding to the **ReplicaId** field of the **FID** structure.

**GlobalCounter (6 bytes):** An unsigned integer identifying the folder.

**Pad (2 bytes):** This value MUST be set to zero.

#### 2.2.4.2 Message EntryID Structure

In the context of an EntryID, a **Message EntryID** structure, as specified in section [2.2.1.2](#), differs from the structure in the context of a ROP. The **ReplicaId** field, as specified in section [2.2.1.2](#), is mapped to a **MessageDatabaseGuid** field, and the whole ID is prefixed with **flags** and a **provider UID** field. In addition, the **Folder ID** structure, as specified in section [2.2.1.1](#), of the folder in which the message resides is included.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Flags																															
ProviderUID																															
...																															
...																															
...																															
MessageType																FolderDatabaseGuid															
...																															
...																															
...																															
...																FolderGlobalCounter															
...																															
Pad																MessageDatabaseGuid															
...																															
...																															
...																															
...																MessageGlobalCounter															
...																															
Pad																															

**Flags (4 bytes):** This value MUST be set to 0x00000000. Bits in this field indicate under what circumstances a short-term EntryID is valid. However, in any EntryID stored in a property value, these 4 bytes MUST be zero, indicating a long-term EntryID.

**ProviderUID (16 bytes):** The value of this field is determined by where the folder is located. For a folder in a private mailbox, this value MUST be set to the value of the **MailboxGuid** field from the **RopLogon** ROP response buffer ([\[MS-OXCROPS\]](#) section 2.2.3.1.2). For a folder in the public message store, this value MUST be set to %x1A.44.73.90.AA.66.11.CD.9B.C8.00.AA.00.2F.C4.5A.

**MessageType (2 bytes):** One of several Store object types specified in the table in section [2.2.4](#).

**FolderDatabaseGuid (16 bytes):** A GUID associated with the Store object of the folder in which the message resides and corresponding to the **ReplicaId** field in the **folder ID** structure, as specified in section [2.2.1.1](#).

**FolderGlobalCounter (6 bytes):** An unsigned integer identifying the folder in which the message resides.

**Pad (2 bytes):** This value MUST be set to zero.

**MessageDatabaseGuid (16 bytes):** A GUID associated with the Store object of the message and corresponding to the **ReplicaId** field of the **Message ID** structure, as specified in section [2.2.1.2](#).

**MessageGlobalCounter (6 bytes):** An unsigned integer identifying the message.

**Pad (2 bytes):** This value MUST be set to zero.

### 2.2.4.3 Store Object EntryID Structure

A **Store Object EntryID** structure specifies a mailbox Store object or a public folder Store object itself, rather than a Message object or Folder object residing in such a database. It is used in certain property values.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Flags																															
ProviderUID																															
...																															
...																															
...																															
Version										Flag										DLLFileName											
...																															
...																															
...																															
WrappedFlags																															
WrappedProvider UID																															

...
...
...
WrappedType
ServerShortname (variable)
...
MailboxDN (variable)
...

**Flags (4 bytes):** This value MUST be set to 0x00000000. Bits in this field indicate under what circumstances a short-term EntryID is valid. However, in any EntryID stored in a property value, these 4 bytes MUST be zero, indicating a long-term EntryID.

**ProviderUID (16 bytes):** The identifier for the provider that created the EntryID. This value is used to route EntryIDs to the correct provider and MUST be set to %x38.A1.BB.10.05.E5.10.1A.A1.BB.08.00.2B.2A.56.C2.

**Version (1 byte):** This value MUST be set to zero.

**Flag (1 byte):** This value MUST be set to zero.

**DLLFileName (14 bytes):** This field MUST be set to the following value, which represents "emsmdb.dll": %x45.4D.53.4D.44.42.2E.44.4C.4C.00.00.00.00.

**WrappedFlags (4 bytes):** This value MUST be set to 0x00000000.

**WrappedProvider UID (16 bytes):** This field MUST be set to one of the values in the following table.

Store object type	ProviderUID value
Mailbox Store object	%x1B.55.FA.20.AA.66.11.CD.9B.C8.00.AA.00.2F.C4.5A
Public folder Store object	%x1C.83.02.10.AA.66.11.CD.9B.C8.00.AA.00.2F.C4.5A

**WrappedType (4 bytes):** The value of this field is determined by where the folder is located. For a mailbox this value MUST be set to %x0C.00.00.00. For a public message store, this value MUST be set to %x06.00.00.00.

**ServerShortname (variable):** A string of single-byte characters terminated by a single zero byte, indicating the short name or NetBIOS name of the server.

**MailboxDN (variable):** A string of single-byte characters terminated by a single zero byte and representing the **X500 DN** of the mailbox, as specified in [\[MS-EXOAB\]](#). This field is present only for mailbox **databases**.

## 2.2.5 Recipient EntryID Structures

### 2.2.5.1 One-Off EntryID Structure

A **One-Off EntryID** structure specifies a set of data representing recipients (1) that do not exist in the directory. All information about a one-off recipient (1) is contained in the EntryID.

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
Flags																															
ProviderUID																															
...																															
...																															
...																															
Version																Pa d	MAE	Format				M	U	R		L	Pad				
DisplayName (variable)																															
...																															
AddressType (variable)																															
...																															
EmailAddress (variable)																															
...																															

**Flags (4 bytes):** This value is set to 0x00000000. Bits in this field indicate under what circumstances a short-term EntryID is valid. However, in any EntryID stored in a property value, these 4 bytes are zero, indicating a long-term EntryID.

**ProviderUID (16 bytes):** The identifier of the provider that created the EntryID. This value is used to route EntryIDs to the correct provider and **MUST** be set to %x81.2B.1F.A4.BE.A3.10.19.9D.6E.00.DD.01.0F.54.02.

**Version (2 bytes):** This value is set to 0x0000.

**Pad (1 bit):** (mask 0x8000) Reserved. This value is set to '0'.

**MAE (2 bits):** (mask 0x0C00) The encoding used for Macintosh-specific data attachments, as specified in [\[MS-OXCMAIL\]](#) section 2.1.3.4.3. The values for this field are specified in the following table.

Name	Word value	Field value	Description
BinHex	0x0000	b'00'	BinHex encoded.
UUENCODE	0x0020	b'01'	UUENCODED. Not valid if the message is in <b>Multipurpose Internet Mail Extensions (MIME)</b> format, in which case the flag will be ignored and BinHex used instead.
AppleSingle	0x0040	b'10'	Apple Single encoded. Allowed only when the message format is MIME.
AppleDouble	0x0060	b'11'	Apple Double encoded. Allowed only when the message format is MIME.

**Format (4 bits):** (enumeration, mask 0x1E00) The message format desired for this recipient (1), as specified in the following table.

Name	Word value	Field value	Description
TextOnly	0x0006	b'0011'	Send a <b>plain text message body</b> .
HtmlOnly	0x000E	b'0111'	Send an <b>HTML message body</b> (1).
TextAndHtml	0x0016	b'1011'	Send a multipart/alternative body with both <b>plain text</b> and HTML.

**M (1 bit):** (mask 0x0100) A flag that indicates how messages are to be sent. If b'0', indicates messages are to be sent to the recipient (1) in **Transport Neutral Encapsulation Format (TNEF)** format; if b'1', messages are sent to the recipient (1) in pure MIME format.

**U (1 bit):** (mask 0x0080) A flag that indicates the format of the string fields that follow. If b'1', the string fields following are in **Unicode (UTF-16 form)** with 2-byte terminating null characters; if b'0', the string fields following are **multibyte character set (MBCS)** characters terminated by a single 0 byte.

**R (2 bits):** (mask 0x0060) Reserved. This value is set to b'00'.

**L (1 bit):** (mask 0x0010) A flag that indicates whether the server can look up an address in the address book. If b'1', server cannot look up this user's **email address** in the address book. If b'0', server can look up this user's email address in the address book.

**Pad (4 bits):** (mask 0x000F) Reserved. This value is set to b'0000'.

**DisplayName (variable):** The recipient's display name (in the **recipient table**, the **PidTagDisplayName** property ([[MS-OXCFOLD](#)] section 2.2.2.2.2.5)) as a null-terminated string. If the **U** field is b'1', the terminating null character is 2 bytes long; otherwise, 1 byte.

**AddressType (variable):** The recipient's email address type (in the recipient table, the **PidTagAddressType** property ([[MS-EXOABK](#)] section 2.2.3.13)) as a null-terminated string. If the **U** field is b'1', the terminating null character is 2 bytes long; otherwise, 1 byte.

**EmailAddress (variable):** The recipient's email address (in the recipient table, the **PidTagEmailAddress** property ([[MS-EXOABK](#)] section 2.2.3.14)) as a null-terminated string. If the **U** field is b'1', the terminating null character is 2 bytes long; otherwise, 1 byte.

### 2.2.5.2 Address Book EntryID Structure

An **Address Book EntryID** structure specifies several types of **Address Book objects**, including individual users, distribution lists, containers, and templates.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Flags																															
ProviderUID																															
...																															
...																															
...																															
Version																															
Type																															
X500DN (variable)																															
...																															

**Flags (4 bytes):** This value MUST be set to 0x00000000. Bits in this field indicate under what circumstances a short-term EntryID is valid. However, in any EntryID stored in a property value, these 4 bytes MUST be zero, indicating a long-term EntryID.

**ProviderUID (16 bytes):** The identifier for the provider that created the EntryID. This value is used to route EntryIDs to the correct provider and MUST be set to %xDC.A7.40.C8.C0.42.10.1A.B4.B9.08.00.2B.2F.E1.82.

**Version (4 bytes):** This value MUST be set to %x01.00.00.00.

**Type (4 bytes):** An integer representing the type of the object. It MUST be one of the values from the following table.

Value (hex bytes)	Address book EntryID type
0x00000000 %x00.00.00.00	Local <b>mail user</b>
0x00000001 %x01.00.00.00	Distribution list
0x00000002 %x02.00.00.00	Bulletin board or public folder
0x00000003	Automated mailbox



Value (hex bytes)	Address book EntryID type
%x03.00.00.00	
0x00000004 %x04.00.00.00	Organizational mailbox
0x00000005 %x05.00.00.00	Private distribution list
0x00000006 %x06.00.00.00	Remote mail user
0x00000100 %x00.01.00.00	Container
0x00000101 %x01.01.00.00	Template
0x00000102 %x02.01.00.00	One-off user
0x00000200 %x00.02.00.00	Search

**X500DN (variable):** The X500 DN of the Address Book object. The **X500DN** field is a null-terminated string of 8-bit characters.

### 2.2.5.3 Contact Address EntryID Structure

A **Contact Address EntryID** structure specifies a set of data representing recipients whose information is stored in a **Contact object**, as specified in [\[MS-OXOCNTC\]](#).

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
Flags																															
ProviderUID																															
...																															
...																															
...																															
Version																															
Type																															
Index																															

EntryIdCount
EntryIdBytes (variable)
...

**Flags (4 bytes):** This value MUST be set to 0x00000000. Bits in this field indicate under what circumstances a short-term EntryID is valid. However, in any EntryID stored in a property value, these 4 bytes MUST be zero, indicating a long-term EntryID.

**ProviderUID (16 bytes):** The Identifier for the provider that created the EntryID. This value is used to route EntryIDs to the correct provider and MUST be set to %xFE.42.AA.0A.18.C7.1A.10.E8.85.0B.65.1C.24.00.00.

**Version (4 bytes):** This value MUST be set to %x03.00.00.00.

**Type (4 bytes):** This value MUST be set to %x04.00.00.00.

**Index (4 bytes):** An unsigned integer value that MUST be a number from 0 through 5. This value represents which electronic address in the contact information to use. A value of 0, 1, or 2 represents Email1, Email2, and Email3 respectively, and a value of 3, 4, or 5 represents Fax1, Fax2, and Fax3 respectively. For more details, see [\[MS-OXOCNTC\]](#) section 2.2.1.2.

**EntryIdCount (4 bytes):** An unsigned integer value representing the count of bytes in the **EntryIdBytes** field.

**EntryIdBytes (variable):** The EntryID of the Contact object that contains this address, which in turn has the format specified in section [2.2.4.2](#). The size of this structure is specified by the **EntryIdCount** field.[<4>](#)

#### 2.2.5.4 Personal Distribution List EntryID Structure

The **Personal Distribution List EntryID** structure specifies recipients (1) whose information is stored in a **Personal Distribution List object**, as specified in [\[MS-OXOCNTC\]](#) section 2.2.2.

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
Flags																															
ProviderUID																															
...																															
...																															
...																															
Version																															

Type
Index
EntryIdCount
EntryIdBytes (variable)
...

**Flags (4 bytes):** This value MUST be set to 0x00000000. Bits in this field indicate under what circumstances a short-term EntryID is valid. However, in any EntryID stored in a property value, these 4 bytes MUST be zero, indicating a long-term EntryID.

**ProviderUID (16 bytes):** The identifier for the provider that created the EntryID. This value is used to route EntryIDs to the correct provider and MUST be set to %xFE.42.AA.0A.18.C7.1A.10.E8.85.0B.65.1C.24.00.00.

**Version (4 bytes):** This value MUST be set to %x03.00.00.00.

**Type (4 bytes):** This value MUST be set to %x05.00.00.00.

**Index (4 bytes):** This value MUST be set to %xFF.00.00.00.

**EntryIdCount (4 bytes):** An unsigned integer value representing the count of bytes in the **EntryIdBytes** field.

**EntryIdBytes (variable):** The EntryID of the Personal Distribution List object to which this address refers, which in turn has the format specified in section [2.2.4.2](#). The size of this structure is specified by the **EntryIdCount** field. [<5>](#)

## 2.3 EntryID Lists

### 2.3.1 EntryList Structure

An **EntryList** structure specifies a set of data used in search folder (2) **search criteria** to serialize a list of **EntryID** structures. **EntryList** structures contain three parts:

- The count of entries in the list
- **COUNT** structures (section [2.11.1.1](#)) giving the length of individual entries
- Data for each of the individual entries

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
EntryCount																															
Pad																															

EntryLength (variable)
...
EntryIDs (variable)
...

**EntryCount (4 bytes):** An unsigned integer giving the number of **EntryID** structures in the list. It MUST be followed by that many **EntryLength** and that many **EntryID** structures.

**Pad (4 bytes):** This field can be any value; clients and servers MUST ignore the value.

**EntryLength (variable):** A series of **EntryCount** field pairs. Each pair consists of an unsigned 32-bit integer giving the size of one **EntryID** field, followed by 4-byte pad that can have any value.

**EntryIDs (variable):** A series of **EntryID** fields. The number of **EntryID** fields is specified by the **EntryCount** field. The length of the first **EntryID** field is specified by the first 32 bits of the first element of the **EntryLength** field; the length of the second **EntryID** field is specified by the first 32 bits of the second element of the **EntryLength** field; and so on up to the number of **EntryID** fields specified by the **EntryCount** field. There is no padding between **EntryID** fields.

### 2.3.2 FlatEntry Structure

A **FlatEntry** structure is the size of an EntryID, followed by the EntryID itself, for ease of serialization.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Size																															
EntryID (variable)																															
...																															

**Size (4 bytes):** An unsigned integer giving the size of the following **EntryID** field, not including the **Size** field.

**EntryID (variable):** The **EntryID** structure itself. It MUST be exactly the length, in bytes, indicated by the **Size** field.

### 2.3.3 FlatEntryList Structure

A **FlatEntryList** structure gives the number of EntryIDs and their total size, followed by a series of **FlatEntry** structures.

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
Count																															
Size																															
FlatEntries (variable)																															
...																															

**Count (4 bytes):** An unsigned integer giving the number of **FlatEntry** structures in the list.

**Size (4 bytes):** The total size of all the **FlatEntry** structures, not including the **Count** and **Size** fields.

**FlatEntries (variable):** A series of **FlatEntry** structures with the actual EntryID data. The number of structures MUST be exactly the same as the value of the **Count** field, and their total size MUST be exactly the same as the value of the **Size** field.

## 2.4 Error Codes

When encoded in **ROP buffers**, all error codes are transmitted as integers in little-endian format. Error codes are presented in the following table.

Error code name	Description (alternate names)	Numeric value (hex)
Success	The operation succeeded. (S_OK, SUCCESS_SUCCESS)	0x00000000, %x00.00.00.00
GeneralFailure	The operation failed for an unspecified reason. (E_FAIL, MAPI_E_CALL_FAILED, ecError, SYNC_E_ERROR)	0x80004005, %x05.40.00.80
OutOfMemory	Not enough memory was available to complete the operation. (E_NOMEMORY, MAPI_E_NOT_ENOUGH_MEMORY, ecMAPIOOM, ecPropSize)	0x8007000E, %x0E.00.07.80
InvalidParameter	An invalid parameter was passed to a <b>remote procedure call (RPC)</b> . (E_INVALIDARG, MAPI_E_INVALID_PARAMETER, ecInvalidParam, ecInvalidSession, ecBadBuffer, SYNC_E_INVALID_PARAMETER)	0x80070057, %x57.00.07.80
NoInterface	The requested interface is not supported. (E_NOINTERFACE, MAPI_E_INTERFACE_NOT_SUPPORTED, ecinterfacenotsupported)	0x80004002, %x02.40.00.80
AccessDenied	The caller does not have sufficient access rights to perform the operation. (E_ACCESSDENIED, MAPI_E_NO_ACCESS,	0x80070005, %x05.00.07.80

Error code name	Description (alternate names)	Numeric value (hex)
	ecaccessdenied, ecpropsecurityviolation)	
StorageInvalidFunction	The server was unable to perform the requested operation. (STG_E_INVALIDFUNCTION)	0x80030001 %x01.00.03.80
StorageAccessDenied	The caller does not have sufficient access rights to perform the operation. (STG_E_ACCESSDENIED)	0x80030005 %x05.00.03.80
StorageInsufficientMemory	There is insufficient memory available to complete the operation. (STG_E_INSUFFICIENTMEMORY)	0x80030008 %x08.00.03.80
StorageInvalidPointer	An invalid pointer was passed to the remote procedure call. (STG_E_INVALIDPOINTER)	0x80030009 %x09.00.03.80
StorageReadFault	A disk error occurred during a read operation. (STG_E_READFAULT)	0x8003001E %x1E.00.03.80
StorageLockViolation	A lock violation has occurred. (STG_E_LOCKVIOLATION)	0x80030021 %x21.00.03.80
StorageInvalidParameter	An invalid parameter was passed to the remote procedure call. (STG_E_INVALIDPARAMETER)	0x80030057 %x57.00.03.80
StreamSizeError	There is insufficient disk space to complete the operation. (ecStreamSizeError, STG_E_MEDIUMFULL)	0x80030070 %x70.00.03.80
StorageInvalidFlag	An invalid flag was passed to a remote procedure call. (STG_E_INVALIDFLAG)	0x800300FF %xFF.00.03.80
StorageCannotSave	A stream could not be saved. (STG_E_CANTSAVE)	0x80030103 %x03.01.03.80
NotSupported	The server does not support this method call. (MAPI_E_NO_SUPPORT, ecNotSupported, ecNotImplemented)	0x80040102, %x02.01.04.80
InvalidCharacterWidth	Unicode characters were requested when only 8-bit characters are supported, or vice versa. (MAPI_E_BAD_CHARWIDTH, ecBadCharwidth)	0x80040103, %x03.01.04.80
StringTooLong	In the context of this method call, a string exceeds the maximum permitted length. (MAPI_E_STRING_TOO_LONG, ecStringTooLarge)	0x80040105, %x05.01.04.80
InvalidFlag	An unrecognized flag bit was passed to a method call. (MAPI_E_UNKNOWN_FLAGS, ecUnknownFlags, SYNC_E_UNKNOWN_FLAGS)	0x80040106, %x06.01.04.80

Error code name	Description (alternate names)	Numeric value (hex)
InvalidEntryID	An incorrectly formatted EntryID was passed to a method call. (MAPI_E_INVALID_ENTRYID, ecInvalidEntryId)	0x80040107, %x07.01.04.80
InvalidObject	A method call was made using a reference to an object that has been destroyed or is not in a viable state. (MAPI_E_INVALID_OBJECT, ecInvalidObject)	0x80040108, %x08.01.04.80
ObjectChanged	An attempt to commit changes failed because the object was changed separately. (MAPI_E_OBJECT_CHANGED, ecObjectModified)	0x80040109, %x09.01.04.80
ObjectDeleted	An operation failed because the object was deleted separately. (MAPI_E_OBJECT_DELETED, ecObjectDeleted)	0x8004010A, %x0A.01.04.80
ServerBusy	A table operation failed because a separate operation was in progress at the same time. (MAPI_E_BUSY, ecBusy)	0x8004010B, %x0B.01.04.80
OutOfDisk	Not enough disk space was available to complete the operation. (MAPI_E_NOT_ENOUGH_DISK, ecDiskFull)	0x8004010D, %x0D.01.04.80
OutOfResources	Not enough of an unspecified resource was available to complete the operation. (MAPI_E_NOT_ENOUGH_RESOURCES, ecInsufficientResrc)	0x8004010E, %x0E.01.04.80
NotFound	The requested object could not be found at the server. (MAPI_E_NOT_FOUND, ecNotFound, ecAttachNotFound, ecUnknownRecip, ecPropNotExistent)	0x8004010F, %x0F.01.04.80
VersionMismatch	Client and server versions are not compatible. (MAPI_E_VERSION, ecVersionMismatch, ecVersion)	0x80040110, %x10.01.04.80
LogonFailed	A client was unable to log on to the server. (MAPI_E_LOGON_FAILED, ecLoginFailure)	0x80040111, %x11.01.04.80
TooManySessions	A server or service is unable to create any more <b>sessions</b> (2). (MAPI_E_SESSION_LIMIT, ecTooManySessions)	0x80040112, %x12.01.04.80
UserCanceled	An operation failed because a user cancelled it. (MAPI_E_USER_CANCEL, ecUserAbort)	0x80040113, %x13.01.04.80
AbortFailed	A <b>RopAbort</b> ([MS-OXCROPS] section 2.2.5.5) or <b>RopAbortSubmit</b> ([MS-OXCROPS] section 2.2.7.2) <b>ROP request</b> was unsuccessful. (MAPI_E_UNABLE_TO_ABORT, ecUnableToAbort)	0x80040114, %x14.01.04.80
NetworkError	An operation was unsuccessful because of a problem with network operations or services. (MAPI_E_NETWORK_ERROR, ecNetwork)	0x80040115, %x15.01.04.80

Error code name	Description (alternate names)	Numeric value (hex)
DiskError	There was a problem writing to or reading from disk. (MAPI_E_DISK_ERROR, ecWriteFault, ecReadFault)	0x80040116, %x16.01.04.80
TooComplex	The operation requested is too complex for the server to handle; often applied to restrictions. (MAPI_E_TOO_COMPLEX, ecTooComplex)	0x80040117, %x17.01.04.80
InvalidColumn	The column requested is not allowed in this type of table. (MAPI_E_BAD_COLUMN)	0x80040118, %x18.01.04.80
ComputedValue	A property cannot be updated because it is read-only, computed by the server. (MAPI_E_COMPUTED, ecComputed)	0x8004011A, %x1A.01.04.80
CorruptData	There is an internal inconsistency in a database, or in a complex property value. (MAPI_E_CORRUPT_DATA, ecCorruptData)	0x8004011B, %x1B.01.04.80
InvalidCodepage	The server is not configured to support the code page requested by the client. (MAPI_E_UNKNOWN_CPID)	0x8004011E, %x1E.01.04.80
InvalidLocale	The server is not configured to support the locale requested by the client. (MAPI_E_UNKNOWN_LCID)	0x8004011F, %x1F.01.04.80
TimeSkew	The operation failed due to clock skew between servers. (MAPI_E_INVALID_ACCESS_TIME, ecTimeSkew)	0x80040123, %x23.01.04.80
EndOfSession	Indicates that the server session (2) has been destroyed, possibly by a server restart. (MAPI_E_END_OF_SESSION)	0x80040200, %x00.02.04.80
UnknownEntryId	Indicates that the EntryID passed to OpenEntry was created by a different MAPI provider. (MAPI_E_UNKNOWN_ENTRYID)	0x80040201, %x01.02.04.80
NotCompleted	A complex operation such as building a table row set could not be completed. (MAPI_E_UNABLE_TO_COMPLETE, ecUnableToComplete)	0x80040400, %x00.04.04.80
Timeout	An asynchronous operation did not succeed within the specified time-out. (MAPI_E_TIMEOUT, ecTimeout)	0x80040401, %x01.04.04.80
EmptyTable	A table essential to the operation is empty. (MAPI_E_TABLE_EMPTY, ecTableEmpty)	0x80040402, %x02.04.04.80
TableTooBig	The table is too big for the requested operation to complete. (MAPI_E_TABLE_TOO_BIG, ecTableTooBig)	0x80040403, %x03.04.04.80
InvalidBookmark	The bookmark passed to a table operation was not	0x80040405,



Error code name	Description (alternate names)	Numeric value (hex)
	created on the same table. (MAPI_E_INVALID_BOOKMARK, ecInvalidBookmark)	%x05.04.04.80
ErrorWait	A wait time-out has expired. (MAPI_E_WAIT, ecWait)	0x80040500, %x00.05.04.80
ErrorCancel	The operation had to be canceled. (MAPI_E_CANCEL, ecCancel)	0x80040501, %x01.05.04.80
NoSuppress	The server does not support the suppression of read receipts. (MAPI_E_NO_SUPPRESS)	0x80040602, %x02.06.04.80
CollidingNames	A folder or item cannot be created because one with the same name or other criteria already exists. (MAPI_E_COLLISION, ecDuplicateName)	0x80040604, %x04.06.04.80
NotInitialized	The subsystem is not ready. (MAPI_E_NOT_INITIALIZED, ecNotInitialized)	0x80040605, %x05.06.04.80
NoRecipients	A message cannot be sent because it has no recipients (1). (MAPI_E_NO_RECIPIENTS)	0x80040607, %x07.06.04.80
AlreadySent	A message cannot be opened for modification because it has already been sent. (MAPI_E_SUBMITTED, ecSubmitted)	0x80040608, %x08.06.04.80
HasFolders	A folder cannot be deleted because it still contains subfolders. (MAPI_E_HAS_FOLDERS, ecFolderHasChildren)	0x80040609, %x09.06.04.80
HasMessages	A folder cannot be deleted because it still contains messages. (MAPI_E_HAS_MESSAGES, ecFolderHasContents)	0x8004060A, %x0A.06.04.80
FolderCycle	A folder move or copy operation would create a cycle (typically when the request is to copy a parent folder to one of its subfolders). (MAPI_E_FOLDER_CYCLE, ecRootFolder)	0x8004060B, %x0B.06.04.80
TooManyLocks	Too many locks have been requested. (MAPI_E_LOCKID_LIMIT, ecLockIdLimit)	0x8004060D, %x0D.06.04.80
AmbiguousRecipient	An unresolved recipient (2) matches more than one entry in the directory. (MAPI_E_AMBIGUOUS_RECIP, ecAmbiguousRecip)	0x80040700, %x00.07.04.80
SyncObjectDeleted	The requested object was previously deleted. (SYNC_E_OBJECT_DELETED)	0x80040800, %x00.08.04.80
IgnoreFailure	An error occurred, but it's safe to ignore the error, perhaps because the change in question has been superseded.	0x80040801 %x01.08.04.80

Error code name	Description (alternate names)	Numeric value (hex)
	(SYNC_E_IGNORE)	
SyncConflict	Conflicting changes to an object have been detected. (SYNC_E_CONFLICT)	0x80040802 %x02.08.04.80
NoParentFolder	The parent folder could not be found. (SYNC_E_NO_PARENT)	0x80040803 %x03.08.04.80
CycleDetected	An operation would create a cycle (for instance, by copying a parent folder to one of its subfolders).	0x80040804 %x04.08.04.80
NotSynchronized	A sync operation did not take place, possibly due to a conflicting change. (SYNC_E_UNSYNCHRONIZED)	0x80040805 %x05.08.04.80
NamedPropertyQuota	The Store object cannot store any more <b>named property</b> mappings. (MAPI_E_NAMED_PROP_QUOTA_EXCEEDED, ecNPQuotaExceeded)	0x80040900, %x00.09.04.80
NotImplemented	The server does not implement this method call.	0x80040FFF, %xFF.0F.04.80

### 2.4.1 Additional Error Codes

When encoded in ROP buffers, all error codes are transmitted as 32-bit integers in little-endian format. Additional error codes are presented in the following table.

Error code name	Description (alternate names)	Numeric value (hex)
IsamError	Unspecified database failure. (ecJetError)	0x000003EA , %EA.03.00.00
UnknownUser	Unable to identify a home Store object for this user. (ecUnknownUser)	0x000003EB , %xEB.03.00.00
Exiting	The server is in the process of stopping. (ecExiting)	0x000003ED, %xED.03.00.00
BadConfiguration	Protocol settings for this user are incorrect. (ecBadConfig)	0x000003EE , %xEE.03.00.00
UnknownCodePage	The specified code page is not installed on the server.	0x000003EF ,

Error code name	Description (alternate names)	Numeric value (hex)
	(ecUnknownCodePage)	%xEF.03.00 .00
ServerMemory	The server is out of memory. (ecServerOOM, ecMemory)	0x000003F0 , %xF0.03.00 .00
LoginPermission	This user does not have access rights to the mailbox. (ecLoginPerm)	0x000003F2 , %xF2.03.00 .00
DatabaseRolledBack	The database has been restored and needs fix-up but cannot be fixed up. (ecDatabaseRolledBack)	0x000003F3 , %xF3.03.00 .00
DatabaseCopiedError	The database file has been copied from another server. (ecDatabaseCopiedError)	0x000003F4 , %xF4.03.00 .00
AuditNotAllowed	Auditing of security operations is not permitted. (ecAuditNotAllowed)	0x000003F5 , %xF5.03.00 .00
ZombieUser	User has no security identifier. (ecZombieUser)	0x000003F6 , %xF6.03.00 .00
UnconvertableACL	An <b>access control list (ACL)</b> cannot be converted to <b>NTFS</b> format. (ecUnconvertableACL)	0x000003F7 , %xF7.03.00 .00
NoFreeJetSessions	No Jet session (2) is available. (ecNoFreeJses) A Jet session (2) is an internal resource created and used by the server. Like any other resource, its supply can be exhausted; when that happens, this error is returned from the server.	0x0000044C , %x4C.04.00 .00
DifferentJetSession	Warning, a Jet session (2) other than the one requested was returned. (ecDifferentJses) A Jet session (2) is an internal resource created and used by the Exchange server.	0x0000044D, %x4D.04.00 .00
FileRemove	An error occurred when attempting to remove a database file.	0x0000044F , %x4F.04.00

Error code name	Description (alternate names)	Numeric value (hex)
	(ecFileRemove)	.00
ParameterOverflow	Parameter value overflow. (ecParameterOverflow)	0x00000450 , %x50.04.00 .00
BadVersion	Bad message store database version number. (ecBadVersion)	0x00000451 , %x51.04.00 .00
TooManyColumns	Too many columns requested in SetColumns. (ecTooManyCols)	0x00000452 , %x52.04.00 .00
HaveMore	A ROP has more data to return. (ecHaveMore)	0x00000453 , %x53.04.00 .00
DatabaseError	General database problem. (ecDatabaseError)	0x00000454 , %x54.04.00 .00
IndexNameTooBig	An index name is larger than what Jet allows. (ecIndexNameTooBig)	0x00000455 , %x55.04.00 .00
UnsupportedProperty	The property data type is not supported. (ecUnsupportedProp)	0x00000456 , %x56.04.00 .00
MessageNotSaved	During AbortSubmit, a message was not saved. (ecMsgNotSaved)	0x00000457 , %x57.04.00 .00
UnpublishedNotification	A notification could not be published at this time. (ecUnpubNotif)	0x00000459 , %x59.04.00 .00
DifferentRoot	Moving or copying folders to a different top-level hierarchy is not supported. (ecDifferentRoot)	0x0000045B , %x5B.04.00 .00
BadFolderName	Invalid folder name. (ecBadFolderName)	0x0000045C , %x5C.04.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
AttachmentOpen	The attachment is open. (ecAttachOpen)	0x0000045D, %x5D.04.00.00
InvalidCollapseState	The collapse state given to SetCollapseState is invalid. (ecInvClpsState)	0x0000045E, %x5E.04.00.00
SkipMyChildren	While walking a folder tree, do not consider children of this folder. (ecSkipMyChildren)	0x0000045F, %x5F.04.00.00
SearchFolder	The operation is not supported on a search folder (2). (ecSearchFolder)	0x00000460, %x60.04.00.00
NotSearchFolder	The operation is valid only on a search folder (2). (ecNotSearchFolder)	0x00000461, %x61.04.00.00
FolderSetReceive	This is a <b>Receive folder</b> and cannot be deleted. (ecFolderSetReceive)	0x00000462, %x62.04.00.00
NoReceiveFolder	No Receive folder is available (even no default). (ecNoReceiveFolder)	0x00000463, %x63.04.00.00
DeleteSubmittedMessage	Deleting a message that has been submitted for sending is not permitted. (ecNoDelSubmitMsg)	0x00000465, %x65.04.00.00
InvalidRecipients	It was impossible to deliver to this recipient (1). (ecInvalidRecips)	0x00000467, %x67.04.00.00
NoReplicaHere	No <b>replica</b> (2) of the public folder in this Store object. (ecNoReplicaHere)	0x00000468, %x68.04.00.00
NoReplicaAvailable	No available Store object has a replica (2) of this public folder. (ecNoReplicaAvailable)	0x00000469, %x69.04.00.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
PublicDatabase	The operation is invalid on a public Store object. (ecPublicMDB)	0x0000046A , %x6A.04.00 .00
NotPublicDatabase	The operation is valid only on a public Store object. (ecNotPublicMDB)	0x0000046B , %x6B.04.00 .00
RecordNotFound	The record was not found. (ecRecordNotFound)	0x0000046C , %x6C.04.00 .00
ReplicationConflict	A replication conflict was detected. (ecReplConflict)	0x0000046D , %x6D.04.00 .00
FXBufferOverrun	Prevented an overrun while reading a fast transfer buffer. (ecFxBufferOverrun)	0x00000470 , %x70.04.00 .00
FXBufferEmpty	No more in a fast transfer buffer. (ecFxBufferEmpty)	0x00000471 , %x71.04.00 .00
FXPartialValue	Partial long value in a fast transfer buffer. (ecFxPartialValue)	0x00000472 , %x72.04.00 .00
FxNoRoom	No room for an atomic value in a fast transfer buffer. (ecFxNoRoom)	0x00000473 , %x73.04.00 .00
TimeExpired	Housekeeping functions have exceeded their time window. (ecMaxTimeExpired)	0x00000474 , %x74.04.00 .00
DestinationError	An error occurred on the destination folder during a copy operation. (ecDstError)	0x00000475 , %x75.04.00 .00
DatabaseNotInitialized	The Store object was not properly initialized. (ecMDBNotInit)	0x00000476 , %x76.04.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
WrongServer	This server does not host the user's mailbox database. (ecWrongServer)	0x00000478 , %x78.04.00 .00
BufferTooSmall	A buffer passed to this function is not big enough. (ecBufferTooSmall)	0x0000047D , %x7D.04.00 .00
AttachmentResolutionRequired	Linked attachments could not be resolved to actual files. (ecRequiresRefResolve)	0x0000047E , %x7E.04.00 .00
ServerPaused	The service is in a paused state. (ecServerPaused)	0x0000047F , %x7F.04.00 .00
ServerBusy	The server is too busy to complete an operation. (ecServerBusy)	0x00000480 , %x80.04.00 .00
NoSuchLogon	No such logon exists in the Store object's Logon list. (ecNoSuchLogon)	0x00000481 , %x81.04.00 .00
LoadLibraryFailed	Internal error: the service cannot load a required DLL. (ecLoadLibFailed)	0x00000482 , %x82.04.00 .00
AlreadyConfigured	A synchronization object has already been configured. (ecObjAlreadyConfig)	0x00000483 , %x83.04.00 .00
NotConfigured	A synchronization object has not yet been configured. (ecObjNotConfig)	0x00000484 , %x84.04.00 .00
DataLoss	A code page conversion incurred data loss. (ecDataLoss)	0x00000485 , %x85.04.00 .00
MaximumSendThreadExceeded	The maximum number of send threads has been exceeded. (ecMaxSendThreadExceeded)	0x00000488 , %x88.04.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
FxErrorMarker	A fast transfer error marker was found, and recovery is necessary. (ecFxErrorMarker)	0x00000489 , %x89.04.00 .00
NoFreeJtabs	There are no more free Jet tables. (ecNoFreeJtabs)	0x0000048A , %x8A.04.00 .00
NotPrivateDatabase	The operation is valid only on a private mailbox database. (ecNotPrivateMDB)	0x0000048B , %x8B.04.00 .00
IsintegMDB	The Store object has been locked by the ISINTEG utility. (ecIsintegMDB)	0x0000048C , %x8C.04.00 .00
RecoveryMismatch	A recovery storage group operation was attempted on a non-RSG Store object, or vice versa. (ecRecoveryMDBMismatch)	0x0000048D , %x8D.04.00 .00
TableMayNotBeDeleted	Attempt to delete a critical table, such as the messages or <b>attachments table</b> . (ecTableMayNotBeDeleted)	0x0000048E , %x8E.04.00 .00
SearchFolderScopeViolation	Attempt to perform a recursive search on a search folder (2). (ecSearchFolderScopeViolation)	0x00000490 , %x90.04.00 .00
RpcRegisterIf	Error in registering RPC interfaces. (ecRpcRegisterIf)	0x000004B1 , %xB1.04.00 .00
RpcListen	Error in starting the RPC listener. (ecRpcListen)	0x000004B2 , %xB2.04.00 .00
RpcFormat	A badly formatted RPC buffer was detected. (ecRpcFormat)	0x000004B6 , %xB6.04.00 .00
NoCopyTo	Single instance storage cannot be used in this case. (ecNoCopyTo)	0x000004B7 , %xB7.04.00



Error code name	Description (alternate names)	Numeric value (hex)
		.00
NullObject	An object handle reference in the RPC buffer could not be resolved. (ecNullObject)	0x000004B9 , %xB9.04.00 .00
RpcAuthentication	Server requests client to use authentication. (ecRpcAuthentication)	0x000004BC , %xBC.04.00 .00
RpcBadAuthenticationLevel	The server doesn't recognize a client's authentication level. (ecRpcBadAuthenticationLevel)	0x000004BD , %xBD.04.00 .00
NullCommentRestriction	The subrestriction of a comment restriction is empty. (ecNullCommentRestriction)	0x000004BE , %xBE.04.00 .00
RulesLoadError	<b>Rule</b> (4) data was unavailable for this folder. (ecRulesLoadError)	0x000004CC , %xCC.04.00 .00
RulesDeliverErr	Delivery-time failure in rule (4) execution. (ecRulesDeliverErr)	0x000004CD , %xCD.04.00 .00
RulesParsingErr	Invalid syntax in a stored rule (4) condition or <b>action</b> (3). (ecRulesParsingErr)	0x000004CE , %xCE.04.00 .00
RulesCreateDAE	Failure creating a deferred rule (4) action (3) error message. (ecRulesCreateDaeErr)	0x000004CF , %xCF.04.00 .00
RulesCreateDAM	Failure creating a deferred rule (4) action (3) message. (ecRulesCreateDamErr)	0x000004D0 , %xD0.04.00 .00
RulesNoMoveCopyFolder	A move or copy rule (4) action (3) could not be performed due to a problem with the target folder. (ecRulesNoMoveCopyFolder)	0x000004D1 , %xD1.04.00 .00
RulesNoFolderRights	A move or copy rule (4) action (3) could not be performed due to a permissions problem with the target folder.	0x000004D2 , %xD2.04.00

Error code name	Description (alternate names)	Numeric value (hex)
	(ecRulesNoFolderRights)	.00
MessageTooBig	A message could not be delivered because it exceeds a size limit. (ecMessageTooBig)	0x000004D4, %xD4.04.00.00
FormNotValid	There is a problem with the form mapped to the message's <b>message class</b> . (ecFormNotValid)	0x000004D5, %xD5.04.00.00
NotAuthorized	Delivery to the desired folder was not authorized. (ecNotAuthorized)	0x000004D6, %xD6.04.00.00
DeleteMessage	The message was deleted by a rule (4) action (3). (ecDeleteMessage)	0x000004D7, %xD7.04.00.00
BounceMessage	Delivery of the message was denied by a rule (4) action (3). (ecBounceMessage)	0x000004D8, %xD8.04.00.00
QuotaExceeded	The operation failed because it would have exceeded a resource quota. (ecQuotaExceeded)	0x000004D9, %xD9.04.00.00
MaxSubmissionExceeded	A message could not be submitted because its size exceeds the defined maximum. (ecMaxSubmissionExceeded)	0x000004DA, %xDA.04.00.00
MaxAttachmentExceeded	The maximum number of message attachments has been exceeded. (ecMaxAttachmentExceeded)	0x000004DB, %xDB.04.00.00
SendAsDenied	The user account does not have permission to send mail as the owner of this mailbox. (ecSendAsDenied)	0x000004DC, %xDC.04.00.00
ShutoffQuotaExceeded	The operation failed because it would have exceeded the mailbox's shutoff quota. (ecShutoffQuotaExceeded)	0x000004DD, %xDD.04.00.00
TooManyOpenObjects	A client has opened too many objects of a specific type. (ecMaxObjsExceeded)	0x000004DE, %xDE.04.00.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
ClientVersionBlocked	The server is configured to block clients of this version. (ecClientVerDisallowed)	0x000004DF , %xDF.04.00 .00
RpcHttpDisallowed	The server is configured to block RPC connections via HTTP. (ecRpcHttpDisallowed)	0x000004E0 , %xE0.04.00 .00
CachedModeRequired	The server is configured to block online mode connections; only cached mode connections are allowed. (ecCachedModeRequired)	0x000004E1 , %xE1.04.00 .00
FolderNotCleanedUp	The folder has been deleted but not yet cleaned up. (ecFolderNotCleanedUp)	0x000004E3 , %xE3.04.00 .00
FormatError	Part of a ROP buffer was incorrectly formatted. (ecFmtError)	0x000004ED , %xED.04.00 .00
NotExpanded	Error in expanding or collapsing rows in a categorized view. (ecNotExpanded)	0x000004F7 , %xF7.04.00 .00
NotCollapsed	Error in expanding or collapsing rows in a categorized view. (ecNotCollapsed)	0x000004F8 , %xF8.04.00 .00
NoExpandLeafRow	Leaf rows cannot be expanded; only category header rows can be expanded. (ecLeaf)	0x000004F9 , %xF9.04.00 .00
UnregisteredNameProp	An operation was attempted on a named property ID for which no name has been registered. (ecUnregisteredNameProp)	0x000004FA , %xFA.04.00 .00
FolderDisabled	Access to the folder is disabled, perhaps because form design is in progress. (ecFolderDisabled)	0x000004FB , %xFB.04.00 .00
DomainError	There is an inconsistency in the Store object's association with its server. (ecDomainError)	0x000004FC , %xFC.04.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
NoCreateRight	The operation requires create access rights that the user does not have. (ecNoCreateRight)	0x000004FF , %xFF.04.00 .00
PublicRoot	The operation requires create access rights at a public folder root. (ecPublicRoot)	0x00000500 , %x00.05.00 .00
NoReadRight	The operation requires read access rights that the user does not have. (ecNoReadRight)	0x00000501 , %x01.05.00 .00
NoCreateSubfolderRight	The operation requires create subfolder access rights that the user does not have. (ecNoCreateSubfolderRight)	0x00000502 , %x02.05.00 .00
MessageCycle	The source message contains the destination message and cannot be attached to it. (ecMsgCycle)	0x00000504 , %x04.05.00 .00
NullDestinationObject	The RPC buffer contains a destination object handle that could not be resolved to a <b>Server object</b> . (ecDstNullObject)	0x00000503 , %x03.05.00 .00
TooManyRecips	A hard limit on the number of recipients (1) per message was exceeded. (ecTooManyRecips)	0x00000505 , %x05.05.00 .00
VirusScanInProgress	The operation failed because the target message is being scanned for viruses. (ecVirusScanInProgress)	0x0000050A , %x0A.05.00 .00
VirusDetected	The operation failed because the target message is infected with a virus. (ecVirusDetected)	0x0000050B , %x0B.05.00 .00
MailboxInTransit	The mailbox is in transit and is not accepting mail. (ecMailboxInTransit)	0x0000050C , %x0C.05.00 .00
BackupInProgress	The operation failed because the Store object is being backed up. (ecBackupInProgress)	0x0000050D , %x0D.05.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
VirusMessageDeleted	The operation failed because the target message was infected with a virus and has been deleted. (ecVirusMessageDeleted)	0x0000050E , %x0E.05.00 .00
InvalidBackupSequence	Backup steps were performed out of sequence. (ecInvalidBackupSequence)	0x0000050F , %x0F.05.00 .00
InvalidBackupType	The requested backup type was not recognized. (ecInvalidBackupType)	0x00000510 , %x10.05.00 .00
TooManyBackups	Too many backups are already in progress. (ecTooManyBackupsInProgress)	0x00000511 , %x11.05.00 .00
RestoreInProgress	A restore is already in progress. (ecRestoreInProgress)	0x00000512 , %x12.05.00 .00
DuplicateObject	The object already exists. (ecDuplicateObject)	0x00000579 , %x79.05.00 .00
ObjectNotFound	An internal <b>database object</b> could not be found. (ecObjectNotFound)	0x0000057A , %x7A.05.00 .00
FixupReplyRule	The template Message ID in a reply rule (4) object is missing or incorrect. (ecFixupReplyRule)	0x0000057B , %x7B.05.00 .00
TemplateNotFound	The reply template could not be found for a message that triggered an auto-reply rule (4). (ecTemplateNotFound)	0x0000057C , %x7C.05.00 .00
RuleExecution	An error occurred while executing a rule (4) action (3). (ecRuleExecution)	0x0000057D , %x7D.05.00 .00
DSNoSuchObject	A Server object could not be found in the directory. (ecDSNoSuchObject)	0x0000057E , %x7E.05.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
AlreadyTombstoned	An attempt to tombstone a message already in the message tombstone list failed. (ecMessageAlreadyTombstoned)	0x0000057F , %x7F.05.00 .00
ReadOnlyTransaction	A write operation was attempted in a read-only transaction. (ecRequiresRWTransaction)	0x00000596 , %x96.05.00 .00
Paused	Attempt to pause a server that is already paused. (ecPaused)	0x0000060E , %x0E.06.00 .00
NotPaused	Attempt to unpause a server that is not paused. (ecNotPaused)	0x0000060F , %x0F.06.00 .00
WrongMailbox	The operation was attempted on the wrong mailbox. (ecWrongMailbox)	0x00000648 , %x48.06.00 .00
ChangePassword	The account password needs to be changed. (ecChgPassword)	0x0000064C , %x4C.06.00 .00
PasswordExpired	The account password has expired. (ecPwdExpired)	0x0000064D , %x4D.06.00 .00
InvalidWorkstation	The account has logged on from the wrong workstation. (ecInvWkstn)	0x0000064E , %x4E.06.00 .00
InvalidLogonHours	The account has logged on at the wrong time of day. (ecInvLogonHrs)	0x0000064F , %x4F.06.00 .00
AccountDisabled	The account is disabled. (ecAcctDisabled)	0x00000650 , %x50.06.00 .00
RuleVersion	The rule (4) data contains an invalid rule (4) version. (ecRuleVersion)	0x000006A4 , %xA4.06.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
RuleFormat	The rule (4) condition or action (3) was incorrectly formatted. (ecRuleFormat)	0x000006A5 , %xA5.06.00 .00
RuleSendAsDenied	The rule (4) is not authorized to send from this mailbox. (ecRuleSendAsDenied)	0x000006A6 , %xA6.06.00 .00
NoServerSupport	A newer client requires functionality that an older server does not support. (ecNoServerSupport)	0x000006B9 , %xB9.06.00 .00
LockTimedOut	An attempt to unlock a message failed because the lock had already timed out. (ecLockTimedOut)	0x000006BA , %xBA.06.00 .00
ObjectLocked	The operation failed because the target object is locked. (ecObjectLocked)	0x000006BB , %xBB.06.00 .00
InvalidLockNamespace	Attempt to lock a nonexistent object. (ecInvalidLockNamespace)	0x000006BD, %xBD.06.00 .00
MessageDeleted	Operation failed because the message has been deleted. (ecMessageDeleted)	0x000007D6, %xD6.07.00 .00
ProtocolDisabled	The requested protocol is disabled in the server configuration. (ecProtocolDisabled)	0x000007D8, %xD8.07.00 .00
CleartextLogonDisabled	Clear text logons were disabled. (ecCleartextLogonDisabled)	0x000007D9, %xD9.07.00 .00
Rejected	The operation was rejected, perhaps because it is not supported. (ecRejected)	0x000007EE , %xEE.07.00 .00
AmbiguousAlias	User account information did not uniquely identify a user. (ecAmbiguousAlias)	0x0000089A , %x9A.08.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
UnknownMailbox	No mailbox object for this logon exists in the address book. (ecUnknownMailbox)	0x0000089B , %x9B.08.00 .00
ExpressionReserved	Internal error in evaluating an expression. (ecExpReserved)	0x000008FC , %xFC.08.00 .00
ExpressionParseDepth	The expression tree exceeds a defined depth limit. (ecExpParseDepth)	0x000008FD , %xFD.08.00 .00
ExpressionArgumentType	An argument to a function has the wrong type. (ecExpFuncArgType)	0x000008FE , %xFE.08.00 .00
ExpressionSyntax	Syntax error in expression. (ecExpSyntax)	0x000008FF , %xFF.08.00 .00
ExpressionBadStringToken	Invalid string token in expression. (ecExpBadStrToken)	0x00000900 , %x00.09.00 .00
ExpressionBadColToken	Invalid column name in expression. (ecExpBadColToken)	0x00000901 , %x01.09.00 .00
ExpressionTypeMismatch	<b>Property types</b> , for example, in a comparison expression, are incompatible. (ecExpTypeMismatch)	0x00000902 , %x02.09.00 .00
ExpressionOperatorNotSupported	The requested operator is not supported. (ecExpOpNotSupported)	0x00000903 , %x03.09.00 .00
ExpressionDivideByZero	Divide by zero doesn't work. (ecExpDivByZero)	0x00000904 , %x04.09.00 .00
ExpressionUnaryArgument	The argument to a unary expression is of incorrect type. (ecExpUnaryArgType)	0x00000905 , %x05.09.00



Error code name	Description (alternate names)	Numeric value (hex)
		.00
NotLocked	An attempt to lock a resource failed. (ecNotLocked)	0x00000960 , %x60.09.00 .00
ClientEvent	A client-supplied event has fired. (ecClientEvent)	0x00000961 , %x61.09.00 .00
CorruptEvent	Data in the event table is bad. (ecCorruptEvent)	0x00000965 , %x65.09.00 .00
CorruptWatermark	A watermark in the event table is bad. (ecCorruptWatermark)	0x00000966 , %x66.09.00 .00
EventError	General event processing error. (ecEventError)	0x00000967 , %x67.09.00 .00
WatermarkError	An event watermark is out of range or otherwise invalid. (ecWatermarkError)	0x00000968 , %x68.09.00 .00
NonCanonicalACL	A modification to an ACL failed because the existing ACL is not in canonical format. (ecNonCanonicalACL)	0x00000969 , %x69.09.00 .00
MailboxDisabled	Logon was unsuccessful because the mailbox is disabled. (ecMailboxDisabled)	0x0000096C , %x6C.09.00 .00
RulesFolderOverQuota	A move or copy rule (4) action (3) failed because the destination folder is over quota. (ecRulesFolderOverQuota)	0x0000096D, %x6D.09.00 .00
AddressBookUnavailable	The <b>address book</b> server could not be reached. (ecADUnavailable)	0x0000096E , %x6E.09.00 .00
AddressBookError	Unspecified error from the address book server. (ecADError)	0x0000096F , %x6F.09.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
AddressBookObjectNotFound	An object was not found in the address book. (ecADNotFound)	0x00000971 , %x71.09.00 .00
AddressBookPropertyError	A property was not found in the address book. (ecADPropertyError)	0x00000972 , %x72.09.00 .00
NotEncrypted	The server is configured to force encrypted connections, but the client requested an unencrypted connection. (ecNotEncrypted)	0x00000970 , %x70.09.00 .00
RpcServerTooBusy	An external RPC failed because the server was too busy. (ecRpcServerTooBusy)	0x00000973 , %x73.09.00 .00
RpcOutOfMemory	An external RPC failed because the local server was out of memory. (ecRpcOutOfMemory)	0x00000974 , %x74.09.00 .00
RpcServerOutOfMemory	An external RPC failed because the remote server was out of memory. (ecRpcServerOutOfMemory)	0x00000975 , %x75.09.00 .00
RpcOutOfResources	An external RPC failed because the remote server was out of an unspecified resource. (ecRpcOutOfResources)	0x00000976 , %x76.09.00 .00
RpcServerUnavailable	An external RPC failed because the remote server was unavailable. (ecRpcServerUnavailable)	0x00000977 , %x77.09.00 .00
SecureSubmitError	A failure occurred while setting the secure submission state of a message. (ecSecureSubmitError)	0x0000097A , %x7A.09.00 .00
EventsDeleted	Requested events were already deleted from the queue. (ecEventsDeleted)	0x0000097C , %x7C.09.00 .00
SubsystemStopping	A component service is in the process of shutting down. (ecSubsystemStopping)	0x0000097D, %x7D.09.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
AttendantUnavailable	The system attendant service is unavailable. (ecSAUnavailable)	0x0000097E , %x7E.09.00 .00
CIStopping	The content indexer service is stopping. (ecCIStopping)	0x00000A28 , %x28.0A.00 .00
FxInvalidState	An internal fast transfer object has invalid state. (ecFxInvalidState)	0x00000A29 , %x29.0A.00 .00
FxUnexpectedMarker	Fast transfer parsing has hit an invalid marker. (ecFxUnexpectedMarker)	0x00000A2A , %x2A.0A.00 .00
DuplicateDelivery	A copy of this message has already been delivered. (ecDuplicateDelivery)	0x00000A2B , %x2B.0A.00 .00
ConditionViolation	The condition was not met for a conditional operation. (ecConditionViolation)	0x00000A2C , %x2C.0A.00 .00
MaximumConnectionPoolsExceeded	An RPC client has exceeded the defined limit of RPC connection pools. (ecMaxPoolExceeded)	0x00000A2D, %x2D.0A.00 .00
InvalidRpcHandle	The RPC connection is no longer valid. (ecRpcInvalidHandle)	0x00000A2E , %x2E.0A.00 .00
EventNotFound	There are no events in the event table, or the requested event was not found. (ecEventNotFound)	0x00000A2F , %x2F.0A.00 .00
PropertyNotPromoted	A property was not copied from the message table to the message header table. (ecPropNotPromoted)	0x00000A30 , %x30.0A.00 .00
LowFreeSpaceForDatabase	The drive hosting database files has little or no free space. (ecLowMdbSpace)	0x00000A31 , %x31.0A.00

Error code name	Description (alternate names)	Numeric value (hex)
		.00
LowFreeSpaceForLogs	The drive hosting log files for the database has little or no free space. (ecLowMdbLogSpace)	0x00000A32 , %x32.0A.00 .00
MailboxIsQuarantined	The mailbox has been placed under quarantine by an administrator. (ecMailboxQuarantined)	0x00000A33 , %x33.0A.00 .00
DatabaseMountInProgress	The mailbox database is being mounted. (ecMountInProgress)	0x00000A34 , %x34.0A.00 .00
DatabaseDismountInProgress	The mailbox database is being dismounted. (ecDismountInProgress)	0x00000A35 , %x35.0A.00 .00
ConnectionsOverBudget	The number of RPC connections in use exceeds the amount budgeted for this client. (ecMaxConnectionsExceeded)	0x00000A36 , %x36.0A.00 .00
NotFoundInContainer	The mailbox was not found in the mailbox metadata cache. (ecNotFoundInContainer)	0x00000A37 , %x37.0A.00 .00
CannotRemove	An item cannot be removed from an internal list. (ecCannotRemove)	0x00000A38 , %x38.0A.00 .00
InvalidConnectionPool	An RPC client has attempted connection using a connection pool unknown to the server. (ecInvalidPool)	0x00000A39 , %x39.0A.00 .00
VirusScanGeneralFailure	A nonspecified failure occurred while scanning an item. ecVirusScannerError	0x00000A3A , %x3A.0A.00 .00
IsamErrorRfsFailure	The Resource Failure Simulator failed. (JET_errRfsFailure)	0xFFFFFFFF9C, %x9C.FF.FF. FF
IsamErrorRfsNotArmed	The Resource Failure Simulator has not been initialized. (JET_errRfsNotArmed)	0xFFFFFFFF9B, %x9B.FF.FF. FF

Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorFileClose	The file could not be closed. (JET_errFileClose)	0xFFFFFFFF9A, %x9A.FF.FF. FF
IsamErrorOutOfThreads	The thread could not be started. (JET_errOutOfThreads)	0xFFFFFFFF99, %x99.FF.FF. FF
IsamErrorTooManyIO	The system is busy due to too many I/Os. (JET_errTooManyIO)	0xFFFFFFFF97, %x97.FF.FF. FF
IsamErrorTaskDropped	The requested asynchronous task could not be executed. (JET_errTaskDropped)	0xFFFFFFFF96, %x96.FF.FF. FF
IsamErrorInternalError	There was a fatal internal error. (JET_errInternalError)	0xFFFFFFFF95, %x95.FF.FF. FF
IsamErrorDatabaseBufferDependenciesCorrupted	The buffer dependencies were set improperly and there was a recovery failure. (JET_errDatabaseBufferDependenciesCorrupted)	0xFFFFFFFF01, %x01.FF.FF. FF
IsamErrorPreviousVersion	The version already existed and there was a recovery failure. (JET_errPreviousVersion)	0xFFFFFEBE, %xBE.FE.FF. .FF
IsamErrorPageBoundary	The page boundary has been reached. (JET_errPageBoundary)	0xFFFFFEBD, %xBD.FE.FF. .FF
IsamErrorKeyBoundary	The key boundary has been reached. (JET_errKeyBoundary)	0xFFFFFEBB, %xBC.FE.FF. .FF
IsamErrorBadPageLink	The database is corrupt. (JET_errBadPageLink)	0xFFFFFEB9, %xB9.FE.FF. .FF
IsamErrorBadBookmark	The bookmark has no corresponding address in the database. (JET_errBadBookmark)	0xFFFFFEB8, %xB8.FE.FF. .FF
IsamErrorNTSystemCallFailed	The call to the operating system failed. (JET_errNTSystemCallFailed)	0xFFFFFEB2, %xB2.FE.FF. .FF
IsamErrorBadParentPageLink	A parent database is corrupt. (JET_errBadParentPageLink)	0xFFFFFEAE, %xAE.FE.FF. .FF

Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorSPAvailExtCacheOutOfSync	The AvailExt cache does not match the B+ tree. (JET_errSPAvailExtCacheOutOfSync)	0xFFFFFEAC , %xAC.FE.FF .FF
IsamErrorSPAvailExtCorrupted	The AllAvailExt space tree is corrupt. (JET_errSPAvailExtCorrupted)	0xFFFFFEAB , %xAB.FE.FF .FF
IsamErrorSPAvailExtCacheOutOfMemory	An out of memory error occurred while allocating an AvailExt cache node. (JET_errSPAvailExtCacheOutOfMemory)	0xFFFFFEAA , %xAA.FE.FF .FF
IsamErrorSPOwnExtCorrupted	The OwnExt space tree is corrupt. (JET_errSPOwnExtCorrupted)	0xFFFFFEA9, %xA9.FE.FF .FF
IsamErrorDbTimeCorrupted	The Dbtime on the current page is greater than the global database dbtime. (JET_errDbTimeCorrupted)	0xFFFFFEA8, %xA8.FE.FF .FF
IsamErrorKeyTruncated	An attempt to create a key for an index entry failed because the key would have been truncated and the index definition disallows key truncation. (JET_errKeyTruncated)	0xFFFFFEA6, %xA6.FE.FF .FF
IsamErrorKeyTooBig	The key is too large. (JET_errKeyTooBig)	0xFFFFFE68, %x68.FE.FF. FF
IsamErrorInvalidLoggedOperation	The logged operation cannot be redone. (JET_errInvalidLoggedOperation)	0xFFFFFE0C , %x0C.FE.FF .FF
IsamErrorLogFileCorrupt	The log file is corrupt. (JET_errLogFileCorrupt)	0xFFFFFE0B, %x0B.FE.FF .FF
IsamErrorNoBackupDirectory	A backup directory was not given. (JET_errNoBackupDirectory)	0xFFFFFE09, %x09.FE.FF. FF
IsamErrorBackupDirectoryNotEmpty	The backup directory is not empty. (JET_errBackupDirectoryNotEmpty)	0xFFFFFE08, %x08.FE.FF. FF
IsamErrorBackupInProgress	The backup is already active. (JET_errBackupInProgress)	0xFFFFFE07, %x07.FE.FF. FF

Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorRestoreInProgress	A restore is in progress. (JET_errRestoreInProgress)	0xFFFFFE06, %x06.FE.FF. FF
IsamErrorMissingPreviousLogFile	The log file is missing for the checkpoint. (JET_errMissingPreviousLogFile)	0xFFFFFE03, %x03.FE.FF. FF
IsamErrorLogWriteFail	There was a failure writing to the log file. (JET_errLogWriteFail)	0xFFFFFE02, %x02.FE.FF. FF
IsamErrorLogDisabledDueToRecoveryFailure	The attempt to write to the log after recovery failed. (JET_errLogDisabledDueToRecoveryFailure)	0xFFFFFE01, %x01.FE.FF. FF
IsamErrorCannotLogDuringRecoveryRedo	The attempt to write to the log during the recovery redo failed. (JET_errCannotLogDuringRecoveryRedo)	0xFFFFFE00, %x00.FE.FF. FF
IsamErrorLogGenerationMismatch	The name of the log file does not match the internal generation number. (JET_errLogGenerationMismatch)	0xFFFFFDFF, %xFF.FD.FF. FF
IsamErrorBadLogVersion	The version of the log file is not compatible with the ESE version. (JET_errBadLogVersion)	0xFFFFFDFF, %xFF.FD.FF. FF
IsamErrorInvalidLogSequence	The time stamp in the next log does not match the expected time stamp. (JET_errInvalidLogSequence)	0xFFFFFDFF, %xFF.FD.FF. FF
IsamErrorLoggingDisabled	The log is not active. (JET_errLoggingDisabled)	0xFFFFFDFF, %xFF.FD.FF. FF
IsamErrorLogBufferTooSmall	The log buffer is too small for recovery. (JET_errLogBufferTooSmall)	0xFFFFFDFF, %xFF.FD.FF. FF
IsamErrorLogSequenceEnd	The maximum log file number has been exceeded. (JET_errLogSequenceEnd)	0xFFFFFDFF, %xFF.FD.FF. FF
IsamErrorNoBackup	There is no backup in progress. (JET_errNoBackup)	0xFFFFFDFF, %xFF.FD.FF. FF

Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorInvalidBackupSequence	The backup call is out of sequence. (JET_errInvalidBackupSequence)	0xFFFFFDF7 , %xF7.FD.FF .FF
IsamErrorBackupNotAllowedYet	A backup cannot be done at this time. (JET_errBackupNotAllowedYet)	0xFFFFFDF5 , %xF5.FD.FF .FF
IsamErrorDeleteBackupFileFail	A backup file could not be deleted. (JET_errDeleteBackupFileFail)	0xFFFFFDF4 , %xF4.FD.FF .FF
IsamErrorMakeBackupDirectoryFail	The backup temporary directory could not be created. (JET_errMakeBackupDirectoryFail)	0xFFFFFDF3 , %xF3.FD.FF .FF
IsamErrorInvalidBackup	Circular logging is enabled; an incremental backup cannot be performed. (JET_errInvalidBackup)	0xFFFFFDF2 , %xF2.FD.FF .FF
IsamErrorRecoveredWithErrors	The data was restored with errors. (JET_errRecoveredWithErrors)	0xFFFFFDF1 , %xF1.FD.FF .FF
IsamErrorMissingLogFile	The current log file is missing. (JET_errMissingLogFile)	0xFFFFFDF0 , %xF0.FD.FF .FF
IsamErrorLogDiskFull	The log disk is full. (JET_errLogDiskFull)	0xFFFFDEF , %xEF.FD.FF .FF
IsamErrorBadLogSignature	There is a bad signature for a log file. (JET_errBadLogSignature)	0xFFFFDEE , %xEE.FD.FF .FF
IsamErrorBadDbSignature	There is a bad signature for a database file. (JET_errBadDbSignature)	0xFFFFDED , %xED.FD.FF .FF
IsamErrorBadCheckpointSignature	There is a bad signature for a checkpoint file. (JET_errBadCheckpointSignature)	0xFFFFDEC , %xEC.FD.FF .FF



Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorCheckpointCorrupt	The checkpoint file was not found or was corrupt. (JET_errCheckpointCorrupt)	0xFFFFFDEB , %xEB.FD.FF .FF
IsamErrorMissingPatchPage	The database patch file page was not found during recovery. (JET_errMissingPatchPage)	0xFFFFFDEA , %xEA.FD.FF .FF
IsamErrorBadPatchPage	The database patch file page is not valid. (JET_errBadPatchPage)	0xFFFFFDE9 , %xE9.FD.FF .FF
IsamErrorRedoAbruptEnded	The redo abruptly ended due to a sudden failure while reading logs from the log file. (JET_errRedoAbruptEnded)	0xFFFFFDE8 , %xE8.FD.FF .FF
IsamErrorBadSLVSignature	The signature in the SLV file does not agree with the database. (JET_errBadSLVSignature)	0xFFFFFDE7 , %xE7.FD.FF .FF
IsamErrorPatchFileMissing	The hard restore detected that a database patch file is missing from the backup set. (JET_errPatchFileMissing)	0xFFFFFDE6 , %xE6.FD.FF .FF
IsamErrorDatabaseLogSetMismatch	The database does not belong with the current set of log files. (JET_errDatabaseLogSetMismatch)	0xFFFFFDE5 , %xE5.FD.FF .FF
IsamErrorDatabaseStreamingFileMismatch	This flag is reserved. (JET_errDatabaseStreamingFileMismatch)	0xFFFFFDE4 , %xE4.FD.FF .FF
IsamErrorLogFileSizeMismatch	The actual log file size does not match the configured size. (JET_errLogFileSizeMismatch)	0xFFFFFDE3 , %xE3.FD.FF .FF
IsamErrorCheckpointFileNotFound	The checkpoint file could not be located. (JET_errCheckpointFileNotFound)	0xFFFFFDE2 , %xE2.FD.FF .FF
IsamErrorRequiredLogFilesMissing	The required log files for recovery are missing. (JET_errRequiredLogFilesMissing)	0xFFFFFDE1 , %xE1.FD.FF .FF

Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorSoftRecoveryOnBackupDatabase	A soft recovery is about to be used on a backup database when a restore is supposed to be used instead. (JET_errSoftRecoveryOnBackupDatabase)	0xFFFFFDE0 , %xE0.FD.FF .FF
IsamErrorLogFileSizeMismatchDatabasesConsistent	The databases have been recovered, but the log file size used during recovery does not match JET_paramLogFileSize. (JET_errLogFileSizeMismatchDatabasesConsistent)	0xFFFFFDDF , %xDF.FD.FF .FF
IsamErrorLogSectorSizeMismatch	The log file sector size does not match the sector size of the current volume. (JET_errLogSectorSizeMismatch)	0xFFFFFDDE , %xDE.FD.FF .FF
IsamErrorLogSectorSizeMismatchDatabasesConsistent	The databases have been recovered, but the log file sector size (used during recovery) does not match the sector size of the current volume. (JET_errLogSectorSizeMismatchDatabasesConsistent)	0xFFFFFDDD , %xDD.FD.FF .FF
IsamErrorLogSequenceEndDatabasesConsistent	The databases have been recovered, but all possible log generations in the current sequence have been used. All log files and the checkpoint file is required to be deleted and databases are required to be backed up before continuing. (JET_errLogSequenceEndDatabasesConsistent)	0xFFFFFDDC , %xDC.FD.FF .FF
IsamErrorStreamingDataNotLogged	There was an illegal attempt to replay a streaming file operation where the data was not logged. This is probably caused by an attempt to roll forward with circular logging enabled. (JET_errStreamingDataNotLogged)	0xFFFFFDDB , %xDB.FD.FF .FF
IsamErrorDatabaseDirtyShutdown	The database was not shut down cleanly. A recovery is required first be run to properly complete database operations for the previous shutdown. (JET_errDatabaseDirtyShutdown)	0xFFFFFDDA , %xDA.FD.FF .FF
IsamErrorConsistentTimeMismatch	The last consistent time for the database has not been matched. (JET_errConsistentTimeMismatch)	0xFFFFFDD9 , %xD9.FD.FF .FF
IsamErrorDatabasePatchFileMismatch	The database patch file is not generated from this backup. (JET_errDatabasePatchFileMismatch)	0xFFFFFDD8 , %xD8.FD.FF .FF
IsamErrorEndingRestoreLogTooLow	The starting log number is too low for the	0xFFFFFDD7

Error code name	Description (alternate names)	Numeric value (hex)
	restore. (JET_errEndingRestoreLogTooLow)	, %xD7.FD.FF .FF
IsamErrorStartingRestoreLogTooHigh	The starting log number is too high for the restore. (JET_errStartingRestoreLogTooHigh)	0xFFFFFDD6 , %xD6.FD.FF .FF
IsamErrorGivenLogFileHasBadSignature	The restore log file has a bad signature. (JET_errGivenLogFileHasBadSignature)	0xFFFFFDD5 , %xD5.FD.FF .FF
IsamErrorGivenLogFileIsNotContiguous	The restore log file is not contiguous. (JET_errGivenLogFileIsNotContiguous)	0xFFFFFDD4 , %xD4.FD.FF .FF
IsamErrorMissingRestoreLogFiles	Some restore log files are missing. (JET_errMissingRestoreLogFiles)	0xFFFFFDD3 , %xD3.FD.FF .FF
IsamErrorMissingFullBackup	The database missed a previous full backup before attempting to perform an incremental backup. (JET_errMissingFullBackup)	0xFFFFFDD0 , %xD0.FD.FF .FF
IsamErrorBadBackupDatabaseSize	The backup database size is not a multiple of the database page size. (JET_errBadBackupDatabaseSize)	0xFFFFDCFF , %xCF.FD.FF .FF
IsamErrorDatabaseAlreadyUpgraded	The current attempt to upgrade a database has been stopped because the database is already current. (JET_errDatabaseAlreadyUpgraded)	0xFFFFDCE , %xCE.FD.FF .FF
IsamErrorDatabaseIncompleteUpgrade	The database was only partially converted to the current format. The database is required to be restored from backup. (JET_errDatabaseIncompleteUpgrade)	0xFFFFDCD , %xCD.FD.FF .FF
IsamErrorMissingCurrentLogFiles	Some current log files are missing for continuous restore. (JET_errMissingCurrentLogFiles)	0xFFFFDCB , %xCB.FD.FF .FF
IsamErrorDbTimeTooOld	The dbtime on a page is smaller than the dbtimeBefore that is in the record. (JET_errDbTimeTooOld)	0xFFFFDCA , %xCA.FD.FF .FF
IsamErrorDbTimeTooNew	The dbtime on a page is in advance of the	0xFFFFDC9

Error code name	Description (alternate names)	Numeric value (hex)
	dbtimeBefore that is in the record. (JET_errDbTimeTooNew)	, %xC9.FD.FF .FF
IsamErrorMissingFileToBackup	Some log or database patch files were missing during the backup. (JET_errMissingFileToBackup)	0xFFFFFDC7 , %xC7.FD.FF .FF
IsamErrorLogTornWriteDuringHardRestore	A torn write was detected in a backup that was set during a hard restore. (JET_errLogTornWriteDuringHardRestore)	0xFFFFFDC6 , %xC6.FD.FF .FF
IsamErrorLogTornWriteDuringHardRecovery	A torn write was detected during a hard recovery (the log was not part of a backup set). (JET_errLogTornWriteDuringHardRecovery)	0xFFFFFDC5 , %xC5.FD.FF .FF
IsamErrorLogCorruptDuringHardRestore	Corruption was detected in a backup set during a hard restore. (JET_errLogCorruptDuringHardRestore)	0xFFFFFDC3 , %xC3.FD.FF .FF
IsamErrorLogCorruptDuringHardRecovery	Corruption was detected during hard recovery (the log was not part of a backup set). (JET_errLogCorruptDuringHardRecovery)	0xFFFFFDC2 , %xC2.FD.FF .FF
IsamErrorMustDisableLoggingForDbUpgrade	Logging cannot be enabled while attempting to upgrade a database. (JET_errMustDisableLoggingForDbUpgrade)	0xFFFFFDC1 , %xC1.FD.FF .FF
IsamErrorBadRestoreTargetInstance	Either the TargetInstance that was specified for restore has not been found or the log files do not match. (JET_errBadRestoreTargetInstance)	0xFFFFDBF , %xBF.FD.FF .FF
IsamErrorRecoveredWithoutUndo	The database engine successfully replayed all operations in the transaction log to perform a crash recovery but the caller elected to stop recovery without rolling back uncommitted updates. (JET_errRecoveredWithoutUndo)	0xFFFFDBD , %xBD.FD.FF .FF
IsamErrorDatabasesNotFromSameSnapshot	The databases to be restored are not from the same shadow copy backup. (JET_errDatabasesNotFromSameSnapshot)	0xFFFFDBC , %xBC.FD.FF .FF
IsamErrorSoftRecoveryOnSnapshot	There is a soft recovery on a database from a shadow copy backup set. (JET_errSoftRecoveryOnSnapshot)	0xFFFFDBB , %xBB.FD.FF .FF

Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorCommittedLogFilesMissing	One or more logs that were committed to this database are missing. (JET_errCommittedLogFilesMissing)	0xFFFFFDBA , %xBA.FD.FF .FF
IsamErrorCommittedLogFilesCorrupt	One or more logs were found to be corrupt during recovery. (JET_errCommittedLogFilesCorrupt)	0xFFFFFDB6 , %xB6.FD.FF .FF
IsamErrorUnicodeTranslationBufferTooSmall	The Unicode translation buffer is too small. (JET_errUnicodeTranslationBufferTooSmall)	0xFFFFFDA7 , %xA7.FD.FF .FF
IsamErrorUnicodeTranslationFail	The Unicode normalization failed. (JET_errUnicodeTranslationFail)	0xFFFFFDA6 , %xA6.FD.FF .FF
IsamErrorUnicodeNormalizationNotSupported	The operating system does not provide support for Unicode normalization and a normalization callback was not specified. (JET_errUnicodeNormalizationNotSupported)	0xFFFFFDA5 , %xA5.FD.FF .FF
IsamErrorExistingLogFileHasBadSignature	The existing log file has a bad signature. (JET_errExistingLogFileHasBadSignature)	0xFFFFFD9E , %x9E.FD.FF .FF
IsamErrorExistingLogFileIsNotContiguous	An existing log file is not contiguous. (JET_errExistingLogFileIsNotContiguous)	0xFFFFFD9D , %x9D.FD.FF .FF
IsamErrorLogReadVerifyFailure	A checksum error was found in the log file during backup. (JET_errLogReadVerifyFailure)	0xFFFFFD9C , %x9C.FD.FF .FF
IsamErrorSLVReadVerifyFailure	A checksum error was found in the SLV file during backup. (JET_errSLVReadVerifyFailure)	0xFFFFFD9B , %x9B.FD.FF .FF
IsamErrorCheckpointDepthTooDeep	There are too many outstanding generations between the checkpoint and the current generation. (JET_errCheckpointDepthTooDeep)	0xFFFFFD9A , %x9A.FD.FF .FF
IsamErrorRestoreOfNonBackupDatabase	A hard recovery was attempted on a database that was not a backup database. (JET_errRestoreOfNonBackupDatabase)	0xFFFFFD99 , %x99.FD.FF .FF

Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorInvalidGrbit	There is an invalid <i>grbit</i> parameter. (JET_errInvalidGrbit)	0xFFFFFC7C , %x7C.FC.FF .FF
IsamErrorTermInProgress	Termination is in progress. (JET_errTermInProgress)	0xFFFFFC18 , %x18.FC.FF .FF
IsamErrorFeatureNotAvailable	This API element is not supported. (JET_errFeatureNotAvailable)	0xFFFFFC17 , %x17.FC.FF .FF
IsamErrorInvalidName	An invalid name is being used. (JET_errInvalidName)	0xFFFFFC16 , %x16.FC.FF .FF
IsamErrorInvalidParameter	An invalid API parameter is being used. (JET_errInvalidParameter)	0xFFFFFC15 , %x15.FC.FF .FF
IsamErrorDatabaseFileReadOnly	There was an attempt to attach to a read-only database file for read/write operations. (JET_errDatabaseFileReadOnly)	0xFFFFFC10 , %x10.FC.FF .FF
IsamErrorInvalidDatabaseId	There is an invalid database ID. (JET_errInvalidDatabaseId)	0xFFFFFC0E , %x0E.FC.FF .FF
IsamErrorOutOfMemory	The system is out of memory. (JET_errOutOfMemory)	0xFFFFFC0D , %x0D.FC.FF .FF
IsamErrorOutOfDatabaseSpace	The maximum database size has been reached. (JET_errOutOfDatabaseSpace)	0xFFFFFC0C , %x0C.FC.FF .FF
IsamErrorOutOfCursors	The table is out of cursors. (JET_errOutOfCursors)	0xFFFFFC0B , %x0B.FC.FF .FF
IsamErrorOutOfBuffers	The database is out of page buffers. (JET_errOutOfBuffers)	0xFFFFFC0A , %x0A.FC.FF .FF

Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorTooManyIndexes	There are too many indexes. (JET_errTooManyIndexes)	0xFFFFFC09 , %x09.FC.FF .FF
IsamErrorTooManyKeys	There are too many columns in an index. (JET_errTooManyKeys)	0xFFFFFC08 , %x08.FC.FF .FF
IsamErrorRecordDeleted	The record has been deleted. (JET_errRecordDeleted)	0xFFFFFC07 , %x07.FC.FF .FF
IsamErrorReadVerifyFailure	There is a checksum error on a database page. (JET_errReadVerifyFailure)	0xFFFFFC06 , %x06.FC.FF .FF
IsamErrorPageNotInitialized	There is a blank database page. (JET_errPageNotInitialized)	0xFFFFFC05 , %x05.FC.FF .FF
IsamErrorOutOfFileHandles	There are no file <b>handles</b> . (JET_errOutOfFileHandles)	0xFFFFFC04 , %x04.FC.FF .FF
IsamErrorDiskIO	There is a disk I/O error. (JET_errDiskIO)	0xFFFFFC02 , %x02.FC.FF .FF
IsamErrorInvalidPath	A file path is invalid. (JET_errInvalidPath)	0xFFFFFC01 , %x01.FC.FF .FF
IsamErrorInvalidSystemPath	A system path is invalid. (JET_errInvalidSystemPath)	0xFFFFFC00 , %x00.FC.FF .FF
IsamErrorInvalidLogDirectory	A log directory is invalid. (JET_errInvalidLogDirectory)	0xFFFFFBFF, %xFF.FB.FF. FF
IsamErrorRecordTooBig	The record is larger than maximum size. (JET_errRecordTooBig)	0xFFFFBFBE, %xFE.FB.FF. FF
IsamErrorTooManyOpenDatabases	Too many databases are open.	0xFFFFBFBD

Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errTooManyOpenDatabases)	, %xFD.FB.FF .FF
IsamErrorInvalidDatabase	This is not a database file. (JET_errInvalidDatabase)	0xFFFFBFC, %xFC.FB.FF .FF
IsamErrorNotInitialized	The database engine has not been initialized. (JET_errNotInitialized)	0xFFFFBFB, %xFB.FB.FF .FF
IsamErrorAlreadyInitialized	The database engine is already initialized. (JET_errAlreadyInitialized)	0xFFFFBFA, %xFA.FB.FF .FF
IsamErrorInitInProgress	The database engine is being initialized. (JET_errInitInProgress)	0xFFFFBF9, %xF9.FB.FF .FF
IsamErrorFileAccessDenied	The file cannot be accessed because the file is locked or in use. (JET_errFileAccessDenied)	0xFFFFBF8, %xF8.FB.FF .FF
IsamErrorBufferTooSmall	The buffer is too small. (JET_errBufferTooSmall)	0xFFFFBF2, %xF2.FB.FF .FF
IsamErrorTooManyColumns	Too many columns are defined. (JET_errTooManyColumns)	0xFFFFBF0, %xF0.FB.FF .FF
IsamErrorContainerNotEmpty	The container is not empty. (JET_errContainerNotEmpty)	0xFFFFBED, %xED.FB.FF .FF
IsamErrorInvalidFilename	The file name is invalid. (JET_errInvalidFilename)	0xFFFFBEC, %xEC.FB.FF .FF
IsamErrorInvalidBookmark	A bookmark is invalid. (JET_errInvalidBookmark)	0xFFFFBEB, %xEB.FB.FF .FF
IsamErrorColumnInUse	The column used is in an index. (JET_errColumnInUse)	0xFFFFBEA, %xEA.FB.FF .FF
IsamErrorInvalidBufferSize	The data buffer does not match the column size.	0xFFFFBE9, %xE9.FB.FF



Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errInvalidBufferSize)	.FF
IsamErrorColumnNotUpdatable	The column value cannot be set. (JET_errColumnNotUpdatable)	0xFFFFFBE8, %xE8.FB.FF .FF
IsamErrorIndexInUse	The index is in use. (JET_errIndexInUse)	0xFFFFFBE5, %xE5.FB.FF .FF
IsamErrorLinkNotSupported	The link support is unavailable. (JET_errLinkNotSupported)	0xFFFFFBE4, %xE4.FB.FF .FF
IsamErrorNullKeyDisallowed	Null keys are not allowed on an index. (JET_errNullKeyDisallowed)	0xFFFFFBE3, %xE3.FB.FF .FF
IsamErrorNotInTransaction	The operation has to occur within a transaction. (JET_errNotInTransaction)	0xFFFFFBE2, %xE2.FB.FF .FF
IsamErrorTooManyActiveUsers	There are too many active database users. (JET_errTooManyActiveUsers)	0xFFFFBDD , %xDD.FB.FF .FF
IsamErrorInvalidCountry	A country/region code is invalid or unknown. (JET_errInvalidCountry)	0xFFFFBDB , %xDB.FB.FF .FF
IsamErrorInvalidLanguageId	A language ID is invalid or unknown. (JET_errInvalidLanguageId)	0xFFFFBDA , %xDA.FB.FF .FF
IsamErrorInvalidCodePage	A code page is invalid or unknown. (JET_errInvalidCodePage)	0xFFFFBD9 , %xD9.FB.FF .FF
IsamErrorInvalidLCMapStringFlags	Invalid flags are being used for LCMapString. (JET_errInvalidLCMapStringFlags)	0xFFFFBD8 , %xD8.FB.FF .FF
IsamErrorVersionStoreEntryTooBig	There was an attempt to create a version store entry (RCE) that was larger than a version bucket. (JET_errVersionStoreEntryTooBig)	0xFFFFBD7 , %xD7.FB.FF .FF
IsamErrorVersionStoreOutOfMemoryAndCleanupTimedOut	The version store is out of memory and the cleanup attempt failed to complete. (JET_errVersionStoreOutOfMemoryAndCleanupTimedOut)	0xFFFFBD6 , %xD6.FB.FF

Error code name	Description (alternate names)	Numeric value (hex)
	upTimedOut)	.FF
IsamErrorVersionStoreOutOfMemory	The version store is out of memory and a cleanup was already attempted. (JET_errVersionStoreOutOfMemory)	0xFFFFFBD3 , %xD3.FB.FF .FF
IsamErrorCannotIndex	The escrow and SLV columns cannot be indexed. (JET_errCannotIndex)	0xFFFFFBD1 , %xD1.FB.FF .FF
IsamErrorRecordNotDeleted	The record has not been deleted. (JET_errRecordNotDeleted)	0xFFFFFBD0 , %xD0.FB.FF .FF
IsamErrorTooManyMempoolEntries	Too many mempool entries have been requested. (JET_errTooManyMempoolEntries)	0xFFFFFBCF, %xCF.FB.FF .FF
IsamErrorOutOfObjectIDs	The database is out of B+ tree ObjectIDs so an offline defragmentation has to be performed to reclaim freed or unused ObjectIDs. (JET_errOutOfObjectIDs)	0xFFFFFBCE , %xCE.FB.FF .FF
IsamErrorOutOfLongValueIDs	The Long-value ID counter has reached the maximum value. An offline defragmentation has to be performed to reclaim free or unused LongValueIDs. (JET_errOutOfLongValueIDs)	0xFFFFFBCD , %xCD.FB.FF .FF
IsamErrorOutOfAutoincrementValues	The automatic increment counter has reached the maximum value. An offline defragmentation will not be able to reclaim free or unused automatically increment values. (JET_errOutOfAutoincrementValues)	0xFFFFFBCC , %xCC.FB.FF .FF
IsamErrorOutOfDbtimeValues	The Dbtime counter has reached the maximum value. An offline defragmentation is required to be performed to reclaim free or unused Dbtime values. (JET_errOutOfDbtimeValues)	0xFFFFFBCB , %xCB.FB.FF .FF
IsamErrorOutOfSequentialIndexValues	A sequential index counter has reached the maximum value. An offline defragmentation has to be performed to reclaim Free or unused SequentialIndex values. (JET_errOutOfSequentialIndexValues)	0xFFFFFBCA , %xCA.FB.FF .FF
IsamErrorRunningInOneInstanceMode	This multi-instance call has the single-instance mode enabled. (JET_errRunningInOneInstanceMode)	0xFFFFFBC8 , %xC8.FB.FF

Error code name	Description (alternate names)	Numeric value (hex)
		.FF
IsamErrorRunningInMultiInstanceMode	This single-instance call has the multi-instance mode enabled. (JET_errRunningInMultiInstanceMode)	0xFFFFFBC7 , %xC7.FB.FF .FF
IsamErrorSystemParamsAlreadySet	The global system parameters have already been set. (JET_errSystemParamsAlreadySet)	0xFFFFFBC6 , %xC6.FB.FF .FF
IsamErrorSystemPathInUse	The system path is already being used by another database instance. (JET_errSystemPathInUse)	0xFFFFFBC5 , %xC5.FB.FF .FF
IsamErrorLogFilePathInUse	The log file path is already being used by another database instance. (JET_errLogFilePathInUse)	0xFFFFFBC4 , %xC4.FB.FF .FF
IsamErrorTempPathInUse	The path to the temporary database is already being used by another database instance. (JET_errTempPathInUse)	0xFFFFFBC3 , %xC3.FB.FF .FF
IsamErrorInstanceNameInUse	The instance name is already in use. (JET_errInstanceNameInUse)	0xFFFFFBC2 , %xC2.FB.FF .FF
IsamErrorInstanceUnavailable	This instance cannot be used because it encountered a fatal error. (JET_errInstanceUnavailable)	0xFFFFFBBE , %xBE.FB.FF .FF
IsamErrorDatabaseUnavailable	This database cannot be used because it encountered a fatal error. (JET_errDatabaseUnavailable)	0xFFFFFBBD , %xBD.FB.FF .FF
IsamErrorInstanceUnavailableDueToFatalLogDiskFull	This instance cannot be used because it encountered a log-disk-full error while performing an operation (such as a transaction rollback) that could not tolerate failure. (JET_errInstanceUnavailableDueToFatalLogDiskFull)	0xFFFFFBBC , %xBC.FB.FF .FF
IsamErrorOutOfSessions	The database is out of sessions (2). (JET_errOutOfSessions)	0xFFFFFBB3 , %xB3.FB.FF .FF

Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorWriteConflict	The write lock failed due to the existence of an outstanding write lock. (JET_errWriteConflict)	0xFFFFFBB2 , %xB2.FB.FF .FF
IsamErrorTransTooDeep	The transactions are nested too deeply. (JET_errTransTooDeep)	0xFFFFFBB1 , %xB1.FB.FF .FF
IsamErrorInvalidSesid	A session (2) handle is invalid. (JET_errInvalidSesid)	0xFFFFFBB0 , %xB0.FB.FF .FF
IsamErrorWriteConflictPrimaryIndex	An update was attempted on an uncommitted primary index. (JET_errWriteConflictPrimaryIndex)	0xFFFFBBAF, %xAF.FB.FF .FF
IsamErrorInTransaction	The operation is not allowed within a transaction. (JET_errInTransaction)	0xFFFFFBAC , %xAC.FB.FF .FF
IsamErrorRollbackRequired	The current transaction is required to be rolled back. It cannot be committed and a new one cannot be started. (JET_errRollbackRequired)	0xFFFFFBAB , %xAB.FB.FF .FF
IsamErrorTransReadOnly	A read-only transaction tried to modify the database. (JET_errTransReadOnly)	0xFFFFBAA , %xAA.FB.FF .FF
IsamErrorSessionWriteConflict	Two different cursors attempted to replace the same record in the same session (2). (JET_errSessionWriteConflict)	0xFFFFBAA9 , %xA9.FB.FF .FF
IsamErrorRecordTooBigForBackwardCompatibility	The record would be too big if represented in a database format from a previous version of Jet. (JET_errRecordTooBigForBackwardCompatibility)	0xFFFFBAA8 , %xA8.FB.FF .FF
IsamErrorCannotMaterializeForwardOnlySort	The temporary table could not be created due to parameters that conflict with JET_bitTTForwardOnly. (JET_errCannotMaterializeForwardOnlySort)	0xFFFFBAA7 , %xA7.FB.FF .FF
IsamErrorSesidTableIdMismatch	The session (2) handle cannot be used with the table id because it was not used to create it. (JET_errSesidTableIdMismatch)	0xFFFFBAA6 , %xA6.FB.FF .FF

Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorInvalidInstance	The instance handle is invalid or refers to an instance that has been shut down. (JET_errInvalidInstance)	0xFFFFFBA5 , %xA5.FB.FF .FF
IsamErrorDatabaseDuplicate	The database already exists. (JET_errDatabaseDuplicate)	0xFFFFFB4F, %x4F.FB.FF. FF
IsamErrorDatabaseInUse	The database in use. (JET_errDatabaseInUse)	0xFFFFFB4E, %x4E.FB.FF .FF
IsamErrorDatabaseNotFound	No such database exists. (JET_errDatabaseNotFound)	0xFFFFFB4D , %x4D.FB.FF .FF
IsamErrorDatabaseInvalidName	The database name is invalid. (JET_errDatabaseInvalidName)	0xFFFFFB4C , %x4C.FB.FF .FF
IsamErrorDatabaseInvalidPages	The number of pages is invalid. (JET_errDatabaseInvalidPages)	0xFFFFFB4B , %x4B.FB.FF .FF
IsamErrorDatabaseCorrupted	There is a nondatabase file or corrupt database. (JET_errDatabaseCorrupted)	0xFFFFFB4A , %x4A.FB.FF .FF
IsamErrorDatabaseLocked	The database is exclusively locked. (JET_errDatabaseLocked)	0xFFFFFB49, %x49.FB.FF .FF
IsamErrorCannotDisableVersioning	The versioning for this database cannot be disabled. (JET_errCannotDisableVersioning)	0xFFFFFB48, %x48.FB.FF .FF
IsamErrorInvalidDatabaseVersion	The database engine is incompatible with the database. (JET_errInvalidDatabaseVersion)	0xFFFFFB47, %x47.FB.FF .FF
IsamErrorDatabase200Format	The database is in an older (200) format. (JET_errDatabase200Format)	0xFFFFFB46, %x46.FB.FF .FF
IsamErrorDatabase400Format	The database is in an older (400) format. (JET_errDatabase400Format)	0xFFFFFB45, %x45.FB.FF .FF
IsamErrorDatabase500Format	The database is in an older (500) format.	0xFFFFFB44,

Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errDatabase500Format)	%x44.FB.FF .FF
IsamErrorPageSizeMismatch	The database page size does not match the engine. (JET_errPageSizeMismatch)	0xFFFFFB43, %x43.FB.FF .FF
IsamErrorTooManyInstances	No more database instances can be started. (JET_errTooManyInstances)	0xFFFFFB42, %x42.FB.FF .FF
IsamErrorDatabaseSharingViolation	A different database instance is using this database. (JET_errDatabaseSharingViolation)	0xFFFFFB41, %x41.FB.FF .FF
IsamErrorAttachedDatabaseMismatch	An outstanding database attachment has been detected at the start or end of the recovery, but the database is missing or does not match attachment info. (JET_errAttachedDatabaseMismatch)	0xFFFFFB40, %x40.FB.FF .FF
IsamErrorDatabaseInvalidPath	The specified path to the database file is illegal. (JET_errDatabaseInvalidPath)	0xFFFFFB3F, %x3F.FB.FF .FF
IsamErrorDatabaseIdInUse	A database is being assigned an ID that is already in use. (JET_errDatabaseIdInUse)	0xFFFFFB3E, %x3E.FB.FF .FF
IsamErrorForceDetachNotAllowed	The forced detach is allowed only after the normal detach was stopped due to an error. (JET_errForceDetachNotAllowed)	0xFFFFFB3D, %x3D.FB.FF .FF
IsamErrorCatalogCorrupted	Corruption was detected in the catalog. (JET_errCatalogCorrupted)	0xFFFFFB3C, %x3C.FB.FF .FF
IsamErrorPartiallyAttachedDB	The database is only partially attached and the attach operation cannot be completed. (JET_errPartiallyAttachedDB)	0xFFFFFB3B, %x3B.FB.FF .FF
IsamErrorDatabaseSignInUse	The database with the same signature is already in use. (JET_errDatabaseSignInUse)	0xFFFFFB3A, %x3A.FB.FF .FF
IsamErrorDatabaseCorruptedNoRepair	The database is corrupted but a repair is not allowed. (JET_errDatabaseCorruptedNoRepair)	0xFFFFFB38, %x38.FB.FF .FF
IsamErrorInvalidCreateDbVersion	The database engine attempted to replay a Create Database operation from the	0xFFFFFB37, %x37.FB.FF

Error code name	Description (alternate names)	Numeric value (hex)
	transaction log but failed due to an incompatible version of that operation. (JET_errInvalidCreateDbVersion)	.FF
IsamErrorTableLocked	The table is exclusively locked. (JET_errTableLocked)	0xFFFFFAEA , %xEA.FA.FF .FF
IsamErrorTableDuplicate	The table already exists. (JET_errTableDuplicate)	0xFFFFFAE9, %xE9.FA.FF .FF
IsamErrorTableInUse	The table is in use and cannot be locked. (JET_errTableInUse)	0xFFFFFAE8, %xE8.FA.FF .FF
IsamErrorObjectNotFound	There is no such table or object. (JET_errObjectNotFound)	0xFFFFFAE7, %xE7.FA.FF .FF
IsamErrorDensityInvalid	There is a bad file or index density. (JET_errDensityInvalid)	0xFFFFFAE5, %xE5.FA.FF .FF
IsamErrorTableNotEmpty	The table is not empty. (JET_errTableNotEmpty)	0xFFFFFAE4, %xE4.FA.FF .FF
IsamErrorInvalidTableId	The table ID is invalid. (JET_errInvalidTableId)	0xFFFFFAE2, %xE2.FA.FF .FF
IsamErrorTooManyOpenTables	No more tables can be opened, even after the internal cleanup task has run. (JET_errTooManyOpenTables)	0xFFFFFAE1, %xE1.FA.FF .FF
IsamErrorIllegalOperation	The operation is not supported on the table. (JET_errIllegalOperation)	0xFFFFFAE0, %xE0.FA.FF .FF
IsamErrorTooManyOpenTablesAndCleanupTimedOut	No more tables can be opened because the cleanup attempt failed to complete. (JET_errTooManyOpenTablesAndCleanupTimedOut)	0xFFFFFADF , %xDF.FA.FF .FF
IsamErrorObjectDuplicate	The table or object name is in use. (JET_errObjectDuplicate)	0xFFFFFADE , %xDE.FA.FF .FF
IsamErrorInvalidObject	The object is invalid for operation. (JET_errInvalidObject)	0xFFFFFADC , %xDC.FA.FF

Error code name	Description (alternate names)	Numeric value (hex)
		.FF
IsamErrorCannotDeleteTempTable	JetCloseTable is required to be used instead of JetDeleteTable to delete a temporary table. (JET_errCannotDeleteTempTable)	0xFFFFFADB , %xDB.FA.FF .FF
IsamErrorCannotDeleteSystemTable	There was an illegal attempt to delete a system table. (JET_errCannotDeleteSystemTable)	0xFFFFFADA , %xDA.FA.FF .FF
IsamErrorCannotDeleteTemplateTable	There was an illegal attempt to delete a template table. (JET_errCannotDeleteTemplateTable)	0xFFFFFAD9 , %xD9.FA.FF .FF
IsamErrorExclusiveTableLockRequired	There has to be an exclusive lock on the table. (JET_errExclusiveTableLockRequired)	0xFFFFFAD6 , %xD6.FA.FF .FF
IsamErrorFixedDDL	DDL operations are prohibited on this table. (JET_errFixedDDL)	0xFFFFFAD5 , %xD5.FA.FF .FF
IsamErrorFixedInheritedDDL	On a derived table, DDL operations are prohibited on the inherited portion of the DDL. (JET_errFixedInheritedDDL)	0xFFFFFAD4 , %xD4.FA.FF .FF
IsamErrorCannotNestDDL	Nesting the hierarchical DDL is not currently supported. (JET_errCannotNestDDL)	0xFFFFFAD3 , %xD3.FA.FF .FF
IsamErrorDDLNotInheritable	There was an attempt to inherit a DDL from a table that is not marked as a template table. (JET_errDDLNotInheritable)	0xFFFFFAD2 , %xD2.FA.FF .FF
IsamErrorInvalidSettings	The system parameters were set improperly. (JET_errInvalidSettings)	0xFFFFFAD0 , %xD0.FA.FF .FF
IsamErrorClientRequestToStopJetService	The client has requested that the service be stopped. (JET_errClientRequestToStopJetService)	0xFFFFFACF, %xCF.FA.FF .FF
IsamErrorCannotAddFixedVarColumnToDerivedTable	The template table was created with the <b>NoFixedVarColumnsInDerivedTables</b> flag set. (JET_errCannotAddFixedVarColumnToDerive	0xFFFFFACE , %xCE.FA.FF .FF



Error code name	Description (alternate names)	Numeric value (hex)
	dTable)	
IsamErrorIndexCantBuild	The index build failed. (JET_errIndexCantBuild)	0xFFFFFA87, %x87.FA.FF .FF
IsamErrorIndexHasPrimary	The primary index is already defined. (JET_errIndexHasPrimary)	0xFFFFFA86, %x86.FA.FF .FF
IsamErrorIndexDuplicate	The index is already defined. (JET_errIndexDuplicate)	0xFFFFFA85, %x85.FA.FF .FF
IsamErrorIndexNotFound	There is no such index. (JET_errIndexNotFound)	0xFFFFFA84, %x84.FA.FF .FF
IsamErrorIndexMustStay	The clustered index cannot be deleted. (JET_errIndexMustStay)	0xFFFFFA83, %x83.FA.FF .FF
IsamErrorIndexInvalidDef	The index definition is invalid. (JET_errIndexInvalidDef)	0xFFFFFA82, %x82.FA.FF .FF
IsamErrorInvalidCreateIndex	The creation of the index description was invalid. (JET_errInvalidCreateIndex)	0xFFFFFA7F, %x7F.FA.FF .FF
IsamErrorTooManyOpenIndexes	The database is out of index description blocks. (JET_errTooManyOpenIndexes)	0xFFFFFA7E, %x7E.FA.FF .FF
IsamErrorMultiValuedIndexViolation	Non-unique inter-record index keys have been generated for a multivalued index. (JET_errMultiValuedIndexViolation)	0xFFFFFA7D, %x7D.FA.FF .FF
IsamErrorIndexBuildCorrupted	A secondary index that properly reflects the primary index failed to build. (JET_errIndexBuildCorrupted)	0xFFFFFA7C, %x7C.FA.FF .FF
IsamErrorPrimaryIndexCorrupted	The primary index is corrupt and the database is required be defragmented. (JET_errPrimaryIndexCorrupted)	0xFFFFFA7B, %x7B.FA.FF .FF
IsamErrorSecondaryIndexCorrupted	The secondary index is corrupt and the database is required to be defragmented. (JET_errSecondaryIndexCorrupted)	0xFFFFFA7A, %x7A.FA.FF .FF

Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorInvalidIndexId	The index ID is invalid. (JET_errInvalidIndexId)	0xFFFFFA78, %x78.FA.FF .FF
IsamErrorIndexTuplesSecondaryIndexOnly	The tuple index can only be set on a secondary index. (JET_errIndexTuplesSecondaryIndexOnly)	0xFFFFFA6A, %x6A.FA.FF .FF
IsamErrorIndexTuplesTooManyColumns	The index definition for the tuple index contains more key columns that the database engine can support. (JET_errIndexTuplesTooManyColumns)	0xFFFFFA69, %x69.FA.FF .FF
IsamErrorIndexTuplesNonUniqueOnly	The tuple index cannot be a unique index. (JET_errIndexTuplesNonUniqueOnly)	0xFFFFFA68, %x68.FA.FF .FF
IsamErrorIndexTuplesTextBinaryColumnsOnly	A tuple index definition can only contain key columns that have text or binary column types. (JET_errIndexTuplesTextBinaryColumnsOnly)	0xFFFFFA67, %x67.FA.FF .FF
IsamErrorIndexTuplesVarSegMacNotAllowed	The tuple index does not allow setting cbVarSegMac. (JET_errIndexTuplesVarSegMacNotAllowed)	0xFFFFFA66, %x66.FA.FF .FF
IsamErrorIndexTuplesInvalidLimits	The minimum/maximum tuple length or the maximum number of characters that are specified for an index is invalid. (JET_errIndexTuplesInvalidLimits)	0xFFFFFA65, %x65.FA.FF .FF
IsamErrorIndexTuplesCannotRetrieveFromIndex	JetRetrieveColumn cannot be called with the <b>JET_bitRetrieveFromIndex</b> flag set while retrieving a column on a tuple index. (JET_errIndexTuplesCannotRetrieveFromIndex)	0xFFFFFA64, %x64.FA.FF .FF
IsamErrorIndexTuplesKeyTooSmall	The specified key does not meet the minimum tuple length. (JET_errIndexTuplesKeyTooSmall)	0xFFFFFA63, %x63.FA.FF .FF
IsamErrorColumnLong	The column value is long. (JET_errColumnLong)	0xFFFFFA23, %x23.FA.FF .FF
IsamErrorColumnNoChunk	There is no such chunk in a long value. (JET_errColumnNoChunk)	0xFFFFFA22, %x22.FA.FF .FF
IsamErrorColumnDoesNotFit	The field will not fit in the record. (JET_errColumnDoesNotFit)	0xFFFFFA21, %x21.FA.FF .FF
IsamErrorNullInvalid	Null is not valid.	0xFFFFFA20,

Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errNullInvalid, JET_errColumnIllegalNull)	%x20.FA.FF .FF
IsamErrorColumnIndexed	The column is indexed and cannot be deleted. (JET_errColumnIndexed)	0xFFFFFA1F, %x1F.FA.FF. .FF
IsamErrorColumnTooBig	The field length is greater than the maximum allowed length. (JET_errColumnTooBig)	0xFFFFFA1E, %x1E.FA.FF .FF
IsamErrorColumnNotFound	No such column exists. (JET_errColumnNotFound)	0xFFFFFA1D , %x1D.FA.FF .FF
IsamErrorColumnDuplicate	This field is already defined. (JET_errColumnDuplicate)	0xFFFFFA1C , %x1C.FA.FF .FF
IsamErrorMultiValuedColumnMustBeTagged	An attempt was made to create a multivalued column, but the column was not tagged. (JET_errMultiValuedColumnMustBeTagged)	0xFFFFFA1B , %x1B.FA.FF .FF
IsamErrorColumnRedundant	There is a second automatic increment or version column. (JET_errColumnRedundant)	0xFFFFFA1A , %x1A.FA.FF .FF
IsamErrorInvalidColumnType	The column data type is invalid. (JET_errInvalidColumnType)	0xFFFFFA19, %x19.FA.FF .FF
IsamErrorTaggedNotNULL	There are no non-NULL tagged columns. (JET_errTaggedNotNULL)	0xFFFFFA16, %x16.FA.FF .FF
IsamErrorNoCurrentIndex	The database is invalid because it does not contain a current index. (JET_errNoCurrentIndex)	0xFFFFFA15, %x15.FA.FF .FF
IsamErrorKeyIsMade	The key is completely made. (JET_errKeyIsMade)	0xFFFFFA14, %x14.FA.FF .FF
IsamErrorBadColumnId	The column ID is incorrect. (JET_errBadColumnId)	0xFFFFFA13, %x13.FA.FF .FF
IsamErrorBadItagSequence	There is a bad itagSequence for the tagged column. (JET_errBadItagSequence)	0xFFFFFA12, %x12.FA.FF .FF

Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorColumnInRelationship	A column cannot be deleted because it is part of a relationship. (JET_errColumnInRelationship)	0xFFFFFA11, %x11.FA.FF .FF
IsamErrorCannotBeTagged	The automatic increment and version cannot be tagged. (JET_errCannotBeTagged)	0xFFFFFA0F, %x0F.FA.FF .FF
IsamErrorDefaultValueTooBig	The default value exceeds the maximum size. (JET_errDefaultValueTooBig)	0xFFFFFA0C, %x0C.FA.FF .FF
IsamErrorMultiValuedDuplicate	A duplicate value was detected on a unique multivalued column. (JET_errMultiValuedDuplicate)	0xFFFFFA0B, %x0B.FA.FF .FF
IsamErrorLVCorrupted	Corruption was encountered in a long-value tree. (JET_errLVCorrupted)	0xFFFFFA0A, %x0A.FA.FF .FF
IsamErrorMultiValuedDuplicateAfterTruncation	A duplicate value was detected on a unique multivalued column after the data was normalized, and it is normalizing truncated data before comparison. (JET_errMultiValuedDuplicateAfterTruncation)	0xFFFFFA08, %x08.FA.FF .FF
IsamErrorDerivedColumnCorruption	There is an invalid column in a derived table. (JET_errDerivedColumnCorruption)	0xFFFFFA07, %x07.FA.FF .FF
IsamErrorInvalidPlaceholderColumn	An attempt was made to convert a column to a primary index placeholder, but the column does not meet the necessary criteria. (JET_errInvalidPlaceholderColumn)	0xFFFFFA06, %x06.FA.FF .FF
IsamErrorRecordNotFound	The key was not found. (JET_errRecordNotFound)	0xFFFFF9BF, %xBF.F9.FF .FF
IsamErrorRecordNoCopy	There is no working buffer. (JET_errRecordNoCopy)	0xFFFFF9BE, %xBE.F9.FF .FF
IsamErrorNoCurrentRecord	There is no current record. (JET_errNoCurrentRecord)	0xFFFFF9BD, %xBD.F9.FF .FF
IsamErrorRecordPrimaryChanged	The primary key might not change. (JET_errRecordPrimaryChanged)	0xFFFFF9BC, %xBC.F9.FF

Error code name	Description (alternate names)	Numeric value (hex)
		.FF
IsamErrorKeyDuplicate	There is an illegal duplicate key. (JET_errKeyDuplicate)	0xFFFFF9BB, %xBB.F9.FF .FF
IsamErrorAlreadyPrepared	An attempt was made to update a record while a record update was already in progress. (JET_errAlreadyPrepared)	0xFFFFF9B9, %xB9.F9.FF .FF
IsamErrorKeyNotMade	A call was not made to JetMakeKey. (JET_errKeyNotMade)	0xFFFFF9B8, %xB8.F9.FF .FF
IsamErrorUpdateNotPrepared	A call was not made to JetPrepareUpdate. (JET_errUpdateNotPrepared)	0xFFFFF9B7, %xB7.F9.FF .FF
IsamErrorDataHasChanged	The data has changed and the operation was aborted. (JET_errDataHasChanged)	0xFFFFF9B5, %xB5.F9.FF .FF
IsamErrorLanguageNotSupported	The operating system does not support the selected language. (JET_errLanguageNotSupported)	0xFFFFF9AD, %xAD.F9.FF .FF
IsamErrorTooManySorts	There are too many sort processes. (JET_errTooManySorts)	0xFFFFF95B, %x5B.F9.FF .FF
IsamErrorInvalidOnSort	An invalid operation occurred during a sort. (JET_errInvalidOnSort)	0xFFFFF95A, %x5A.F9.FF .FF
IsamErrorTempFileOpenError	The temporary file could not be opened. (JET_errTempFileOpenError)	0xFFFFF8F5, %xF5.F8.FF. FF
IsamErrorTooManyAttachedDatabases	Too many databases are open. (JET_errTooManyAttachedDatabases)	0xFFFFF8F3, %xF3.F8.FF. FF
IsamErrorDiskFull	There is no space left on disk. (JET_errDiskFull)	0xFFFFF8F0, %xF0.F8.FF. FF
IsamErrorPermissionDenied	Permission is denied. (JET_errPermissionDenied)	0xFFFFF8EF, %xEF.F8.FF. FF
IsamErrorFileNotFound	The file was not found.	0xFFFFF8ED

Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errFileNotFound)	, %xED.F8.FF .FF
IsamErrorFileInvalidType	The file type is invalid. (JET_errFileInvalidType)	0xFFFFF8EC, %xEC.F8.FF .FF
IsamErrorAfterInitialization	A restore cannot be started after initialization. (JET_errAfterInitialization)	0xFFFFF8C6, %xC6.F8.FF .FF
IsamErrorLogCorrupted	The logs could not be interpreted. (JET_errLogCorrupted)	0xFFFFF8C4, %xC4.F8.FF .FF
IsamErrorInvalidOperation	The operation is invalid. (JET_errInvalidOperation)	0xFFFFF88E, %x8E.F8.FF .FF
IsamErrorAccessDenied	Access is denied. (JET_errAccessDenied)	0xFFFFF88D, %x8D.F8.FF .FF
IsamErrorTooManySplits	An infinite split. (JET_errTooManySplits)	0xFFFFF88B, %x8B.F8.FF .FF
IsamErrorSessionSharingViolation	Multiple threads are using the same session (2). (JET_errSessionSharingViolation)	0xFFFFF88A, %x8A.F8.FF .FF
IsamErrorEntryPointNotFound	An entry point in a required DLL could not be found. (JET_errEntryPointNotFound)	0xFFFFF889, %x89.F8.FF .FF
IsamErrorSessionContextAlreadySet	The specified session (2) already has a session context set. (JET_errSessionContextAlreadySet)	0xFFFFF888, %x88.F8.FF .FF
IsamErrorSessionContextNotSetByThisThread	An attempt was made to reset the session context, but the current thread was not the original one that set the session context. (JET_errSessionContextNotSetByThisThread)	0xFFFFF887, %x87.F8.FF .FF
IsamErrorSessionInUse	An attempt was made to terminate the session (2) currently in use. (JET_errSessionInUse)	0xFFFFF886, %x86.F8.FF .FF
IsamErrorRecordFormatConversionFailed	An internal error occurred during a dynamic record format conversion.	0xFFFFF885, %x85.F8.FF

Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errRecordFormatConversionFailed)	FF
IsamErrorOneDatabasePerSession	Only one open user database per session (2) is allowed. (JET_errOneDatabasePerSession)	0xFFFFF884, %x84.F8.FF. FF
IsamErrorRollbackError	There was an error during rollback. (JET_errRollbackError)	0xFFFFF883, %x83.F8.FF. FF
IsamErrorCallbackFailed	A callback function call failed. (JET_errCallbackFailed)	0xFFFFF7CB , %xCB.F7.FF. .FF
IsamErrorCallbackNotResolved	A callback function could not be found. (JET_errCallbackNotResolved)	0xFFFFF7CA , %xCA.F7.FF. .FF
IsamErrorOSSnapshotInvalidSequence	The operating system shadow copy API was used in an invalid sequence. (JET_errOSSnapshotInvalidSequence)	0xFFFFF69F, %x9F.F6.FF. FF
IsamErrorOSSnapshotTimeOut	The operating system shadow copy ended with a time-out. (JET_errOSSnapshotTimeOut)	0xFFFFF69E, %x9E.F6.FF. FF
IsamErrorOSSnapshotNotAllowed	The operating system shadow copy is not allowed because a backup or recovery is in progress. (JET_errOSSnapshotNotAllowed)	0xFFFFF69D , %x9D.F6.FF. .FF
IsamErrorOSSnapshotInvalidSnapId	The operation failed because the specified operating system shadow copy handle was invalid. (JET_errOSSnapshotInvalidSnapId)	0xFFFFF69C , %x9C.F6.FF. .FF
IsamErrorLSCallbackNotSpecified	An attempt was made to use local storage without a callback function being specified. (JET_errLSCallbackNotSpecified)	0xFFFFF448, %x48.F4.FF. FF
IsamErrorLSAlreadySet	An attempt was made to set the local storage for an object that already had it set. (JET_errLSAlreadySet)	0xFFFFF447, %x47.F4.FF. FF
IsamErrorLSNotSet	An attempt was made to retrieve local storage from an object that did not have it set. (JET_errLSNotSet)	0xFFFFF446, %x46.F4.FF. FF
IsamErrorFileIOSparse	An I/O operation failed because it was attempted against an unallocated region of a file.	0xFFFFF060, %x60.F0.FF. FF

Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errFileIOSparse)	
IsamErrorFileIOBeyondEOF	A read was issued to a location beyond the EOF (writes will expand the file). (JET_errFileIOBeyondEOF)	0xFFFFF05F, %x5F.F0.FF.FF
IsamErrorFileCompressed	Read/write access is not supported on compressed files. (JET_errFileCompressed)	0xFFFFF05B, %x5B.F0.FF.FF

## 2.4.2 Property Error Codes

Property errors appear in two different contexts. When an error occurs in getting a property of an object, or a column of a table, from the server, then the type of the returned property value is `ErrorCode` (0x000A) and the property value itself is the error code. When an error occurs in setting a property of an object on the server, the **RopSetProperties** ROP ([\[MS-OXCROPS\]](#) section 2.2.8.6) returns an array of **PropertyProblem** structures, as specified in section [2.7](#), that includes the error code.

Most property error codes are also used as general error codes, but they have a special meaning in the context of a property operation.

Property error codes are presented in the following table.

Error code name	Description (alternate names)	Numeric value (hex)
NotEnoughMemory	On get, indicates that the property or column value is too large to be retrieved by the request, and the property value needs to be accessed with the <b>RopOpenStream</b> ROP ( <a href="#">[MS-OXCROPS]</a> section 2.2.9.1). (E_NOMEMORY, MAPI_E_NOT_ENOUGH_MEMORY)	0x8007000E, %x0E.00.07.80
NotFound	On get, indicates that the property or column has no value for this object. (MAPI_E_NOT_FOUND)	0x8004010F, %x0F.01.04.80
BadValue	On set, indicates that the property value is not acceptable to the server. (MAPI_E_BAD_VALUE, ecPropBadValue)	0x80040301, %x01.03.04.80
InvalidType	On get or set, indicates that the data type passed with the property or column is undefined. (MAPI_E_INVALID_TYPE, ecInvalidType)	0x80040302, %x02.03.04.80
UnsupportedType	On get or set, indicates that the data type passed with the property or column is not acceptable to the server. (MAPI_E_TYPE_NO_SUPPORT, ecTypeNotSupported)	0x80040303, %x03.03.04.80
UnexpectedType	On get or set, indicates that the data type passed with the property or column is not the type expected by the server. (MAPI_E_UNEXPECTED_TYPE, ecPropType)	0x80040304, %x04.03.04.80



Error code name	Description (alternate names)	Numeric value (hex)
TooBig	Indicates that the result set of the operation is too big for the server to return. (MAPI_E_TOO_BIG, ecTooBig)	0x80040305, %x05.03.04.80
DeclineCopy	On a copy operation, indicates that the server cannot copy the object, possibly because the source and destination are on different types of servers, and the server will delegate the copying to client code. (MAPI_E_DECLINE_COPY)	0x80040306, %x06.03.04.80
UnexpectedId	On get or set, indicates that the server does not support <b>property IDs</b> in this range, usually the named property ID range (from 0x8000 through 0xFFFF). (MAPI_E_UNEXPECTED_ID)	0x80040307, %x07.03.04.80

### 2.4.3 Warning Codes

Warning codes indicate that while the operation as a whole was processed successfully by the server, individual items or properties were not processed successfully. For example, if three properties are requested from a Message object in a **RopGetPropertiesSpecific** ROP request ([\[MS-OXCROPS\]](#) section 2.2.8.3) and one of the three properties does not exist on the Message object, then in the response buffer:

1. The ROP returns an **ErrorsReturned** warning, as specified in the following table.
2. The type in the property tag of the missing property is **PtypErrorCode** (section [2.11.1](#)).
3. The property value of the missing property is **NotFound**, as specified in section [2.4](#).

Warning codes are presented in the following table.

Warning code name	Description (alternate names)	Numeric value (hex)
ErrorsReturned	A request involving multiple properties failed for one or more individual properties, while succeeding overall. (MAPI_W_ERRORS_RETURNED, ecWarnWithErrors)	0x00040380, %x80.03.04.00
PositionChanged	A table operation succeeded, but the bookmark specified is no longer set at the same row as when it was last used. (MAPI_W_POSITION_CHANGED, ecWarnPositionChanged)	0x00040481, %x81.04.04.00
ApproximateCount	The row count returned by a table operation is approximate, not exact. (MAPI_W_APPROX_COUNT, ecWarnApproxCount)	0x00040482, %x82.04.04.00
PartiallyComplete	A move, copy, or delete operation succeeded for some messages but not for others.	0x00040680, %x80.06.04.00

Warning code name	Description (alternate names)	Numeric value (hex)
	(MAPI_W_PARTIAL_COMPLETION, ecPartialCompletion)	
SyncProgress	The operation succeeded, but there is more to do. (SYNC_W_PROGRESS)	0x00040820, %x20.08.04.00
NewerClientChange	In a change conflict, the client has the more recent change. (SYNC_W_CLIENT_CHANGE_NEWER)	0x00040821, %x21.08.04.00
IsamWarningRemainingVersions	The version store is still active. (JET_wrnRemainingVersions)	0x00000141, %x41.01.00.00
IsamWarningUniqueKey	A seek on an index that is not unique yielded a unique key. (JET_wrnUniqueKey)	0x00000159, %x59.01.00.00
IsamWarningSeparateLongValue	A database column is a separated long value. (JET_wrnSeparateLongValue)	0x00000196, %x96.01.00.00
IsamWarningExistingLogFileHasBadSignature	The existing log file has a bad signature. (JET_wrnExistingLogFileHasBadSignature)	0x0000022E, %x2E.02.00.00
IsamWarningExistingLogFileIsNotContiguous	The existing log file is not contiguous. (JET_wrnExistingLogFileIsNotContiguous)	0x0000022F, %x2F.02.00.00
IsamWarningSkipThisRecord	This error is for internal use only. (JET_wrnSkipThisRecord)	0x00000234, %x34.02.00.00
IsamWarningTargetInstanceRunning	The TargetInstance specified for the restore is running. (JET_wrnTargetInstanceRunning)	0x00000242, %x42.02.00.00
IsamWarningDatabaseRepaired	The database corruption has been repaired. (JET_wrnDatabaseRepaired)	0x00000253, %x53.02.00.00
IsamWarningColumnNull	The column has a null value. (JET_wrnColumnNull)	0x000003EC, %xEC.03.00.00
IsamWarningBufferTruncated	The buffer is too small for the data. (JET_wrnBufferTruncated)	0x000003EE, %xEE.03.00.00
IsamWarningDatabaseAttached	The database is already attached. (JET_wrnDatabaseAttached)	0x000003EF, %xEF.03.00.00
IsamWarningSortOverflow	The sort that is being attempted does not have enough memory to complete. (JET_wrnSortOverflow)	0x000003F1, %xF1.03.00.00
IsamWarningSeekNotEqual	An exact match was not found during a seek. (JET_wrnSeekNotEqual,	0x0000040F, %x0F.04.00.00

Warning code name	Description (alternate names)	Numeric value (hex)
	JET_wrnRecordFoundGreater, JET_wrnRecordFoundLess)	
IsamWarningNoErrorInfo	There is no extended error information. (JET_wrnNoErrorInfo)	0x0000041F, %x1F.04.00.00
IsamWarningNoIdleActivity	No idle activity occurred. (JET_wrnNoIdleActivity)	0x00000422, %x22.04.00.00
IsamWarningNoWriteLock	There is a no write lock at transaction level 0. (JET_wrnNoWriteLock)	0x0000042B, %x2B.04.00.00
IsamWarningColumnSetNull	The column is set to a null value. (JET_wrnColumnSetNull)	0x0000042C, %x2C.04.00.00
IsamWarningTableEmpty	An empty table was opened. (JET_wrnTableEmpty)	0x00000515, %x15.05.00.00
IsamWarningTableInUseBySystem	The system cleanup has a cursor open on the table. (JET_wrnTableInUseBySystem)	0x0000052F, %x2F.05.00.00
IsamWarningCorruptIndexDeleted	The out-of-date index is required to be removed. (JET_wrnCorruptIndexDeleted)	0x00000587, %x87.05.00.00
IsamWarningColumnMaxTruncated	The maximum length is too large and has been truncated. (JET_wrnColumnMaxTruncated)	0x000005E8, %xE8.05.00.00
IsamWarningCopyLongValue	A <b>binary large object (BLOB)</b> value has been moved from the record into a separate storage of BLOBs. (JET_wrnCopyLongValue)	0x000005F0, %xF0.05.00.00
IsamWarningColumnSkipped	The column values were not returned because the corresponding column ID or <b>itagSequence</b> member from the <b>JET_ENUMCOLUMNVALUE</b> structure that was requested for enumeration was null. (JET_wrnColumnSkipped)	0x000005FB, %xFB.05.00.00
IsamWarningColumnNotLocal	The column values were not returned because they could not be reconstructed from the existing data. (JET_wrnColumnNotLocal)	0x000005FC, %xFC.05.00.00
IsamWarningColumnMoreTags	The existing column values were not requested for enumeration. (JET_wrnColumnMoreTags)	0x000005FD, %xFD.05.00.00
IsamWarningColumnTruncated	The column value was truncated at the requested size limit during enumeration. (JET_wrnColumnTruncated)	0x000005FE, %xFE.05.00.00

Warning code name	Description (alternate names)	Numeric value (hex)
IsamWarningColumnPresent	The column values exist but were not returned by the request. (JET_wrnColumnPresent)	0x000005FF, %xFF.05.00.00
IsamWarningColumnSingleValue	The column value was returned in JET_COLUMNENUM as a result of the JET_bitEnumerateCompressOutput being set. (JET_wrnColumnSingleValue)	0x00000600, %x00.06.00.00
IsamWarningColumnDefault	The column value is set to the default value of the column. (JET_wrnColumnDefault)	0x00000601, %x01.06.00.00
IsamWarningDataHasChanged	The data has changed. (JET_wrnDataHasChanged)	0x0000064A, %x4A.06.00.00
IsamWarningKeyChanged	A new key is being used. (JET_wrnKeyChanged)	0x00000652, %x52.06.00.00
IsamWarningFileOpenReadOnly	The database file is read-only. (JET_wrnFileOpenReadOnly)	0x00000715, %x15.07.00.00
IsamWarningIdleFull	The idle registry is full. (JET_wrnIdleFull)	0x00000774, %x74.07.00.00
IsamWarningDefragAlreadyRunning	An online defragmentation was already running on the specified database. (JET_wrnDefragAlreadyRunning)	0x000007D0, %xD0.07.00.00
IsamWarningDefragNotRunning	An online defragmentation is not running on the specified database. (JET_wrnDefragNotRunning)	0x000007D1, %xD1.07.00.00
IsamWarningCallbackNotRegistered	A nonexistent callback function was unregistered. (JET_wrnCallbackNotRegistered)	0x00000834, %x34.08.00.00
IsamWarningNotYetImplemented	The function is not yet implemented. (JET_wrnNyi)	0xFFFFFFFF, %xFF.FF.FF.FF
UnbindSuccess	Warning code returned by the NSPI server to indicate that the unbind call was successful.	0x00000001, %x01.00.00.00
UnbindFailure	Warning code returned by the NSPI server to indicate that the NSPI bind call failed.	0x00000002, %x02.00.00.00

## 2.5 Flat UID Structures

The **FlatUID** structure, as specified in section [2.5.1](#), is a byte-order independent version of a **GUID** structure and is used to uniquely identify a service provider. It appears in EntryIDs.

The **FlatUID\_r** structure is an encoding of the **FlatUID** structure. The semantic meaning is unchanged from the **FlatUID** data structure.

### 2.5.1 FlatUID Structure

A **FlatUID** structure is a **GUID** structure put into little-endian byte order. That is, **FlatUID** and **GUID** structures have the same byte order when used on a little-endian processor. However, on a **big-endian** processor, the **FlatUID** structure has the same byte order as on the little-endian machine, but the **GUID** structure uses big-endian format for all multi-byte fields.

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
FlatUID																															
...																															
...																															
...																															

**FlatUID (16 bytes):** A flat little-endian sequence used as a unique identifier in various structures.

### 2.5.2 FlatUID\_r Structure

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
FlatUID																															
...																															
...																															
...																															

**FlatUID (16 bytes):** A flat little-endian sequence used as a unique identifier in various structures.

## 2.6 Property Name Structures

The **PropertyName** structure, as specified in section [2.6.1](#), describes a named property. It is used in **RopGetPropertyIdsFromNames** ([\[MS-OXCROPS\]](#) section 2.2.8.1) and **RopGetNamesFromPropertyIds** ([\[MS-OXCROPS\]](#) section 2.2.8.2) ROP requests.

The **PropertyName\_r** structure, specified in [\[MS-NSPI\]](#), is an encoding of the **PropertyName** data structure. Strictly speaking, both the **PropertyName\_r** structure and the **PropertyName** structure are distinct encodings of the same abstract data structure rather than **PropertyName\_r** being an encoding of **PropertyName**. In this case, the semantics of the **PropertyName\_r** structure is different from the **PropertyName** structure; **PropertyName\_r** uses no string names, only **long IDs (LIDs)**. The packet diagrams in sections [2.6.1](#) and [2.6.2](#) illustrate the differences between the two structures.

### 2.6.1 PropertyName Structure

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
Kind										GUID																					
...																															
...																															
...																															
...										LID (optional)																					
...										NameSize (optional)											Name (optional) (variable)										
...																															

**Kind (1 byte):** The possible values for the **Kind** field are in the following table.

Value	Meaning
0x00	The property is identified by the <b>LID</b> field.
0x01	The property is identified by the <b>Name</b> field.
0xFF	The property does not have an associated <b>PropertyName</b> field.

**GUID (16 bytes):** The GUID that identifies the **property set** for the named property.

**Note** The **GUID** field is treated as a **FlatUID** structure, as specified in section [2.5.1](#), and consequently, all multi-byte fields are in little-endian byte order. Client code on big-endian systems therefore places all multi-byte **GUID** fields in little-endian byte order in the request buffer.

**LID (optional) (4 bytes):** This field is present only if the value of the **Kind** field is equal to 0x00. An unsigned integer that identifies the named property within its property set.

**NameSize (optional) (1 byte):** The value of this field is equal to the number of bytes in the **Name** string that follows it. This field is present only if the value of the **Kind** field is equal to 0x01.

**Name (optional) (variable):** This field is present only if Kind is equal to 0x01. The value is a Unicode (UTF-16 format) string, followed by two zero bytes as terminating null characters, that identifies the property within its property set.

### 2.6.2 PropertyName\_r Structure

The **PropertyName\_r** structure does not support string names for named properties. The **PropertyName\_r** structure only supports LIDs.

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
GUID																															
...																															
...																															
...																															
Reserved																															
LID																															

**GUID (16 bytes):** Encodes the GUID field of the **PropertyName** structure, as specified in section [2.6.1](#).

**Reserved (4 bytes):** All clients and servers MUST set this value to 0x00000000.

**LID (4 bytes):** This value encodes the **LID** field in the **PropertyName** structure, as specified in section [2.6.1](#). But unlike the **PropertyName** structure, in the **PropertyName\_r** structure the **LID** field alone is present; string names for named properties are not supported.

## 2.7 PropertyProblem Structure

A **PropertyProblem** structure describes an error relating to an operation involving a property.

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
Index																PropertyTag															
...																ErrorCode															
...																															

**Index (2 bytes):** An unsigned integer. This value specifies an index into an array of property tags.

**PropertyTag (4 bytes):** A **PropertyTag** structure, as specified in section [2.9](#). This value specifies the property for which there was an error.

**ErrorCode (4 bytes):** An unsigned integer. This value specifies the error that occurred when processing this property.

An array of **PropertyProblem** structures is returned from the following ROPs:

- **RopDeleteProperties** ([\[MS-OXCROPS\]](#) section 2.2.8.8)
- **RopDeletePropertiesNoReplicate** ([\[MS-OXCROPS\]](#) section 2.2.8.9)

- **RopSetProperties** ([\[MS-OXCROPS\]](#) section 2.2.8.6)
- **RopSetPropertiesNoReplicate** ([\[MS-OXCROPS\]](#) section 2.2.8.7)
- **RopCopyProperties** ([\[MS-OXCROPS\]](#) section 2.2.8.11)
- **RopCopyTo** ([\[MS-OXCROPS\]](#) section 2.2.8.12)

A **PropertyProblem** structure contains an error value that is a result of an operation attempting to modify or delete a property, as specified in section [2.4.2](#). That property is identified by its **PropertyTag** field and also by its index in the property array passed to the request.

## 2.8 Property Row Structures

### 2.8.1 PropertyRow Structures

A **PropertyRow** structure is used to pass back a list of property values without including the property tag values that correspond to them. It is used to format property data returned to the client when the list of property tags is known in advance.

For instance, this data structure is used to format the ROP response buffers of the **RopGetPropertiesSpecific** ([\[MS-OXCROPS\]](#) section 2.2.8.3), **RopFindRow** ([\[MS-OXCROPS\]](#) section 2.2.5.13), and **RopGetReceiveFolderTable** ([\[MS-OXCROPS\]](#) section 2.2.3.4) ROPs. In addition, an array of **PropertyRow** structures makes up the key part of the **PropertyRowSet** structure, as specified in section [2.8.2](#), returned in the **RopQueryRows** ROP response buffer ([\[MS-OXCROPS\]](#) section 2.2.5.4).

Because the property tags are not returned, clients interpret the property values based on the context of the ROP request. For the **RopGetPropertiesSpecific** ROP, property values are returned in the order that the properties were requested. For the **RopFindRow**, **RopGetReceiveFolderTable**, and **RopQueryRows** ROPs, property values are returned in the order of the properties in the table, set by a prior call to a **RopSetColumns** ROP request ([\[MS-OXCROPS\]](#) section 2.2.5.1).

There are three **PropertyRow** structure variants. A **StandardPropertyRow** structure, as specified in section [2.8.1.1](#), contains no error values and no type data; it is a sequence of property values. A **FlaggedPropertyRow** structure contains type data, if the request included **PtypUnspecified**, as specified in section [2.11.1](#), for any property or column, and it contains error values if a property value is missing or there was a problem retrieving the value. By examining the first byte of the property row, the client can identify the variant. A **PropertyRow\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **StandardPropertyRow** data structure. The semantic meaning is unchanged from the **StandardPropertyRow** structure.

#### 2.8.1.1 StandardPropertyRow Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1					
Flag									ValueArray (variable)																											
...																																				

**Flag (1 byte):** An unsigned integer. This value MUST be set to 0x00 to indicate that all property values are present and without error.



**ValueArray (variable):** An array of variable-sized structures. At each position of the array, the structure will either be a **PropertyValue** structure, as specified in section [2.11.2.1](#), if the type of the corresponding property tag was specified, or a **TypedPropertyValue** structure, as specified in section [2.11.3](#), if the type of the corresponding property tag was **PtypUnspecified** (section [2.11.1](#)).

### 2.8.1.2 FlaggedPropertyRow Structure

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
Flag									ValueArray (variable)																						
...																															

**Flag (1 byte):** An unsigned integer. This value MUST be set to 0x01 to indicate that there are errors or some property values are missing. This value MUST also be set to 0x01 to indicate when **PtypUnspecified** (section [2.11.1](#)) was used in the ROP request and the **ROP response** includes a type. Otherwise, this value MUST be set to 0x00.

**ValueArray (variable):** An array of variable-sized structures. At each position of the array, the structure will be either a **FlaggedPropertyValue** structure, as specified in section [2.11.5](#), if the type of the corresponding property tag was previously specified or a **FlaggedPropertyValueWithType** structure, as specified in section [2.11.6](#), if the type of the corresponding property tag was **PtypUnspecified**.

### 2.8.1.3 PropertyRow\_r Structure

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
Reserved																															
ValueCount																															
ValueArray (variable)																															
...																															

**Reserved (4 bytes):** Servers MUST set this value to 0x00000000.

**ValueCount (4 bytes):** The number of property values represented in the **ValueArray** field. This value MUST NOT exceed 100,000.

**ValueArray (variable):** Encodes the **ValueArray** field of a **StandardPropertyRow** structure, as specified in section [2.8.1.1](#).

## 2.8.2 PropertyRowSet Structures

A **PropertyRowSet** structure, as specified in section [2.8.2.1](#), is a counted series of **PropertyRow** structures. As for **PropertyRow** structures, the number of columns in each **PropertyRow** structure is not included in the **PropertyRowSet** structure.

In table operations, such as in the response to a **RopQueryRows** ROP request ([\[MS-OXCROPS\]](#) section 2.2.5.4), column values larger than 255 bytes (for binary types) or 255 characters (for string types) can be truncated by the server for performance reasons. Clients analyzing data returned from table operations can assume that if the length of such a value is exactly 255 bytes or characters, then the value of the same property obtained by opening the message and issuing a **RopGetPropertiesSpecific** ROP request ([\[MS-OXCROPS\]](#) section 2.2.8.3) is likely to be larger.

The **PropertyRowSet\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **PropertyRowSet** data structure. The permissible number of **PropertyRow** structures in the **PropertyRowSet\_r** data structure exceeds that of the **PropertyRowSet** data structure. For more details, see section [2.8.2.2](#). The semantic meaning is otherwise unchanged from the **PropertyRowSet** data structure.

### 2.8.2.1 PropertyRowSet Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
RowCount																Rows (variable)															
...																															

**RowCount (2 bytes):** An unsigned integer specifying the number of **PropertyRow** structures in the **Rows** field.

**Rows (variable):** A series of **PropertyRow** structures.

### 2.8.2.2 PropertyRowSet\_r Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
RowCount																Rows (variable)															
...																															

**RowCount (2 bytes):** This value encodes the **RowCount** field of the **PropertyRowSet** structure, as specified in section [2.8.2.1](#).

**Rows (variable):** This value encodes the rows field of the **PropertyRowSet** structure.

## 2.8.3 RecipientRow Structure

A **RecipientRow** structure represents a single recipient (1) belonging to a Message object. It is rather complex but can be considered as a sequence of three different parts:

- A flags field indicating which of several standard properties are present
- Standard property values
- Arbitrary property values outside the standard set

This structure is used by several ROPs, including:

- **RopReadRecipients** ([\[MS-OXCROPS\]](#) section 2.2.6.6)
- **RopOpenMessage** ([\[MS-OXCROPS\]](#) section 2.2.6.1)
- **RopOpenEmbeddedMessage** ([\[MS-OXCROPS\]](#) section 2.2.6.16)

First, specify the **RecipientFlags** field.

### 2.8.3.1 RecipientFlags Field

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
R	S	T	D	E	Type			O	Reserved				I	U	N																

**R (1 bit):** (mask 0x0080). If this flag is b'1', a different transport is responsible for delivery to this recipient (1).

**S (1 bit):** (mask 0x0040). If this flag is b'1', the value of the **TransmittableDisplayName** field is the same as the value of the **DisplayName** field.

**T (1 bit):** (mask 0x0020). If this flag is b'1', the **TransmittableDisplayName** (section [2.8.3.2](#)) field is included.

**D (1 bit):** (mask 0x0010). If this flag is b'1', the **DisplayName** (section [2.8.3.2](#)) field is included.

**E (1 bit):** (mask 0x0008). If this flag is b'1', the **EmailAddress** (section [2.8.3.2](#)) field is included.

**Type (3 bits):** (mask 0x0007). This enumeration specifies the type of address. The valid types are:

- NoType (0x0)
- X500DN (0x1)
- MsMail (0x2)
- SMTP (0x3)
- Fax (0x4)
- ProfessionalOfficeSystem (0x5)
- PersonalDistributionList1 (0x6)
- PersonalDistributionList2 (0x7)

**O (1 bit):** (mask 0x8000). If this flag is b'1', this recipient (1) has a non-standard address type and the **AddressType** field is included.

**Reserved (4 bits):** (mask 0x7800) The server MUST set this to b'0000'.

**I (1 bit):** (mask 0x0400). If this flag is b'1', the **SimpleDisplayName** field is included.

**U (1 bit):** (mask 0x0200). If this flag is b'1', the associated string properties are in Unicode with a 2-byte terminating null character; if this flag is b'0', string properties are MBCS with a single terminating null character, in the **code page** sent to the server in the **EcDoConnectEx** method, as specified in [\[MS-OXCRPC\]](#) section 3.1.4.1, or the **Connect** request type [≤6>](#), as specified in [\[MS-OXCMAPIHTTP\]](#) section 2.2.4.1.

**N (1 bit):** (mask 0x0100). If b'1', this flag specifies that the recipient (1) does not support receiving rich text messages.

### 2.8.3.2 RecipientRow Structure

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
RecipientFlags																AddressPrefixUsed (optional)								DisplayType (optional)							
X500DN (optional) (variable)																															
...																															
EntryIdSize (optional)																EntryID (optional) (variable)															
...																															
SearchKeySize (optional)																SearchKey (optional) (variable)															
...																															
AddressType (optional) (variable)																															
...																															
EmailAddress (optional) (variable)																															
...																															
DisplayName (optional) (variable)																															
...																															
SimpleDisplayName (optional) (variable)																															

...	
TransmittableDisplayName (optional) (variable)	
...	
RecipientColumnCount	RecipientProperties (variable)
...	

**RecipientFlags (2 bytes):** A **RecipientFlags** structure, as specified in section [2.8.3.1](#). This value specifies the type of recipient (1) and which standard properties are included.

**AddressPrefixUsed (optional) (1 byte):** Unsigned integer. This field MUST be present when the **Type** field of the **RecipientFlags** field is set to **X500DN** (0x1) and MUST NOT be present otherwise. This value specifies the amount of the Address Prefix to be prepended to this X500 DN. The Address Prefix is used only in the context of a bulk data transfer buffer, and is specified there by the **MetaTagDnPrefix meta-property**. For details about the **MetaTagDnPrefix** meta-property, see [\[MS-OXCFXICS\]](#) section 2.2.4.1.5.6.

**DisplayType (optional) (1 byte):** An enumeration. This field MUST be present when the **Type** field of the **RecipientFlags** field is set to X500DN (0x1) and MUST NOT be present otherwise. This value specifies the display type of this address. Valid values for this field are specified in the following table.

Value	Meaning
0x00	A messaging user
0x01	A distribution list
0x02	A forum, such as a bulletin board service or a public or shared folder
0x03	An automated agent
0x04	An Address Book object defined for a large group, such as helpdesk, accounting, coordinator, or department
0x05	A private, personally administered distribution list
0x06	An Address Book object known to be from a foreign or remote messaging system

**X500DN (optional) (variable):** A null-terminated **ASCII** string. This field MUST be present when the **Type** field of the **RecipientFlags** field is set to **X500DN** (0x1) and MUST NOT be present otherwise. This value specifies the X500 DN of this recipient (1).

**EntryIdSize (optional) (2 bytes):** An unsigned integer. This field MUST be present when the **Type** field of the **RecipientFlags** field is set to **PersonalDistributionList1** (0x6) or **PersonalDistributionList2** (0x7). This field MUST NOT be present otherwise. This value specifies the size of the **EntryID** field.

**EntryID (optional) (variable):** An array of bytes. This field MUST be present when the **Type** field of the **RecipientFlags** field is set to **PersonalDistributionList1** (0x6) or **PersonalDistributionList2** (0x7). This field MUST NOT be present otherwise. The number of

bytes in this field MUST be the same as specified in the **EntryIdSize** field. This array specifies the **address book EntryID** structure, as specified in section [2.2.5.2](#), of the distribution list.

**SearchKeySize (optional) (2 bytes):** An unsigned integer. This field MUST be present when the **Type** field of the **RecipientFlags** field is set to **PersonalDistributionList1** (0x6) or **PersonalDistributionList2** (0x7). This field MUST NOT be present otherwise. This value specifies the size of the **SearchKey** field.

**SearchKey (optional) (variable):** An array of bytes. This field is used when the **Type** field of the **RecipientFlags** field is set to **PersonalDistributionList1** (0x6) or **PersonalDistributionList2** (0x7). This field MUST NOT be present otherwise. The number of bytes in this field MUST be the same as what is specified in the **SearchKeySize** field and can be 0. This array specifies the **search key** of the distribution list.

**AddressType (optional) (variable):** A null-terminated ASCII string. This field MUST be present when the **Type** field of the **RecipientsFlags** field is set to **NoType** (0x0) and the **O** flag of the **RecipientsFlags** field is set. This field MUST NOT be present otherwise. This string specifies the address type of the recipient (1).

**EmailAddress (optional) (variable):** A null-terminated string. This field MUST be present when the **E** flag of the **RecipientsFlags** field is set and MUST NOT be present otherwise. This field MUST be specified in Unicode characters if the **U** flag of the **RecipientsFlags** field is set and in the 8-bit **character set** (1) otherwise. This string specifies the email address of the recipient (1).

**DisplayName (optional) (variable):** A null-terminated string. This field MUST be present when the **D** flag of the **RecipientsFlags** field is set and MUST NOT be present otherwise. This field MUST be specified in Unicode characters if the **U** flag of the **RecipientsFlags** field is set and in the 8-bit character set (1) otherwise. This string specifies the email address of the recipient (1).

**SimpleDisplayName (optional) (variable):** A null-terminated string. This field MUST be present when the **I** flag of the **RecipientsFlags** field is set and MUST NOT be present otherwise. This field MUST be specified in Unicode characters if the **U** flag of the **RecipientsFlags** field is set and in the 8-bit character set (1) otherwise. This string specifies the email address of the recipient (1).

**TransmittableDisplayName (optional) (variable):** A null-terminated string. This field MUST be present when the **T** flag of the **RecipientsFlags** field is set and MUST NOT be present otherwise. This field MUST be specified in Unicode characters if the **U** flag of the **RecipientsFlags** field is set and in the 8-bit character set (1) otherwise. This string specifies the email address of the recipient (1).

**RecipientColumnCount (2 bytes):** An unsigned integer. This value specifies the number of columns from the **RecipientColumns** field that are included in the **RecipientProperties** field.

**RecipientProperties (variable):** **PropertyRow** structures, as specified in section [2.8.1](#). The columns used for this row are those specified in **RecipientProperties**.

## 2.9 PropertyTag Structure

A property tag both identifies a property and gives the data type its value.

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

**PropertyType (2 bytes):** An unsigned integer that identifies the data type of the property value, as specified by the table in section [2.11.1](#).

**PropertyId (2 bytes):** An unsigned integer that identifies the property.

## 2.10 Property Tag Array Structures

A **PropertyTagArray** structure, as specified in section [2.10.1](#), is a counted set of property tags, as specified in section [2.10.1](#).

The **PropertyTagArray\_r** structure is an encoding of the **PropTagArray** data structure. The permissible number of property tag values in the **PropertyTagArray\_r** structure exceeds that of the **PropertyTagArray** data structure. The semantic meaning is otherwise unchanged from the **PropTagArray** data structure.

### 2.10.1 PropertyTagArray Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Count																PropertyTags (variable)															
...																															

**Count (2 bytes):** An unsigned integer, specifying the number of property tags to follow.

**PropertyTags (variable):** Unsigned integers representing property tags, the number of which is specified by the **Count** field.

### 2.10.2 PropertyTagArray\_r Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Count																PropertyTags (variable)															
...																															

**Count (2 bytes):** Encodes the **Count** field in the **PropTagArray** structure, as specified in section [2.10.1](#).

**PropertyTags (variable):** Encodes the **PropertyTags** field of the **PropTagArray** structure.

## 2.11 Property Values

A variety of structures are used for conveying the value of a property to and from the server. Some variants contain only the value, because the usage context dictates the type. Other variants include the type, or the full property tag. Still others include an indication of whether an error occurred.

### 2.11.1 Property Data Types

For all variants, the structure of a property value is the same and is specified by the property data type, whether or not the property data type is actually encoded in the buffer. The following table lists both the property data type identifiers and the format of the property values. **Web Distributed Authoring and Versioning Protocol (WebDAV)** property data type identifiers are specified in section [2.11.1.6](#).

There is one variation in the width of count fields. In the context of ROP buffers, such as the **RopGetPropertiesSpecific** ROP ([\[MS-OXCROPS\]](#) section 2.2.8.3), byte counts for **PtypBinary** property values and value counts for all **PtypMultiple** property values are 16 bits wide. But in the context of **extended rules**, as specified in [\[MS-OXORULE\]](#) section 2.2.4, byte counts and property value counts are 32 bits wide, and in the [\[MS-OXCMAPIHTTP\]](#) protocol, the byte counts for **PtypBinary** property values are also 32 bits wide. Such count fields have a width designation of **COUNT**, as specified in section [2.11.1.1](#), rather than an explicit width, as throughout section [2.11](#).

In the context of a table operation, properties are referred to as columns. The format of property identifiers, types, and values in table operations such as the **RopQueryRows** ROP ([\[MS-OXCROPS\]](#) section 2.2.5.4) is the same as in property operations such as the **RopGetPropertiesSpecific** ROP. Property data types are presented in the following table. The property data type values specified are 16-bit integers. The Name Service Provider Interface (NSPI) Protocol, as specified in [\[MS-NSPI\]](#), uses the same numeric values but expresses them as 32-bit integers, with the high-order 16 bits of the 32-bit representation set to 0x0000.

Property type name	Property type value	Property type specification	Alternate names
<b>PtypInteger16</b>	0x0002, %x02.00	2 bytes; a 16-bit integer <a href="#">[MS-DTYP]</a> : <b>INT16</b>	PT_SHORT, PT_I2, i2, ui2
<b>PtypInteger32</b>	0x0003, %x03.00	4 bytes; a 32-bit integer <a href="#">[MS-DTYP]</a> : <b>INT32</b>	PT_LONG, PT_I4, int, ui4
<b>PtypFloating32</b>	0x0004, %x04.00	4 bytes; a 32-bit floating point number <a href="#">[MS-DTYP]</a> : <b>FLOAT</b>	PT_FLOAT, PT_R4, float, r4
<b>PtypFloating64</b>	0x0005, %x05.00	8 bytes; a 64-bit floating point number <a href="#">[MS-DTYP]</a> : <b>DOUBLE</b>	PT_DOUBLE, PT_R8, r8
<b>PtypCurrency</b>	0x0006, %x06.00	8 bytes; a 64-bit signed, scaled integer representation of a decimal currency value, with four places to the right of the decimal point <a href="#">[MS-DTYP]</a> : <b>LONGLONG</b> <a href="#">[MS-OAUT]</a> : <b>CURRENCY</b>	PT_CURRENCY, fixed.14.4
<b>PtypFloatingTime</b>	0x0007,	8 bytes; a 64-bit floating point	PT_APPTIME



Property type name	Property type value	Property type specification	Alternate names
	%x07.00	number in which the whole number part represents the number of days since December 30, 1899, and the fractional part represents the fraction of a day since midnight [MS-DTYP]: <b>DOUBLE</b> [MS-OAUT]: <b>DATE</b>	
<b>PtypErrorCode</b>	0x000A, %x0A.00	4 bytes; a 32-bit integer encoding error information as specified in section <a href="#">2.4.1</a> .	PT_ERROR
<b>PtypBoolean</b>	0x000B, %x0B.00	1 byte; restricted to 1 or 0 [MS-DTYP]: <b>BOOLEAN</b>	PT_BOOLEAN, bool
<b>PtypInteger64</b>	0x0014, %x14.00	8 bytes; a 64-bit integer [MS-DTYP]: <b>LONGLONG</b>	PT_LONGLONG, PT_I8, i8, ui8
<b>PtypString</b>	0x001F, %x1F.00	Variable size; a string of Unicode characters in <b>UTF-16LE</b> format encoding with terminating null character (0x0000).	PT_UNICODE, string
<b>PtypString8</b>	0x001E, %z1E.00	Variable size; a string of multibyte characters in externally specified encoding with terminating null character (single 0 byte).	PT_STRING8
<b>PtypTime</b>	0x0040, %x40.00	8 bytes; a 64-bit integer representing the number of 100-nanosecond intervals since January 1, 1601 [MS-DTYP]: <b>FILETIME</b>	PT_SYSTIME, time, datetime, datetime.tz, datetime.rfc1123, Date, time, time.tz
<b>PtypGuid</b>	0x0048, %x48.00	16 bytes; a GUID with <b>Data1</b> , <b>Data2</b> , and <b>Data3</b> fields in little-endian format [MS-DTYP]: GUID	PT_CLSID, UUID
<b>PtypServerId</b>	0x00FB, %xFB.00	Variable size; a 16-bit <b>COUNT</b> field followed by a structure as specified in section <a href="#">2.11.1.4</a> .	PT_SVREID
<b>PtypRestriction</b>	0x00FD, %xFD.00	Variable size; a byte array representing one or more Restriction structures as specified in section <a href="#">2.12</a> .	PT_SRESTRICT
<b>PtypRuleAction</b>	0x00FE, %xFE.00	Variable size; a 16-bit <b>COUNT</b> field followed by that many rule (4) action (3) structures, as specified in <a href="#">[MS-OXORULE]</a> section 2.2.5.	PT_ACTIONS
<b>PtypBinary</b>	0x0102, %x02.01	Variable size; a <b>COUNT</b> field followed by that many bytes.	PT_BINARY

Property type name	Property type value	Property type specification	Alternate names
<b>PtypMultipleInteger16</b>	0x1002, %x02.10	Variable size; a <b>COUNT</b> field followed by that many <b>PtypInteger16</b> values.	PT_MV_SHORT, PT_MV_I2, mv.i2
<b>PtypMultipleInteger32</b>	0x1003, %x03.10	Variable size; a <b>COUNT</b> field followed by that many <b>PtypInteger32</b> values.	PT_MV_LONG, PT_MV_I4, mv.i4
<b>PtypMultipleFloating32</b>	0x1004, %x04.10	Variable size; a <b>COUNT</b> field followed by that many <b>PtypFloating32</b> values.	PT_MV_FLOAT, PT_MV_R4, mv.float
<b>PtypMultipleFloating64</b>	0x1005, %x05.10	Variable size; a <b>COUNT</b> field followed by that many <b>PtypFloating64</b> values.	PT_MV_DOUBLE, PT_MV_R8
<b>PtypMultipleCurrency</b>	0x1006, %x06.10	Variable size; a <b>COUNT</b> field followed by that many <b>PtypCurrency</b> values.	PT_MV_CURRENCY, mv.fixed.14.4
<b>PtypMultipleFloatingTime</b>	0x1007, %x07.10	Variable size; a <b>COUNT</b> field followed by that many <b>PtypFloatingTime</b> values.	PT_MV_APPTIME
<b>PtypMultipleInteger64</b>	0x1014, %x14.10	Variable size; a <b>COUNT</b> field followed by that many <b>PtypInteger64</b> values.	PT_MV_I8, PT_MV_LONGLONG
<b>PtypMultipleString</b>	0x101F, %x1F.10	Variable size; a <b>COUNT</b> field followed by that many <b>PtypString</b> values.	PT_MV_UNICODE
<b>PtypMultipleString8</b>	0x101E, %x1E.10	Variable size; a <b>COUNT</b> field followed by that many <b>PtypString8</b> values.	PT_MV_STRING8, mv.string
<b>PtypMultipleTime</b>	0x1040, %x40.10	Variable size; a <b>COUNT</b> field followed by that many <b>PtypTime</b> values.	PT_MV_SYSTIME
<b>PtypMultipleGuid</b>	0x1048, %x48.10	Variable size; a <b>COUNT</b> field followed by that many <b>PtypGuid</b> values.	PT_MV_CLSID, mv.uuid
<b>PtypMultipleBinary</b>	0x1102, %x02.11	Variable size; a <b>COUNT</b> field followed by that many <b>PtypBinary</b> values.	PT_MV_BINARY, mv.bin.hex
<b>PtypUnspecified</b>	0x0000, %x00.00	Any: this property type value matches any type; a server MUST return the actual type in its response. Servers MUST NOT return this type in response to a client request other than <b>NspiGetIdsFromNames</b> or the <b>RopGetPropertyIdsFromNames</b> ROP request ( <a href="#">[MS-OXCROPS]</a> section 2.2.8.1).	PT_UNSPECIFIED
<b>PtypNull</b>	0x0001, %x01.00	None: This property is a placeholder.	PT_NULL
<b>PtypObject or PtypEmbeddedTable</b>	0x000D, %x0D.00	The property value is a <b>Component Object Model (COM)</b> object, as	PT_OBJECT

Property type name	Property type value	Property type specification	Alternate names
	%x0D.00	specified in section <a href="#">2.11.1.5</a> .	

### 2.11.1.1 COUNT Data Type Values

**COUNT** data type values are either 2 bytes or 4 bytes, depending on the context where this data type is referenced, though within a given buffer, they are always 2 bytes or always 4 bytes, never a mix of the two. **COUNT** values are typically used to specify the size of an associated field.

In the context of ROP buffers, byte counts for **PtypBinary** property values and value counts for all **PtypMultiple** property values, are 16 bits wide. But in the context of extended rules, as specified in [\[MS-OXORULE\]](#) section 2.2.4, byte counts and property value counts are 32 bits wide.

Such "count" fields have a width designation of **COUNT**, rather than an explicit width, throughout section [2.11.1](#).

### 2.11.1.2 String Property Values

Clients SHOULD use string properties in Unicode format. When using strings in Unicode format, string data MUST be encoded as UTF-16LE format, and property data types MUST be specified as 0x001F (**PtypString**) or 0x101F (**PtypMultipleString**).

Clients can use **PtypString8** and **PtypMultipleString8** properties in a specific 8-bit or MBCS code page. If they do, property data types MUST be specified as 0x001E (**PtypString8**) or 0x101E (**PtypMultipleString8**).

In requests sent to a message store server, the code page of strings MUST match the code page sent to the server in an **EcDoConnectEx** method call, as specified in [\[MS-OXCRPC\]](#) section 3.1.4.1, or sent to the server using the **Connect** request type<7>, as specified in [\[MS-OXCMAPIHTTP\]](#) section 2.2.4.1. Address book **server-side rules** for working with **PtypString8** properties are somewhat more involved and are specified in [\[MS-NSPI\]](#).

### 2.11.1.3 Multivalue Property Value Instances

When working with multivalue columns in the context of table operations, clients set the 0x2000 (**MultivalueInstance**, %x00.20) flag bit in the column's **PropertyType** field to indicate that the multivalue column is to be treated as individual values. The **MultivalueInstance** flag MUST NOT be set for any column that does not also set the 0x1000 (**Multivalue**) bit in its property type. All **PtypMultiple** types in the table in section [2.11.1](#) set the 0x1000 bit.

The **MultivalueInstance** flag specifies that table operations are to treat multivalue columns as if they were multiple instances of a single-value column (as specified in [\[MS-OXCTABL\]](#) section 2.2.2.2.1).

### 2.11.1.4 PtypServerId Type

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

...	
...	message ID
...	
...	Instance
...	

**Ours (1 byte):** The value 0x01 indicates the remaining bytes conform to this structure; the value 0x00 indicates this is a client-defined value and has whatever size and structure the client has defined.

**folder ID (8 bytes):** A **Folder ID** structure, as specified in section [2.2.1.1](#).

**message ID (8 bytes):** A **Message ID** structure, as specified in section [2.2.1.2](#), identifying a message in a folder identified by an associated folder ID. If the object pointed to is a folder, the value of this field **MUST** be all zeros.

**Instance (4 bytes):** An unsigned instance number within an array of **PtypServerId** values to compare against. This field is used only for searches against **multivalue properties** whose base type is **PtypServerId**, and **MUST** be zero in any other context.

#### 2.11.1.5 PtypObject and PtypEmbeddedTable Types

Message store and address book servers treat these property type somewhat differently, but in both cases these property types represents a complex structure. Access to these properties requires the server to construct an object, and the client to issue requests similar to those used for top-level objects.

- Message store servers do not allow access to properties of type **PtypObject** through the **RopGetPropertiesSpecific** ROP ([\[MS-OXCROPS\]](#) section 2.2.8.3) or the **RopGetPropertiesAll** ROP ([\[MS-OXCROPS\]](#) section 2.2.8.4). Instead, properties of this type **MUST** be accessed with the **RopOpenStream** ([\[MS-OXCROPS\]](#) section 2.2.9.1) or **RopOpenEmbeddedMessage** ([\[MS-OXCROPS\]](#) section 2.2.6.16) ROP requests.
- Address book servers use the **PtypEmbeddedTable** type to designate properties whose value is a table, for example, the members of a distribution list. The necessary methods are specified in [\[MS-NSPI\]](#).

#### 2.11.1.6 WebDAV Property Data Types

WebDAV property data types are specified for a property by using the **dt** attribute from the namespace "urn:uuid:c2f41010-65b3-11d1-a29f-00aa00c14882/".

The WebDAV property types are listed in the following table. Unless their formats are specified elsewhere, all property type formats are in **Augmented Backus-Naur Form (ABNF)** notation, as specified in [\[RFC5234\]](#).

Server property type name	WebDAV property type name	Description	Format
<b>PtypBinary</b>	i1	The Unicode value of the element is interpreted as an optionally signed 1-byte, 8-bit decimal integer.	As a <b>byte</b> , as specified in <a href="#">[XMLSCHEMA2/2]</a> <b>Example:</b> <element... d:dt="i1">3</element>
<b>PtypInteger16</b>	i2	The Unicode value of the element is interpreted as an optionally signed 2-byte, 16-bit decimal integer.	As a <b>short</b> , as specified in <a href="#">[XMLSCHEMA2/2]</a> <b>Example:</b> <element... d:dt="i2">-255</element>
<b>PtypInteger32</b>	int	The Unicode value of the element is interpreted as an optionally signed 4-byte, 32-bit decimal integer.	As an <b>int</b> , as specified in <a href="#">[XMLSCHEMA2/2]</a> <b>Example:</b> <element... d:dt="int">-53496</element>
<b>PtypInteger64</b>	i8	The Unicode value of the element is interpreted as an optionally signed 8-byte, 64-bit decimal integer.	As a <b>long</b> , as specified in <a href="#">[XMLSCHEMA2/2]</a> <b>Example:</b> <element... d:dt="i8">-32415</element>
<b>PtypBinary</b>	ui1	The Unicode value of the element is	As an <b>unsignedByte</b> , as specified in <a href="#">[XMLSCHEMA2/2]</a> <b>Example:</b> <element... d:dt="ui1">255</element>

Server property type name	WebDAV property type name	Description	Format
		interpreted as an unsigned 1-byte, 8-bit decimal integer.	
<b>PtypInteger16</b>	ui2	The Unicode value of the element is interpreted as an unsigned 2-byte, 16-bit decimal integer.	As an <b>unsignedShort</b> , as specified in <a href="#">[XMLSCHEMA2/2]</a> <b>Example:</b> <element... d:dt="ui2">2296</element>
<b>PtypInteger32</b>	ui4	The Unicode value of the element is interpreted as an unsigned 4-byte, 32-bit decimal integer.	As an <b>unsignedInt</b> , as specified in <a href="#">[XMLSCHEMA2/2]</a> <b>Example:</b> <element... d:dt="ui4">32768</element>
<b>PtypInteger64</b>	ui8	The Unicode value of the element is interpreted as an unsigned 8-byte, 64-bit decimal integer.	As an <b>unsignedLong</b> , as specified in <a href="#">[XMLSCHEMA2/2]</a> <b>Example:</b> <element... d:dt="ui8">-189</element>
<b>PtypFloating64</b>	float	The Unicode value of the element is interpreted as a single precision floating point number.	float-val = ([ "+" / "-" ] [ 1 * DIGIT ] [ "." 1 * DIGIT ] [ "d" / "D" / "e" / "E" ([ "+" / "-" ) 1 * DIGIT ] <b>Example:</b> <element... d:dt="float">9.9</element>
<b>PtypFloating32</b>	r4	The Unicode	r4-val = ([ "+" / "-" ] [ 1 * DIGIT ] [ "." 1 * DIGIT ] [ "d" / "D" / "e" / "E" ([ "+" / "-" ) 1 * DIGIT ]

Server property type name	WebDAV property type name	Description	Format
		value of the element is interpreted as a 4-byte single precision floating point number.	<b>Example:</b> <element... d:dt="r4">9.9</element>
<b>PtypFloating64</b>	r8	The Unicode value of the element is interpreted as an 8-byte double precision floating point number.	$r8\text{-val} = ([ "+" / "-" ] [ 1 * \text{DIGIT} ] [ "." 1 * \text{DIGIT} ] [ "d" / "D" / "e" / "E" ] [ "+" / "-" ] 1 * \text{DIGIT} ]$ <b>Example:</b> <element... d:dt="r8">.33333333</element>
<b>PtypBoolean</b>	boolean	The Unicode value of the element is interpreted as a Boolean value either "1" (TRUE) or "0" (FALSE).	As a <b>boolean</b> , as specified in <a href="#">[XMLSCHEMA2/2]</a> <b>Example:</b> <element... d:dt="boolean">1</element>
<b>PtypString</b>	string	The Unicode value of the element is interpreted as a sequence of Unicode characters.	As a <b>string</b> , as specified in <a href="#">[XMLSCHEMA2/2]</a> <b>Example:</b> <element... d:dt="string">Description</element>
<b>PtypString</b>	char	The Unicode value of the element is interpreted as a single	char-val = 1VCHAR <b>Example:</b> <element... d:dt="char">D</element>

Server property type name	WebDAV property type name	Description	Format
		Unicode character. The character data type maps to a string and can be used for any sequence of Unicode characters.	
<b>PtypCurrency</b>	fixed.14.4	The Unicode value of the element is interpreted as an optionally signed floating point number with no more than 14 digits to the left of the decimal point, and no more than 4 digits to the right of the decimal point. This data type is normally used to represent currency values.	fixed144-val = 0*14DIGIT "." 0*4 DIGIT <b>Example:</b> <element... d:dt="fixed.14.4">00000000000012.9500</element>
<b>PtypString</b>	number	The Unicode value of the element is interpreted as a number, limited by the operating system	As a <b>string</b> , as specified in <a href="#">[XMLSCHEMA2/2]</a> <b>Example:</b> <element... d:dt="number">-123.456E+10</element>



Server property type name	WebDAV property type name	Description	Format
		limits, which can optionally contain a leading sign, fractional digits, and an exponent.	
<b>PtypTime</b>	dateTime	The Unicode value of the element is interpreted as a date and time value expressed in the format specified in <a href="#">[ISO-8601]</a> with no time zone specified.	As specified in <a href="#">[ISO-8601]</a> <b>Example:</b> <element... d:dt="datetime">2008-09-19T18:53:47.060</element>
<b>PtypTime</b>	dateTime.tz	The Unicode value of the element is interpreted as a date and time value expressed in the format specified in <a href="#">[ISO-8601]</a> with an optional time zone identifier.	As specified in <a href="#">[ISO-8601]</a> <b>Example:</b> <element... d:dt="datetime.tz">2008-09-19T18:53:47.060Z</element> <element... d:dt="datetime.tz">2008-09-19T18:53:47.060-0700</element>
<b>PtypTime</b>	dateTime.rfc1123	The Unicode value of the element is interpreted as a date and time value	As specified in <a href="#">[RFC1123]</a> <b>Example:</b> <element... d:dt="datetime.rfc1123">Mon, 15 Feb 1999 13:05:29-0700</element>

Server property type name	WebDAV property type name	Description	Format
		expressed in the format specified in <a href="#">[RFC1123]</a> .	
<b>PtypTime</b>	Date	The Unicode value of the element is interpreted as a date value that is expressed in the format specified in <a href="#">[ISO-8601]</a> with no time or time zone specified.	As specified in <a href="#">[ISO-8601]</a> <b>Example:</b> <element... d:dt="date">2008-09-18</element>
<b>PtypTime</b>	time	The Unicode value of the element is interpreted as a time value expressed in the format specified in <a href="#">[ISO-8601]</a> with no date or time zone specified.	As specified in <a href="#">[ISO-8601]</a> <b>Example:</b> <element... d:dt="time">19T18:53:47.060</element>
<b>PtypTime</b>	time.tz	The Unicode value of the element is interpreted as a time value expressed in the format specified in <a href="#">[ISO-8601]</a> with an	As specified in <a href="#">[ISO-8601]</a> <b>Example:</b> <element... d:dt="time.tz">19T18:53:47.060Z</element> <element... d:dt="time.tz">19T18:53:47.060-0700</element>

Server property type name	WebDAV property type name	Description	Format
		optional time zone identifier.	
<b>PtypString</b>	uri	The Unicode value of the element is interpreted as a <b>Uniform Resource Identifier (URI)</b> as specified in <a href="#">[RFC3986]</a> .	As specified in <a href="#">[RFC3986]</a> <b>Example:</b> <element... d:dt="uri">http://www.example.com/</element>
<b>PtypGuid</b>	uuid	The Unicode value of the element is interpreted as a <b>universally unique identifier (UUID)</b> as specified in <a href="#">[RFC4122]</a> .	As specified in <a href="#">[RFC4122]</a> <b>Example:</b> <element... d:dt="uuid">55B329F4-EF8A-4fac-A47C-C81213DB3061</element>
<b>PtypBinary</b>	bin.hex	The Unicode value of the element is interpreted as a BLOB encoded in hexadecimal digits.	As specified in <a href="#">[XMLSCHEMA2/2]</a> <b>Example:</b> <element... d:dt="bin.hex">1f8b9d</element>
<b>PtypBinary</b>	bin.base64	The Unicode value of the element is interpreted as a BLOB encoded in <b>base64 encoding</b> as specified in <a href="#">[RFC2045]</a> .	As specified in <a href="#">[RFC2045]</a> <b>Example:</b> <element... d:dt="bin.base64">jfsUSdjsdsUSDASjsdsusaiq</element>

### 2.11.1.6.1 Multivalue WebDAV Property Data Types

WebDAV supports multivalue properties in which the value of the specified property is an array of items of a specific type. Multivalue properties are represented in the **XML** markup by using the **dt** attribute with the value "mv", followed by the data type of the contents of the array.

For example, an array of strings is represented by the following:

```
<author d:dt="mv.string"></author>
```

Within the property element, the contents of the array are specified by a number of subelements, each with the element name "v" from the "xml" namespace. For example:

```
<author xmlns:x="xml:" d:dt="mv.string">
```

```
<x:v>Aziz Hassouneh</x:v>
```

```
<x:v>Jeff Hay</x:v>
```

```
</author>
```

The multivalue property data types supported by WebDAV are listed in the following table.

Server property type name	WebDAV type name
<b>PtypMultipleInteger16</b>	mv.i2
<b>PtypMultipleInteger32</b>	mv.i4
<b>PtypMultipleFloating64</b>	mv.float
<b>PtypMultipleCurrency</b>	mv.fixed.14.4
<b>PtypMultipleString8</b>	mv.string
<b>PtypMultipleBinary</b>	mv.bin.hex
<b>PtypMultipleGuid</b>	mv.uuid

### 2.11.2 Property Value Structures

The **PropertyValue** structure, as specified in section [2.11.2.1](#), specifies the value of the property. It contains no information about the property type or id.

The **PropertyValue\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **PropertyValue** data structure. For property values with uninterpreted byte values, the permissible number of bytes in the **PropertyValue\_r** structure exceeds that of the **PropertyValue** data structure, as specified in [\[MS-NSPI\]](#). For property values with multiple values, the permissible number of values in the **PropertyValue\_r** structure exceeds that of the **PropertyValue** data structure. The semantic meaning is otherwise unchanged from the **PropertyValue** data structure.

### 2.11.2.1 PropertyValue Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
PropertyValue (variable)																															
...																															

**PropertyValue (variable):** The size of this field varies depending on the property type, which can be understood from the usage context. All numeric values are in little-endian format. For multivalue types, the first element in the ROP buffer is a 16-bit integer specifying the number of entries. If the property value being passed is a string, the data includes the terminating null characters.

### 2.11.2.2 PropertyValue\_r Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
PropertyTag																															
Reserved																															
PropertyValue (variable)																															
...																															

**PropertyTag (4 bytes):** This value encodes the property tag with the value represented by the **PropertyValue\_r** structure.

**Reserved (4 bytes):** All clients and servers MUST set this value to 0x00000000.

**PropertyValue (variable):** This value encodes the **PropertyValue** field of the **PropertyValue** structure, as specified in section [2.11.2.1](#). This is the actual value of the property represented by the **PropertyValue\_r** structure. The type value is specified by the **PropertyTag** field.

### 2.11.3 TypedPropertyValue Structure

The **TypedPropertyValue** structure includes the property type with the value of the property.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
PropertyType																PropertyValue (variable)															
...																															

**PropertyType (2 bytes):** An unsigned integer that specifies the data type of the property value, according to the table in section [2.11.1](#).

**PropertyValue (variable):** A **PropertyValue** structure, as specified in section [2.11.2](#). The value MUST be compatible with the value of the **PropertyType** field.

#### 2.11.4 TaggedPropertyValue Structure

As a rule, property tags are not specified explicitly in ROP buffers. To save space, property tags are specified implicitly by a previous operation and only the property values are put in the buffer. But under some circumstances a **TaggedPropertyValue** structure is used to explicitly include the property type and ID in the buffer.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
PropertyTag																															
PropertyValue (variable)																															
...																															

**PropertyTag (4 bytes):** A **PropertyTag** structure, as specified in section [2.9](#), giving the values of the **PropertyId** and **PropertyType** fields for the property.

**PropertyValue (variable):** A **PropertyValue** structure, as specified in section [2.11.2.1](#), specifying the value of the property. Its syntax is specified by the **PropertyType** field of the **PropertyTag** structure, and its semantics by the **PropertyId** field of the **PropertyTag** structure.

#### 2.11.5 FlaggedPropertyValue Structure

The **FlaggedPropertyValue** structure includes a flag to indicate whether the value was successfully retrieved or not. Error conditions include a missing property or a failure at the server.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Flag										PropertyValue (optional) (variable)																					
...																															

**Flag (1 byte):** An unsigned integer. This value of this flag determines what is conveyed in the **PropertyValue** field. The flag MUST be set to one of the values in the following table.

Flag value	Meaning
0x0	The <b>PropertyValue</b> field will be a <b>PropertyValue</b> structure containing a value compatible with the property type implied by the context.
0x1	The <b>PropertyValue</b> field is not present.
0xA	The <b>PropertyValue</b> field will be a <b>PropertyValue</b> structure containing an unsigned 32-bit integer. This value is a property error code, as specified in section <a href="#">2.4.2</a> , that

Flag value	Meaning
	indicates why the property value is not present.

**PropertyValue (optional) (variable):** A **PropertyValue** structure, as specified in section [2.11.2.1](#), unless the **Flag** field is set to 0x1.

### 2.11.6 FlaggedPropertyValueWithType Structure

The **FlaggedPropertyValueWithType** structure includes both the property type and a flag giving more information about the property value.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
PropertyType																Flag						PropertyValue (optional) (variable)									
...																															

**PropertyType (2 bytes):** An unsigned integer that specifies the data type of the property value, according to the table in section [2.11.1](#).

**Flag (1 byte):** An unsigned integer. This flag MUST be set one of three possible values: 0x0, 0x1, or 0xA, which determines what is conveyed in the **PropertyValue** field. For the interpretation of this flag, refer to the table in section [2.11.5](#).

**PropertyValue (optional) (variable):** A **PropertyValue** structure, as specified in section [2.11.2.1](#), unless the **Flag** field is set to 0x1. The value MUST be compatible with the value of the **PropertyType** field.

### 2.11.7 TypedString Structure

A **TypedString** structure is used in certain ROPs in order to compact the string representation on the wire as much as possible.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1						
StringType										String (optional)																											
...																																					

**StringType (1 byte):** An enumeration. The value MUST be one of the following.

Value	Meaning
0x00	No string is present.
0x01	The string is empty.

Value	Meaning
0x02	Null-terminated 8-bit character string. The terminating null character is one zero byte.
0x03	Null-terminated reduced Unicode character string. The terminating null character is one zero byte.
0x04	Null-terminated Unicode character string. The terminating null character is 2 zero bytes.

**String (optional) (4 bytes):** If the **StringType** field is set to 0x02, 0x03, or 0x04, then this field **MUST** be present and in the format specified by the **Type** field. Otherwise, this field **MUST NOT** be present.

To produce a reduced Unicode string from an original Unicode string, the server first scans the original Unicode string and determines that every character has a value less than 0x100; in other words, that the high-order byte of every character, including the terminating null character, is zero. It then produces a reduced Unicode string that is exactly half the size of the original Unicode string by omitting all the high-order zero bytes, including that of the terminating null character.

To reproduce the original Unicode string from a reduced Unicode string, the server inserts a zero byte after each byte of the reduced Unicode string, doubling its size.

## 2.12 Restrictions

Restrictions describe a filter for limiting the view of a table to a particular set of rows. This filter represents a Boolean expression that is evaluated against each item of the table. The item will be included as a row of the restricted table if and only if the value of the Boolean expression evaluates to **TRUE**.

Restrictions are sent to the server with the **RopFindRow** ([\[MS-OXCROPS\]](#) section 2.2.5.13), **RopRestrict** ([\[MS-OXCROPS\]](#) section 2.2.5.3), **RopSetSearchCriteria** ([\[MS-OXCROPS\]](#) section 2.2.4.4), and **RopSynchronizationConfigure** ([\[MS-OXCROPS\]](#) section 2.2.13.1) ROP requests, and they are returned from the **RopGetSearchCriteria** ROP request ([\[MS-OXCROPS\]](#) section 2.2.4.5).

There are 12 different **restriction** (2) packet formats: Six of them (**AndRestriction**, **OrRestriction**, **NotRestriction**, **SubObjectRestriction**, **CommentRestriction**, and **CountRestriction**) are used to construct more complicated restrictions (2) from one or more simpler ones. The other six types (**ContentRestriction**, **PropertyRestriction**, **ComparePropertiesRestriction**, **BitMaskRestriction**, **SizeRestriction**, and **ExistRestriction**) specify specific tests based on the properties of an item.

Although the packet formats differ, every packet stores **RestrictType**, an unsigned byte value specifying the type of restriction (2), in the first 8 bits. The possible values for **RestrictType** are presented in the following table.

RestrictType value	Hexadecimal value	Description	Alternate name
<b>AndRestriction</b> <b>AndRestriction_r</b>	0x00	Logical <b>AND</b> operation applied to a list of subrestrictions.	<b>RES_AND</b>
<b>OrRestriction</b> <b>OrRestriction_r</b>	0x01	Logical <b>OR</b> operation applied to a list of	<b>RES_OR</b>



RestrictType value	Hexadecimal value	Description	Alternate name
		subrestrictions.	
<b>NotRestriction</b> <b>NotRestriction_r</b>	0x02	Logical <b>NOT</b> operation applied to a subrestriction.	<b>RES_NOT</b>
<b>ContentRestriction</b> <b>ContentRestriction_r</b>	0x03	Search a property value for specific content.	<b>RES_CONTENT</b>
<b>PropertyRestriction</b> <b>PropertyRestriction_r</b>	0x04	Compare a property value with a particular value.	<b>RES_PROPERTY</b>
<b>ComparePropertiesRestriction</b> <b>ComparePropertiesRestriction_r</b>	0x05	Compare the values of two properties.	<b>RES_COMPAREPROPS</b>
<b>BitMaskRestriction</b> <b>BitMaskRestriction_r</b>	0x06	Perform a bitwise <b>AND</b> operation on a property value with a mask and compare that with 0 (zero).	<b>RES_BITMASK</b>
<b>SizeRestriction</b> <b>SizeRestriction_r</b>	0x07	Compare the size of a property value to a particular figure.	<b>RES_SIZE</b>
<b>ExistRestriction</b> <b>ExistRestriction_r</b>	0x08	Test whether a property has a value.	<b>RES_EXIST</b>
<b>SubObjectRestriction</b> <b>SubRestriction_r</b>	0x09	Test whether any row of a message's attachment or recipient table satisfies a subrestriction.	<b>RES_SUBRESTRICTION</b>
<b>CommentRestriction</b>	0x0A	Associates a comment with a subrestriction.	<b>RES_COMMENT</b>
<b>CountRestriction</b>	0x0B	Limits the number of matches returned from a subrestriction.	<b>RES_COUNT</b>

The subsections that follow describe each packet format.

There is one variation in the way restriction structures are serialized. In the context of ROP buffers, such as the **RopRestrict** ROP or the **RopSetSearchCriteria** ROP, all count fields (such as the number of subrestrictions of an **AndRestriction**) are 16 bits wide. However, in the context of extended rules, as specified in [\[MS-OXORULE\]](#) section 2.2.4, or **search folder definition messages**, as specified in [\[MS-OXOSRCH\]](#) section 2.2.1, these counts are 32 bits wide. Such fields are identified as **COUNT** fields throughout section [2.12](#).

### 2.12.1 And Restriction Structures

The **AndRestriction** structure, as specified in section [2.12.1.1](#) describes an AND restriction (2), which is used to join a group of restrictions (2) using a logical **AND** operation.

The **AndRestriction\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **AndRestriction** data structure. The permissible number of restriction structures in the **AndRestriction\_r** data structure exceeds that for the **AndRestriction** structure. The semantic meaning is otherwise unchanged from the **AndRestriction** data structure.

#### 2.12.1.1 AndRestriction Structure

The result of an **AndRestriction** is **TRUE** if all of its child restrictions (2) evaluate to **TRUE**, and it is **FALSE** if any child restriction (2) evaluates to **FALSE**.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1	
RestrictType										RestrictCount (variable)																						
...										Restricts (variable)																						
...																																

**RestrictType (1 byte):** An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x00.

**RestrictCount (variable):** This value specifies how many restriction structures are present in the **Restricts** field. The width of this field is 16 bits in the context of ROPs and 32 bits in the context of extended rules.

**Restricts (variable):** An array of restriction structures. This field MUST contain the number of structures indicated in the **RestrictCount** field.

#### 2.12.1.2 AndRestriction\_r Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1	
RestrictCount																																
Restricts (variable)																																
...																																

**RestrictCount (4 bytes):** Encodes the **RestrictCount** field of the **AndRestriction** structure, as specified in section [2.12.1.1](#). This value MUST NOT exceed 100,000.

**Restricts (variable):** Encodes the **Restricts** field of the **AndRestriction** structure. For more details, see section [2.12.1](#).

## 2.12.2 Or Restriction Structures

The **OrRestriction** structure, as specified in section [2.12.2.1](#), describes an OR restriction (2), which is used to join a group of restrictions (2) by using a logical **OR** operation.

The **OrRestriction\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **OrRestriction** data structure. The permissible number of restriction structures in the **OrRestriction\_r** data structure exceeds that of the **OrRestriction** structure. The semantic meaning is otherwise unchanged from the **OrRestriction** data structure.

### 2.12.2.1 OrRestriction Structure

The result of an **OrRestriction** is **TRUE** if at least one of its child restrictions (2) evaluates to **TRUE**, and it is **FALSE** if all child restrictions (2) evaluate to **FALSE**.

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1	
RestrictType										RestrictCount (variable)																						
...										Restricts (variable)																						
...																																

**RestrictType (1 byte):** An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x01.

**RestrictCount (variable):** This value specifies how many restriction structures are present in the **Restricts** field. The width of this field is 16 bits in the context of ROPs and 32 bits in the context of extended rules.

**Restricts (variable):** An array of restriction structures. This field MUST contain the number of structures indicated by the **RestrictCount** field.

### 2.12.2.2 OrRestriction\_r Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1	
RestrictCount																																
Restricts (variable)																																
...																																

**RestrictCount (4 bytes):** This value encodes the **RestrictCount** field of the **OrRestriction** structure, as specified in section [2.12.2.1](#). This value MUST NOT exceed 100,000.

**Restricts (variable):** This value encodes the **Restricts** field of the **OrRestriction** structure. For more details, see section [2.12.1](#).

### 2.12.3 Not Restriction Structures

The **NotRestriction** structure, as specified in section [2.12.3.1](#), describes a NOT restriction (2), which is used to apply a logical **NOT** operation to a single restriction (2).

The **NotRestriction\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **NotRestriction** data structure. The semantic meaning is unchanged from the **NotRestriction** data structure.

#### 2.12.3.1 NotRestriction Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1						
RestrictType										Restriction (variable)																											
...																																					

**RestrictType (1 byte):** An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x02.

**Restriction (variable):** A restriction structure. This value specifies the restriction (2) that the logical **NOT** operation applies to.

The result of a **NotRestriction** structure is **TRUE** if the child restriction (2) evaluates to **FALSE**, and it is **FALSE** if the child restriction (2) evaluates to **TRUE**.

#### 2.12.3.2 NotRestriction\_r Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Restriction (variable)																															
...																															

**Restriction (variable):** This value encodes the **Restriction** field of the **NotRestriction** structure, as specified in section [2.12.3.1](#).

### 2.12.4 Content Restriction Structures

The **ContentRestriction** structure, as specified in section [2.12.4.1](#), describes a content restriction, which is used to limit a table view to only those rows that include a column with contents matching a search string.

The **ContentRestriction\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **ContentRestriction** data structure. The semantic meaning is unchanged from the **ContentRestriction** data structure.

### 2.12.4.1 ContentRestriction Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1		
RestrictType									FuzzyLevelLow															FuzzyLevelHigh									
...									PropertyTag																								
...									TaggedValue (variable)																								
...																																	

**RestrictType (1 byte):** An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x03.

**FuzzyLevelLow (2 bytes):** An unsigned integer. This field specifies the level of precision that the server enforces when checking for a match against a **ContentRestriction** structure. The value of the **FuzzyLevelLow** field applies to both binary and string properties and MUST be set to one of the values in the following table.

FuzzyLevelLow value	Meaning
0x0000 FL_FULLSTRING	The value stored in the <b>TaggedValue</b> field and the value of the column property tag match one another in their entirety.
0x0001 FL_SUBSTRING	The value stored in the <b>TaggedValue</b> field matches some portion of the value of the column property tag.
0x0002 FL_PREFIX	The value stored in the <b>TaggedValue</b> field matches a starting portion of the value of the column property tag.

**FuzzyLevelHigh (2 bytes):** This field applies only to string-value properties and can be set to the bit values listed in the following table, in any combination. The values of the **FuzzyLevelHigh** field can be combined by using the bitwise **OR** operation.

FuzzyLevelHigh values	Meaning
0x0001 FL_IGNORECASE	The comparison does not consider case.
0x0002 FL_IGNORENONSPACE	The comparison ignores Unicode-defined nonspacing characters such as diacritical marks.
0x0004 FL_LOOSE	The comparison results in a match whenever possible, ignoring case and nonspacing characters.

**PropertyTag (4 bytes):** An unsigned integer. This value indicates the property tag of the column whose value MUST be matched against the value specified in the **TaggedValue** field.

**TaggedValue (variable):** A **TaggedPropertyValue** structure, as specified in section [2.11.4](#). This structure contains the value to be matched.

The property ID portion of the **PropertyTag** field in the **TaggedValue** field is ignored.

The result of a content restriction (2) imposed against a property is undefined when the property does not exist. When a client requires well-defined behavior for such a restriction (2) and is not sure whether the property exists, the client can create an **AndRestriction** to join the **ContentRestriction** with an **ExistRestriction**.

Multivalue properties (when the **MultivalueFlag** bit is set) are supported for this type of restriction (2), but the property types (obtained by masking off the **MultivalueFlag** bit) of both the **PropertyTag** field and the property tag subfield of the **TaggedValue** subfield MUST be the same in all cases.

The cases supported for multivalue properties are described in the following table.

PropertyTag value	TaggedValue value	Support	Details
Single-valued	Single-valued	All <b>RelOp</b> values are supported.	Simple comparison.
Single-valued	Multivalued	Not supported.	
Multivalued and the same as the <b>MultivalueInstance</b> column in the table	Single-valued	All <b>RelOp</b> values are supported.	Each value of the property tag is compared with the value in the <b>TaggedValue</b> field. One successful match means that the restriction (2) is satisfied.
Multivalued and the same as the <b>MultivalueInstance</b> column in the table	Multivalued	Not supported.	
Multivalued but not the same as the <b>MultivalueInstance</b> column in the table	Single-valued	All <b>RelOp</b> values are supported.	Each value of the property tag is compared with the value in the <b>TaggedValue</b> field. One successful match means that the restriction (2) is satisfied.
Multivalued but not the same as the <b>MultivalueInstance</b> column in the table	Multivalued	Not supported.	

#### 2.12.4.2 ContentRestriction\_r Structure

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

TaggedValue (variable)
...

**FuzzyLevelLow (2 bytes):** This value encodes the **FuzzyLevelLow** field of the **ContentRestriction** structure, as specified in section [2.12.4.1](#).

**FuzzyLevelHigh (2 bytes):** This value encodes the **FuzzyLevelHigh** field of the **ContentRestriction** structure.

**PropertyTag (4 bytes):** This value encodes the **PropertyTag** field of the **ContentRestriction** structure.

**TaggedValue (variable):** This value encodes the **TaggedValue** field of the **ContentRestriction** structure.

## 2.12.5 Property Restriction Structures

The **PropertyRestriction** structure, as specified in section [2.12.5.1](#), describes a property restriction that is used to match a constant with the value of a property.

The **PropertyRestriction\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **PropertyRestriction** data structure. The semantic meaning is unchanged from that of the **PropertyRestriction** data structure.

### 2.12.5.1 PropertyRestriction Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
RestrictType									RelOp							PropTag															
...																TaggedValue (variable)															
...																															

**RestrictType (1 byte):** An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x4.

**RelOp (1 byte):** An unsigned integer. This value indicates the relational operator that is used to compare the property on the object with the value of the **TaggedValue** field. The value MUST be one of the values listed in the following table.

Relational operator	Hexadecimal value	Evaluation	Alternate name
<b>RelationalOperatorLessThan</b>	0x00	<b>TRUE</b> if the value of the object's property is less than the specified	<b>RELOP_LT</b>

Relational operator	Hexadecimal value	Evaluation	Alternate name
		value.	
<b>RelationalOperatorLessThanOrEqual</b>	0x01	<b>TRUE</b> if the value of the object's property is less than or equal to the specified value.	<b>RELOP_LE</b>
<b>RelationalOperatorGreaterThan</b>	0x02	<b>TRUE</b> if the value of the object's property value is greater than the specified value.	<b>RELOP_GT</b>
<b>RelationalOperatorGreaterThanOrEqual</b>	0x03	<b>TRUE</b> if the value of the object's property value is greater than or equal to the specified value.	<b>RELOP_GE</b>
<b>RelationalOperatorEqual</b>	0x04	<b>TRUE</b> if the object's property value equals the specified value.	<b>RELOP_EQ</b>
<b>RelationalOperatorNotEqual</b>	0x05	<b>TRUE</b> if the object's property value does not equal the specified value.	<b>RELOP_NE</b>
<b>RelationalOperatorMemberOfDL</b>	0x64	<b>TRUE</b> if the value of the object's property is in the DL membership of the specified property value. The value of the object's property	<b>RELOP_MEMBER_OF_DL</b>



Relational operator	Hexadecimal value	Evaluation	Alternate name
		MUST be an EntryID of a mail-enabled object in the address book. The specified property value MUST be an EntryID of a <b>Distribution List object</b> in the address book.	

**PropTag (4 bytes):** An unsigned integer. This value indicates the property tag of the property that MUST be compared.

**TaggedValue (variable):** A **TaggedValue** structure, as specified in section [2.11.4](#). This structure describes the property value to be compared with. The **TaggedValue** field contains a property tag subfield that is distinct from the **PropTag** field of this structure. Only the property type portion of the **TaggedValue** structure's property tag subfield is used; the property ID is ignored.

Multivalue properties (when the **MultivalueFlag** bit is set) are supported for this type of restriction (2), but the property types (obtained by masking off the **MultivalueFlag** bit) of both the **PropTag** field and property tag subfield of the **TaggedValue** subfield MUST be the same in all cases.

The **MultivalueInstance** bit MUST NOT be set on either the **PropTag** field or the property tag subfield of the **TaggedValue**.

The cases that are supported for multivalue properties are listed and described in the following table.

PropTag value	TaggedValue value	Support	Details
Single-valued	Single-valued	All <b>RelOp</b> values are supported.	Simple comparison.
Single-valued	Multivalued	Not supported. <a href="#">&lt;8&gt;</a>	
Multivalued and the same as a property tag for a <b>MultivalueInstance</b> column in the table	Single-valued	All <b>RelOp</b> values are supported.	In this case, the client has previously called the <b>RopSetColumns</b> ROP ( <a href="#">[MS-OXCROPS]</a> section 2.2.5.1) with the <b>MultivalueInstance</b> bit set in the property tag that matches the value in the <b>PropTag</b> field. The value in the <b>TaggedValue</b> field is compared with the value in the

PropTag value	TaggedValue value	Support	Details
			column for each row. Only the row that has a matching value is returned.
Multivalued and the same as a property tag for a <b>MultivalueInstance</b> column in the table	Multivalued	Not supported.	
Multivalued and the same as a property tag for a non- <b>MultivalueInstance</b> column in the table	Single-valued	All <b>RelOp</b> values supported.	In this case, the client has previously called the <b>RopSetColumns</b> ROP without the <b>MultivalueInstance</b> bit set in the property tag that matches the value in the <b>PropTag</b> field. Each value of the property <b>PropTag</b> field is compared with the value of the <b>TaggedValue</b> field. For all <b>RelOp</b> values except <b>RelationalOperatorNotEqual</b> , one successful match means that the restriction (2) is satisfied. For <b>RelationalOperatorNotEqual</b> , the restriction (2) is satisfied when there are no matches.
Multivalued and the same as a property tag for a non- <b>MultivalueInstance</b> column in the table	Multi-valued	Not supported.	

In the context of a **RopFindRow** ([MS-OXCROPS] section 2.2.5.13) or **RopRestrict** ([MS-OXCROPS] section 2.2.5.3) ROP call, the results are undefined if the value of the property **PropTag** field does not exist on the object being tested. By creating an **AndRestriction** structure that joins the property restriction with an **ExistRestriction**, a caller can be guaranteed accurate results. Only **RelationalOperatorEqual** and **RelationalOperatorNotEqual** operators are allowed for the **RelOp** field when the type of the value of the **PropTag** field is **PtypBoolean**.

### 2.12.5.2 PropertyRestriction\_r Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1						
Relop										PropTag																											
...										TaggedValue (variable)																											
...																																					

**Relop (1 byte):** This value encodes the **Relop** field of the **PropertyRestriction** structure, as specified in section 2.12.5.1.

**PropTag (4 bytes):** This value encodes the **PropTag** field of the **PropertyRestriction** structure.

**TaggedValue (variable):** This value encodes the **TaggedValue** field of the **PropertyRestriction** structure.

## 2.12.6 Compare Properties Restriction Structures

The **ComparePropertiesRestriction** structure, as specified in section [2.12.6.1](#), specifies a comparison between the values of two properties by using a relational operator.

The **ComparePropsRestriction\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **ComparePropertiesRestriction** data structure. The semantic meaning is unchanged from that of the **ComparePropertiesRestriction** data structure.

### 2.12.6.1 ComparePropertiesRestriction Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1							
RestrictType									RelOp							PropTag1																						
...																PropTag2																						
...																																						

**RestrictType (1 byte):** An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x05.

**RelOp (1 byte):** An unsigned integer. This value indicates the relational operator used to compare the two properties. The value MUST be one the values listed in the following table.

Relational operator	Hexadecimal value	Evaluation	Alternate name
<b>RelationalOperatorLessThan</b>	0x00	<b>TRUE</b> if the object's property value is less than the specified value.	<b>RELOP_LT</b>
<b>RelationalOperatorLessThanOrEqual</b>	0x01	<b>TRUE</b> if the object's property value is less than or equal to the specified value.	<b>RELOP_LE</b>
<b>RelationalOperatorGreaterThan</b>	0x02	<b>TRUE</b> if the	<b>RELOP_GT</b>

Relational operator	Hexadecimal value	Evaluation	Alternate name
		object's property value is greater than the specified value.	
<b>RelationalOperatorGreaterThanOrEqualTo</b>	0x03	<b>TRUE</b> if the object's property value is greater than or equal to the specified value.	<b>RELOP_GE</b>
<b>RelationalOperatorEqual</b>	0x04	<b>TRUE</b> if the object's property value equals the specified value.	<b>RELOP_EQ</b>
<b>RelationalOperatorNotEqual</b>	0x05	<b>TRUE</b> if the object's property value does not equal the specified value.	<b>RELOP_NE</b>
<b>RelationalOperatorMemberOfDL</b>	0x64	<b>TRUE</b> if the object's property value is in the DL membership of the specified property value. The object's property value <b>MUST</b> be an EntryID of a mail-enabled object in the address book. Also, the specified	<b>RELOP_MEMBER_OF_DL</b>

Relational operator	Hexadecimal value	Evaluation	Alternate name
		property value MUST be an EntryID of a distribution list object in the address book.	

**PropTag1 (4 bytes):** An unsigned integer. This value is the property tag of the first property that MUST be compared.

**PropTag2 (4 bytes):** An unsigned integer. This value is the property tag of the second property that MUST be compared.

The comparison order is (property tag 1) (relational operator) (property tag 2).

The properties to be compared MUST both be of the same type.

The result of a compare property value restriction (2) is undefined when one or both of the properties do not exist. When a client requires well-defined behavior for such a restriction (2) and is not sure whether the property exists (for example, it is not a required column in a table), the client can create an **AndRestriction** to join the compare property restriction with an **Exist** restriction.

The properties specified by the **PropTag1** and **PropTag2** fields MUST be single-valued.

Only **Equal** and **NotEqual** operators are allowed fields when the types of the **PropTag1** and **PropTag2** fields are **PtypBoolean**.

#### 2.12.6.2 ComparePropsRestriction\_r Structure

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
Relop										PropTag1																					
...										PropTag2																					
...																															

**Relop (1 byte):** This value encodes the **Relop** field of the **ComparePropertiesRestriction** structure, as specified in section [2.12.6.1](#).

**PropTag1 (4 bytes):** This value encodes the **PropTag1** field of the **ComparePropertiesRestriction** structure.

**PropTag2 (4 bytes):** This value encodes the **PropTag2** field of the **ComparePropertiesRestriction** structure.

## 2.12.7 Bitmask Restriction Structures

The **BitMaskRestriction** structure, as specified in section [2.12.7.1](#), describes a bitmask restriction, which performs a bitwise **AND** operation and compares the result with 0 (zero).

The **BitMaskRestriction\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **BitMaskRestriction** data structure. The semantic meaning is unchanged from that of the **BitMaskRestriction** data structure.

### 2.12.7.1 BitMaskRestriction Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1	
RestrictType									BitmapRelOp							PropTag																
...																Mask																
...																																

**RestrictType (1 byte):** An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x06.

**BitmapRelOp (1 byte):** An unsigned integer. This value specifies how the server MUST perform the masking operation. The value MUST be one of the values listed in the following table.

Operator name	Value	Meaning
<b>BMR_EQZ</b>	0x00	Perform a bitwise <b>AND</b> operation on the value of the <b>Mask</b> field with the value of the property <b>PropTag</b> field, and test for being equal to 0 (zero).
<b>BMR_NEZ</b>	0x01	Perform a bitwise <b>AND</b> operation on the value of the <b>Mask</b> field with the value of the property <b>PropTag</b> field, and test for not being equal to 0 (zero).

**PropTag (4 bytes):** An unsigned integer. This value is the property tag of the property to be tested. Its property type MUST be single-valued **Int32**, as specified in section [2.11.1](#).

**Mask (4 bytes):** An unsigned integer. The bitmask to be used for the **AND** operation.

The **BitMaskRestriction** structure performs a bitwise **AND** operation by using the bitmask from the **Mask** field and the value of the property **PropTag** field. If the result is 0 (zero), the **BMR\_EQZ** operator is satisfied. If the result is not 0 (zero) — that is, if the property value has at least one of the same bits set as the **Mask** field — the **BMR\_NEZ** operator is satisfied.

### 2.12.7.2 BitMaskRestriction\_r Structure

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
BitmapRelOp										PropTag																					

...	Mask
...	

**BitmapRelOp (1 byte):** This value encodes the **BitmapRelop** field of the **BitMaskRestriction** structure, as specified in section [2.12.7.1](#).

**PropTag (4 bytes):** This value encodes the **PropTag** field of the **BitMaskRestriction** structure.

**Mask (4 bytes):** This value encodes the **Mask** field of the **BitMaskRestriction** structure.

## 2.12.8 Size Restriction Structures

The **SizeRestriction** structure, as specified in section [2.12.8.1](#), describes a size restriction that compares the size (in bytes) of a property value with a specified size.

The **SizeRestriction\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **SizeRestriction** data structure. The semantic meaning is unchanged from that of the **SizeRestriction** data structure.

### 2.12.8.1 SizeRestriction Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
RestrictType									RelOp							PropTag															
...																Size															
...																															

**RestrictType (1 byte):** An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x07.

**RelOp (1 byte):** An unsigned integer. This value indicates the relational operator used in the size comparison. The value MUST be one the value listed in the following table.

Relational operator name	Hexadecimal value	Evaluation	Alternate name
<b>RelationalOperatorLessThan</b>	0x00	<b>TRUE</b> if the object's property value is less than the specified value.	<b>RELOP_LT</b>
<b>RelationalOperatorLessThanOrEqual</b>	0x01	<b>TRUE</b> if the object's property value is less than or equal to the specified value.	<b>RELOP_LE</b>
<b>RelationalOperatorGreaterThan</b>	0x02	<b>TRUE</b> if the	<b>RELOP_GT</b>

Relational operator name	Hexadecimal value	Evaluation	Alternate name
		object's property value is greater than the specified value.	
<b>RelationalOperatorGreaterThanOrEqual</b>	0x03	<b>TRUE</b> if the object's property value is greater than or equal to the specified value.	<b>RELOP_GE</b>
<b>RelationalOperatorEqual</b>	0x04	<b>TRUE</b> if the object's property value equals the specified value.	<b>RELOP_EQ</b>
<b>RelationalOperatorNotEqual</b>	0x05	<b>TRUE</b> if the object's property value does not equal the specified value.	<b>RELOP_NE</b>

**PropTag (4 bytes):** An unsigned integer. This value indicates the property tag of the property whose value size is being tested.

**Size (4 bytes):** An unsigned integer. This value indicates the size, in bytes, that is to be used in the comparison.

If the value of the **PropTag** field is multivalued, there are two cases. If it was specified as a **MultivalueInstance** column in the table, the size restriction is evaluated for each row by using the size of the single instance value of the row. If the value of the **PropTag** field was not specified as a **MultivalueInstance** column in the table, the size restriction is evaluated for each multivalue. If one of the size restrictions succeeds, the restriction (2) is satisfied.

### 2.12.8.2 SizeRestriction\_r Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Relop									PropTag																						
...									Size																						
...																															

**Relop (1 byte):** This value encodes the **Relop** field of the **SizeRestriction** structure, as specified in section [2.12.8.1](#).

**PropTag (4 bytes):** This value encodes the **PropTag** field of the **SizeRestriction** structure.

**Size (4 bytes):** This value encodes the **Size** field of the **SizeRestriction** structure.



### 2.12.9 Exist Restriction Structures

The **ExistRestriction** structure, as specified in section [2.12.9.1](#), tests whether a particular property value exists on a row in the table.

The **ExistRestriction\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **ExistRestriction** data structure. The semantic meaning is unchanged from that of the **ExistRestriction** data structure.

#### 2.12.9.1 ExistRestriction Structure

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

**RestrictType (1 byte):** An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x08.

**PropTag (4 bytes):** An unsigned integer. This value is the property tag of the column to be tested for existence in each row.

The **ExistRestriction** structure is used to guarantee meaningful results for other types of restrictions (2) that involve properties, such as property and content restrictions. The result of a restriction (2) that involves a property that does not exist on a row is undefined. By creating an **AndRestriction** structure that joins the property restriction with an **ExistRestriction** structure, a client can be guaranteed accurate results.

#### 2.12.9.2 ExistRestriction\_r Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Reserved1																															
PropTag																															
Reserved2																															

**Reserved1 (4 bytes):** All clients and servers MUST set this value to 0x00000000.

**PropTag (4 bytes):** This value encodes the **PropTag** field of the **ExistRestriction** structure, as specified in section [2.12.9.1](#).

**Reserved2 (4 bytes):** All clients and servers MUST set this value to 0x00000000.

### 2.12.10 Subobject Restriction Structures

The **SubObjectRestriction** structure, as specified in section [2.12.10.1](#), applies its subrestriction to a Message object's attachments table or recipient table. If any row of the **subobject** satisfies the subrestriction, the message satisfies the **SubObjectRestriction** structure.

The **SubRestriction\_r** structure, as specified in [\[MS-NSPI\]](#), is an encoding of the **SubObjectRestriction** data structure. The semantic meaning is unchanged from that of the **SubObjectRestriction** data structure.

#### 2.12.10.1 SubObjectRestriction Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
RestrictType										Subobject																					
...										Restriction (variable)																					
...																															

**RestrictType (1 byte):** An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x09.

**Subobject (4 bytes):** An unsigned integer. This value is a property tag that designates the target of the subrestriction. Only the two values listed and described in the following table are supported.

Value	Meaning
<b>PidTagMessageRecipients</b> ( <a href="#">[MS-OXCMSG]</a> section 2.2.1.47)	Apply the subrestriction to a message's recipient table.
<b>PidTagMessageAttachments</b> ( <a href="#">[MS-OXPROPS]</a> section 2.774)	Apply the subrestriction to a message's attachments table.

**Restriction (variable):** A **Restriction** structure. This subrestriction is applied to the rows in the subobject.

#### 2.12.10.2 SubRestriction\_r Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Subobject																															
Restriction (variable)																															
...																															

**Subobject (4 bytes):** This value encodes the **Subobject** field of the **SubObjectRestriction** structure, as specified in section [2.12.10.1](#).

**Restriction (variable):** This value encodes the **Restriction** field of the **SubObjectRestriction** structure.

### 2.12.11 CommentRestriction Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1				
RestrictType									TaggedValuesCount								TaggedValues (variable)																		
...																																			
RestrictionPresent									Restriction (optional) (variable)																										
...																																			

**RestrictType (1 byte):** An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x0A.

**TaggedValuesCount (1 byte):** An unsigned integer. This value specifies how many **TaggedValue** structures are present in the **TaggedValues** field.

**TaggedValues (variable):** An array of **TaggedPropertyValue** structures, as specified in section 2.11.4. This field MUST contain the number of structures indicated by the value of the **TaggedValuesCount** field. The **TaggedPropertyValue** structures MUST NOT include any multivalue properties.

**RestrictionPresent (1 byte):** An unsigned integer. This field MUST contain either **TRUE** (0x01) or **FALSE** (0x00). A **TRUE** value means that the **Restriction** field is present, whereas a **FALSE** value indicates that the **Restriction** field is not present.

**Restriction (optional) (variable):** A **Restriction** structure. This field is present only if **RestrictionPresent** is **TRUE**.

Clients can use a **CommentRestriction** structure to save associated comments together with a restriction (2) that they pertain to. The comments are formatted as an arbitrary array of **TaggedPropValue** structures, and servers MUST store and retrieve this information for the client. If the **Restriction** field is present, servers MUST evaluate it; if it is not present, the **CommentRestriction** node will effectively evaluate as **TRUE**. In either case, the comments have no effect on the evaluation of the restriction (2).

### 2.12.12 CountRestriction Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1						
RestrictType										Count																											
...										SubRestriction (variable)																											
...																																					

**RestrictType (1 byte):** An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x0B.

**Count (4 bytes):** An unsigned integer. This value specifies the limit on the number of matches to be returned when the value of the **SubRestriction** field is evaluated.

**SubRestriction (variable):** A restriction structure. This field specifies the restriction (2) to be limited.

## 2.13 Table Sorting Structures

Table sorting is performed by sending a **RopSortTable** ROP ([\[MS-OXCROPS\]](#) section 2.2.5.2) to the server. The sort key is specified by using a **SortOrderSet** structure, as specified in section [2.13.2](#). The **SortOrder** structure, as specified in section [2.13.1](#), is part of a **SortOrderSet** structure.

### 2.13.1 SortOrder Structure

The **SortOrder** structure describes one column that is part of a sort key for sorting rows in a table. This structure specifies both the column and the direction of the sort.

A **SortOrderSet** structure, as specified in section [2.13.2](#), combines one or more **SortOrder** structures to describe multiple sort keys and directions in a **RopSortTable** ROP request ([\[MS-OXCROPS\]](#) section 2.2.5.2).

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
PropertyType (bits 0-15)																PropertyId (bits 16-31)															
Order																															

**PropertyType (bits 0-15) (2 bytes):** This value identifies the data type of the column to be used for sorting. If the property is multivalued, for example, the **MultivalueFlag** bit (0x1000) is set in the **PropertyType** field, and clients MUST also set the **MultivalueInstance** bit (0x2000). In this case, the server MUST generate one row for each individual value of a multivalue column and sort the table by individual values of that column.

**PropertyId (bits 16-31) (2 bytes):** This value identifies the column to be used for sorting.

**Order (1 byte):** This field MUST be set to one of the values listed in the following table.

Order name	Order value	Meaning
Ascending	0x00	Sort by this column in ascending order.
Descending	0x01	Sort by this column in descending order.
MaximumCategory	0x04	This is an aggregated column in a categorized sort, whose maximum value (within the group of items with the same value as that of the previous category) is to be used as the sort key for the entire group.

If the **MultivalueFlag** bit is set, the **MultivalueInstance** bit MUST also be set, and if the **MultivalueInstance** bit is set, the **MultivalueFlag** bit MUST also be set. In other words, it is

not possible to sort on all values of a multivalue column; one row per value **MUST** be generated, and individual values **MUST** be used in the sort.

The **MaximumCategory** bit causes groups of messages in a categorized sort to be ordered by the maximum value of a column across an entire group. For example, a conversation view is grouped by the value of the **PidTagConversationTopic** property ([MS-OXOMSG] section 2.2.1.5). In this case, Groups are sorted by the value of the group's most recent (maximum) **PidTagMessageDeliveryTime** property ([MS-OXOMSG] section 2.2.3.9), and within each group messages are sorted by the value of the **PidTagConversationIndex** property ([MS-OXOMSG] section 2.2.1.3).

### 2.13.2 SortOrderSet Structure

0	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
SortOrderCount																CategorizedCount															
ExpandedCount																SortOrders (variable)															
...																															

**SortOrderCount (2 bytes):** An unsigned integer. This value specifies how many **SortOrder** structures are present in the **SortOrders** field.

**CategorizedCount (2 bytes):** An unsigned integer. This value specifies that the first **CategorizedCount** columns are categorized. This value **MUST** be in the range from 0 to the value of the **SortOrderCount** field.

**ExpandedCount (2 bytes):** An unsigned integer. This value specifies that the first **ExpandedCount** field in the categorized columns starts in an expanded state in which all of the rows that apply to the category are visible in the table view. This value **MUST** be in the range from 0 to the value of the **CategorizedCount** field.

**SortOrders (variable):** An array of **SortOrder** structures. This field **MUST** contain the number of structures indicated by the value of the **SortOrderCount** field. At most, one of the structures can specify a multivalue property.

## 3 Structure Examples

This section provides two examples of how some of the structures documented in this specification would appear as a stream of bytes.

### 3.1 Restriction Example

The following **restriction**, as described in section 2.12, described in high level terms, could be used to search for items with reminders set on them.

A **restriction** of the type **AndRestriction** with the following two subclauses:

1. A **restriction** of type **AndRestriction**, with the following eight subclauses:
  1. A **restriction** of type **PropertyRestriction** with a **relop** value of **RelationalOperatorNotEqual**, comparing the value of the **PidTagParentEntryId** property ([MS-OXCFCOLD] section 2.2.2.2.1.6) with the value of the **PidTagEntryId** property ([MS-OXCFCOLD] section 2.2.4) of the **Deleted Items folder** (see [MS-OXOSFLD]).
  2. A **restriction** of type **PropertyRestriction** with a **relop** value of **RelationalOperatorNotEqual**, comparing the value of the **PidTagParentEntryId** property with the value of the **PidTagEntryId** property of the **Junk E-mail folder**.
  3. A **restriction** of type **PropertyRestriction** with a **relop** value of **RelationalOperatorNotEqual**, comparing the value of the **PidTagParentEntryId** property with the **PidTagEntryId** property of the **Drafts folder**.
  4. A **restriction** of type **PropertyRestriction** with a **relop** value of **RelationalOperatorNotEqual**, comparing the value of the **PidTagParentEntryId** property with the value of the **PidTagEntryId** property of the **Outbox folder**.
  5. A **restriction** of type **PropertyRestriction** with a **relop** value of **RelationalOperatorNotEqual**, comparing the value of the **PidTagParentEntryId** property with the value of the **PidTagEntryId** property of the Conflicts **special folder**.
  6. A **restriction** of type **PropertyRestriction** with a **relop** value of **RelationalOperatorNotEqual**, comparing the value of the **PidTagParentEntryId** property with the value of the **PidTagEntryId** property of the Local Failures special folder.
  7. A **restriction** of type **PropertyRestriction** with a **relop** value of **RelationalOperatorNotEqual**, comparing the value of the **PidTagParentEntryId** property with the value of the **PidTagEntryId** property of the Server Failures special folder.
  8. A **restriction** of type **PropertyRestriction** with a **relop** value of **RelationalOperatorNotEqual**, comparing the value of the **PidTagParentEntryId** property with the value of the **PidTagEntryId** property of the Sync Issues special folder.
2. A **restriction** of type **AndRestriction**, with the following three subclauses:
  1. A **restriction** of type **NotRestriction**, with a **restriction** of type **AndRestriction** that has the following two subclauses:
    1. A **restriction** of type **ExistRestriction** that specifies the **PidTagMessageClass** property ([MS-OXCMSG] section 2.2.1.3).

2. A **restriction** of type **ContentRestriction** with the value FL\_PREFIX in the **FuzzyLevelLow** field, comparing the value of the **PidTagMessageClass** property with the string value "IPM.Schedule".
2. A **restriction** of type **BitMaskRestriction** with a **BitmapRelOp** value of BMR\_EQZ that compares the value of the **PidTagMessageFlags** property ([\[MS-OXCMSG\]](#) section 2.2.1.6) with the **ULONG** value MSGFLAG\_SUBMIT.
3. A **restriction** of type **OrRestriction**, with the following two subclauses:
  1. A **restriction** of type **PropertyRestriction** with **relop RelationalOperatorEqual**, comparing the value of the **PidLidReminderSet** property ([\[MS-OXORMDR\]](#) section 2.2.1.1) with the Boolean value 1.
  2. A **restriction** of type **AndRestriction**, with the following two subclauses:
    1. A **restriction** of type **ExistRestriction** that specifies the **PidLidRecurring** property ([\[MS-OXOCAL\]](#) section 2.2.1.12).
    2. A **restriction** of type **PropertyRestriction** with **relop RelationalOperatorEqual**, comparing the value of the **PidLidRecurring** property with the Boolean value 1.

The following table shows how this corresponds to a byte stream that is passed between the client and the server.

Before formatting this data structure to send to the server, the client would need to send a **RopGetPropertyIdsFromNames** ROP request ([\[MS-OXCROPS\]](#) section 2.2.8.1) to the server to map the two named properties **PidLidReminderSet** and **PidLidRecurring** to actual property IDs.

Bytes				Field name	Meaning
00				<b>RestrictType</b>	<b>AndRestriction</b>
02 00				<b>RestrictCount</b>	2
	00			<b>RestrictType</b>	<b>AndRestriction</b>
	08 00			<b>RestrictCount</b>	8
		04		<b>RestrictType</b>	<b>PropertyRestriction</b>
		05		<b>RelOp</b>	<b>RelationalOperatorNotEqual</b>
		20 10 09 0E		<b>PropTag</b>	<b>PidTagParentEntryId</b>
				<b>TaggedValue</b>	<b>PtypBinary</b>
			0E 02	<b>COUNT</b> , as described in section <a href="#">2.11.1.1</a>	46
				Bytes	Interpreted as <b>Folder EntryID</b> , as described in section <a href="#">2.2.1.1</a>
			00 00 00 00	<b>Flags</b>	Zero
			EE C1 BD 78 61 11 D0 11 91 7B 00 00 00 00 00 01	<b>Provider UID</b> , as described in section <a href="#">2.2.4.1</a>	User ID for mailbox

Bytes					Field name	Meaning
				01 00	<b>FolderType</b>	eitLTPrivateFolder
				(16-byte GUID specific to database)	<b>DatabaseGuid</b>	UID identifies database where folder was originally created
				(6 bytes identifying Deleted Items folder)	<b>GlobalCounter</b>	UID identifies specific folder within database
				00 00	<b>Pad</b>	Zero
			04		<b>RestrictType</b>	<b>PropertyRestriction</b>
			05		<b>RelOp</b>	<b>RelationalOperatorNotEqual</b>
			20 10 09 0E		<b>PropTag</b>	<b>PidTagParentEntryId</b>
					<b>TaggedValue</b>	<b>PtypBinary</b>
			0E 02		<b>COUNT</b>	46
					Bytes	Interpreted as <b>Folder EntryID</b>
				00 00 00 00	<b>Flags</b>	Zero
				EE C1 BD 78 61 11 D0 11 91 7B 00 00 00 00 00 01	<b>Provider UID</b>	UID for mailbox
				01 00	<b>FolderType</b>	eitLTPrivateFolder
				(16-byte GUID specific to database)	<b>DatabaseGuid</b>	UID identifies database where folder was originally created
				(6 bytes identifying Junk E-mail folder)	<b>GlobalCounter</b>	UID identifies specific folder within database
				00 00	<b>Pad</b>	Zero
			04		<b>RestrictType</b>	<b>PropertyRestriction</b>
			05		<b>RelOp</b>	<b>RelationalOperatorNotEqual</b>
			20 10 09 0E		<b>PropTag</b>	<b>PidTagParentEntryId</b>
					<b>TaggedValue</b>	<b>PtypBinary</b>
			0E 02		<b>COUNT</b>	46
					Bytes	Interpreted as <b>Folder EntryID</b>
				00 00 00 00	<b>Flags</b>	Zero
				EE C1 BD 78 61 11 D0 11 91 7B 00 00 00 00 00 01	<b>Provider UID</b>	UID for mailbox



Bytes					Field name	Meaning
				01 00	<b>FolderType</b>	eitLTPrivateFolder
				(16-byte GUID specific to database)	<b>DatabaseGuid</b>	UID identifies database where folder was originally created
				(6 bytes identifying Drafts folder)	<b>GlobalCounter</b>	UID identifies specific folder within database
				00 00	<b>Pad</b>	Zero
			04		<b>RestrictType</b>	<b>PropertyRestriction</b>
			05		<b>RelOp</b>	<b>RelationalOperatorNotEqual</b>
			20 10 09 0E		<b>PropTag</b>	<b>PidTagParentEntryId</b>
					<b>TaggedValue</b>	<b>PtypBinary</b>
			0E 02		<b>COUNT</b>	46
					Bytes	Interpreted as <b>Folder EntryID</b>
				00 00 00 00	<b>Flags</b>	Zero
				EE C1 BD 78 61 11 D0 11 91 7B 00 00 00 00 00 01	<b>Provider UID</b>	UID for mailbox
				01 00	<b>FolderType</b>	eitLTPrivateFolder
				(16-byte GUID specific to database)	<b>DatabaseGuid</b>	UID identifies database where folder was originally created
				(6 bytes identifying Outbox folder)	<b>GlobalCounter</b>	UID identifies specific folder within database
				00 00	<b>Pad</b>	Zero
			04		<b>RestrictType</b>	<b>PropertyRestriction</b>
			05		<b>RelOp</b>	<b>RelationalOperatorNotEqual</b>
			20 10 09 0E		<b>PropTag</b>	<b>PidTagParentEntryId</b>
					<b>TaggedValue</b>	<b>PtypBinary</b>
			0E 02		<b>COUNT</b>	46
					Bytes	Interpreted as <b>Folder EntryID</b>
				00 00 00 00	<b>Flags</b>	Zero
				EE C1 BD 78 61 11 D0 11 91 7B 00 00 00 00 00 01	<b>Provider UID</b>	UID for mailbox

Bytes					Field name	Meaning
				01 00	<b>FolderType</b>	eitLTPrivateFolder
				(16-byte GUID specific to database)	<b>DatabaseGuid</b>	UID identifies database where folder was originally created
				(6 bytes identifying Conflicts folder)	<b>GlobalCounter</b>	UID identifies specific folder within database
				00 00	<b>Pad</b>	Zero
			04		<b>RestrictType</b>	<b>PropertyRestriction</b>
			05		<b>RelOp</b>	<b>RelationalOperatorNotEqual</b>
			20 10 09 0E		<b>PropTag</b>	<b>PidTagParentEntryId</b>
					<b>TaggedValue</b>	<b>PtypBinary</b>
			0E 02		<b>COUNT</b>	46
					Bytes	Interpreted as <b>Folder EntryID</b>
				00 00 00 00	<b>Flags</b>	Zero
				EE C1 BD 78 61 11 D0 11 91 7B 00 00 00 00 00 01	<b>Provider UID</b>	UID for mailbox
				01 00	<b>FolderType</b>	eitLTPrivateFolder
				(16-byte GUID specific to database)	<b>DatabaseGuid</b>	UID identifies database where folder was originally created
				(6 bytes identifying Local Failures folder)	<b>GlobalCounter</b>	UID identifies specific folder within database
				00 00	<b>Pad</b>	Zero
			04		<b>RestrictType</b>	<b>PropertyRestriction</b>
			05		<b>RelOp</b>	<b>RelationalOperatorNotEqual</b>
			20 10 09 0E		<b>PropTag</b>	<b>PidTagParentEntryId</b>
					<b>TaggedValue</b>	<b>PtypBinary</b>
			0E 02		<b>COUNT</b>	46
					Bytes	Interpreted as <b>Folder EntryID</b>
				00 00 00 00	<b>Flags</b>	Zero
				EE C1 BD 78 61 11 D0 11 91 7B 00 00 00 00 00 01	<b>Provider UID</b>	UID for mailbox

Bytes					Field name	Meaning
				01 00	<b>FolderType</b>	eitLTPriateFolder
				(16-byte GUID specific to database)	<b>DatabaseGuid</b>	UID identifies database where folder was originally created
				(6 bytes identifying Server Failures folder)	<b>GlobalCounter</b>	UID identifies specific folder within database
				00 00	<b>Pad</b>	Zero
			04		<b>RestrictType</b>	<b>PropertyRestriction</b>
			05		<b>RelOp</b>	<b>RelationalOperatorNotEqual</b>
			20 10 09 0E		<b>PropTag</b>	<b>PidTagParentEntryId</b>
					<b>TaggedValue</b>	<b>PtypBinary</b>
			0E 02		<b>COUNT</b>	46
					Bytes	Interpreted as <b>Folder EntryID</b> , as described in section <a href="#">2.2.1.1</a>
				00 00 00 00	<b>Flags</b>	Zero
				EE C1 BD 78 61 11 D0 11 91 7B 00 00 00 00 00 01	<b>Provider UID</b>	UID for mailbox
				01 00	<b>FolderType</b>	eitLTPriateFolder
				(16-byte GUID specific to database)	<b>DatabaseGuid</b>	UID identifies database where folder was originally created
				(6 bytes identifying Sync Issues folder)	<b>GlobalCounter</b>	UID identifies specific folder within database
				00 00	<b>Pad</b>	Zero
			00		<b>RestrictType</b>	<b>AndRestriction</b>
			03 00		<b>RestrictCount</b>	3
			02		<b>RestrictType</b>	<b>NotRestriction</b>
			00		<b>RestrictType</b>	<b>AndRestriction</b>
			02 00		<b>RestrictCount</b>	2
			08		<b>RestrictType</b>	<b>ExistRestriction</b>
			1F 00 1A 00		<b>PropTag</b>	<b>PidTagMessageClass</b>

Bytes				Field name	Meaning
			03	<b>RestrictType</b>	<b>ContentRestriction</b>
			02 00	<b>FuzzyLevelLow</b>	FL_PREFIX
			00 00	<b>FuzzyLevelHigh</b>	
			1F 00 1A 00	<b>PropertyTag</b>	<b>PidTagMessageClass</b>
			49 00 50 00 4D 00 2E 00 53 00 63 00 68 00 65 00 64 00 75 00 6C 00 65 00 00 00	<b>PropValue</b>	"IPM.Schedule"
			06	<b>RestrictType</b>	<b>BitMaskRestriction</b>
			00	<b>BitmapRelOp</b>	BMR_EQZ
			03 00 07 0E	<b>PropTag</b>	<b>PidTagMessageFlags</b>
			04 00 00 00	<b>Mask</b>	MSGFLAG_SUBMIT
			01	<b>RestrictType</b>	<b>OrRestriction</b>
			02 00	<b>RestrictCount</b>	2
			04	<b>RestrictType</b>	<b>PropertyRestriction</b>
			04	<b>RelOp</b>	<b>RelationalOperatorEqual</b>
			0B 00 + (2-byte mapped prop id)	<b>PropTag</b>	<b>PidLidReminderSet</b>
			01	<b>PropValue</b>	TRUE
			00	<b>RestrictType</b>	<b>AndRestriction</b>
			02 00	<b>RestrictCount</b>	2
			08	<b>RestrictType</b>	<b>ExistRestriction</b>
			0B 00 + (2-byte mapped prop id)	<b>PropTag</b>	<b>PidLidRecurring</b>
			04	<b>RestrictType</b>	<b>PropertyRestriction</b>
			04	<b>RelOp</b>	<b>RelationalOperatorEqual</b>
			0B 00 + (2-byte mapped prop id)	<b>PropTag</b>	<b>PidLidRecurring</b>
			01	<b>PropValue</b>	TRUE

## 3.2 PropertyRow Example

In this example, the client sends the **RopGetPropertiesSpecific** ROP ([\[MS-OXCROPS\]](#) section 2.2.8.3) to the server requesting the properties from an open Message object.

Hexadecimal value	Property ID	Property type
0E070003	<b>PidTagMessageFlags</b> ( <a href="#">[MS-OXCMSG]</a> section 2.2.1.6)	<b>PtypInteger32</b>
00370001	<b>PidTagSubject</b> ( <a href="#">[MS-OXCMSG]</a> section 2.2.1.46)	<b>PtypUnspecified</b>
1000001F	<b>PidTagBody</b> ( <a href="#">[MS-OXCMSG]</a> section 2.2.1.56.1)	<b>PtypString</b>

For this example, it is also assumed that:

- This message had been sent to this mailbox from a different user.
- The message contained an attachment.
- The message had already been read by the user but had not been modified.
- The subject of this message is "Hello".
- The body of the message is so large that the server requires the client to stream the body to the client.

Under these conditions, the data returned from the server for the **PropertyRow** structure, as described in section [2.8](#), would use the **FlaggedPropertyRow** structure variant, as described in section [2.11.5](#), to return the data from the **RopGetPropertiesSpecific** ROP with the data shown in the following table.

Bytes	Field	Meaning
01	Flag for the <b>PropertyRow</b> structure	Either there were errors retrieving values or some values were not returned.
00	Flag for the <b>FlaggedPropertyValue</b> structure, as described in section <a href="#">2.11.5</a>	The value for this property is returned.
13 00 00 00	<b>PtypInteger32 PropertyValue</b>	MSGFLAG_READ  MSGFLAG_UMODIFIED  MSGFLAG_HASATTACH
1F 00	PropertyType for the <b>FlaggedPropertyValueWithType</b> structure, as described in section <a href="#">2.11.6</a>	<b>PtypString</b>
00	Flag for the <b>FlaggedPropertyValueWithType</b> structure	<b>PropertyRestriction</b>
48 00 65 00 6C 00 6C 00 6F 00 00 00	String PropertyValue	"Hello"
0A	Flag for the <b>FlaggedPropertyValue</b> structure	The value for this property was not returned. The <b>RopOpenStream</b> ROP ( <a href="#">[MS-OXCROPS]</a> section 2.2.8.6) can be used to

Bytes	Field	Meaning
		obtain the property value.
0E 00 07 80	32-bit SCODE	NotEnoughMemory error, as described in section <a href="#">2.4</a> .

## **4 Security**

### **4.1 Security Considerations for Implementers**

None.

### **4.2 Index of Security Parameters**

None.

## 5 Appendix A: Product Behavior

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

- Microsoft Exchange Server 2003
- Microsoft Exchange Server 2007
- Microsoft Exchange Server 2010
- Microsoft Exchange Server 2013
- Microsoft Office Outlook 2003
- Microsoft Office Outlook 2007
- Microsoft Outlook 2010
- Microsoft Outlook 2013

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

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

[<1> Section 2.2.2:](#) Exchange 2007 and Exchange 2010 do not support the **NNTP Newsgroup Folder EntryID** structure.

[<2> Section 2.2.4:](#) The value for the MappedPublicFolder Store object type is neither read nor written to by the server. Only Office Outlook 2003, Office Outlook 2007, and Outlook 2010 use this object type.

[<3> Section 2.2.4:](#) The value for the MappedPublicMessage Store object type is neither read nor written to by the server. Only Office Outlook 2003, Office Outlook 2007, and Outlook 2010 use this object type.

[<4> Section 2.2.5.3:](#) Office Outlook 2003 and Office Outlook 2007 can leave 3 extra bytes not filled at the end of the Contact Address EntryID structure; in other words, the sum of all fields specified in this protocol can be 3 bytes less than the count of bytes of the entire EntryID. The value of the extra 3 bytes has no meaning to either the server or the client.

[<5> Section 2.2.5.4:](#) Office Outlook 2003 and Office Outlook 2007 can leave 3 extra bytes not filled at the end of the **Personal distribution list EntryID** structure; in other words, the sum of all fields specified in this protocol can be 3 bytes less than the count of bytes of the entire **EntryID**. The value of the extra 3 bytes has no meaning to either the server or the client.

[<6> Section 2.8.3.1:](#) Exchange 2003, Exchange 2007, Exchange 2010, the initial release of Exchange 2013, Office Outlook 2003, Office Outlook 2007, Outlook 2010, and the initial release of Outlook 2013 do not support the **Connect** request type. The **Connect** request type was introduced in Outlook 2013 SP1 and Exchange 2013 SP1.



<7> [Section 2.11.1.2:](#) Exchange 2003, Exchange 2007, Exchange 2010, the initial release of Exchange 2013, Office Outlook 2003, Office Outlook 2007, Outlook 2010, and the initial release of Outlook 2013 do not support the **Connect** request type. The **Connect** request type was introduced in Outlook 2013 SP1 and Exchange 2013 SP1.

<8> [Section 2.12.5.1:](#) Exchange 2003, Exchange 2007, Office Outlook 2003, Office Outlook 2007, and Outlook 2010 support the **RelationalOperatorEqual** and **RelationalOperatorNotEqual** operators when the value of the **PropTag** field is single-valued and the value of the **TaggedValue** field is multivalued. The value of the property **PropTag** field is compared with each value of the **TaggedValue** field. If there are any matches, the **RelationalOperatorEqual** operator is satisfied. If there are no matches, the **RelationalOperatorNotEqual** operator is satisfied.

## 6 Change Tracking

This section identifies changes that were made to the [MS-OXCDATA] protocol document between the July 2014 and October 2014 releases. Changes are classified as New, Major, Minor, Editorial, or No change.

The revision class **New** means that a new document is being released.

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

- A document revision that incorporates changes to interoperability requirements or functionality.
- The removal of a document from the documentation set.

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

The revision class **Editorial** means that the formatting in the technical content was changed. Editorial changes apply to grammatical, formatting, and style issues.

The revision class **No change** means that no new technical changes were introduced. Minor editorial and formatting changes may have been made, but the technical content of the document is identical to the last released version.

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

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

- Obsolete document removed.

Editorial changes are always classified with the change type **Editorially updated**.

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

- **Protocol syntax** refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.
- **Protocol revision** refers to changes made to a protocol that affect the bits that are sent over the wire.

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

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
<a href="#">2.4.3 Warning Codes</a>	Added two warning codes referenced in MS-OXNSPI.	N	New content added.
<a href="#">2.4.3 Warning Codes</a>	Added details for the UnbindSuccess and UnbindFailure warning codes.	N	New content added.

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