[MS-OXCDATA]:

Data Structures

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Revision Summary

Date	Revision History	Revision Class	Comments
4/4/2008	0.1.0	Major	Initial Availability.
4/25/2008	0.2.0	Minor	Revised and updated property names and other technical content.
6/27/2008	1.0.0	Major	Initial Release.
8/6/2008	1.01	Editorial	Revised and edited technical content.
9/3/2008	1.02	Editorial	Revised and edited technical content.
12/3/2008	1.03	Editorial	Revised and edited technical content.
4/10/2009	2.0.0	Major	Updated technical content and applicable product releases.
7/15/2009	3.0.0	Major	Revised and edited for technical content.
11/4/2009	3.1.0	Minor	Updated the technical content.
2/10/2010	4.0.0	Major	Updated and revised the technical content.
5/5/2010	4.1.0	Minor	Updated the technical content.
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Date	Revision History	Revision Class	Comments
5/26/2015	13.0	No Change	No changes to the meaning, language, or formatting of the technical content.
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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 specific to this document:

access control list (ACL): A list of access control entries (ACEs) that collectively describe the security rules for authorizing access to some resource; for example, an object or set of objects.

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

address book: A collection of **Address Book objects**, each of which are contained in any number of address lists.

Address Book object: An entity in an **address book** that contains a set of attributes (1), each attribute with a set of associated values.

ASCII: The American Standard Code for Information Interchange (ASCII) is an 8-bit character-encoding scheme based on the English alphabet. ASCII codes represent text in computers, communications equipment, and other devices that work with text. ASCII refers to a single 8-bit ASCII character or an array of 8-bit ASCII characters with the high bit of each character set to zero.

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

Augmented Backus-Naur Form (ABNF): A modified version of Backus-Naur Form (BNF), commonly used by Internet specifications. ABNF notation balances compactness and simplicity with reasonable representational power. ABNF differs from standard BNF in its definitions and uses of naming rules, repetition, alternatives, order-independence, and value ranges. For more information, see [RFC5234].

base64 encoding: A binary-to-text encoding scheme whereby an arbitrary sequence of bytes is converted to a sequence of printable **ASCII** characters, as described in [RFC4648].

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

binary large object (BLOB): A discrete packet of data that is stored in a database and is treated as a sequence of uninterpreted bytes.

code page: An ordered set of characters of a specific script in which a numerical index (code-point value) is associated with each character. Code pages are a means of providing support for character sets (1) and keyboard layouts used in different countries. Devices such as the display and keyboard can be configured to use a specific code page and to switch from one code page (such as the United States) to another (such as Portugal) at the user's request.

Component Object Model (COM): An object-oriented programming model that defines how objects interact within a single process or between processes. In **COM**, clients have access to an object through interfaces implemented on the object. For more information, see [MS-DCOM].

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contact: A person, company, or other entity that is stored in a directory and is associated with one or more unique identifiers and attributes (2), such as an Internet message address or login name.

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

database: For the purposes of the Netlogon RPC, a database is a collection of user accounts, machine accounts, aliases, groups, and policies, managed by a component. The database, or the component managing the database, must expose a mechanism to enable Netlogon to gather changes from and apply changes to the database. Additionally, it must export a database serial number in order to track changes for efficient replication.

database object: An object such as a table, query, form, report, macro, or module that can be referenced by name in a database, database application, or database project.

Deleted Items folder: A **special folder** that is the default location for objects that have been deleted.

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

Distribution List object: A **Message object** that contains properties that describe a **distribution list**.

Drafts folder: A **special folder** that is the default location for **Message objects** that have been saved but not sent.

email address: A string that identifies a user and enables the user to receive Internet messages.

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

extended rule: A **rule** that is added to, modified, and deleted from a server by using a mechanism other than standard rules, but is otherwise functionally identical to a standard rule.

flags: A set of values used to configure or report options or settings.

Folder object: A messaging construct that is typically used to organize data into a hierarchy of objects containing Message objects and folder associated information (FAI) Message objects.

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

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

Hypertext Markup Language (HTML): An application of the Standard Generalized Markup Language (SGML) that uses tags to mark elements in a document, as described in [HTML].

Hypertext Transfer Protocol (HTTP): An application-level protocol for distributed, collaborative, hypermedia information systems (text, graphic images, sound, video, and other multimedia files) on the World Wide Web.

Junk Email folder: A **special folder** that is the default location for **Message objects** that are determined to be junk email by a Junk Email rule.

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

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long ID (LID): A 32-bit quantity that, in combination with a GUID, defines a **named property**.

mail user: An **Address Book object** that represents a person or entity that can receive deliverable messages.

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

message body: The content within an HTTP message, as described in [RFC2616] section 4.3.

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

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

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

meta-property: An entity that is identified with a **property tag** containing information (a value) that describes how to process other data in a FastTransfer stream.

multibyte character set (MBCS): An alternative to **Unicode** for supporting character sets, like Japanese and Chinese, that cannot be represented in a single byte. Under MBCS, characters are encoded in either one or two bytes. In two-byte characters, the first byte, or "lead" byte, signals that both it and the following byte are to be interpreted as one character. The first byte comes from a range of codes reserved for use as lead bytes. Which ranges of bytes can be lead bytes depends on the **code page** in use. For example, Japanese **code page** 932 uses the range 0x81 through 0x9F as lead bytes, but Korean **code page** 949 uses a different range.

Multipurpose Internet Mail Extensions (MIME): A set of extensions that redefines and expands support for various types of content in email messages, as described in [RFC2045], [RFC2046], and [RFC2047].

multivalue property: A property that can contain multiple values of the same type.

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

NT file system (NTFS): **NT file system (NTFS)** is a proprietary Microsoft File System. For more information, see [MSFT-NTFS].

Outbox folder: A **special folder** that contains **Message objects** that are submitted to be sent.

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

Personal Information Manager (PIM): A category of software packages for managing commonly used types of personal information, including contacts, email messages, calendar appointments, and meetings.

plain text: Text that does not have markup. See also **plain text message body**.

plain text message body: A **message body** for which the Content-Type value of the Email Text Body header field is "text/plain". A plain text message body can be identified explicitly in the content, or implicitly if it is in a message that is as described in [RFC822] or a message that does not contain a Content-Type header field.

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property ID: A 16-bit numeric identifier of a specific attribute (1). A property ID does not include any **property type** information.

property set: A set of attributes (1), identified by a **GUID**. Granting access to a property set grants access to all the attributes in the set.

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

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

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

Receive folder: A **Folder object** that is configured to be the destination for email messages that are delivered.

recipient: (1) An entity that can receive email messages.

(2) An entity that is in an address list, can receive email messages, and contains a set of attributes (1). Each attribute has a set of associated values.

recipient table: The part of a **Message object** that represents users to whom a message is addressed. Each row of the table is a set of properties that represents one **recipient (2)**.

remote operation (ROP): An operation that is invoked against a server. Each ROP represents an action, such as delete, send, or query. A ROP is contained in a **ROP buffer** for transmission over the wire.

remote procedure call (RPC): A context-dependent term commonly overloaded with three meanings. Note that much of the industry literature concerning RPC technologies uses this term interchangeably for any of the three meanings. Following are the three definitions: (*) The runtime environment providing remote procedure call facilities. The preferred usage for this meaning is "RPC runtime". (*) The pattern of request and response message exchange between two parties (typically, a client and a server). The preferred usage for this meaning is "RPC exchange". (*) A single message from an exchange as defined in the previous definition. The preferred usage for this term is "RPC message". For more information about RPC, see [C706].

replica: A copy of the data that is in a user's **mailbox** at a specific point in time.

restriction: (1) A set of conditions that an item meets to be included in the search results that are returned by a query server in response to a search query.

(2) A filter used to map some domain into a subset of itself, by passing only those items from the domain that match the filter. Restrictions can be used to filter existing Table objects or to define new ones, such as **search folder** or rule criteria.

ROP buffer: A structure containing an array of bytes that encode a **remote operation (ROP)**. The first byte in the buffer identifies the ROP. This byte is followed by ROP-specific fields. Multiple ROP buffers can be packed into a single **remote procedure call (RPC)** request or response.

ROP request: See ROP request buffer.

ROP response: See **ROP response buffer**.

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

rule: An item that defines a condition and an action. The condition is evaluated for each **Message object** as it is delivered, and the action is executed if the new Message object matches the condition.

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

search folder definition message: A folder associated information (FAI) message that persists all the information that defines a search folder. It is in the associated contents table of the Common Views folder in the message database.

search key: A binary-comparable key that identifies related objects for a search.

Server object: An object on a server that is used as input or created as output for **remote operations (ROPs)**.

server-side rule: A **rule** for which all actions are executed by a server.

session: A representation of application data in system memory. It is used to maintain state for application data that is being manipulated or monitored on a protocol server by a user.

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

Store object: An object that is used to store **mailboxes** and **public folder** content.

subobject: For a folder, the messages and subfolders that are contained in that folder. For a message, the **recipients (2)** and attachments to that message. For an attachment, the Embedded Message object for that attachment.

Transport Neutral Encapsulation Format (TNEF): A binary type-length-value encoding that is used to encode properties for transport, as described in [MS-OXTNEF].

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

Uniform Resource Identifier (URI): A string that identifies a resource. The URI is an addressing mechanism defined in Internet Engineering Task Force (IETF) Uniform Resource Identifier (URI): Generic Syntax [RFC3986].

universally unique identifier (UUID): A 128-bit value. UUIDs can be used for multiple purposes, from tagging objects with an extremely short lifetime, to reliably identifying very persistent objects in cross-process communication such as client and server interfaces, manager entry-point vectors, and **RPC** objects. UUIDs are highly likely to be unique. UUIDs are also known as **globally unique identifiers (GUIDs)** and these terms are used interchangeably in the Microsoft protocol technical documents (TDs). Interchanging the usage of these terms does not imply or require a specific algorithm or mechanism to generate the UUID. Specifically, the use of this term does not imply or require that the algorithms described in [RFC4122] or [C706] must be used for generating the UUID.

UTF-16: A standard for encoding Unicode characters, defined in the Unicode standard, in which the most commonly used characters are defined as double-byte characters. Unless specified otherwise, this term refers to the UTF-16 encoding form specified in [UNICODE5.0.0/2007] section 3.9.

UTF-16LE: The Unicode Transformation Format - 16-bit, Little Endian encoding scheme. It is used to encode **Unicode** characters as a sequence of 16-bit codes, each encoded as two 8-bit bytes with the least-significant byte first.

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

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X500 DN: A distinguished name (DN), in Teletex form, of an object that is in an **address book**. An X500 DN can be more limited in the size and number of relative distinguished names (RDNs) than a full DN.

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

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

1.2 References

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

1.2.1 Normative References

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

[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-OXOABK] Microsoft Corporation, "Address Book Object Protocol".

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

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

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

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

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

[MS-OXPROTO] 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.

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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-OXOMSG] 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.

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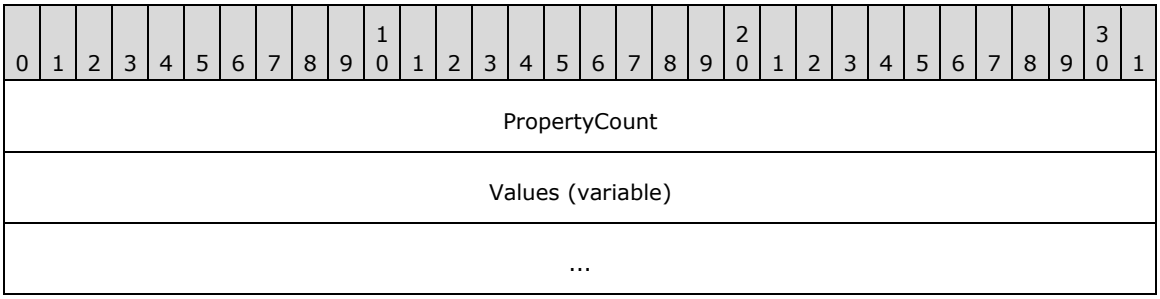
2 Structures

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** 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.

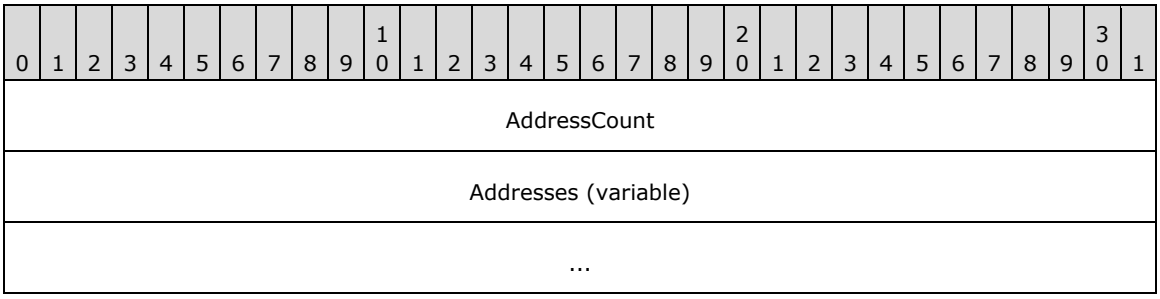


PropertyCount (4 bytes): An unsigned integer whose value is equal to the number of associated **TaggedPropertyValue** structures, as specified in section 2.11.4.

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.



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.

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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** 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.

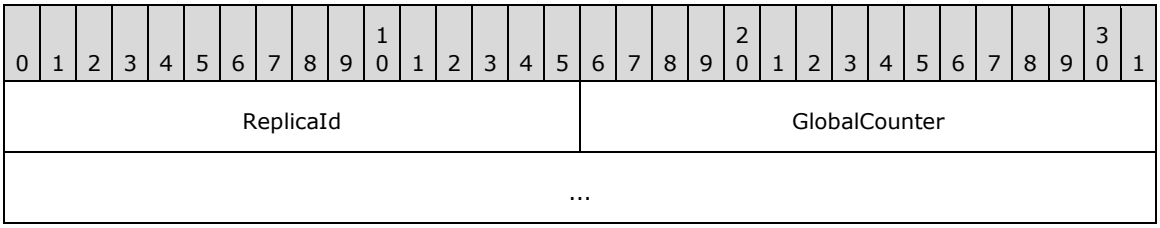
2.2.1 Folder ID, Message ID, and Global Identifier Structures

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.



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 **RopOpenMessage**

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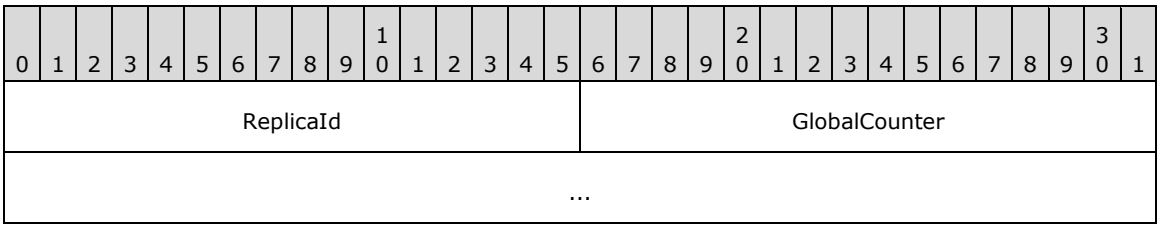
ROP ([MS-OXCROPS] section 2.2.6.1), where the Store object context is already established. It is an 8-byte structure.

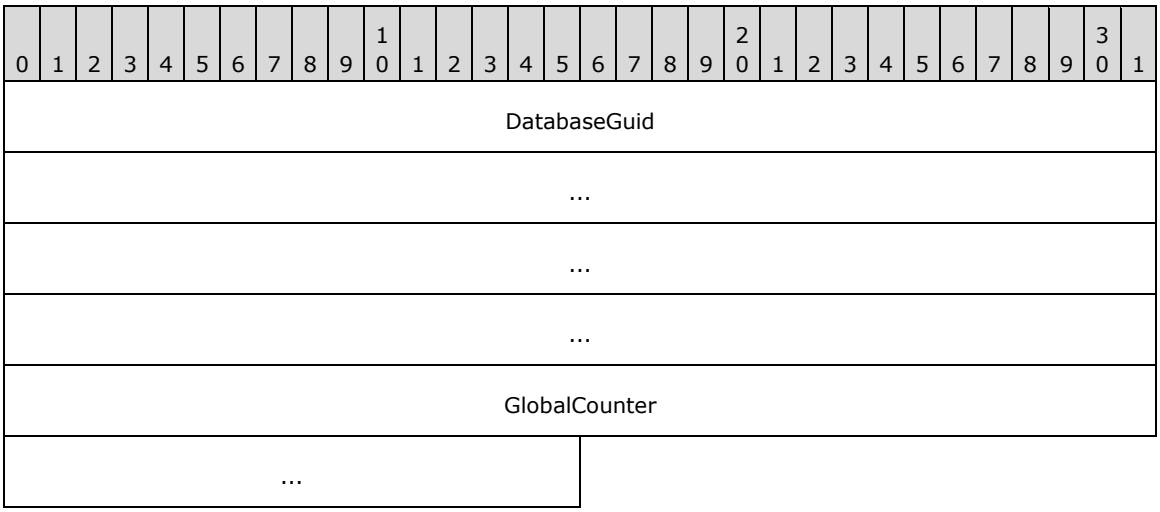


ReplicaId (2 bytes): An unsigned integer identifying a Store object.

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.



DatabaseGuid (16 bytes): An unsigned integer 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).

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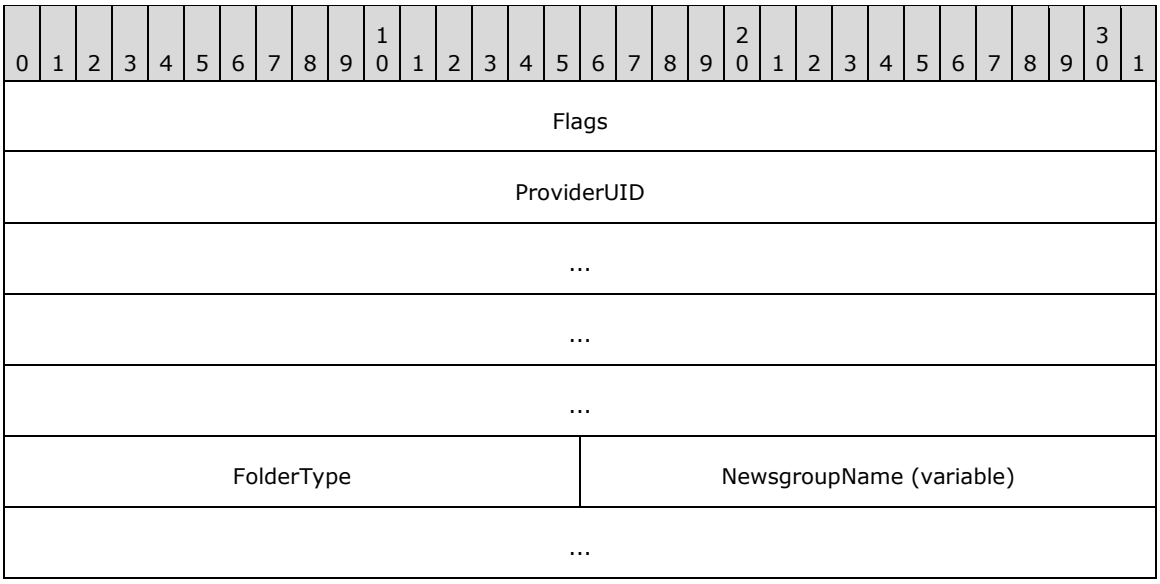
2.2.2 NNTP Newsgroup Folder EntryID Structure

The **NNTP Newsgroup Folder EntryID** structure identifies a newsgroup folder in a public message store.<1>



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.

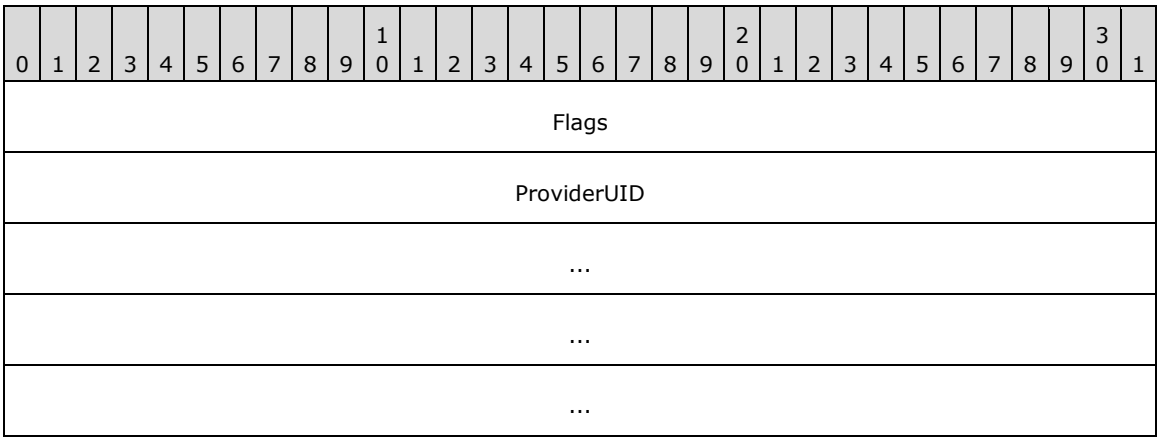
ProviderUID (16 bytes): The identifier for the provider that created the EntryID. The value is used to route EntryIDs to the correct provider and MUST be set to %x38.A1.BB.10.05.E5.10.1A.A1.BB.08.00.2B.2A.56.C2.

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.



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ProviderData (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.

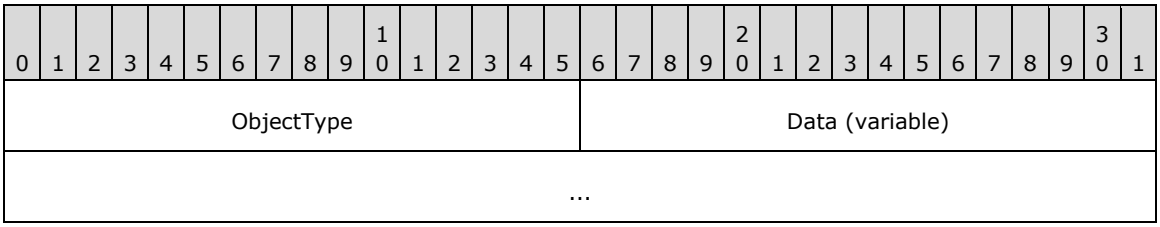
ProviderUID (16 bytes): The identifier for the provider that created the EntryID. This value is used to route EntryIDs to the correct provider. Values for this field appear in the following table.

EntryID UID type	ProviderUID value
Object in private message store	Is set to the **MailboxGuid** field value provided in the **RopLogon ROP response buffer** ([MS-OXCROPS] 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 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.



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>	0x0005

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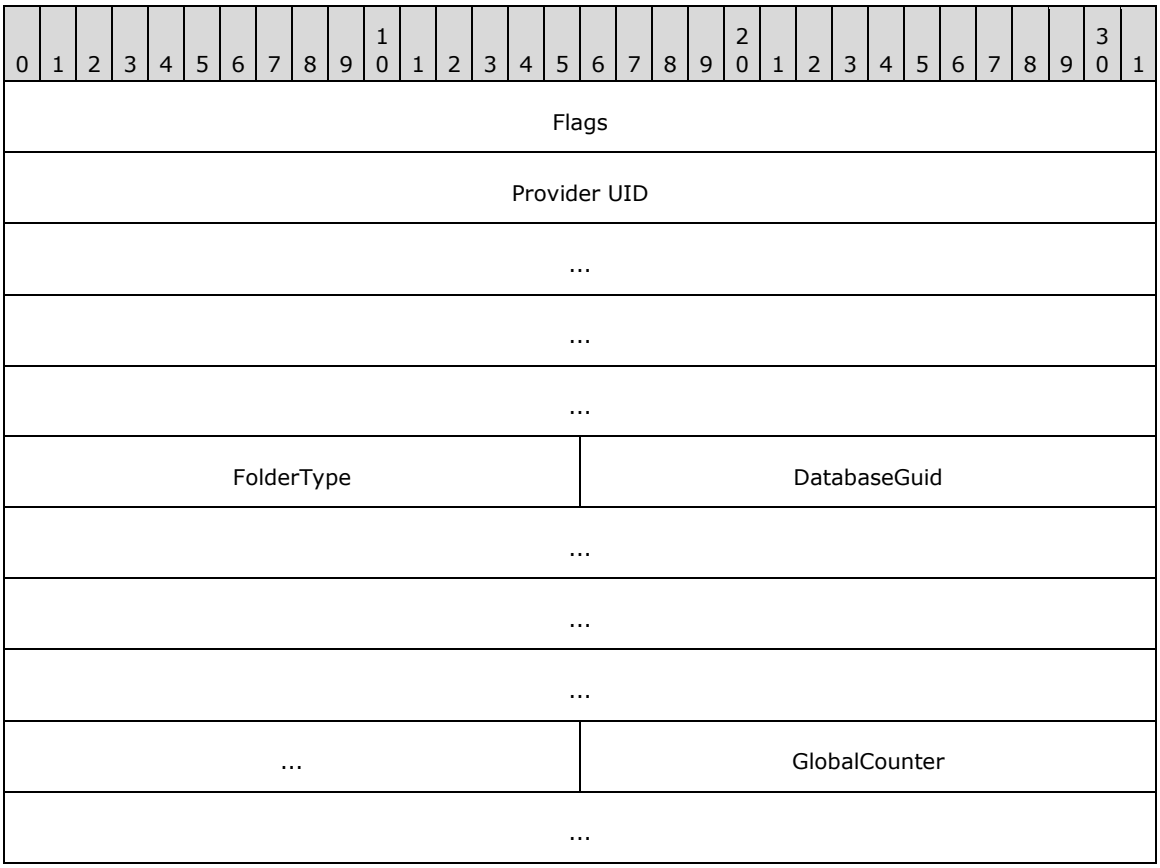
Store object type (alternate name)	Hexadecimal value
(eitLTWackyFolder)	%x05.00
PrivateMessage (eitLTPrivateMessage)	0x0007 %x07.00
PublicMessage (eitLTPublicMessage)	0x0009 %x09.00
MappedPublicMessage<3> (eitLTWackyMessage)	0x000B %x0B.00
PublicNewsgroupFolder (eitLTPublicFolderByName)	0x000C %x0C.00

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.



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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.

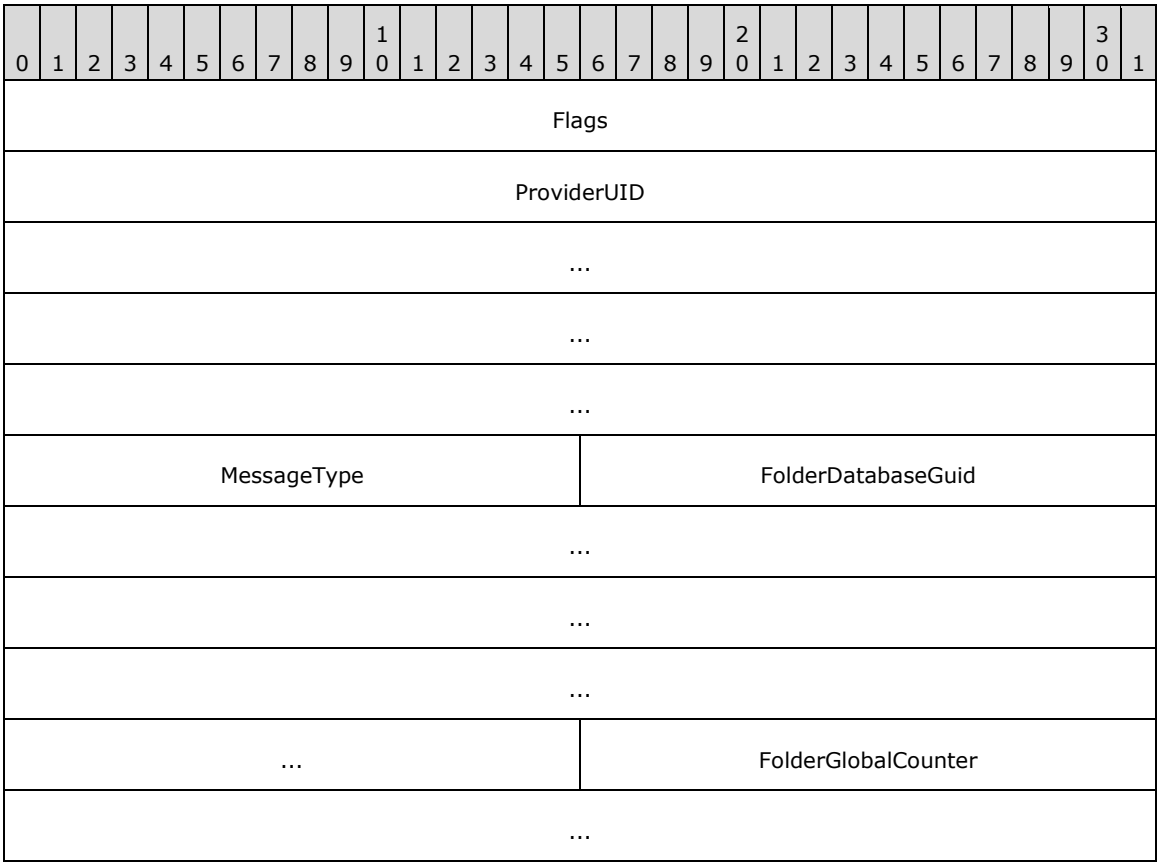
DatabaseGuid (16 bytes): A GUID associated with the Store object and corresponding to the **ReplicaId** field of the **FID** structure.

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.



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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																															

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...		
...		
...		
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.

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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.

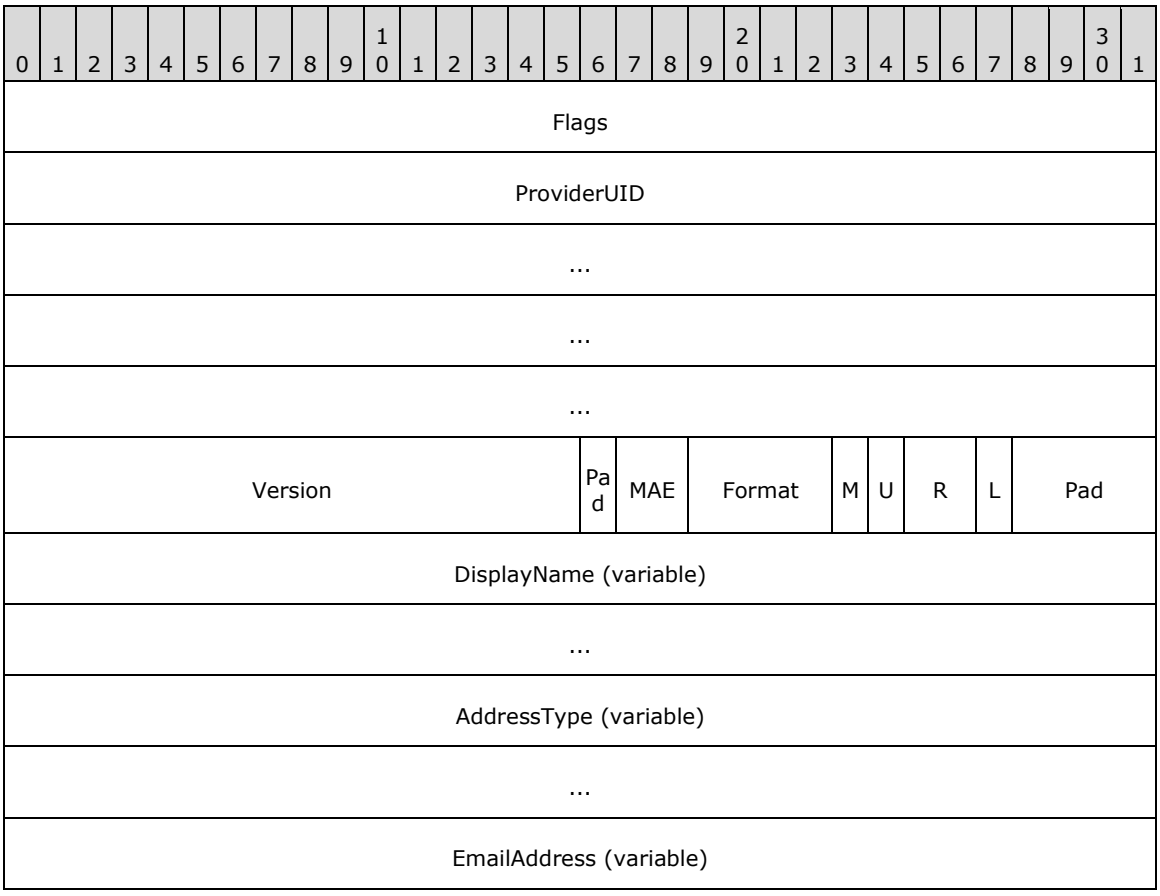
ServerShortname (variable): A string of single-byte characters terminated by a single zero byte, indicating the short name or NetBIOS name of the server.

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-OXOAB]. 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.



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...

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 **Multipurpose Internet Mail Extensions (MIME)** 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 **plain text message body**.
HtmlOnly	0x000E	b'0111'	Send an **HTML message body**.
TextAndHtml	0x0016	b'1011'	Send a multipart/alternative body with both **plain text** 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'.

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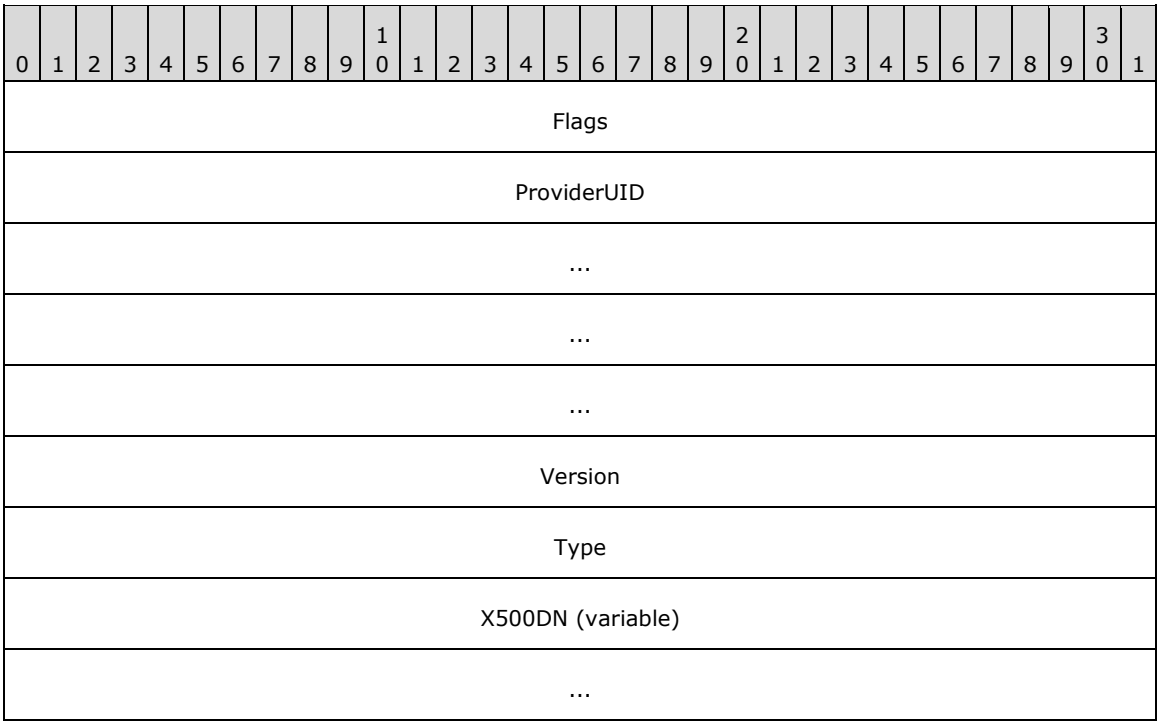
DisplayName (variable): The recipient's display name (in the **recipient table**, the **PidTagDisplayName** property ([MS-OXCFOLD] section 2.2.2.2.2.5)) as a null-terminated string. If the **U** field is b'1', the terminating null character is 2 bytes long; otherwise, 1 byte.

AddressType (variable): The recipient's email address type (in the recipient table, the **PidTagAddressType** property ([MS-OXOABK] 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-OXOABK] 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.



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	Local **mail user**

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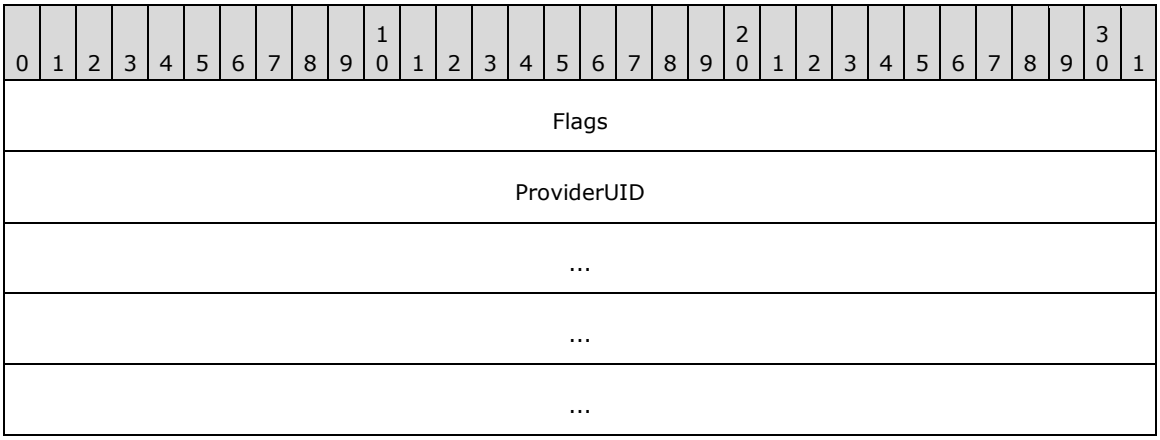
Value (hex bytes)	Address book EntryID type
%x00.00.00.00	
0x00000001 %x01.00.00.00	Distribution list
0x00000002 %x02.00.00.00	Bulletin board or public folder
0x00000003 %x03.00.00.00	Automated mailbox
0x00000004 %x04.00.00.00	Organizational mailbox
0x00000005 %x05.00.00.00	Private distribution list
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].



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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																															
...																															
...																															

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...
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 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	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
EntryCount																															

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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: an unsigned 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 **EntryID** field is specified by the first 32 bits of the second element of the **EntryLength** field.

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	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5	6	7	8	9	30	1
Count																															

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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 **remote procedure call (RPC)**. (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, ecaccessdenied, ecpropsecurityviolation)	0x80070005, %x05.00.07.80
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.	0x80030008 %x08.00.03.80

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Error code name	Description (alternate names)	Numeric value (hex)
	(STG_E_INSUFFICIENTMEMORY)	
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
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.	0x8004010D,

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Error code name	Description (alternate names)	Numeric value (hex)
	(MAPI_E_NOT_ENOUGH_DISK, ecDiskFull)	%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 **sessions**. (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 **RopAbort** ([MS-OXCROPS] section 2.2.5.5) or **RopAbortSubmit** ([MS-OXCROPS] section 2.2.7.2) **ROP request** 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
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

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Error code name	Description (alternate names)	Numeric value (hex)
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 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 created on the same table. (MAPI_E_INVALID_BOOKMARK, ecInvalidBookmark)	0x80040405, %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.	0x8004060A,

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Error code name	Description (alternate names)	Numeric value (hex)
	(MAPI_E_HAS_MESSAGES, ecFolderHasContents)	%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. (SYNC_E_IGNORE)	0x80040801 %x01.08.04.80
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 **named property** 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

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Error code name	Description (alternate names)	Numeric value (hex)
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. (ecUnknownCodePage)	0x000003EF, %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 **access control list (ACL)** cannot be converted to **NTFS** format. (ecUnconvertableACL)	0x000003F7, %xF7.03.00.00
NoFreeJetSessions	No Jet session is available. (ecNoFreeJses)	0x0000044C, %x4C.04.00.00
DifferentJetSession	Warning, a Jet session other than the one requested was returned. (ecDifferentJses)	0x0000044D, %x4D.04.00.00
FileRemove	An error occurred when attempting to remove	0x0000044F,

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Error code name	Description (alternate names)	Numeric value (hex)
	a database file. (ecFileRemove)	%x4F.04.00.00
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.04.00.00
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

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Error code name	Description (alternate names)	Numeric value (hex)
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. (ecSearchFolder)	0x00000460, %x60.04.00.00
NotSearchFolder	The operation is valid only on a search folder. (ecNotSearchFolder)	0x00000461, %x61.04.00.00
FolderSetReceive	This is a **Receive folder** 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 **replica** of the public folder in this Store object. (ecNoReplicaHere)	0x00000468, %x68.04.00.00
NoReplicaAvailable	No available Store object has a replica of this public folder. (ecNoReplicaAvailable)	0x00000469, %x69.04.00.00
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	0x00000470,

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Error code name	Description (alternate names)	Numeric value (hex)
	transfer buffer. (ecFxBufferOverrun)	%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, %x76.04.00.00
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.	0x00000483, %x83.04.00.

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Error code name	Description (alternate names)	Numeric value (hex)
	(ecObjAlreadyConfig)	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, %x88.04.00.00
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 **attachments table**. (ecTableMayNotBeDeleted)	0x0000048E, %x8E.04.00.00
SearchFolderScopeViolation	Attempt to perform a recursive search on a search folder. (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,

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Error code name	Description (alternate names)	Numeric value (hex)
		%xB6.04.00.00
NoCopyTo	Single instance storage cannot be used in this case. (ecNoCopyTo)	0x000004B7, %xB7.04.00.00
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	**Rule** data was unavailable for this folder. (ecRulesLoadError)	0x000004CC, %xCC.04.00.00
RulesDeliverErr	Delivery-time failure in rule execution. (ecRulesDeliverErr)	0x000004CD, %xCD.04.00.00
RulesParsingErr	Invalid syntax in a stored rule condition or **action**. (ecRulesParsingErr)	0x000004CE, %xCE.04.00.00
RulesCreateDAE	Failure creating a deferred rule action error message. (ecRulesCreateDaeErr)	0x000004CF, %xCF.04.00.00
RulesCreateDAM	Failure creating a deferred rule action message. (ecRulesCreateDamErr)	0x000004D0, %xD0.04.00.00
RulesNoMoveCopyFolder	A move or copy rule action could not be performed due to a problem with the target folder. (ecRulesNoMoveCopyFolder)	0x000004D1, %xD1.04.00.00
RulesNoFolderRights	A move or copy rule action could not be performed due to a permissions problem with	0x000004D2

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Error code name	Description (alternate names)	Numeric value (hex)
	the target folder. (ecRulesNoFolderRights)	, %xD2.04.00.00
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 **message class**. (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 action. (ecDeleteMessage)	0x000004D7, %xD7.04.00.00
BounceMessage	Delivery of the message was denied by a rule action. (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

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Error code name	Description (alternate names)	Numeric value (hex)
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.04.00.00
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	0x00000501,

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Error code name	Description (alternate names)	Numeric value (hex)
	the user does not have. (ecNoReadRight)	%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 **Server object**. (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.05.00.00
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.	0x00000512,

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Error code name	Description (alternate names)	Numeric value (hex)
	(ecRestoreInProgress)	%x12.05.00.00
DuplicateObject	The object already exists. (ecDuplicateObject)	0x00000579, %x79.05.00.00
ObjectNotFound	An internal **database object** could not be found. (ecObjectNotFound)	0x0000057A, %x7A.05.00.00
FixupReplyRule	The template Message ID in a reply rule 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. (ecTemplateNotFound)	0x0000057C, %x7C.05.00.00
RuleExecution	An error occurred while executing a rule action. (ecRuleExecution)	0x0000057D, %x7D.05.00.00
DSNoSuchObject	A Server object could not be found in the directory. (ecDSNoSuchObject)	0x0000057E, %x7E.05.00.00
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,

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Error code name	Description (alternate names)	Numeric value (hex)
		%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 data contains an invalid rule version. (ecRuleVersion)	0x000006A4, %xA4.06.00.00
RuleFormat	The rule condition or action was incorrectly formatted. (ecRuleFormat)	0x000006A5, %xA5.06.00.00
RuleSendAsDenied	The rule 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

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Error code name	Description (alternate names)	Numeric value (hex)
		.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.08.00.00
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	**Property types**, 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

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Error code name	Description (alternate names)	Numeric value (hex)
ExpressionUnaryArgument	The argument to a unary expression is of incorrect type. (ecExpUnaryArgType)	0x00000905, %x05.09.00.00
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 action failed because the destination folder is over quota. (ecRulesFolderOverQuota)	0x0000096D, %x6D.09.00.00
AddressBookUnavailable	The **address book** server could not be reached. (ecADUnavailable)	0x0000096E, %x6E.09.00.00
AddressBookError	Unspecified error from the address book server. (ecADError)	0x0000096F, %x6F.09.00.00
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

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Error code name	Description (alternate names)	Numeric value (hex)
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.09.00.00
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.

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Error code name	Description (alternate names)	Numeric value (hex)
		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.00.00
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.	0x00000A36,

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Error code name	Description (alternate names)	Numeric value (hex)
	(ecMaxConnectionsExceeded)	%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)	0xFFFFFF9C, %x9C.FF.FF.FF
IsamErrorRfsNotArmed	The Resource Failure Simulator has not been initialized. (JET_errRfsNotArmed)	0xFFFFFF9B, %x9B.FF.FF.FF
IsamErrorFileClose	The file could not be closed. (JET_errFileClose)	0xFFFFFF9A, %x9A.FF.FF.FF
IsamErrorOutOfThreads	The thread could not be started. (JET_errOutOfThreads)	0xFFFFFF99, %x99.FF.FF.FF
IsamErrorTooManyIO	The system is busy due to too many I/Os. (JET_errTooManyIO)	0xFFFFFF97, %x97.FF.FF.FF
IsamErrorTaskDropped	The requested asynchronous task could not be executed. (JET_errTaskDropped)	0xFFFFFF96, %x96.FF.FF.FF
IsamErrorInternalError	There was a fatal internal error. (JET_errInternalError)	0xFFFFFF95, %x95.FF.FF.FF
IsamErrorDatabaseBufferDependenciesCorrupted	The buffer dependencies were set improperly and there was a recovery failure. (JET_errDatabaseBufferDependenciesCorrupted)	0xFFFFFF01, %x01.FF.FF.FF
IsamErrorPreviousVersion	The version already existed and there was a recovery failure.	0xFFFFFEBE, %xBE.FE.FF.

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Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errPreviousVersion)	FF
IsamErrorPageBoundary	The page boundary has been reached. (JET_errPageBoundary)	0xFFFFFEBD, %xBD.FE.FF.FF
IsamErrorKeyBoundary	The key boundary has been reached. (JET_errKeyBoundary)	0xFFFFFEBC, %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
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.

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Error code name	Description (alternate names)	Numeric value (hex)
		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
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)	0xFFFFFDFE, %xFE.FD.FF.FF
IsamErrorInvalidLogSequence	The time stamp in the next log does not match the expected time stamp. (JET_errInvalidLogSequence)	0xFFFFFDFD, %xFD.FD.FF.FF
IsamErrorLoggingDisabled	The log is not active. (JET_errLoggingDisabled)	0xFFFFFDFC, %xFC.FD.FF.FF
IsamErrorLogBufferTooSmall	The log buffer is too small for recovery. (JET_errLogBufferTooSmall)	0xFFFFFDFB, %xFB.FD.FF.FF

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Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorLogSequenceEnd	The maximum log file number has been exceeded. (JET_errLogSequenceEnd)	0xFFFFFDF9, %xF9.FD.FF.FF
IsamErrorNoBackup	There is no backup in progress. (JET_errNoBackup)	0xFFFFFDF8, %xF8.FD.FF.FF
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)	0xFFFFFDEF, %xEF.FD.FF.FF
IsamErrorBadLogSignature	There is a bad signature for a log file. (JET_errBadLogSignature)	0xFFFFFDEE, %xEE.FD.FF.FF
IsamErrorBadDbSignature	There is a bad signature for a database file. (JET_errBadDbSignature)	0xFFFFFDED, %xED.FD.FF.FF
IsamErrorBadCheckpointSignature	There is a bad signature for a checkpoint file. (JET_errBadCheckpointSignature)	0xFFFFFDEC, %xEC.FD.FF.FF
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	0xFFFFFDEA,

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Error code name	Description (alternate names)	Numeric value (hex)
	during recovery. (JET_errMissingPatchPage)	%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
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_errLogSectorSizeMismatchDatabasesCons	0xFFFFFDDD, %xDD.FD.FF.FF

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Error code name	Description (alternate names)	Numeric value (hex)
	istent)	
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 restore. (JET_errEndingRestoreLogTooLow)	0xFFFFFDD7, %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)	0xFFFFFDCF, %xCF.FD.FF.

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Error code name	Description (alternate names)	Numeric value (hex)
		FF
IsamErrorDatabaseAlreadyUpgraded	The current attempt to upgrade a database has been stopped because the database is already current. (JET_errDatabaseAlreadyUpgraded)	0xFFFFFDCE, %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)	0xFFFFFDCD, %xCD.FD.FF.FF
IsamErrorMissingCurrentLogFiles	Some current log files are missing for continuous restore. (JET_errMissingCurrentLogFiles)	0xFFFFFDCB, %xCB.FD.FF.FF
IsamErrorDbTimeTooOld	The dbtime on a page is smaller than the dbtimeBefore that is in the record. (JET_errDbTimeTooOld)	0xFFFFFDCA, %xCA.FD.FF.FF
IsamErrorDbTimeTooNew	The dbtime on a page is in advance of the dbtimeBefore that is in the record. (JET_errDbTimeTooNew)	0xFFFFFDC9, %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)	0xFFFFFDBF, %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.	0xFFFFFDBD, %xBD.FD.FF.FF

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Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errRecoveredWithoutUndo)	
IsamErrorDatabasesNotFromSameSnapshot	The databases to be restored are not from the same shadow copy backup. (JET_errDatabasesNotFromSameSnapshot)	0xFFFFFDBC, %xBC.FD.FF.FF
IsamErrorSoftRecoveryOnSnapshot	There is a soft recovery on a database from a shadow copy backup set. (JET_errSoftRecoveryOnSnapshot)	0xFFFFFDBB, %xBB.FD.FF.FF
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
IsamErrorInvalidGrbit	There is an invalid *grbit* parameter. (JET_errInvalidGrbit)	0xFFFFFC7C, %x7C.FC.FF.FF

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Error code name	Description (alternate names)	Numeric value (hex)
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
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.	0xFFFFFC05,

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Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errPageNotInitialized)	%x05.FC.FF.FF
IsamErrorOutOfFileHandles	There are no file **handles**. (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)	0xFFFFFBFE, %xFE.FB.FF.FF
IsamErrorTooManyOpenDatabases	Too many databases are open. (JET_errTooManyOpenDatabases)	0xFFFFFBFD, %xFD.FB.FF.FF
IsamErrorInvalidDatabase	This is not a database file. (JET_errInvalidDatabase)	0xFFFFFBFC, %xFC.FB.FF.FF
IsamErrorNotInitialized	The database engine has not been initialized. (JET_errNotInitialized)	0xFFFFFBFB, %xFB.FB.FF.FF
IsamErrorAlreadyInitialized	The database engine is already initialized. (JET_errAlreadyInitialized)	0xFFFFFBFA, %xFA.FB.FF.FF
IsamErrorInitInProgress	The database engine is being initialized. (JET_errInitInProgress)	0xFFFFFBF9, %xF9.FB.FF.FF
IsamErrorFileAccessDenied	The file cannot be accessed because the file is locked or in use. (JET_errFileAccessDenied)	0xFFFFFBF8, %xF8.FB.FF.FF
IsamErrorBufferTooSmall	The buffer is too small. (JET_errBufferTooSmall)	0xFFFFFBF2, %xF2.FB.FF.FF
IsamErrorTooManyColumns	Too many columns are defined. (JET_errTooManyColumns)	0xFFFFFBF0, %xF0.FB.FF.FF

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Error code name	Description (alternate names)	Numeric value (hex)
IsamErrorContainerNotEmpty	The container is not empty. (JET_errContainerNotEmpty)	0xFFFFFBED, %xED.FB.FF.FF
IsamErrorInvalidFilename	The file name is invalid. (JET_errInvalidFilename)	0xFFFFFBEC, %xEC.FB.FF.FF
IsamErrorInvalidBookmark	A bookmark is invalid. (JET_errInvalidBookmark)	0xFFFFFBEB, %xEB.FB.FF.FF
IsamErrorColumnInUse	The column used is in an index. (JET_errColumnInUse)	0xFFFFFBEA, %xEA.FB.FF.FF
IsamErrorInvalidBufferSize	The data buffer does not match the column size. (JET_errInvalidBufferSize)	0xFFFFFBE9, %xE9.FB.FF.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)	0xFFFFFBDD, %xDD.FB.FF.FF
IsamErrorInvalidCountry	A country/region code is invalid or unknown. (JET_errInvalidCountry)	0xFFFFFBDB, %xDB.FB.FF.FF
IsamErrorInvalidLanguageId	A language ID is invalid or unknown. (JET_errInvalidLanguageId)	0xFFFFFBDA, %xDA.FB.FF.FF
IsamErrorInvalidCodePage	A code page is invalid or unknown. (JET_errInvalidCodePage)	0xFFFFFBD9, %xD9.FB.FF.FF
IsamErrorInvalidLCMapStringFlags	Invalid flags are being used for LCMapString.	0xFFFFFBD8,

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Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errInvalidLCMapStringFlags)	%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)	0xFFFFFBD7, %xD7.FB.FF.FF
IsamErrorVersionStoreOutOfMemoryAndCleanupTimedOut	The version store is out of memory and the cleanup attempt failed to complete. (JET_errVersionStoreOutOfMemoryAndCleanupTimedOut)	0xFFFFFBD6, %xD6.FB.FF.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.	0xFFFFFBC8, %xC8.FB.FF.

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Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errRunningInOneInstanceMode)	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. (JET_errOutOfSessions)	0xFFFFFBB3, %xB3.FB.FF.FF
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 handle is invalid. (JET_errInvalidSesid)	0xFFFFFBB0, %xB0.FB.FF.FF
IsamErrorWriteConflictPrimaryIndex	An update was attempted on an uncommitted	0xFFFFFBAF,

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Error code name	Description (alternate names)	Numeric value (hex)
	primary index. (JET_errWriteConflictPrimaryIndex)	%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)	0xFFFFFBAA, %xAA.FB.FF.FF
IsamErrorSessionWriteConflict	Two different cursors attempted to replace the same record in the same session. (JET_errSessionWriteConflict)	0xFFFFFBA9, %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)	0xFFFFFBA8, %xA8.FB.FF.FF
IsamErrorCannotMaterializeForwardOnlySort	The temporary table could not be created due to parameters that conflict with JET_bitTTForwardOnly. (JET_errCannotMaterializeForwardOnlySort)	0xFFFFFBA7, %xA7.FB.FF.FF
IsamErrorSesidTableIdMismatch	The session handle cannot be used with the table id because it was not used to create it. (JET_errSesidTableIdMismatch)	0xFFFFFBA6, %xA6.FB.FF.FF
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

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Error code name	Description (alternate names)	Numeric value (hex)
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. (JET_errDatabase500Format)	0xFFFFFB44, %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

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Error code name	Description (alternate names)	Numeric value (hex)
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 transaction log but failed due to an incompatible version of that operation. (JET_errInvalidCreateDbVersion)	0xFFFFFB37, %x37.FB.FF.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

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Error code name	Description (alternate names)	Numeric value (hex)
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.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 **NoFixedVarColumnsInDerivedTables** flag set. (JET_errCannotAddFixedVarColumnToDerivedTable)	0xFFFFFACE, %xCE.FA.FF.FF

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Error code name	Description (alternate names)	Numeric value (hex)
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
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	0xFFFFFA69,

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Error code name	Description (alternate names)	Numeric value (hex)
	engine can support. (JET_errIndexTuplesTooManyColumns)	%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 **JET_bitRetrieveFromIndex** 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. (JET_errNullInvalid, JET_errColumnIllegalNull)	0xFFFFFA20, %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

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Error code name	Description (alternate names)	Numeric value (hex)
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
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	0xFFFFFA08,

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Error code name	Description (alternate names)	Numeric value (hex)
	normalized, and it is normalizing truncated data before comparison. (JET_errMultiValuedDuplicateAfterTruncation)	%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.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.	0xFFFFF95A,

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Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errInvalidOnSort)	%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. (JET_errFileNotFound)	0xFFFFF8ED, %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. (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 already has a session context set. (JET_errSessionContextAlreadySet)	0xFFFFF888, %x88.F8.FF.FF

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Error code name	Description (alternate names)	Numeric value (hex)
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 currently in use. (JET_errSessionInUse)	0xFFFFF886, %x86.F8.FF.FF
IsamErrorRecordFormatConversionFailed	An internal error occurred during a dynamic record format conversion. (JET_errRecordFormatConversionFailed)	0xFFFFF885, %x85.F8.FF.FF
IsamErrorOneDatabasePerSession	Only one open user database per session 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 in is 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.	0xFFFFF446, %x46.F4.FF.

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Error code name	Description (alternate names)	Numeric value (hex)
	(JET_errLSNotSet)	FF
IsamErrorFileIOSparse	An I/O operation failed because it was attempted against an unallocated region of a file. (JET_errFileIOSparse)	0xFFFFF060, %x60.F0.FF.FF
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 **RopOpenStream** ROP ([MS-OXCROPS] 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.	0x80040304, %x04.03.04.80

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Error code name	Description (alternate names)	Numeric value (hex)
	(MAPI_E_UNEXPECTED_TYPE, ecPropType)	
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 **property IDs** 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. (MAPI_W_PARTIAL_COMPLETION,	0x00040680, %x80.06.04.00

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Warning code name	Description (alternate names)	Numeric value (hex)
	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, JET_wrnRecordFoundGreater, JET_wrnRecordFoundLess)	0x0000040F, %x0F.04.00.00
IsamWarningNoErrorInfo	There is no extended error information. (JET_wrnNoErrorInfo)	0x0000041F, %x1F.04.00.00
IsamWarningNoIdleActivity	No idle activity occurred.	0x00000422,

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Warning code name	Description (alternate names)	Numeric value (hex)
	(JET_wrnNoIdleActivity)	%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 **binary large object (BLOB)** 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 **itagSequence** member from the **JET_ENUMCOLUMNVALUE** 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
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.	0x00000652,

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Warning code name	Description (alternate names)	Numeric value (hex)
	(JET_wrnKeyChanged)	%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.	0x000000001, %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

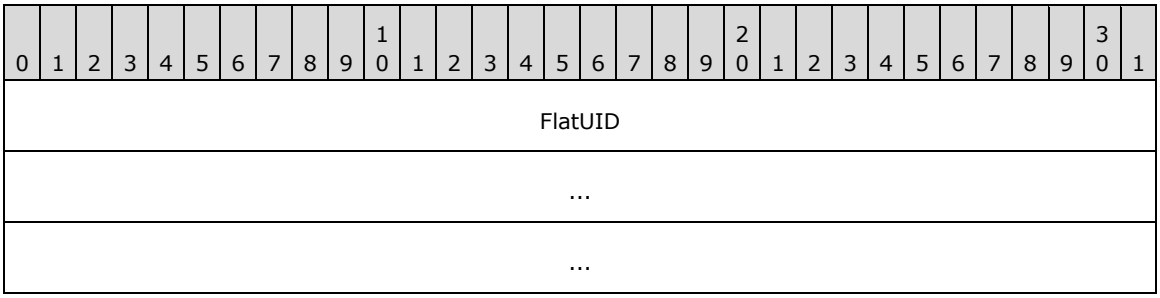
2.5 Flat UID Structures

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 certain fields.



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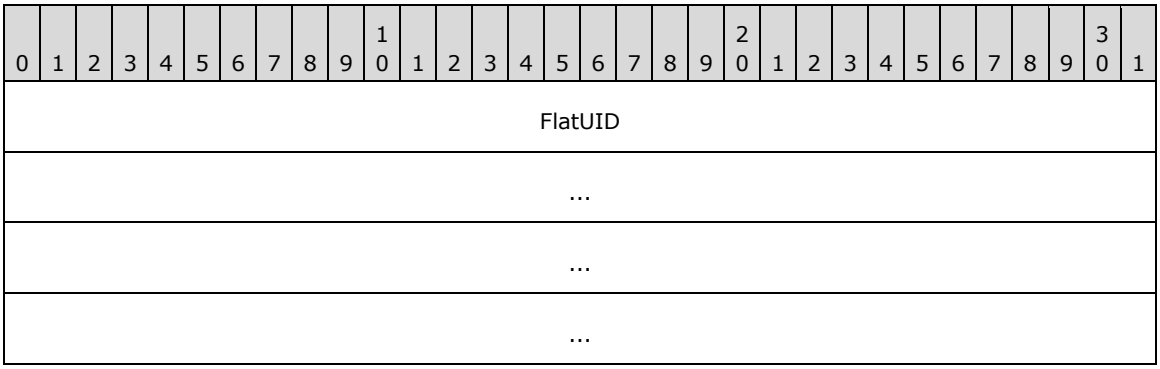
FlatUID (16 bytes): A flat little-endian sequence used as a unique identifier in various structures.

2.5.2 FlatUID_r Structure



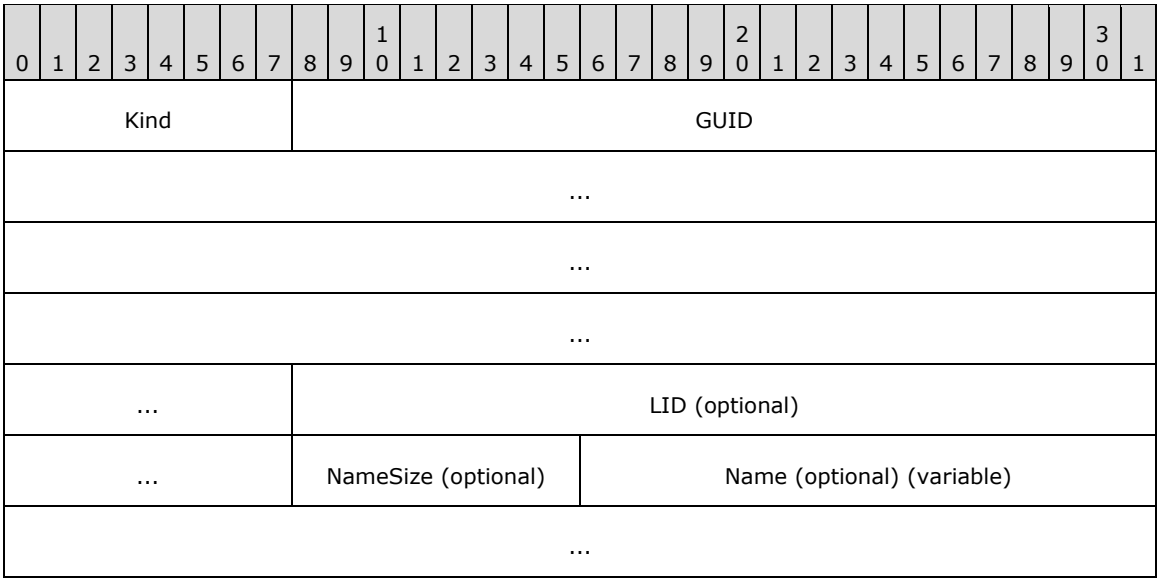
FlatUID (16 bytes): A flat little-endian sequence used as a unique identifier in various structures.

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



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

Value	Meaning
0x00	The property is identified by the **LID** field.
0x01	The property is identified by the **Name** field.
0xFF	The property does not have an associated **PropertyName** 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 is always in little-endian byte order. Client code on big-endian systems is therefore required to place **GUID** fields in little-endian byte order in the request buffer.

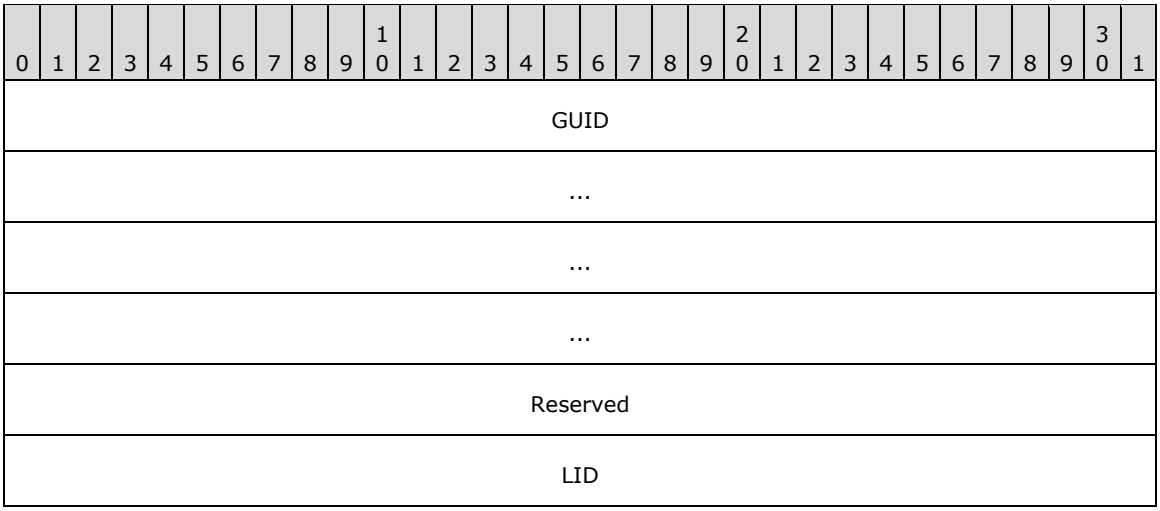
LID (optional) (4 bytes): This field is present only if the value of the **Kind** field is equal to 0x00. An unsigned integer that identifies the named property within its property set.

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.



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. Unlike the optional **LID** field in the **PropertyName** structure, the **LID** field is always present in the **PropertyName_r** structure. Also, string names for named properties are not allowed.

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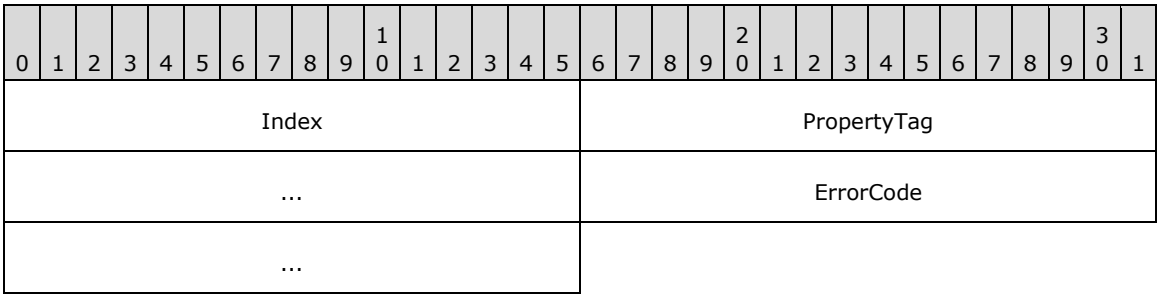
2.7 PropertyProblem Structure

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



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

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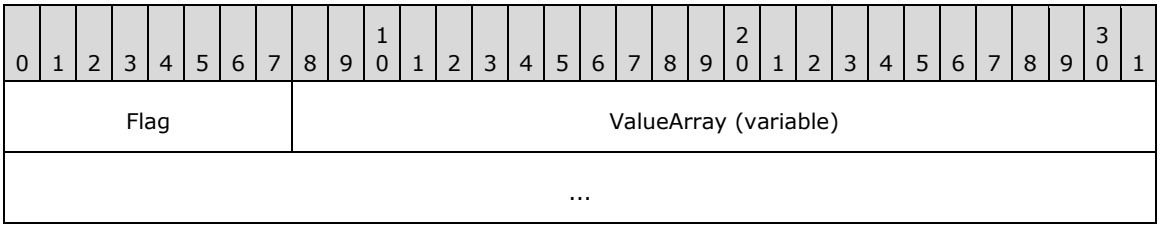
RopQueryRows ROPs, property values are returned in the order of the properties in the table, set by a prior call to a **RopSetColumns** ROP request ([MS-OXCROPS] section 2.2.5.1).

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.

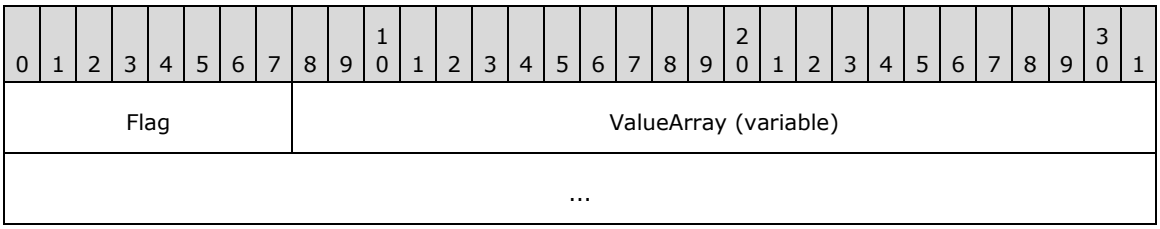
2.8.1.1 StandardPropertyRow Structure



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



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**.

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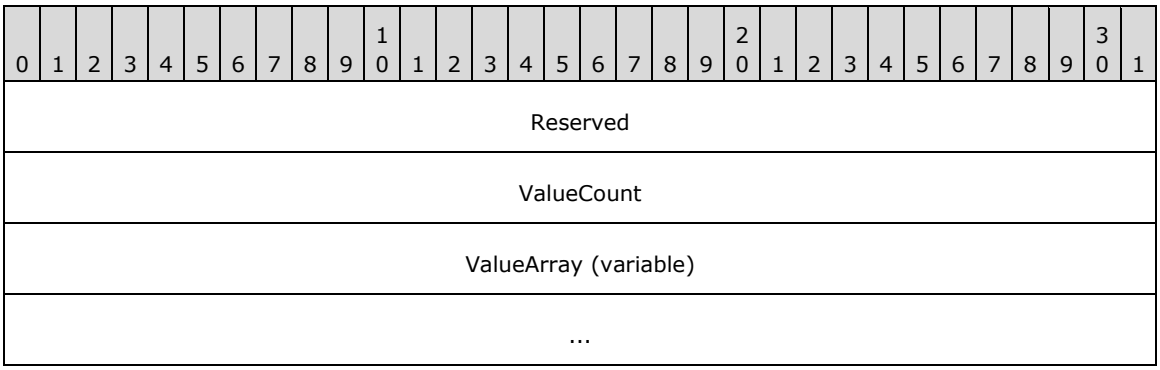
2.8.1.3 PropertyRow_r Structure



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.

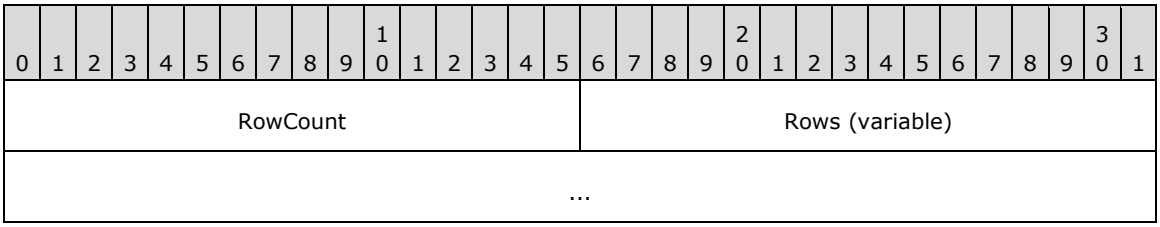
2.8.2 PropertyRowSet Structures

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



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

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

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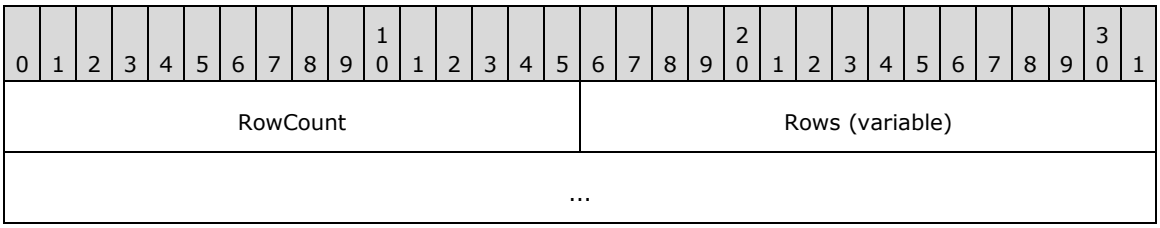
2.8.2.2 PropertyRowSet_r Structure



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:

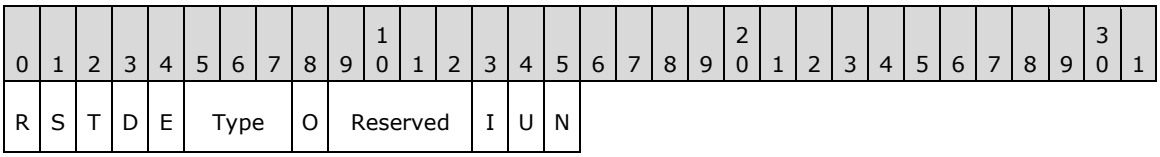
- A flags field indicating which of several standard properties are present
- Standard property values
- Arbitrary property values outside the standard set

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



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)

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- 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.

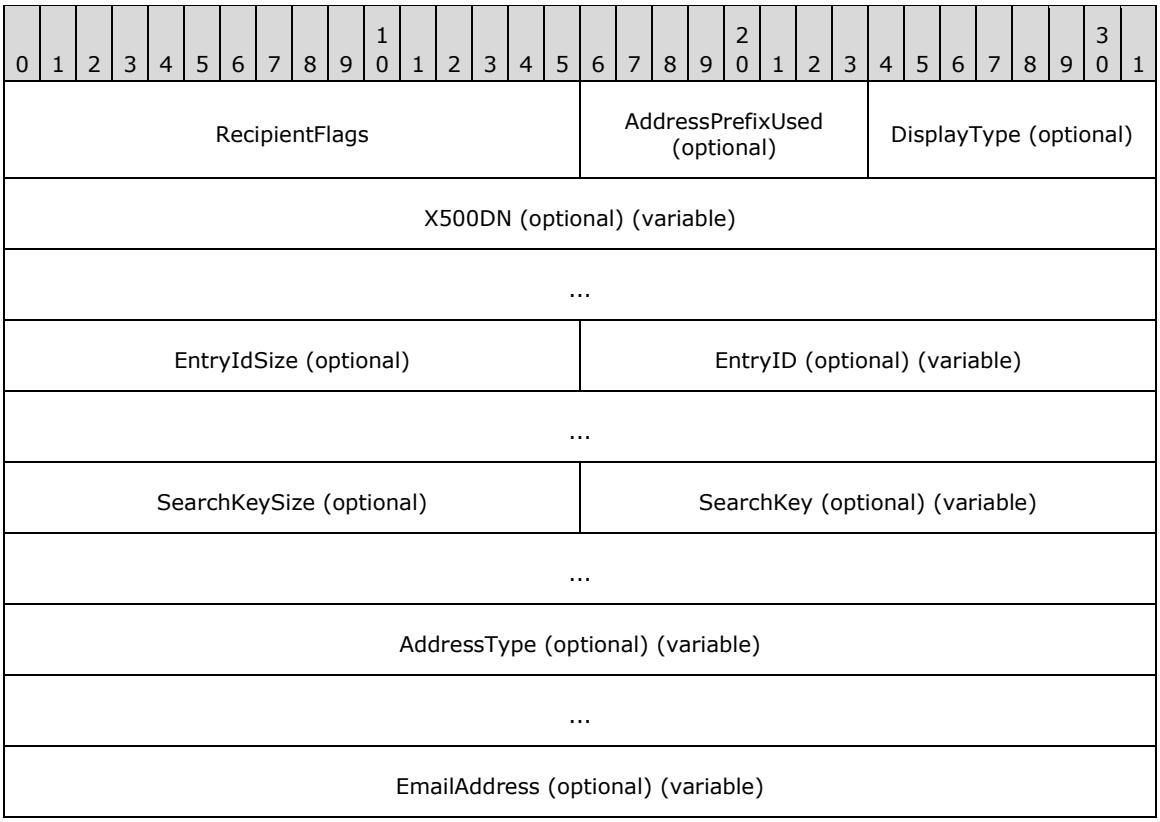
Reserved (4 bits): (mask 0x7800) The server MUST set this to b'0000'.

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



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...	
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 is used for 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).

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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 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 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 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 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.

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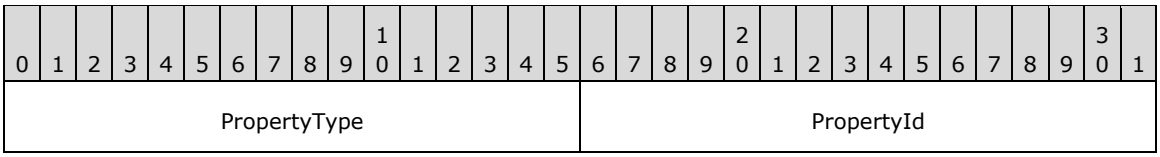


PropertyType (2 bytes): An unsigned integer that identifies the data type of the property value, as specified by the table in section 2.11.1.

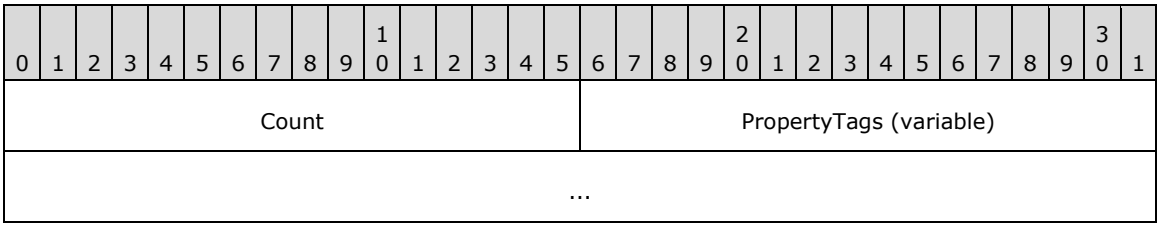
PropertyId (2 bytes): An unsigned integer that identifies the property.

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.

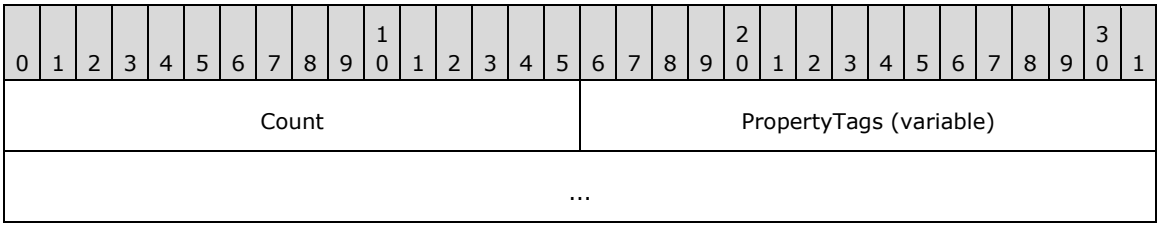
2.10.1 PropertyTagArray Structure



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



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.

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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. However, in the context of **extended rules**, as specified in [MS-OXORULE] section 2.2.4, byte counts for **PtypBinary** property values and value counts for **PtypMultiple** property values are 32 bits wide, and in the context of the MAPI extensions for **HTTP**, as specified in [MS-OXCMAPIHTTP], byte counts for **PtypBinary** property values are 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 always set to 0x0000.

Property type name	Property type value	Property type specification	Alternate names
PtypInteger16	0x0002, %x02.00	2 bytes; a 16-bit integer [MS-DTYP]: **INT16**	PT_SHORT, PT_I2, i2, ui2
PtypInteger32	0x0003, %x03.00	4 bytes; a 32-bit integer [MS-DTYP]: **INT32**	PT_LONG, PT_I4, int, ui4
PtypFloating32	0x0004, %x04.00	4 bytes; a 32-bit floating point number [MS-DTYP]: **FLOAT**	PT_FLOAT, PT_R4, float, r4
PtypFloating64	0x0005, %x05.00	8 bytes; a 64-bit floating point number [MS-DTYP]: **DOUBLE**	PT_DOUBLE, PT_R8, r8
PtypCurrency	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 [MS-DTYP]: **LONGLONG** [MS-OAUT]: **CURRENCY**	PT_CURRENCY, fixed.14.4
PtypFloatingTime	0x0007, %x07.00	8 bytes; a 64-bit floating point 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]: **DOUBLE** [MS-OAUT]: **DATE**	PT_APPTIME
PtypErrorCode	0x000A, %x0A.00	4 bytes; a 32-bit integer encoding error information as specified in section 2.4.1.	PT_ERROR

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Property type name	Property type value	Property type specification	Alternate names
PtypBoolean	0x000B, %x0B.00	1 byte; restricted to 1 or 0 [MS-DTYP]: **BOOLEAN**	PT_BOOLEAN. bool
PtypInteger64	0x0014, %x14.00	8 bytes; a 64-bit integer [MS-DTYP]: **LONGLONG**	PT_LONGLONG, PT_I8, i8, ui8
PtypString	0x001F, %x1F.00	Variable size; a string of Unicode characters in **UTF-16LE** format encoding with terminating null character (0x0000).	PT_UNICODE, string
PtypString8	0x001E, %z1E.00	Variable size; a string of multibyte characters in externally specified encoding with terminating null character (single 0 byte).	PT_STRING8
PtypTime	0x0040, %x40.00	8 bytes; a 64-bit integer representing the number of 100-nanosecond intervals since January 1, 1601 [MS-DTYP]: **FILETIME**	PT_SYSTIME, time, datetime, datetime.tz, datetime.rfc1123, Date, time, time.tz
PtypGuid	0x0048, %x48.00	16 bytes; a GUID with **Data1**, **Data2**, and **Data3** fields in little-endian format [MS-DTYP]: GUID	PT_CLSID, UUID
PtypServerId	0x00FB, %xFB.00	Variable size; a 16-bit **COUNT** field followed by a structure as specified in section 2.11.1.4.	PT_SVREID
PtypRestriction	0x00FD, %xFD.00	Variable size; a byte array representing one or more Restriction structures as specified in section 2.12.	PT_SRESTRICT
PtypRuleAction	0x00FE, %xFE.00	Variable size; a 16-bit **COUNT** field followed by that many rule action structures, as specified in [MS-OXORULE] section 2.2.5.	PT_ACTIONS
PtypBinary	0x0102, %x02.01	Variable size; a **COUNT** field followed by that many bytes.	PT_BINARY
PtypMultipleInteger16	0x1002, %x02.10	Variable size; a **COUNT** field followed by that many **PtypInteger16** values.	PT_MV_SHORT, PT_MV_I2, mv.i2
PtypMultipleInteger32	0x1003, %x03.10	Variable size; a **COUNT** field followed by that many **PtypInteger32** values.	PT_MV_LONG, PT_MV_I4, mv.i4
PtypMultipleFloating32	0x1004, %x04.10	Variable size; a **COUNT** field followed by that many **PtypFloating32** values.	PT_MV_FLOAT, PT_MV_R4, mv.float
PtypMultipleFloating64	0x1005, %x05.10	Variable size; a **COUNT** field followed by that many **PtypFloating64** values.	PT_MV_DOUBLE, PT_MV_R8
PtypMultipleCurrency	0x1006, %x06.10	Variable size; a **COUNT** field followed by that many **PtypCurrency** values.	PT_MV_CURRENCY, mv.fixed.14.4
PtypMultipleFloatingTime	0x1007, %x07.10	Variable size; a **COUNT** field followed by that many **PtypFloatingTime** values.	PT_MV_APPTIME

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Property type name	Property type value	Property type specification	Alternate names
PtypMultipleInteger64	0x1014, %x14.10	Variable size; a **COUNT** field followed by that many **PtypInteger64** values.	PT_MV_I8, PT_MV_LONGLONG
PtypMultipleString	0x101F, %x1F.10	Variable size; a **COUNT** field followed by that many **PtypString** values.	PT_MV_UNICODE
PtypMultipleString8	0x101E, %x1E.10	Variable size; a **COUNT** field followed by that many **PtypString8** values.	PT_MV_STRING8, mv.string
PtypMultipleTime	0x1040, %x40.10	Variable size; a **COUNT** field followed by that many **PtypTime** values.	PT_MV_SYSTIME
PtypMultipleGuid	0x1048, %x48.10	Variable size; a **COUNT** field followed by that many **PtypGuid** values.	PT_MV_CLSID, mv.uuid
PtypMultipleBinary	0x1102, %x02.11	Variable size; a **COUNT** field followed by that many **PtypBinary** values.	PT_MV_BINARY, mv.bin.hex
PtypUnspecified	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 **NspiGetIDsFromNames** or the **RopGetPropertyIdsFromNames** ROP request ([MS-OXCROPS] section 2.2.8.1).	PT_UNSPECIFIED
PtypNull	0x0001, %x01.00	None: This property is a placeholder.	PT_NULL
PtypObject or PtypEmbeddedTable	0x000D, %x0D.00	The property value is a **Component Object Model (COM)** object, as specified in section 2.11.1.5.	PT_OBJECT

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**).

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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**).

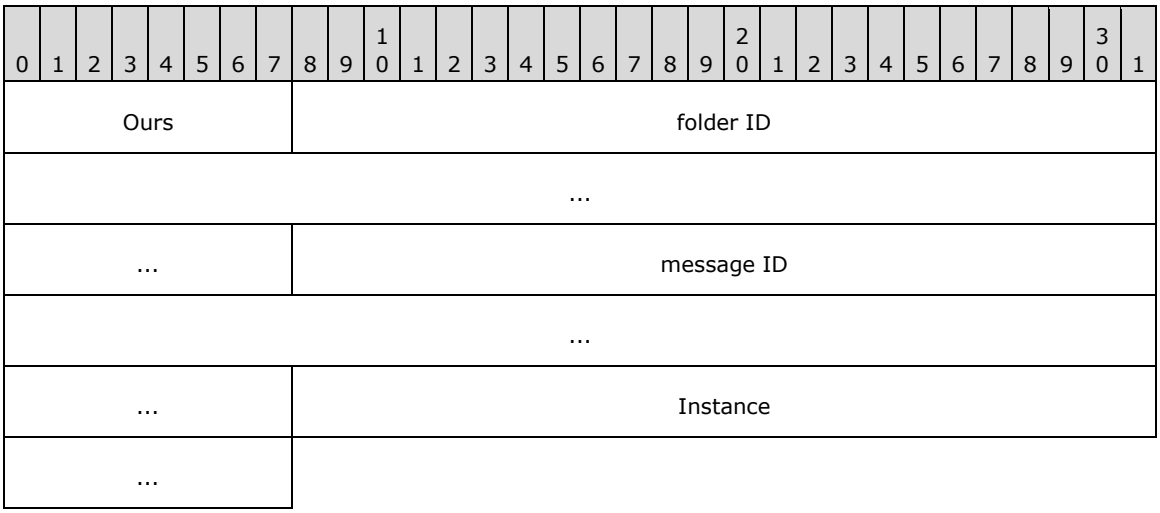
In requests sent to a message store server, the code page of strings MUST match the code page sent to the server in an **EcDoConnectEx** method call, as specified in [MS-OXCRPC] section 3.1.4.1, or sent to the server using the **Connect** request type<7>, as specified in [MS-OXCMAPIHTTP] section 2.2.4.1. 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



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 **ServerIds** to compare against. This field is used only for searches against **multivalue properties** and MUST be zero in any other context.

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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
PtypBinary	i1	The Unicode value of the element is interpreted as an optionally signed 1-byte, 8-bit decimal integer.	As a **byte**, as specified in [XMLSCHEMA2/2] **Example:** <element... d:dt="i1">3</element>
PtypInteger16	i2	The Unicode value of the element is interpreted as an optionally signed 2-byte, 16-bit decimal integer.	As a **short**, as specified in [XMLSCHEMA2/2] **Example:** <element... d:dt="i2">-255</element>
PtypInteger32	int	The Unicode value of the element is interpreted as an optionally signed 4-byte, 32-bit decimal	As an **int**, as specified in [XMLSCHEMA2/2] **Example:** <element... d:dt="int">-53496</element>

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Server property type name	WebDAV property type name	Description	Format
		integer.	
PtypInteger64	i8	The Unicode value of the element is interpreted as an optionally signed 8-byte, 64-bit decimal integer.	As a **long**, as specified in [XMLSCHEMA2/2] **Example:** <element... d:dt="i8">-32415</element>
PtypBinary	ui1	The Unicode value of the element is interpreted as an unsigned 1-byte, 8-bit decimal integer.	As an **unsignedByte**, as specified in [XMLSCHEMA2/2] **Example:** <element... d:dt="ui1">255</element>
PtypInteger16	ui2	The Unicode value of the element is interpreted as an unsigned 2-byte, 16-bit decimal integer.	As an **unsignedShort**, as specified in [XMLSCHEMA2/2] **Example:** <element... d:dt="ui2">2296</element>
PtypInteger32	ui4	The Unicode value of the element is interpreted as an unsigned 4-byte, 32-bit decimal integer.	As an **unsignedInt**, as specified in [XMLSCHEMA2/2] **Example:** <element... d:dt="ui4">32768</element>
PtypInteger64	ui8	The Unicode value of the element is interpreted as an unsigned 8-byte, 64-bit decimal integer.	As an **unsignedLong**, as specified in [XMLSCHEMA2/2] **Example:** <element... d:dt="ui8">-189</element>
PtypFloating64	float	The Unicode value of the element is interpreted as a single precision floating point	float-val = (["+"] / "-") [1*DIGIT] ["." 1*DIGIT] ["d" / "D" / "e" / "E" (["+"] / "-") 1*DIGIT] **Example:** <element... d:dt="float">9.9</element>

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Server property type name	WebDAV property type name	Description	Format
		number.	
PtypFloating32	r4	The Unicode value of the element is interpreted as a 4-byte single precision floating point number.	r4-val = (["+"] / "-") [1*DIGIT] ["." 1*DIGIT] ["d" / "D" / "e" / "E" (["+"] / "-") 1*DIGIT] **Example:** <element... d:dt="r4">9.9</element>
PtypFloating64	r8	The Unicode value of the element is interpreted as an 8-byte double precision floating point number.	r8-val = (["+"] / "-") [1*DIGIT] ["." 1*DIGIT] ["d" / "D" / "e" / "E" (["+"] / "-") 1*DIGIT] **Example:** <element... d:dt="r8">.333333333</element>
PtypBoolean	boolean	The Unicode value of the element is interpreted as a Boolean value either "1" (TRUE) or "0" (FALSE).	As a **boolean**, as specified in [XMLSCHEMA2/2] **Example:** <element... d:dt="boolean">1</element>
PtypString	string	The Unicode value of the element is interpreted as a sequence of Unicode characters.	As a **string**, as specified in [XMLSCHEMA2/2] **Example:** <element... d:dt="string">Description</element>
PtypString	char	The Unicode value of the element is interpreted as a single Unicode character. The character data type maps to a string and can be used for any sequence of Unicode characters.	char-val = 1VCHAR **Example:** <element... d:dt="char">D</element>

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Server property type name	WebDAV property type name	Description	Format
PtypCurrency	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 **Example:** <element... d:dt="fixed.14.4">00000000000012.9500</element>
PtypString	number	The Unicode value of the element is interpreted as a number, limited by the operating system limits, which can optionally contain a leading sign, fractional digits, and an exponent.	As a **string**, as specified in [XMLSCHEMA2/2] **Example:** <element... d:dt="number">-123.456E+10</element>
PtypTime	dateTime	The Unicode value of the element is interpreted as a date and time value expressed in the format	As specified in [ISO-8601] **Example:** <element... d:dt="datetime">2008-09-19T18:53:47.060</element>

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Server property type name	WebDAV property type name	Description	Format
		specified in [ISO-8601] with no time zone specified.	
PtypTime	dateTime.tz	The Unicode value of the element is interpreted as a date and time value expressed in the format specified in [ISO-8601] with an optional time zone identifier.	As specified in [ISO-8601] **Example:** <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>
PtypTime	dateTime.rfc1123	The Unicode value of the element is interpreted as a date and time value expressed in the format specified in [RFC1123].	As specified in [RFC1123] **Example:** <element... d:dt="datetime.rfc1123">Mon, 15 Feb 1999 13:05:29-0700</element>
PtypTime	Date	The Unicode value of the element is interpreted as a date value that is expressed in the format specified in [ISO-8601] with no time or time zone specified.	As specified in [ISO-8601] **Example:** <element... d:dt="date">2008-09-18</element>
PtypTime	time	The Unicode value of the element is interpreted as a time value expressed in the format	As specified in [ISO-8601] **Example:** <element... d:dt="time">19T18:53:47.060</element>

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Server property type name	WebDAV property type name	Description	Format
		specified in [ISO-8601] with no date or time zone specified.	
PtypTime	time.tz	The Unicode value of the element is interpreted as a time value expressed in the format specified in [ISO-8601] with an optional time zone identifier.	As specified in [ISO-8601] **Example:** <element... d:dt="time.tz">19T18:53:47.060Z</element> <element... d:dt="time.tz">19T18:53:47.060-0700</element>
PtypString	uri	The Unicode value of the element is interpreted as a **Uniform Resource Identifier (URI)** as specified in [RFC3986].	As specified in [RFC3986] **Example:** <element... d:dt="uri">http://www.example.com/</element>
PtypGuid	uuid	The Unicode value of the element is interpreted as a **universally unique identifier (UUID)** as specified in [RFC4122].	As specified in [RFC4122] **Example:** <element... d:dt="uuid">55B329F4-EF8A-4fac-A47C-C81213DB3061</element>
PtypBinary	bin.hex	The Unicode value of the element is interpreted as a BLOB encoded in hexadecimal digits.	As specified in [XMLSCHEMA2/2] **Example:** <element... d:dt="bin.hex">1f8b9d</element>
PtypBinary	bin.base64	The Unicode value of the element is interpreted as a BLOB	As specified in [RFC2045] **Example:** <element... d:dt="bin.base64">jfsSUsdjsdsUSDASjsdsusaqiq</element

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Server property type name	WebDAV property type name	Description	Format
		encoded in **base64 encoding** as specified in [RFC2045].	>

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
PtypMultipleInteger16	mv.i2
PtypMultipleInteger32	mv.i4
PtypMultipleFloating64	mv.float
PtypMultipleCurrency	mv.fixed.14.4
PtypMultipleString8	mv.string
PtypMultipleBinary	mv.bin.hex
PtypMultipleGuid	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

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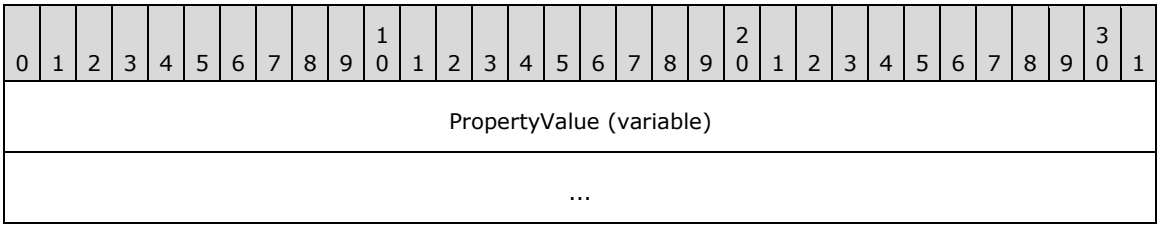
the **PropertyValue_r** structure exceeds that of the **PropertyValue** data structure, as specified in [MS-NSPI]. For property values with multiple values, the permissible number of values in the **PropertyValue_r** structure exceeds that of the **PropertyValue** data structure. The semantic meaning is otherwise unchanged from the **PropertyValue** data structure.

2.11.2.1 PropertyValue Structure



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

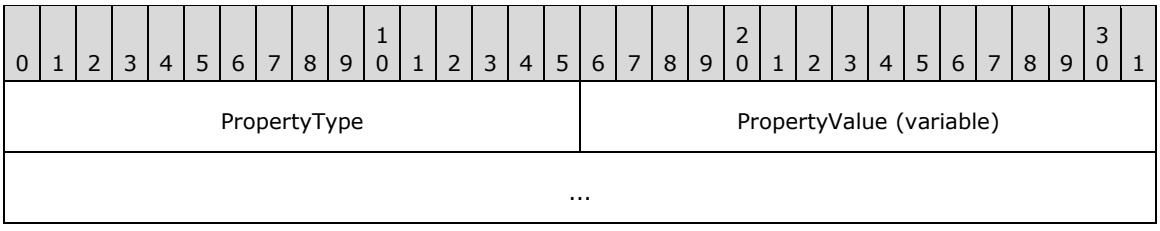
PropertyTag (4 bytes): This value encodes the property tag with the value represented by the **PropertyValue_r** structure.

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.



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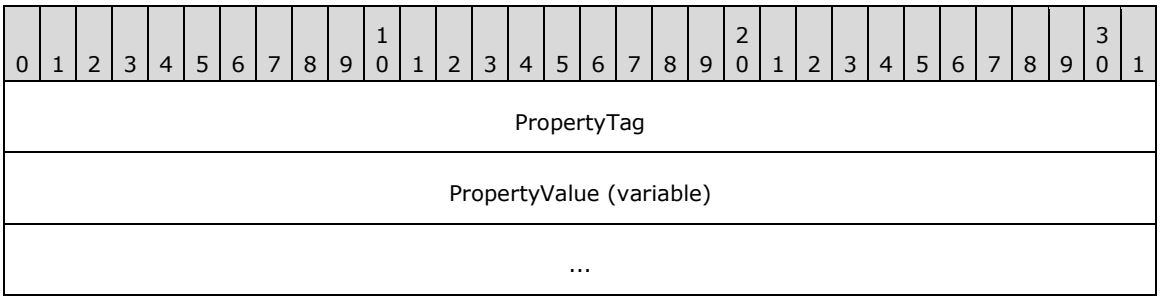
PropertyType (2 bytes): An unsigned integer that specifies the data type of the property value, according to the table in section 2.11.1.

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.

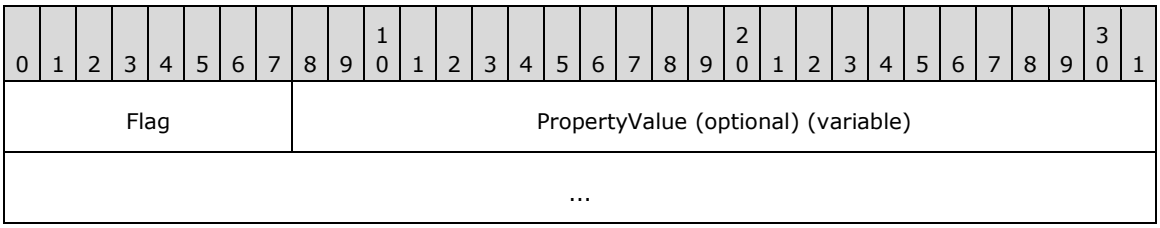


PropertyTag (4 bytes): A **PropertyTag** structure, as specified in section 2.9, giving the values of the **PropertyId** and **PropertyType** fields for the property.

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.



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 **PropertyValue** field will be a **PropertyValue** structure containing a value compatible with the property type implied by the context.
0x1	The **PropertyValue** field is not present.
0xA	The **PropertyValue** field will be a **PropertyValue** structure containing an unsigned 32-bit integer. This value is a property error code, as specified in section 2.4.2, that indicates why the property value is not present.

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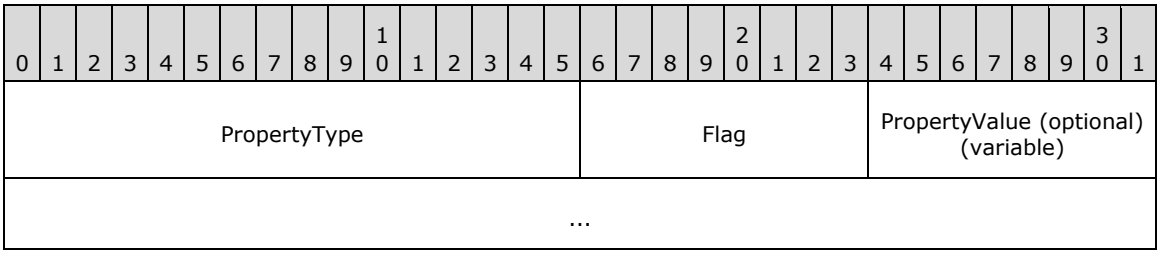
PropertyValue (optional) (variable): A **PropertyValue** structure, as specified in section 2.11.2.1, unless the **Flag** field is set to 0x1.

2.11.6 FlaggedPropertyValueWithType Structure

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



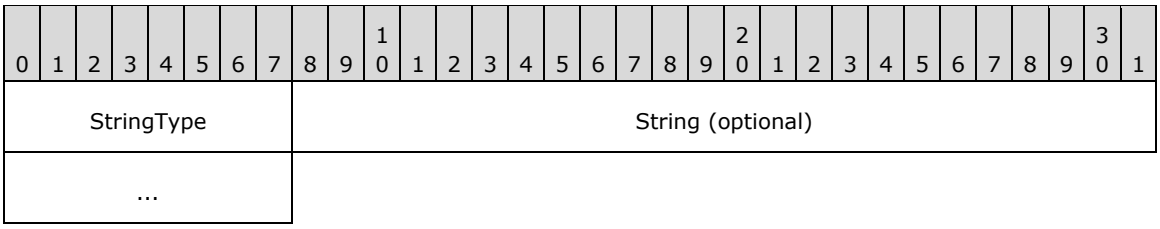
PropertyType (2 bytes): An unsigned integer that specifies the data type of the property value, according to the table in section 2.11.1.

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.



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.
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.

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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**, **CompareRestriction**, **BitMaskRestriction**, **SizeRestriction**, and **ExistRestriction**) specify specific tests based on the properties of an item.

Although the packet formats differ, the first 8 bits always store **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
AndRestriction **AndRestriction_r**	0x00	Logical **AND** operation applied to a list of subrestrictions.	**RES_AND**
OrRestriction **OrRestriction_r**	0x01	Logical **OR** operation applied to a list of subrestrictions.	**RES_OR**
NotRestriction **NotRestriction_r**	0x02	Logical **NOT** operation applied to a subrestriction.	**RES_NOT**
ContentRestriction **ContentRestriction_r**	0x03	Search a property value for specific content.	**RES_CONTENT**
PropertyRestriction **PropertyRestriction_r**	0x04	Compare a property value with a particular value.	**RES_PROPERTY**
CompareRestriction **CompareRestriction_r**	0x05	Compare the values of two properties.	**RES_COMPAREPROPS**
BitMaskRestriction **BitMaskRestriction_r**	0x06	Perform a bitwise **AND** operation on a property value with a mask and compare that with 0 (zero).	**RES_BITMASK**
SizeRestriction	0x07	Compare the size of a property value to a	**RES_SIZE**

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RestrictType value	Hexadecimal value	Description	Alternate name
SizeRestriction_r		particular figure.	
ExistRestriction **ExistRestriction_r**	0x08	Test whether a property has a value.	**RES_EXIST**
SubObjectRestriction **SubRestriction_r**	0x09	Test whether any row of a message's attachment or recipient table satisfies a subrestriction.	**RES_SUBRESTRICTION**
CommentRestriction	0x0A	Associates a comment with a subrestriction.	**RES_COMMENT**
CountRestriction	0x0B	Limits the number of matches returned from a subrestriction.	**RES_COUNT**

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.

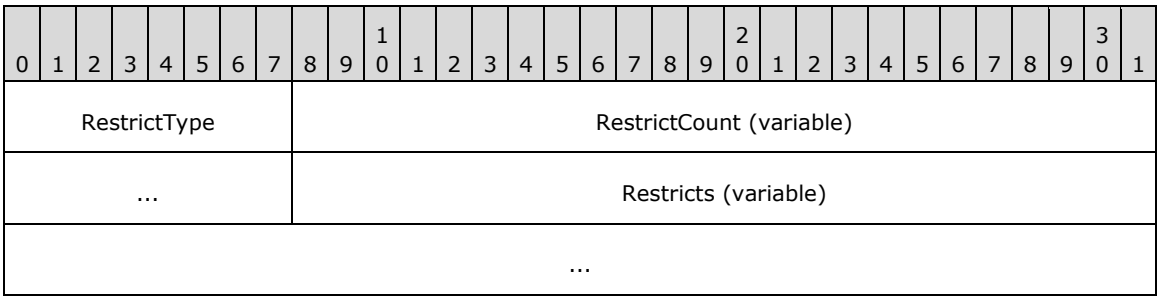
2.12.1 And Restriction Structures

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**.



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

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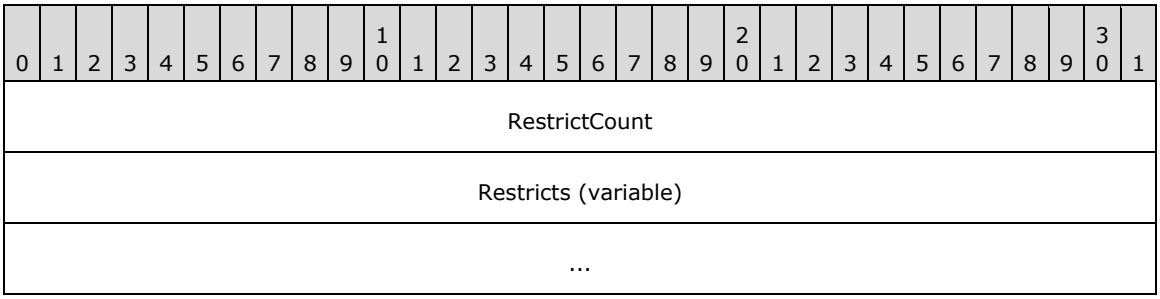
RestrictCount (variable): This value specifies how many restriction structures are present in the **Restricts** field. The width of this field is 16 bits in the context of ROPs and 32 bits in the context of extended rules.

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



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**.

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.

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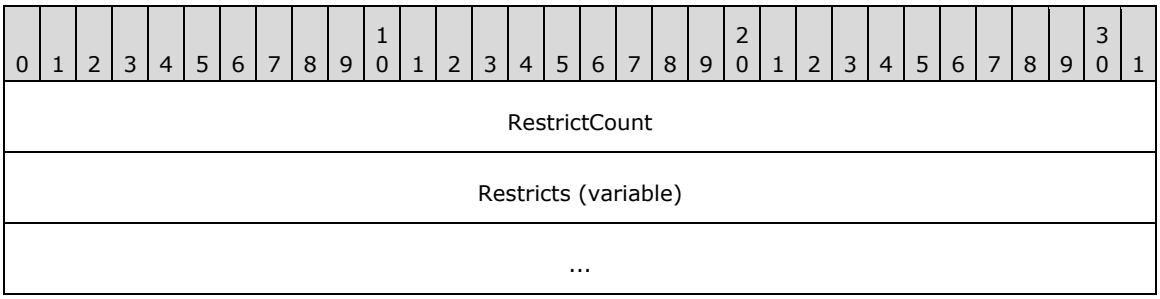
Restricts (variable): An array of restriction structures. This field MUST contain the number of structures indicated by the **RestrictCount** field.

2.12.2.2 OrRestriction_r Structure



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.

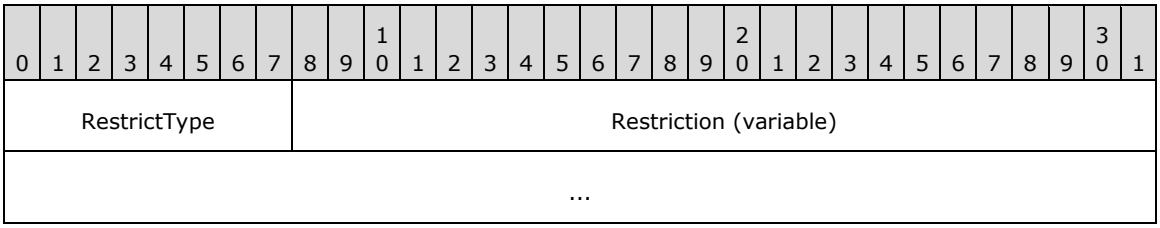
Restricts (variable): This value encodes the **Restricts** field of the **OrRestriction** structure. For more details, see section 2.12.1.

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

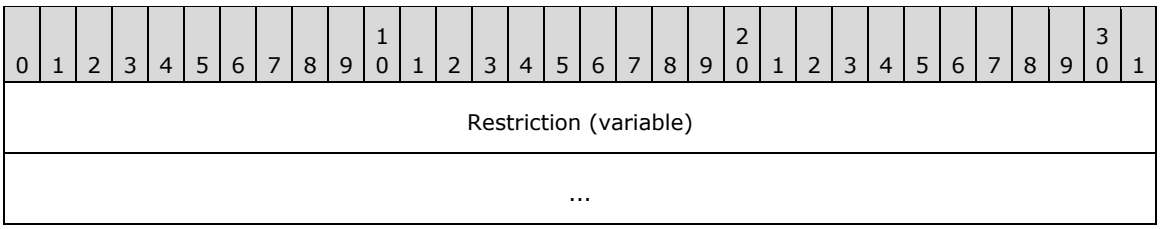


RestrictType (1 byte): An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x02.

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



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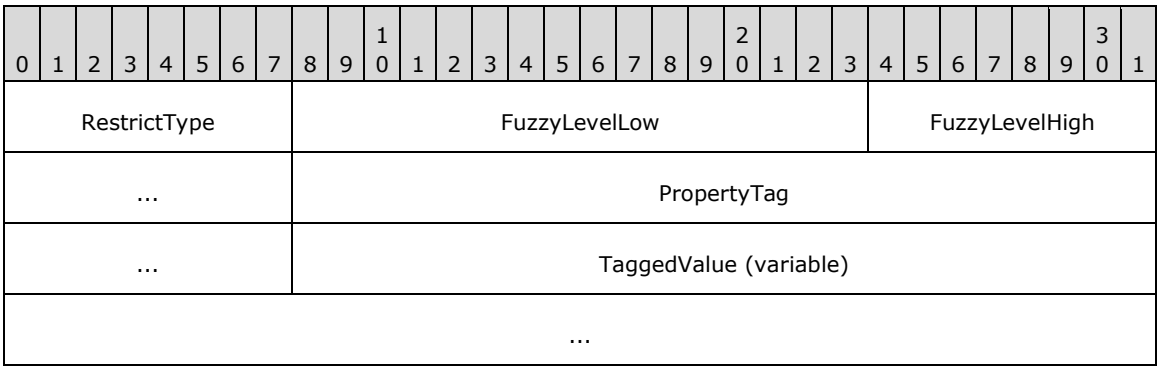
Restriction (variable): This value encodes the **Restriction** field of the **NotRestriction** structure, as specified in section 2.12.3.1.

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



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 **TaggedValue** field and the value of the column property tag match one another in their entirety.
0x0001 FL_SUBSTRING	The value stored in the **TaggedValue** field matches some portion of the value of the column property tag.
0x0002 FL_PREFIX	The value stored in the **TaggedValue** 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.

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

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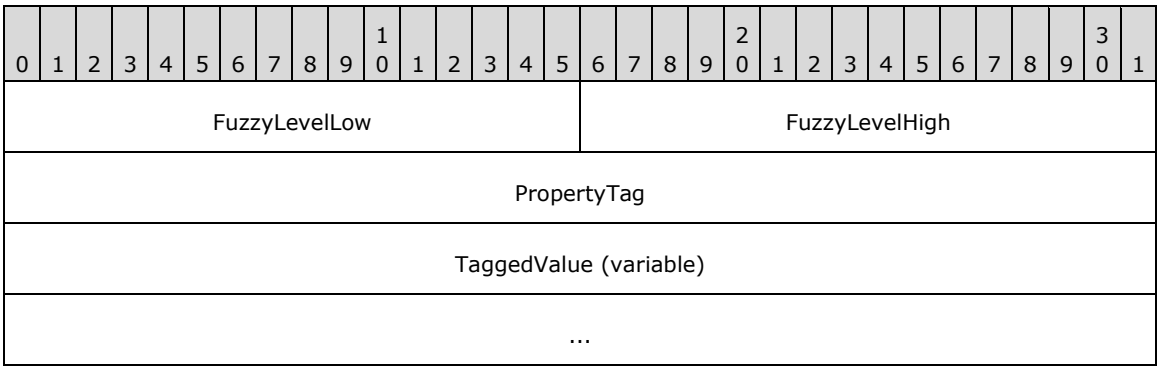
2.12.4.2 ContentRestriction_r Structure



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.

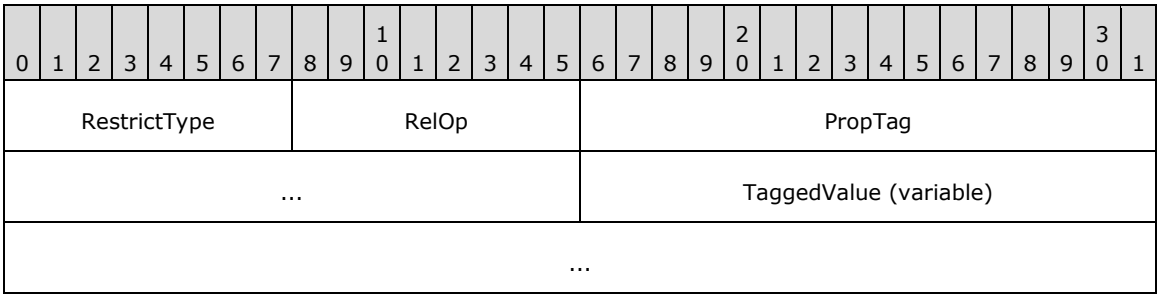
TaggedValue (variable): This value encodes the **TaggedValue** field of the **ContentRestriction** structure.

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



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.

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Relational operator	Hexadecimal value	Evaluation	Alternate name
RelationalOperatorLessThan	0x00	**TRUE** if the value of the object's property is less than the specified value.	**RELOP_LT**
RelationalOperatorLessThanOrEqual	0x01	**TRUE** if the value of the object's property is less than or equal to the specified value.	**RELOP_LE**
RelationalOperatorGreaterThan	0x02	**TRUE** if the value of the object's property value is greater than the specified value.	**RELOP_GT**
RelationalOperatorGreaterThanOrEqual	0x03	**TRUE** if the value of the object's property value is greater than or equal to the specified value.	**RELOP_GE**
RelationalOperatorEqual	0x04	**TRUE** if the object's property value equals the specified value.	**RELOP_EQ**
RelationalOperatorNotEqual	0x05	**TRUE** if the object's property value does not equal the specified value.	**RELOP_NE**
RelationalOperatorMemberOfDL	0x64	**TRUE** 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 MUST be an EntryID of a mail-enabled object in the address book. The specified property value MUST be an EntryID of a **Distribution List object** in the address book.	**RELOP_MEMBER_OF_DL**

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.

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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 **RelOp** values are supported.	Simple comparison.
Single-valued	Multivalued	Not supported.<8>	
Multivalued and the same as a property tag for a **MultivalueInstance** column in the table	Single-valued	All **RelOp** values are supported.	In this case, the client has previously called the **RopSetColumns** ROP ([MS-OXCROPS] section 2.2.5.1) with the **MultivalueInstance** bit set in the property tag that matches the value in the **PropTag** field. The value in the **TaggedValue** field is compared with the value in the column for each row. Only the row that has a matching value is returned.
Multivalued and the same as a property tag for a **MultivalueInstance** column in the table	Multivalued	Not supported.	
Multivalued and the same as a property tag for a non-**MultivalueInstance** column in the table	Single-valued	All **RelOp** values supported.	In this case, the client has previously called the **RopSetColumns** ROP without the **MultivalueInstance** bit set in the property tag that matches the value in the **PropTag** field. Each value of the property **PropTag** field is compared with the value of the **TaggedValue** field. For all **RelOp** values except **RelationalOperatorNotEqual**, one successful match means that the restriction (2) is satisfied. For **RelationalOperatorNotEqual**, the restriction (2) is satisfied when there are no matches.
Multivalued and the same as a property tag for a non-**MultivalueInstance** 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**.

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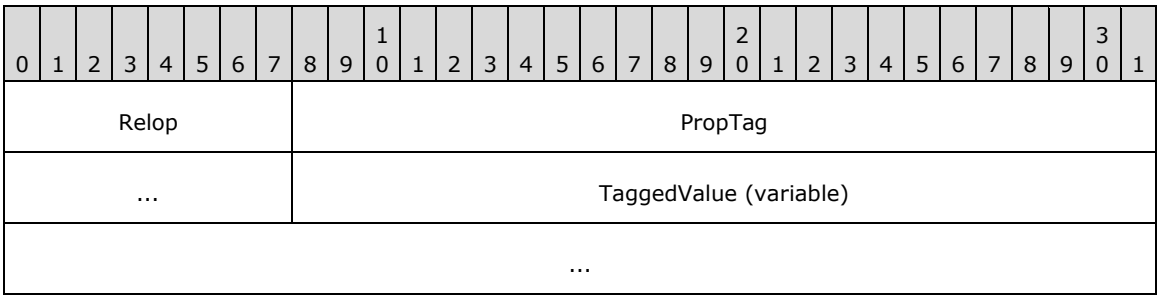
2.12.5.2 PropertyRestriction_r Structure



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.

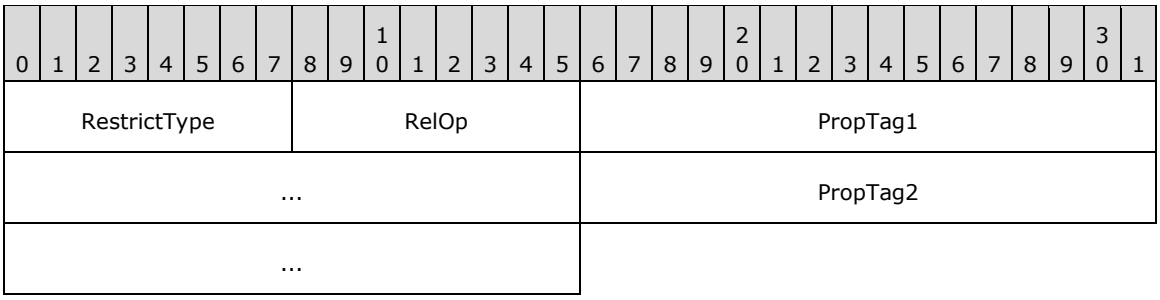
TaggedValue (variable): This value encodes the **TaggedValue** field of the **PropertyRestriction** structure.

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



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
RelationalOperatorLessThan	0x00	**TRUE** if the object's property value is less than the specified value.	**RELOP_LT**
RelationalOperatorLessThanOrEqual	0x01	**TRUE** if the object's property value is less than or equal to	**RELOP_LE**

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Relational operator	Hexadecimal value	Evaluation	Alternate name
		the specified value.	
RelationalOperatorGreaterThan	0x02	**TRUE** if the object's property value is greater than the specified value.	**RELOP_GT**
RelationalOperatorGreaterThanOrEqual	0x03	**TRUE** if the object's property value is greater than or equal to the specified value.	**RELOP_GE**
RelationalOperatorEqual	0x04	**TRUE** if the object's property value equals the specified value.	**RELOP_EQ**
RelationalOperatorNotEqual	0x05	**TRUE** if the object's property value does not equal the specified value.	**RELOP_NE**
RelationalOperatorMemberOfDL	0x64	**TRUE** if the object's property value is in the DL membership of the specified property value. The object's property value MUST be an EntryID of a mail-enabled object in the address book. Also, the specified property value MUST be an EntryID of a distribution list object in the address book.	**RELOP_MEMBER_OF_DL**

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**.

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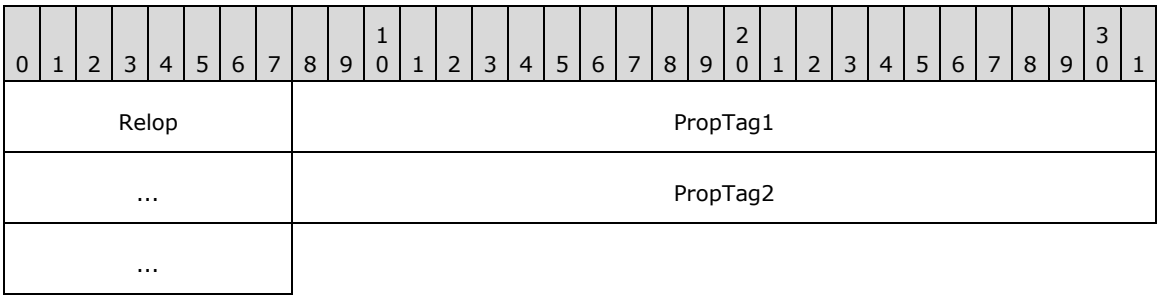
2.12.6.2 CompareRestriction_r Structure



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.

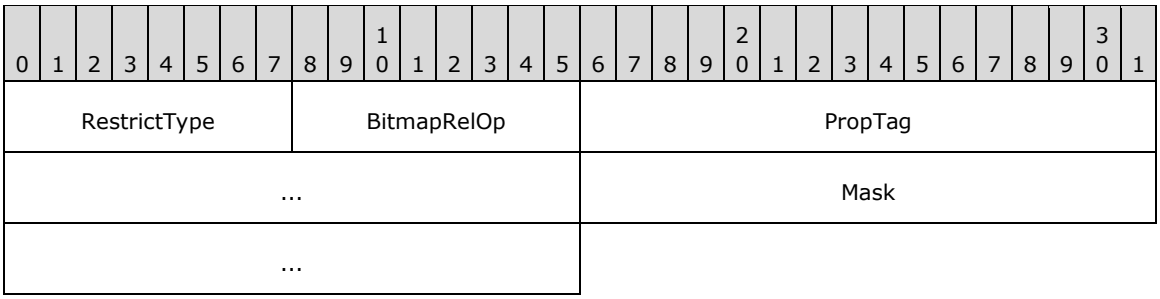
PropTag2 (4 bytes): This value encodes the **PropTag2** field of the **ComparePropertiesRestriction** structure.

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



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
BMR_EQZ	0x00	Perform a bitwise **AND** operation on the value of the **Mask** field with the value of the property **PropTag** field, and test for being equal to 0 (zero).
1. BMR_NEZ	0x01	Perform a bitwise **AND** operation on the value of the **Mask** field with the value of the property **PropTag** field, and test for not being equal to 0 (zero).

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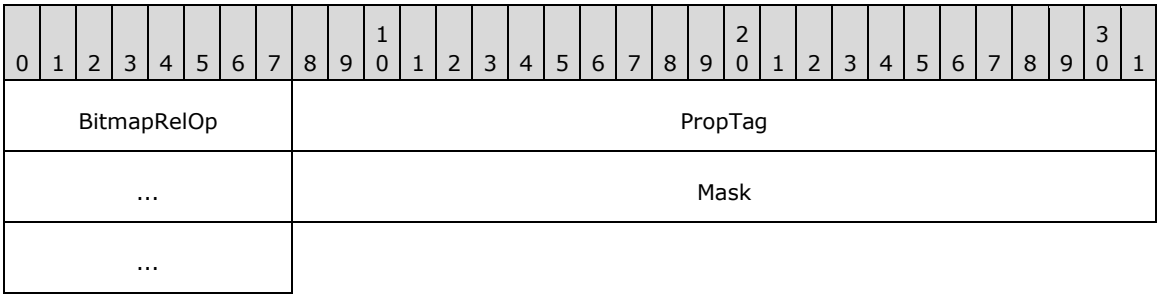
PropTag (4 bytes): An unsigned integer. This value is the property tag of the property to be tested. Its property type MUST be single-valued **Int32**, as specified in section 2.11.1.

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



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.

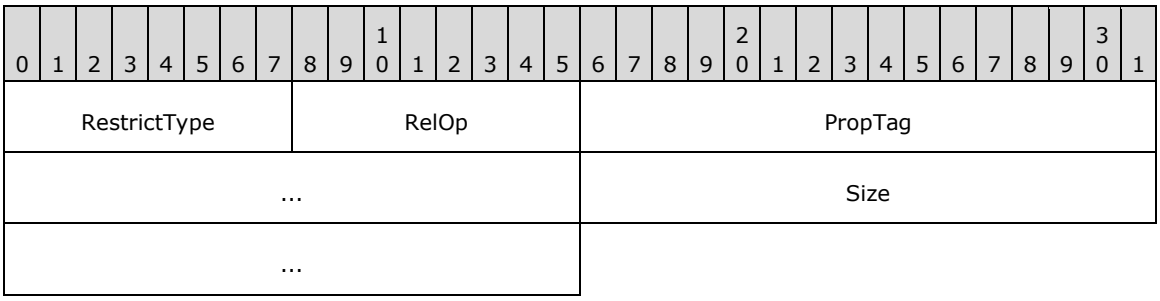
Mask (4 bytes): This value encodes the **Mask** field of the **BitMaskRestriction** structure.

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



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.

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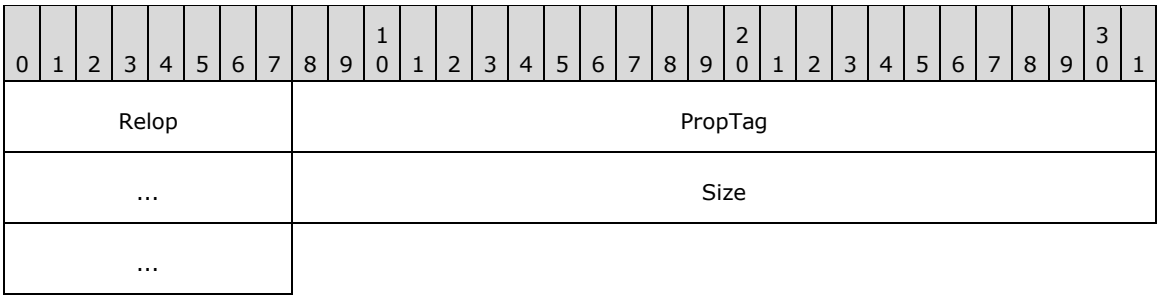
Relational operator name	Hexadecimal value	Evaluation	Alternate name
RelationalOperatorLessThan	0x00	**TRUE** if the object's property value is less than the specified value.	**RELOP_LT**
RelationalOperatorLessThanOrEqual	0x01	**TRUE** if the object's property value is less than or equal to the specified value.	**RELOP_LE**
RelationalOperatorGreaterThan	0x02	**TRUE** if the object's property value is greater than the specified value.	**RELOP_GT**
RelationalOperatorGreaterThanOrEqual	0x03	**TRUE** if the object's property value is greater than or equal to the specified value.	**RELOP_GE**
RelationalOperatorEqual	0x04	**TRUE** if the object's property value equals the specified value.	**RELOP_EQ**
RelationalOperatorNotEqual	0x05	**TRUE** if the object's property value does not equal the specified value.	**RELOP_NE**

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



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.

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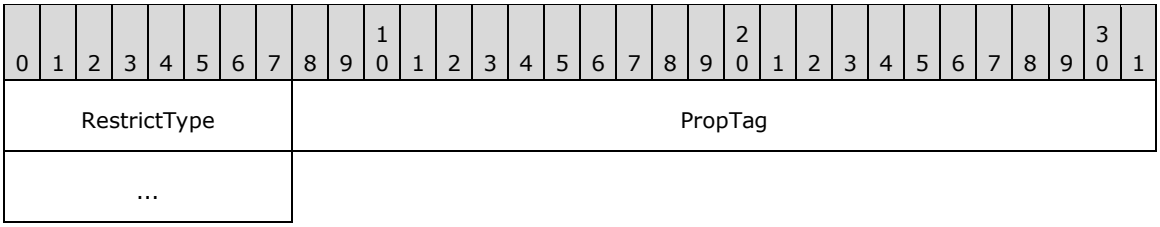
2.12.9 Exist Restriction Structures

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

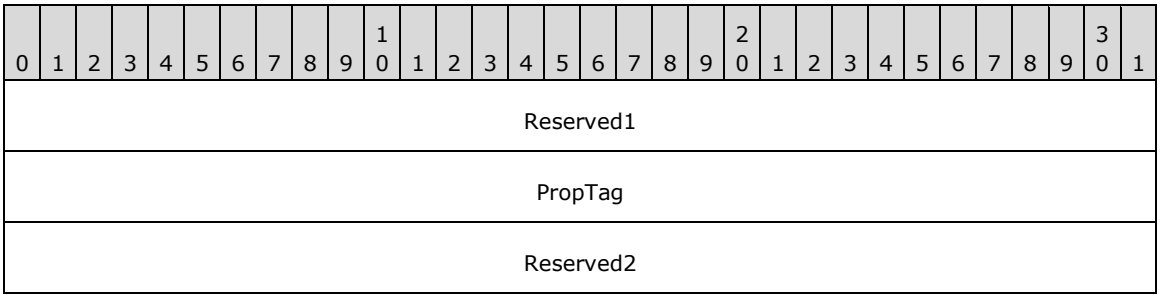


RestrictType (1 byte): An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x08.

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



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.

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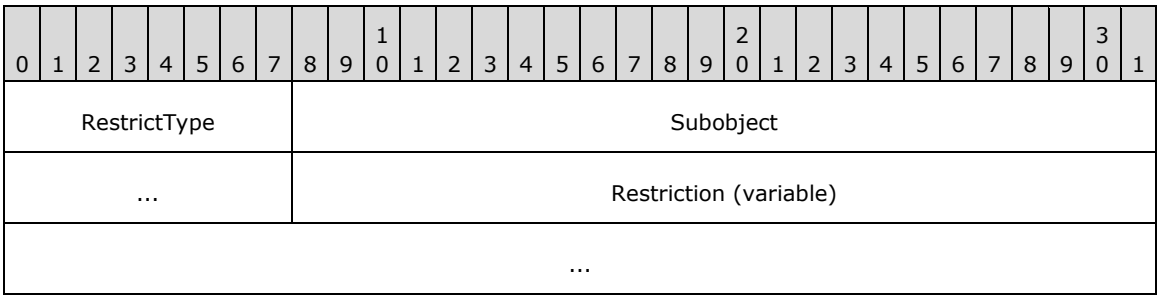
2.12.10.1 SubObjectRestriction Structure



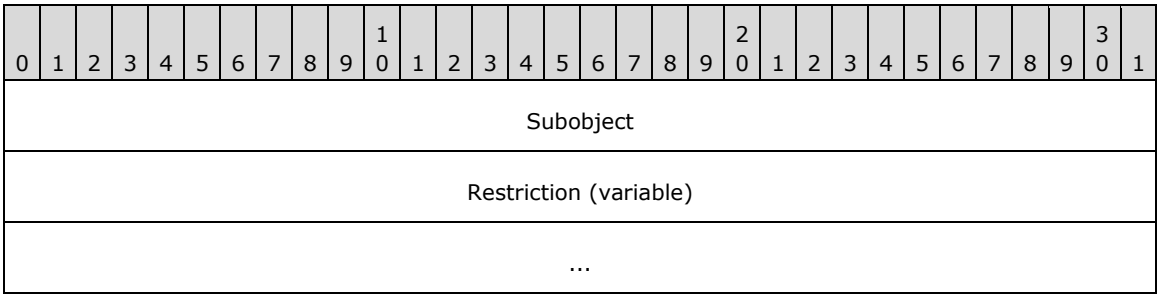
RestrictType (1 byte): An unsigned integer. This value indicates the type of restriction (2) and MUST be set to 0x09.

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
PidTagMessageRecipients ([MS-OXCMSG] section 2.2.1.47)	Apply the subrestriction to a message's recipient table.
PidTagMessageAttachments ([MS-OXPROPS] section 2.776)	Apply the subrestriction to a message's attachments table.

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

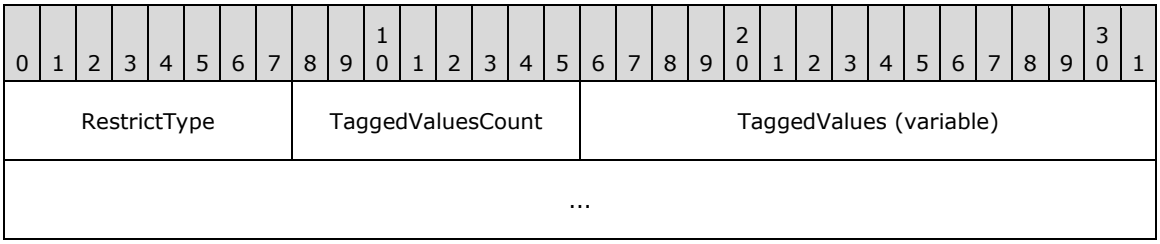
2.12.10.2 SubRestriction_r Structure



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



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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.

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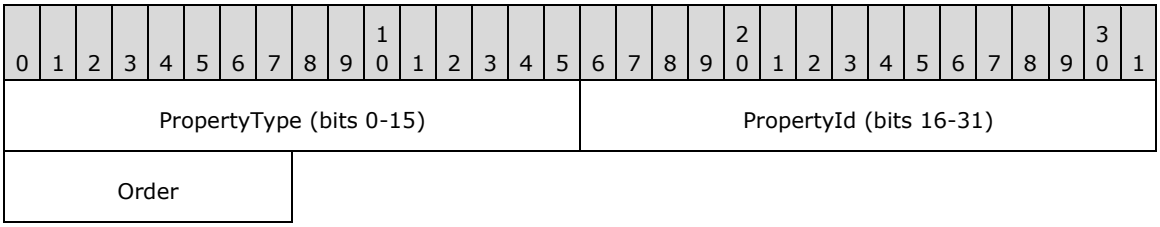
2.13.1 SortOrder Structure

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.

SortOrder structures are typically combined into a **SortOrderSet** structure, as specified in section 2.13.2, to describe multiple sort keys and directions in a **RopSortTable** ROP request ([MS-OXCROPS] section 2.2.5.2).



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.

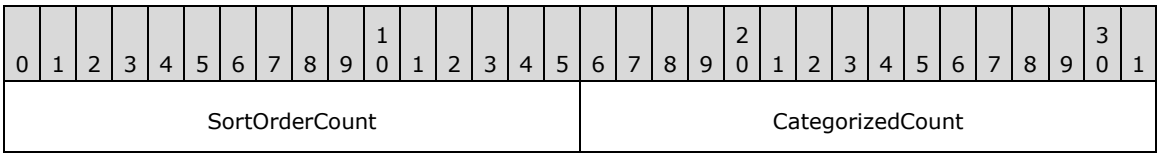
Order (1 byte): This field MUST be set to one of the values listed in the following table.

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



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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.

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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-OXCFOLD] section 2.2.2.2.1.7) with the value of the **PidTagEntryId** property ([MS-OXCPERM] 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).

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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	**RestrictType**	**AndRestriction**
02 00	**RestrictCount**	2
00	**RestrictType**	**AndRestriction**
08 00	**RestrictCount**	8
04	**RestrictType**	**PropertyRestriction**
05	**RelOp**	**RelationalOperatorNotEqual**
20 10 09 0E	**PropTag**	**PidTagParentEntryId**
	TaggedValue	**PtypBinary**
0E 02	**COUNT**, as described in section 2.11.1.1	46
	Bytes	Interpreted as **Folder EntryID**, as described in section 2.2.1.1
00 00 00 00	**Flags**	Zero
EE C1 BD 78 61 11 D0 11 91 7B 00 00 00 00 00 01	**Provider UID**, as described in section 2.2.4.1	User ID for mailbox
01 00	**FolderType**	eitLTPrivateFolder
(16-byte GUID specific to database)	**DatabaseGuid**	UID identifies database where folder was originally created

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

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

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

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Bytes	Field name	Meaning
Bytes		Interpreted as **Folder EntryID**, as described in section 2.2.1.1
00 00 00 00	**Flags**	Zero
EE C1 BD 78 61 11 D0 11 91 7B 00 00 00 00 00 01	**Provider UID**	UID for mailbox
01 00	**FolderType**	eitLTPrivateFolder
(16-byte GUID specific to database)	**DatabaseGuid**	UID identifies database where folder was originally created
(6 bytes identifying Sync Issues folder)	**GlobalCounter**	UID identifies specific folder within database
00 00	**Pad**	Zero
00	**RestrictType**	**AndRestriction**
03 00	**RestrictCount**	3
02	**RestrictType**	**NotRestriction**
00	**RestrictType**	**AndRestriction**
02 00	**RestrictCount**	2
08	**RestrictType**	**ExistRestriction**
1F 00 1A 00	**PropTag**	**PidTagMessageClass**
03	**RestrictType**	**ContentRestriction**
02 00	**FuzzyLevelLow**	FL_PREFIX
00 00	**FuzzyLevelHigh**	
1F 00 1A 00	**PropertyTag**	**PidTagMessageClass**
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	**PropValue**	"IPM.Schedule"
06	**RestrictType**	**BitMaskRestriction**
00	**BitmapRelOp**	BMR_EQZ
03 00 07 0E	**PropTag**	**PidTagMessageFlags**
04 00 00 00	**Mask**	MSGFLAG_SUBMIT
01	**RestrictType**	**OrRestriction**
02 00	**RestrictCount**	2

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Bytes	Field name	Meaning
04	**RestrictType**	**PropertyRestriction**
04	**RelOp**	**RelationalOperatorEqual**
0B 00 + (2-byte mapped prop id)	**PropTag**	**PidLidReminderSet**
01	**PropValue**	TRUE
00	**RestrictType**	**AndRestriction**
02 00	**RestrictCount**	2
08	**RestrictType**	**ExistRestriction**
0B 00 + (2-byte mapped prop id)	**PropTag**	**PidLidRecurring**
04	**RestrictType**	**PropertyRestriction**
04	**RelOp**	**RelationalOperatorEqual**
0B 00 + (2-byte mapped prop id)	**PropTag**	**PidLidRecurring**
01	**PropValue**	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	**PidTagMessageFlags** ([MS-OXCMSG] section 2.2.1.6)	**PtypInteger32**
00370001	**PidTagSubject** ([MS-OXCMSG] section 2.2.1.46)	**PtypUnspecified**
1000001F	**PidTagBody** ([MS-OXCMSG] section 2.2.1.56.1)	**PtypString**

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".

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- 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 **PropertyRow** structure	Either there were errors retrieving values or some values were not returned.
00	Flag for the **FlaggedPropertyValue** structure, as described in section 2.11.5	The value for this property is returned.
13 00 00 00	**PtypInteger32 PropertyValue**	MSGFLAG_READ |MSGFLAG_UMODIFIED |MSGFLAG_HASATTACH
1F 00	PropertyType for the **FlaggedPropertyValueWithType** structure, as described in section 2.11.6	**PtypString**
00	Flag for the **FlaggedPropertyValueWithType** structure	**PropertyRestriction**
48 00 65 00 6C 00 6C 00 6F 00 00 00	String PropertyValue	"Hello"
0A	Flag for the **FlaggedPropertyValue** structure	The value for this property was not returned. The **RopOpenStream** ROP ([MS-OXCROPS] section 2.2.8.6) can be used to obtain the property value.
0E 00 07 80	32-bit SCODE	NotEnoughMemory error, as described in section 2.4.

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4 Security

4.1 Security Considerations for Implementers

None.

4.2 Index of Security Parameters

None.

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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 Exchange Server 2016
- Microsoft Office Outlook 2003
- Microsoft Office Outlook 2007
- Microsoft Outlook 2010
- Microsoft Outlook 2013
- Microsoft Outlook 2016

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 Microsoft 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 Microsoft Outlook 2013 Service Pack 1 (SP1) and Microsoft Exchange Server 2013 Service Pack 1 (SP1).

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<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 **Connec**t request type. The **Connec**t 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.

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6 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.

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