

[MS-OXCPerm]: Exchange Access and Operation Permissions Protocol Specification

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Revision Summary

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04/25/2008	0.2		Revised and updated property names and other technical content.
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08/06/2008	1.01		Revised and edited technical content.
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12/03/2008	1.03		Minor editorial fixes.
03/04/2009	1.04		Revised and edited technical content.
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Preliminary

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1 Introduction

The Exchange Access and Operation Permissions Protocol is used by clients to retrieve and manage the **permissions** on a folder. This protocol extends the Folder Object Protocol, described in [\[MS-OXCFO\]](#). This protocol also extends the Availability Web Service Protocol, described in [\[MS-OXWAVLS\]](#), if both the client and the server support the Availability Web Service Protocol.

Sections 1.8, 2, and 3 of this specification are normative and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in RFC 2119. Sections 1.5 and 1.9 are also normative but cannot contain those terms. All other sections and examples in this specification are informative.

1.1 Glossary

The following terms are defined in [\[MS-GLOS\]](#):

- access control list (ACL)**
- anonymous user**
- flags**
- handle**
- little-endian**
- remote procedure call (RPC)**
- Unicode**

The following terms are defined in [\[MS-OXGLOS\]](#):

- Address Book object**
- binary large object (BLOB)**
- Calendar folder**
- Folder object**
- hierarchy table**
- Message object**
- permission**
- property tag**
- remote operation (ROP)**
- ROP buffer**
- ROP request**
- ROP request buffer**
- ROP response buffer**
- Server object handle**
- Stream object**
- Table object**

The following terms are specific to this document:

permissions list: A list of users and the permissions for each of those users.

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

1.2 References

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

1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information. Please check the archive site, <http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624>, as an additional source.

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

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

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

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

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

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

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

[MS-OXWAVLS] Microsoft Corporation, "[Availability Web Service Protocol Specification](#)".

[MS-XWDVSEC] Microsoft Corporation, "[Web Distributed Authoring and Versioning \(WebDAV\) Protocol Security Descriptor Extensions](#)".

[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>

1.2.2 Informative References

[MS-GLOS] Microsoft Corporation, "[Windows Protocols Master Glossary](#)".

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

1.3 Overview

The Exchange Access and Operation Permissions Protocol is used by a client to retrieve and to manage the **permissions list** on a folder by using **remote operations (ROPs)**. Each entry in this list specifies the permissions granted to a single user. The user's permissions determine what actions the user is allowed on the folder. For example, a user can be allowed to view a folder but not allowed to modify the folder's properties.

The permissions list initially contains two reserved entries: an entry that specifies folder permissions for an **anonymous user** and an entry that specifies the default permissions for a user who is not currently included in the permissions list. For information about how these reserved entries are used, see section [3.2.4.1](#). Additional entries are added by an owner of the folder. Existing entries can be modified or deleted.

This protocol extends the Folder Object Protocol, described in [\[MS-OXCFOLD\]](#). This protocol also extends the Availability Web Service Protocol, described in [\[MS-OXWAVLS\]](#), if both the client and server support the Availability Web Service Protocol.

1.4 Relationship to Other Protocols

This protocol extends the Folder Object Protocol, described in [\[MS-OXCFOLD\]](#), by adding the ability to retrieve and manage the permissions list on a folder and, therefore, has the same dependencies as those described in [\[MS-OXCFOLD\]](#) section 1.4.

If the client and the server both implement the Availability Web Service Protocol, described in [\[MS-OXWAVLS\]](#), this protocol also extends that protocol by adding the ability to retrieve and manage the permissions list on the **Calendar folder**.

1.5 Prerequisites/Preconditions

In addition to the prerequisites of the Folder Object Protocol that are specified in [\[MS-OXCFOLD\]](#) section 1.5, the Exchange Access and Operation Permissions Protocol requires that the client be connected to the server by using credentials that belong to a user who has permissions to read and modify the folder's permissions list.

The client is required to obtain a **handle** to the **Folder object** on the server by using the **RopOpenFolder** ROP ([\[MS-OXCROPS\]](#) section 2.2.4.1). This handle will be included in the **ROP buffers** that are used in this protocol.

1.6 Applicability Statement

A client can use the Exchange Access and Operation Permissions Protocol to read or update the permissions list on a folder. For example, if the owner of a folder grants read permission on that folder to another user, the folder owner's client updates the permissions list on the folder accordingly.

1.7 Versioning and Capability Negotiation

The client checks the server's version number that is returned by the server in the results from **EcDoConnectEx** method, as specified in [\[MS-OXCRPC\]](#). If the server version is greater than or equal to 8.0.360.0, the server supports the Availability Web Service Protocol, described in [\[MS-OXWAVLS\]](#).

The client indicates to the server whether it supports the Availability Web Service Protocol by setting the **IncludeFreeBusy** flag in the **ROP request buffer** for both the **RopGetPermissionsTable** ROP ([\[MS-OXCROPS\]](#) section 2.2.10.2) and the **RopModifyPermissions** ROP ([\[MS-OXCROPS\]](#) section 2.2.10.1), as described in sections [2.2.1.1](#) and [2.2.2.1](#).

1.8 Vendor-Extensible Fields

None.

1.9 Standards Assignments

None.

2 Messages

2.1 Transport

The ROP request buffers and **ROP response buffers** specified in this protocol are sent to and received from the server respectively by using the underlying protocol specified by [\[MS-OXCROPS\]](#) section 2.1.

2.2 Message Syntax

Unless otherwise noted, sizes in this section are expressed in bytes.

Unless otherwise noted, the fields specified in this section are packed in buffers in the order that they appear in this document, without any padding.

Unless otherwise noted, the fields specified in this section, which are larger than a single byte, **MUST** be converted to **little-endian** order when packed in buffers and converted from little-endian order when unpacked.

2.2.1 RopGetPermissionsTable ROP

The **RopGetPermissionsTable** ROP ([\[MS-OXCROPS\]](#) section 2.2.10.2) retrieves a **Server object handle** to a **Table object**, which is then used in other **ROP requests** to retrieve the current permissions list on a folder.

The complete syntax of the ROP request buffer and the ROP response buffer is specified in [\[MS-OXCROPS\]](#). This section specifies the syntax and semantics of various fields that are not fully specified in [\[MS-OXCROPS\]](#).

2.2.1.1 RopGetPermissionsTable ROP Request Buffer

The following descriptions define valid fields for the **RopGetPermissionsTable** ROP request buffer ([\[MS-OXCROPS\]](#) section 2.2.10.2.1).

TableFlags (1 byte): A set of **flags** that control how the server uses the values of the **PidTagMemberRights** property (section [2.2.7](#)). The valid flags for this field are specified in the following table. The client **MUST NOT** set any other flags.

Flag name	Value	Meaning
IncludeFreeBusy	0x02	If this flag is set, the server MUST include the values of the FreeBusySimple and FreeBusyDetailed flags of the PidTagMemberRights property in the returned permissions list. If this flag is not set, the server MUST NOT include the values of those flags in the returned permissions list. The client SHOULD set this flag if the server version is greater than or equal to 8.0.360.0, as specified in [MS-OXCRPC] , and the folder is the Calendar folder. The client MUST NOT set this flag in any other circumstances.

2.2.1.2 RopGetPermissionsTable ROP Response Buffer

The following descriptions define valid fields for the **RopGetPermissionsTable** ROP response buffer ([\[MS-OXCROPS\]](#) section 2.2.10.2.2).

ReturnValue (4 bytes): An integer that indicates the result of the operation. The value 0x00000000 indicates success. For details about common error codes, see [\[MS-OXCDATA\]](#) section 2.4.

2.2.2 RopModifyPermissions ROP

The **RopModifyPermissions** ROP ([\[MS-OXCROPS\]](#) section 2.2.10.1) creates, updates, or deletes entries in the permissions list on a folder.

The complete syntax of the ROP request buffer and the ROP response buffer is specified in [\[MS-OXCROPS\]](#). This section specifies the syntax and semantics of various fields that are not fully specified in [\[MS-OXCROPS\]](#).

2.2.2.1 RopModifyPermissions ROP Request Buffer

The following descriptions define valid fields for the **RopModifyPermissions** ROP request buffer ([\[MS-OXCROPS\]](#) section 2.2.10.1.1).

ModifyFlags (1 byte): A set of flags that control how the server uses the values of the **PidTagMemberRights** property (section [2.2.7](#)) and the flags of the **PermissionData** structures. The valid flags for this field are specified in the following table. The client **MUST NOT** set any other flags.

Flag name	Value	Meaning
ReplaceRows	0x01	If this flag is set, the server MUST replace all existing entries except the anonymous user and the default user entries in the current permissions list with the ones contained in the PermissionsData field. (In this case, each PermissionData structure in the PermissionsData field MUST have the AddRow flag set.) If this flag is not set, the server MUST add, update, or delete entries in the current permissions list according to the changes specified in the PermissionsData field. The client SHOULD ≤ 1 set this flag when copying the access control list (ACL) from the Calendar folder to the Freebusy Data folder.
IncludeFreeBusy	0x02	If this flag is set, the server MUST acknowledge the FreeBusySimple and FreeBusyDetailed flags of the PidTagMemberRights property when modifying the folder permissions. If this flag is not set, the server MUST ignore those flags. The client SHOULD set this flag if the server version is greater than or equal to 8.0.360.0, as specified in [MS-OXCRPC] , and the folder is the Calendar folder. The client MUST NOT set this flag in any other circumstances.

ModifyCount (2 bytes): An integer that specifies the number of structures contained in the **PermissionsData** field.

PermissionsData (variable): An array of **PermissionData** structures (section [2.2.2.1.1](#)). Each **PermissionData** structure specifies details for adding a new entry to the permissions list, updating an existing entry in the permissions list, or deleting an entry from the permissions list. There is one **PermissionData** structure for each entry to be added, updated, or deleted.

If the **ReplaceRows** flag is set in the **ModifyFlags** field, entries can only be added. Therefore, each **PermissionData** structure contained in this field MUST have the **AddRow** flag set if the **ReplaceRows** flag is set.

2.2.2.1.1 PermissionData Structure

The **PermissionData** structure specifies the properties, including folder permissions, for a single user and the requested operation (add entry, update entry, delete entry) to be performed on the permissions list for that user.

PermissionDataFlags (1 byte): A set of flags that specify the type of change to be made to the folder permissions. The valid flags for this field are specified in the following table. The client MUST NOT set any other flags. If the **ReplaceRows** flag is set in the **ModifyFlags** field of the **RopModifyPermissions** ROP request buffer, only the **AddRow** flag is valid.

Flag name	Value	Meaning
AddRow	0x01	The user that is specified by the PidTagEntryId property (section 2.2.4) is added to the permissions list.
ModifyRow	0x02	The existing permissions for the user that is identified by the PidTagMemberId property (section 2.2.5) are modified.
RemoveRow	0x04	The user that is identified by the PidTagMemberId property is deleted from the permissions list.

PropertyValueCount (2 bytes): An integer that specifies the number of structures contained in the **PropertyValues** field.

PropertyValues (variable): An array of **TaggedPropertyValue** structures ([MS-OXCDATA] section 2.11.4). Each structure specifies one property. The properties included depend on the type of change that is being made. For details, see sections 3.1.4.2, 3.1.4.3, and 3.1.4.4.

2.2.2.2 RopModifyPermissions ROP Response Buffer

The following descriptions define valid fields for the **RopModifyPermissions** ROP response buffer ([MS-OXCROPS] section 2.2.10.1.2).

ReturnValue (4 bytes): An integer that indicates the result of the operation. The value 0x00000000 indicates success. For details about common error codes, see [MS-OXCDATA] section 2.4.

2.2.3 PidTagAccessControlListData Property

Note Some of the information in this section is subject to change because it applies to a preliminary implementation of the protocol or structure. For information about specific differences between versions, see the behavior notes that are provided in the Product Behavior appendix.

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

The **PidTagAccessControlListData** property ([MS-OXPROPS] section 2.580) contains a variable-length **binary large object (BLOB)** that constitutes a permissions list for a folder. This property is used when an **ACL** is copied from one folder to another. <2>

The client does not understand the data contained in the BLOB and does not try to use the data. The BLOB is only used to copy the ACL from one folder to another.

2.2.4 PidTagEntryId Property

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

The **PidTagEntryId** property ([MS-OXPROPS] section 2.756) identifies the **Address Book object** that specifies a user. The first two bytes of this property specify the number of bytes that follow. The remaining bytes constitute the **PermanentEntryID** structure ([MS-OXNSPI] section 2.3.8.3).

If the **PidTagMemberId** property (section 2.2.5) is set to one of the two reserved values, the first two bytes of this property MUST be 0x0000, indicating that zero bytes follow (that is, no **PermanentEntryID** structure follows the first two bytes).

2.2.5 PidTagMemberId Property

Type: **PtypInteger64** ([MS-OXCDATA] section 2.11.1)

The **PidTagMemberId** property ([MS-OXPROPS] section 2.853) specifies the unique identifier that the server generates for each user.

The two reserved values for the **PidTagMemberId** property are listed in the following table.

Value	Meaning
0xFFFFFFFFFFFFFFFF	Identifier for the anonymous user entry in the permissions list.
0x0000000000000000	Identifier for the default user entry in the permissions list.

2.2.6 PidTagMemberName Property

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

The **PidTagMemberName** property ([MS-OXPROPS] section 2.854) specifies the user-readable name of the user. The server provides the user-readable name for all entries in the permissions list.

The user-readable names that the server provides for the reserved entries of the permissions list are listed in the following table.

Reserved entry	Value of the PidTagMemberId property	User-readable name
Anonymous user	0xFFFFFFFFFFFFFFFF	"Anonymous"
Default user	0x0000000000000000	"" (empty string)

2.2.7 PidTagMemberRights Property

Note Some of the information in this section is subject to change because it applies to a preliminary implementation of the protocol or structure. For information about specific differences between versions, see the behavior notes that are provided in the Product Behavior appendix.

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

The **PidTagMemberRights** property ([MS-OXPROPS] section 2.855) specifies the folder permissions that are granted to the specified user.

The flags that are used to specify permissions are listed in the following table. The client and server MUST NOT set any other flags.

Flag name	Value	Meaning
ReadAny	0x00000001	If this flag is set, the server MUST allow the specified user's client to read any Message object in the folder. If this flag is not set, the server MUST NOT allow the user's client to read Message objects that are owned by other users.
Create	0x00000002	If this flag is set, the server MUST allow the specified user's client to create new Message objects in the folder. If this flag is not set, the server MUST NOT allow the user's client to create new Message objects in the folder.
EditOwned	0x00000008	If this flag is set, the server MUST allow the specified user's client to modify a Message object that was created by that user in the folder. If this flag is not set, the server MUST NOT allow the user's client to modify Message objects that were created by that user. If the client sets the EditAny flag, the client MUST set this flag as well.
DeleteOwned	0x00000010	If this flag is set, the server MUST allow the specified user's client to delete any Message object that was created by that user in the folder. If this flag is not set, the server MUST NOT allow the user's client to delete Message objects that were created by that user. If the client sets the DeleteAny flag, the client MUST set this flag as well.
EditAny	0x00000020	If this flag is set, the server MUST allow the specified user's client to modify any Message object in the folder. If this flag is not set, the server MUST NOT allow the user's client to modify Message objects that are owned by other users.
DeleteAny	0x00000040	If this flag is set, the server MUST allow the specified user's client to delete any Message object in the folder. If this flag is not set, the server MUST NOT allow the user's client to delete Message objects that are owned by other users.
CreateSubFolder	0x00000080	If this flag is set, the server MUST allow the specified user's client to create new folders within the folder. If this flag is not set, the server MUST NOT allow the user's client to create new folders within the folder.
FolderOwner	0x00000100	If this flag is set, the server MUST allow the specified user's client to modify properties set on the folder itself, including the folder permissions. If this flag is not set, the server MUST NOT allow the specified user's client to make those modifications.
FolderContact	0x00000200	If this flag is set, the server MUST include the specified user in any list of administrative contacts associated with the folder. If this flag is not set, the server MUST NOT include the specified user in any such list. If neither this flag nor the FolderOwner flag is set, the specified user's client does not display the permissions list for the folder. Instead, the specified user's client displays the folder permissions specified in the PidTagRights property ([MS-OXCFLD] section 2.2.2.2.6), which contains the folder permissions only for that user. If the client sets this flag for a reserved entry (default user or anonymous user), the server SHOULD ignore this flag and SHOULD NOT apply this flag to those entries. <3>

Flag name	Value	Meaning
FolderVisible	0x00000400	<p>If this flag is set, the server MUST allow the specified user's client to see the folder in the folder hierarchy table and MUST allow the specified user's client to open the folder by using a RopOpenFolder ROP request ([MS-OXCROPS] section 2.2.4.1), as specified in [MS-OXCFOLD] section 3.1.4.1.</p> <p>If the client sets the ReadAny flag or the FolderOwner flag, the client MUST set this flag as well.</p>
FreeBusySimple	0x00000800	<p>If this flag is set, the server MUST allow the specified user's client to retrieve brief information about the appointments on the calendar through the Availability Web Service Protocol, as specified in [MS-OXWAVLS]. If this flag is not set, the server MUST NOT allow the specified user's client to retrieve information through the Availability Web Service Protocol. <4></p> <p>If the IncludeFreeBusy flag is not set in either the RopGetPermissionsTable request or the RopModifyPermissions request, this flag MUST be ignored.</p> <p>If the client sets the FreeBusyDetailed flag, it MUST set this flag as well.</p>
FreeBusyDetailed	0x00001000	<p>If this flag is set, the server MUST allow the specified user's client to retrieve detailed information about the appointments on the calendar through the Availability Web Service Protocol, as specified in [MS-OXWAVLS]. If this flag is not set, the server MUST NOT allow the specified user's client to see these details.</p> <p>If the IncludeFreeBusy flag is not set in either the RopGetPermissionsTable ROP request or the RopModifyPermissions ROP request, this flag MUST be ignored.</p>

3 Protocol Details

3.1 Client Details

3.1.1 Abstract Data Model

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

The abstract data model for the client is the same as that specified in [\[MS-OXCFOLD\]](#).

3.1.2 Timers

None.

3.1.3 Initialization

None.

3.1.4 Higher-Layer Triggered Events

3.1.4.1 Retrieving Folder Permissions

Before retrieving the permissions list of a folder, the client attempts to retrieve the folder permissions by reading the folder's **PidTagSecurityDescriptorAsXml** property ([\[MS-XWDVSEC\]](#) section 2.2.2). To read this property, the client opens the property as a **Stream object** by sending a **RopOpenStream** ROP request ([\[MS-OXCROPS\]](#) section 2.2.9.1). The server MUST return an error code of **ecNotImplemented** instead of satisfying the **RopOpenStream** ROP request.

To retrieve the current permissions list of a folder, the client SHOULD send the following three ROP requests to the server:

1. **RopGetPermissionsTable** ([\[MS-OXCROPS\]](#) section 2.2.10.2)
2. **RopSetColumns** ([\[MS-OXCROPS\]](#) section 2.2.5.1), with a column set that includes some or all of the following properties:
 - **PidTagEntryId** (section [2.2.4](#)) — If the client is not required to match entries in the permissions list to users, as it would with a search for a particular user, the client SHOULD NOT include this property.
 - **PidTagMemberId** (section [2.2.5](#)) — The client MUST include this property.
 - **PidTagMemberName** (section [2.2.6](#)) — If the client is not displaying the contents of the permissions list, the client SHOULD NOT include this property.
 - **PidTagMemberRights** (section [2.2.7](#)) — The client MUST include this property.
3. **RopQueryRows** ([\[MS-OXCROPS\]](#) section 2.2.5.4)

For more details about how the client uses the **RopSetColumns** and **RopQueryRows** ROP requests, see [\[MS-OXCTABL\]](#) section 3.1.4. If all three of the ROP requests succeed, the permissions list is returned in the **RowData** field of the **RopQueryRows** ROP response buffer. The **RowData** field contains one **PropertyRow** structure ([\[MS-OXCDATA\]](#) section 2.8.1) for each entry in the permissions list. When the client is finished with table operations, the client MUST release the Table object by sending a **RopRelease** ROP request ([\[MS-OXCROPS\]](#) section 2.2.15.3).

The ROP sequence that is used to retrieve the current permissions list of a folder is shown in the following diagram.

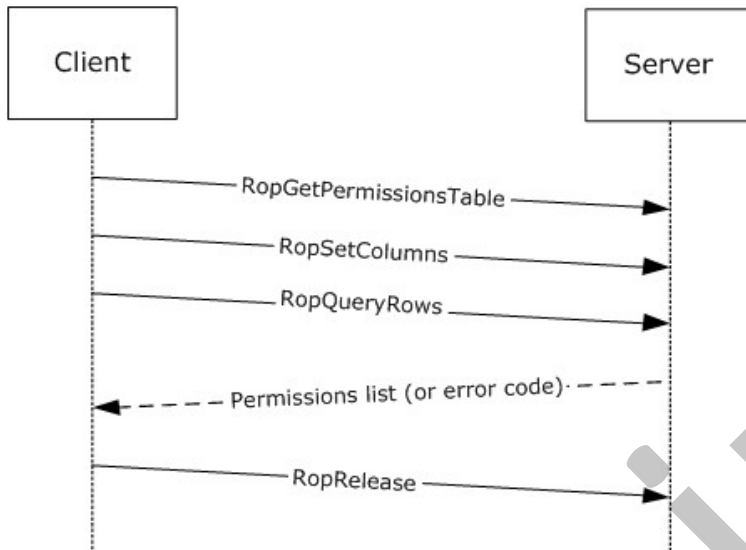


Figure 1: Sequence for retrieving folder permissions

3.1.4.2 Adding Folder Permissions

To add a new entry to the folder's permissions list, the client MUST send a **RopModifyPermissions** ROP request ([\[MS-OXCROPS\]](#) section 2.2.10.1) with the **AddRow** flag set in each **PermissionData** structure that specifies a user to be added. The **PropertyValues** field of the **PermissionData** structure MUST include the following properties:

- **PidTagEntryId** (section [2.2.4](#))
- **PidTagMemberRights** (section [2.2.7](#))

The **PropertyValues** field MUST NOT include the **PidTagMemberId** property (section [2.2.5](#)).

When copying the ACL from the Calendar folder to the Freebusy Data folder, the client SHOULD [<5>](#) set the **ReplaceRows** flag in the **RopModifyPermissions** ROP request buffer. In this case, all of the **PermissionData** structures in the ROP request buffer MUST have the **AddRow** flag set.

3.1.4.3 Updating Folder Permissions

To update an existing entry in the folder's permissions list, the client MUST retrieve the existing permissions list as specified in section [3.1.4.1](#) to get the values of the **PidTagMemberId** properties that are assigned to the users in the permissions list.

The client MUST send a **RopModifyPermissions** ROP request ([\[MS-OXCROPS\]](#) section 2.2.10.1) with the **ModifyRow** flag set in each **PermissionData** structure that specifies a user to be modified. The **PropertyValues** field of the **PermissionData** structure MUST include the following properties:

- **PidTagMemberId** (section [2.2.5](#))
- **PidTagMemberRights** (section [2.2.7](#))

The **PropertyValues** field MUST NOT include the **PidTagEntryId** property (section [2.2.4](#)).

3.1.4.4 Removing Folder Permissions

To remove an entry from the folder's permissions list, the client MUST retrieve the existing permissions list as specified in section [3.1.4.1](#) to get the values of the **PidTagMemberId** properties that are assigned to the users in the permissions list.

The client MUST send a **RopModifyPermissions** ROP request ([\[MS-OXCROPS\]](#) section 2.2.10.1) with the **RemoveRow** flag set in each **PermissionData** structure that specifies a user to be deleted. The **PropertyValues** field of the **PermissionData** structure MUST include only the **PidTagMemberId** property (section [2.2.5](#)).

3.1.5 Message Processing Events and Sequencing Rules

None.

3.1.6 Timer Events

None.

3.1.7 Other Local Events

None.

3.2 Server Details

3.2.1 Abstract Data Model

The abstract data model for the client and server roles is the same.

3.2.2 Timers

None.

3.2.3 Initialization

None.

3.2.4 Higher-Layer Triggered Events

3.2.4.1 Accessing a Folder

When a client sends a request to the server to access a folder, as specified in [\[MS-OXCFCOLD\]](#), the server MUST either allow or deny the request based on the permissions list for the folder and any user credentials that the client provided when making the request.

The server uses the user credentials and the permissions list as follows to determine the user's specific folder permissions:

- If the client did not provide any user credentials, the server MUST use the permissions that have been set for the anonymous user in the permissions list.
- If the client provided user credentials for a user that is included in the permissions list, either explicitly or through membership in a group that is included in the permissions list, the server MUST use the permissions for that user.
- If the client provided user credentials for a user that is not otherwise included in the permissions list, the server MUST use the permissions that have been set for the default user.

3.2.5 Message Processing Events and Sequencing Rules

3.2.5.1 Processing a RopGetPermissionsTable ROP Request

When the server receives a **RopGetPermissionsTable** ROP request buffer ([\[MS-OXCROPS\]](#) section 2.2.10.2) from the client, the server parses the buffer. The server responds with a **RopGetPermissionsTable** ROP response buffer. For details about how the server parses buffers and processes ROPs, see [\[MS-OXCROPS\]](#) section 3.2.5.1. For details about how the server formats buffers for the response, see [\[MS-OXCROPS\]](#) section 3.2.5.2.

The server MUST determine whether the user has permission to view the folder by examining the **FolderVisible** flag of the **PidTagMemberRights** property (section [2.2.7](#)). If the user does not have permission to view the folder, the server MUST return the NoReadRight (0x00000501) error code in the **ReturnValue** field of the ROP response buffer. If the user does have permission to view the folder, the server MUST return a Server object handle to a Table object, which can be used to retrieve the permissions list of the folder, as specified in section [3.1.4.1](#).

3.2.5.2 Processing a RopModifyPermissions ROP Request

When the server receives a **RopModifyPermissions** ROP request buffer ([\[MS-OXCROPS\]](#) section 2.2.10.1) from the client, the server parses the buffer. The server responds with a **RopModifyPermissions** ROP response buffer. For details about how the server parses buffers and processes ROPs, see [\[MS-OXCROPS\]](#) section 3.2.5.1. For details about how the server formats buffers for the response, see [\[MS-OXCROPS\]](#) section 3.2.5.2.

The server MUST determine whether the user has permission to modify the properties of the folder by examining the **FolderOwner** flag of the **PidTagMemberRights** property (section [2.2.7](#)). If the user does not have permission to modify the folder's properties, the server MUST return the AccessDenied (0x80070005) error code in the **ReturnValue** field of the ROP response buffer. If the user does have permission to modify the folder's properties, the server MUST update the permissions list for the folder according to the **PermissionData** structures listed in the **PermissionsData** field of the ROP request buffer, as specified in section [2.2.2.1](#).

If any **PermissionData** structure specifies deletion or modification of a user that is not currently in the permissions list, the server MUST ignore that **PermissionData** structure.

3.2.5.3 Processing a Request for PidTagSecurityDescriptorAsXml Property

When the server receives a **RopOpenStream** ROP request ([\[MS-OXCROPS\]](#) section 2.2.9.1) on the **PidTagSecurityDescriptorAsXml** property ([\[MS-XWDVSEC\]](#) section 2.2.2) of the folder, the server MUST return an error code of **ecNotImplemented** rather than satisfying the **RopOpenStream** ROP request.

3.2.6 Timer Events

None.

3.2.7 Other Local Events

None.

Preliminary

4 Protocol Examples

4.1 Adding an Entry to the Permissions List

In this example, the client is adding an entry for "user8" to the permissions list on the Calendar folder. To retrieve the current permissions on the folder, the client starts by trying to read the deprecated **PidTagSecurityDescriptorAsXml** property ([\[MS-XWDVSEC\]](#) section 2.2.2) of the folder, as described in section [3.1.4.1](#). To read this property, the client sends the following **RopOpenStream** ROP request ([\[MS-OXCROPS\]](#) section 2.2.9.1).

The **RopOpenStream** ROP request buffer contains the following data (9 bytes).

```
0000: 2B 00 01 02 1F 00 6A 0E-00
```

RopId: 0x2B

LogonId: 0

InputHandleIndex: 1 (HSOT=0x000001DA)

OutputHandleIndex: 2 (HSOT=0xFFFFFFFF)

PropertyTag: 0x0E6A001F (**PidTagSecurityDescriptorAsXml** property)

OpenModeFlags: 0x00 (**ReadOnly** flag is set)

The server returns the following ROP response buffer, which indicates that it does not support the **PidTagSecurityDescriptorAsXml** property on this folder.

The **RopOpenStream** ROP response buffer contains the following data (6 bytes):

```
0000: 2B 02 02 01 04 80
```

RopId: 0x2B

OutputHandleIndex: 2 (HSOT=0xFFFFFFFF)

ReturnValue: 0x80040102 (ecNotImplemented)

Because the server does not support the **PidTagSecurityDescriptorAsXml** property, the client falls back to using the **RopGetPermissionsTable** ROP ([\[MS-OXCROPS\]](#) section 2.2.10.2) as described in section [3.1.4.1](#). To retrieve a table that contains the current permissions list of the folder, the client sends the following three ROP requests, batched together into a single **remote procedure call (RPC)**.

The **RopGetPermissionsTable** ROP request buffer contains the following data (5 bytes):

```
0000: 3E 00 00 01 02
```

RopId: 0x3E

LogonId: 0

InputHandleIndex: 0 (HSOT=0x000001DA)

OutputHandleIndex: 1 (HSOT=0xFFFFFFFF)

TableFlags: 0x02 (**IncludeFreeBusy** flag is set)

The **RopSetColumns** ROP request buffer ([\[MS-OXCROPS\]](#) section 2.2.5.1) contains the following data (22 bytes):

```
0000: 12 00 01 00 04 00 14 00-71 66 1F 00 72 66 03 00 .....qf..rf..
0010: 73 66 02 01 FF 0F                                     sf....
```

RopId: 0x12

LogonId: 0

InputHandleIndex: 1 (HSOT=0xFFFFFFFF)

SetColumnsFlags: 0x00 (**Wait** flag is set)

PropertyTagCount: 0x0004 (four **property tags** in the **PropertyTags** field)

PropertyTags:

0x66710014 (**PidTagMemberId** property (section [2.2.5](#)))

0x6672001F (**PidTagMemberName** property (section [2.2.6](#)))

0x66730003 (**PidTagMemberRights** property (section [2.2.7](#)))

0x0FFF0102 (**PidTagEntryId** property (section [2.2.4](#)))

The **RopQueryRows** ROP request buffer ([\[MS-OXCROPS\]](#) section 2.2.5.4) contains the following data (7 bytes):

```
0000: 15 00 01 00 01 00 10
```

RopId: 0x15

LogonId: 0

InputHandleIndex: 1 (HSOT=0xFFFFFFFF)

QueryRowsFlags: 0x00 (Advance)

ForwardRead: 0x01 (True)

RowCount: 0x1000 (4096)

The server returns the following three ROP response buffers. The folder's current permissions list is in the **RowData** field of the **RopQueryRows** ROP response buffer.

The **RopGetPermissionsTable** ROP response buffer contains the following data (6 bytes):

```
0000: 3E 01 00 00 00 00
```

RopId: 0x3E

OutputHandleIndex: 1 (HSOT=0x000000CA)

ReturnValue: 0x00000000 (success)

The **RopSetColumns** ROP response buffer contains the following data (7 bytes):

```
0000: 12 01 00 00 00 00 00
```

RopId: 0x12

InputHandleIndex: 1 (HSOT=0x000000CA)

ReturnValue: 0x00000000 (success)

TableStatus: 0x00 (**TBLSTAT_COMPLETE** flag is set)

The **RopQueryRows** ROP response buffer contains the following data (61 bytes):

```
0000: 15 01 00 00 00 00 02 02-00 00 00 00 00 00 00 00 .....  
0010: 00 00 00 00 00 08 00 00-00 00 00 FF FF FF FF FF .....  
0020: FF FF FF 41 00 6E 00 6F-00 6E 00 79 00 6D 00 6F ...A.n.o.n.y.m.o  
0030: 00 75 00 73 00 00 00 00-00 00 00 00 00 .....u.s.....
```

RopId: 0x15

InputHandleIndex: 1 (HSOT=0x000000CA)

ReturnValue: 0x00000000 (success)

Origin: 0x02 (**BOOKMARK_END** flag is set)

RowCount: 0x0002 (two **PropertyRow** structures in the **RowData** field)

RowData:

PropertyRow structure #1 (beginning at address 0x0009 in the **RopQueryRows** ROP response buffer):

Flag: 0x00 (no errors)

ValueArray: This field contains the values of the properties that were specified in the **PropertyTags** field of the previous **RopSetColumns** request and are in the same order as those properties.

0x0000000000000000 (default user)

0x0000 (**Unicode** null)

0x00000800 (**FreeBusySimple** flag is set)

0x0000 (byte count is zero bytes, indicating that no **PermanentEntryID** structure ([\[MS-OXNSPI\]](#) section 2.3.8.3) is present)

PropertyRow structure #2 (beginning at address 0x001A in the **RopQueryRows** ROP response buffer):

Flag: 0x00 (no errors)

ValueArray:

0xFFFFFFFFFFFFFFFF (anonymous user)

"Anonymous"

0x00000000 (no permissions flags are set)

0x0000 (byte count is zero bytes, indicating that no **PermanentEntryID** structure is present)

Note that the current permissions list on this folder has two entries. The default user entry, contained in **PropertyRow** structure #1, has the **FreeBusySimple** permissions (0x00000800) on this folder. The anonymous user entry, contained in **PropertyRow** structure #2, has no permissions (0x00000000) on this folder.

Finally, the client sends the following **RopModifyPermissions** ROP request ([\[MS-OXCROPS\]](#) section 2.2.10.1) to add "user8" to the permissions list with the **FreeBusyDetailed, FreeBusySimple, FolderVisible, FolderContact, FolderOwner, CreateSubFolder, DeleteAny, EditAny, DeleteOwned, EditOwned, Create, and ReadAny** permissions flags set (0x00001FFB) for "user8" on this folder:

The **RopModifyPermissions** ROP request buffer contains the following data (147 bytes):

```

0000: 40 00 02 02 01 00 01 02-00 02 01 FF 0F 7C 00 00 @.....|...
0010: 00 00 00 DC A7 40 C8 C0-42 10 1A B4 B9 08 00 2B .....@..B.....+
0020: 2F E1 82 01 00 00 00 00-00 00 00 2F 6F 3D 46 69 /...../o=Fi
0030: 72 73 74 20 4F 72 67 61-6E 69 7A 61 74 69 6F 6E rst Organization
0040: 2F 6F 75 3D 45 78 63 68-61 6E 67 65 20 41 64 6D /ou=Exchange Adm
0050: 69 6E 69 73 74 72 61 74-69 76 65 20 47 72 6F 75 inistrative Grou
0060: 70 20 28 46 59 44 49 42-4F 48 46 32 33 53 50 44 p (FYDIBOHF23SPD
0070: 4C 54 29 2F 63 6E 3D 52-65 63 69 70 69 65 6E 74 LT)/cn=Recipient
0080: 73 2F 63 6E 3D 75 73 65-72 38 00 03 00 73 66 FB s/cn=user8...sf.
0090: 1F 00 00 ...

```

RopId: 0x40

LogonId: 0

InputHandleIndex: 2 (HSOT=0x000001DA)

ModifyFlags: 0x02 (**IncludeFreeBusy** flag is set)

ModifyCount: 0x0001 (one **PermissionData** structure in the **PermissionsData** field)

PermissionsData:

PermissionData structure (beginning at address 0x0006 in the **RopModifyPermissions** ROP request buffer):

PermissionDataFlags: 0x01 (**AddRow** flag is set)

PropertyValueCount: 0x0002 (two **TaggedPropertyValue** structures in the **PropertyValues** field)

PropertyValues:

TaggedPropertyValue structure #1 (beginning at address 0x0009 in the **RopModifyPermissions** ROP request buffer):

PropertyTag: 0x0FFF0102 (**PidTagEntryId** property)

PropertyValue: Beginning at address 0x000D in the **RopModifyPermissions** ROP request buffer, this field contains the byte-count, 0x007C (124), followed by the 124-byte **PermanentEntryID** structure.

TaggedPropertyValue structure #2 (beginning at address 0x008B in the **RopModifyPermissions** ROP request buffer):

PropertyTag: 0x66730003 (**PidTagMemberRights** property)

PropertyValue: 0x00001FFB (**FreeBusyDetailed**, **FreeBusySimple**, **FolderVisible**, **FolderContact**, **FolderOwner**, **CreateSubFolder**, **DeleteAny**, **EditAny**, **DeleteOwned**, **EditOwned**, **Create**, and **ReadAny** flags are set)

The server returns the following response buffer, which indicates that it has successfully updated the permissions list for the folder.

The **RopModifyPermissions** ROP response buffer contains the following data (6 bytes):

```
0000: 40 02 00 00 00 00
```

RopId: 0x40

InputHandleIndex: 2 (HSOT=0x000001DA)

ReturnValue: 0x00000000 (success)

4.2 Modifying an Entry in the Permissions List

In this example, the client is modifying the entry for "user8" in the permissions list on the Calendar folder. First, the client retrieves the permissions list by sending the same **RopGetPermissionsTable** ([\[MS-OXCROPS\] section 2.2.10.2](#)), **RopSetColumns** ([\[MS-OXCROPS\] section 2.2.5.1](#)), and **RopQueryRows** ([\[MS-OXCROPS\] section 2.2.5.4](#)) ROP requests as in the example in section [4.1](#). The server returns the following three ROP response buffers with the current permissions list contained in the **RowData** field of the **RopQueryRows** ROP response buffer.

The **RopGetPermissionsTable** ROP response buffer contains the following data (6 bytes).

```
0000: 3E 01 00 00 00 00
```

RopId: 0x3E

OutputHandleIndex: 1 (HSOT=0x000000CA)

ReturnValue: 0x00000000 (success)

The **RopSetColumns** ROP response buffer contains the following data (7 bytes).

```
0000: 12 01 00 00 00 00 00
```


RopId: 0x12

InputHandleIndex: 1 (HSOT=0x000000CA)

ReturnValue: 0x00000000 (success)

TableStatus: 0x00 (**TBLSTAT_COMPLETE** flag is set)

The **RopQueryRows** ROP response buffer contains the following data (212 bytes).

```
0000: 15 01 00 00 00 00 02 03-00 00 00 00 00 00 00 00 .....
0010: 00 00 00 00 00 08 00 00-00 00 00 02 00 00 00 15 .....
0020: 00 00 00 75 00 73 00 65-00 72 00 38 00 00 00 FB ...u.s.e.r.8...
0030: 1F 00 00 7C 00 00 00 00-00 DC A7 40 C8 C0 42 10 ...|.....@..B.
0040: 1A B4 B9 08 00 2B 2F E1-82 01 00 00 00 00 00 00 .....+/.....
0050: 00 2F 4F 3D 46 49 52 53-54 20 4F 52 47 41 4E 49 ./O=FIRST ORGANI
0060: 5A 41 54 49 4F 4E 2F 4F-55 3D 45 58 43 48 41 4E ZATION/OU=EXCHAN
0070: 47 45 20 41 44 4D 49 4E-49 53 54 52 41 54 49 56 GE ADMINISTRATIV
0080: 45 20 47 52 4F 55 50 20-28 46 59 44 49 42 4F 48 E GROUP (FYDIBOH
0090: 46 32 33 53 50 44 4C 54-29 2F 43 4E 3D 52 45 43 F23SPDLT)/CN=REC
00A0: 49 50 49 45 4E 54 53 2F-43 4E 3D 55 53 45 52 38 IPIENTS/CN=USER8
00B0: 00 00 FF FF FF FF FF FF-FF FF 41 00 6E 00 6F 00 .....A.n.o.
00C0: 6E 00 79 00 6D 00 6F 00-75 00 73 00 00 00 00 00 n.y.m.o.u.s.....
00D0: 00 00 00 00 .....

```

RopId: 0x15

InputHandleIndex: 1 (HSOT=0x000000CA)

ReturnValue: 0x00000000 (success)

Origin: 0x02 (**BOOKMARK_END** flag is set)

RowCount: 0x0003 (three **PropertyRow** structures in the **RowData** field)

RowData:

PropertyRow structure #1 (beginning at address 0x0009 in the **RopQueryRows** ROP response buffer):

Flag: 0x00 (no errors)

ValueArray:

0x0000000000000000 (default user)

0x0000 (Unicode null)

0x00000800 (**FreeBusySimple** flag is set)

0x0000 (byte count is zero bytes, indicating that no **PermanentEntryID** structure ([\[MS-OXNSPI\]](#) section 2.3.8.3) is present)

PropertyRow structure #2 (beginning at address 0x001A in the **RopQueryRows** ROP response buffer):

Flag: 0x00 (no errors)

ValueArray:

0x0000001500000002

"user8"

0x00001FFB (**FreeBusyDetailed**, **FreeBusySimple**, **FolderVisible**, **FolderContact**, **FolderOwner**, **CreateSubFolder**, **DeleteAny**, **EditAny**, **DeleteOwned**, **EditOwned**, **Create**, and **ReadAny** flags are set)

The last value in the **ValueArray** field is the value of the **PidTagEntryId** property (section 2.2.4). The value begins with the byte count, 0x007C (124), at address 0x0033 in the **RopQueryRows** ROP response buffer, followed by the 124-byte **PermanentEntryID** structure.

PropertyRow structure #3 (beginning at address 0x00B1 in the **RopQueryRows** ROP response buffer):

Flag: 0x00 (no errors)

ValueArray:

0xFFFFFFFFFFFFFFFF (anonymous user)

"Anonymous"

0x00000000 (no permissions flags are set)

0x0000 (byte count is zero bytes, indicating that no **PermanentEntryID** structure is present)

The permissions list on this folder now has an entry for "user8", which the client added as shown in the example in section 4.1. The client changes the permissions for "user8" from 0x00001FFB to 0x00001800 (**FreeBusyDetailed** and **FreeBusySimple** flags) by sending the following **RopModifyPermissions** request ([MS-OXCROPS] section 2.2.10.1) with the **PermissionsData** field containing the entry to be modified.

The **RopModifyPermissions** ROP request buffer contains the following data (29 bytes).

```
0000: 40 00 00 02 01 00 02 02-00 14 00 71 66 02 00 00 @.....qf...
0010: 00 15 00 00 00 03 00 73-66 00 18 00 00 .....sf....
```

RopId: 0x40

LogonId: 0

InputHandleIndex: 0 (HSOT=0x000001DA)

ModifyFlags: 0x02 (**IncludeFreeBusy** flag is set)

ModifyCount: 0x0001 (one **PermissionData** structure in the **PermissionsData** field)

PermissionsData:

PermissionData structure (beginning at address 0x0006 in the **RopModifyPermissions** ROP request buffer):

PermissionDataFlags: 0x02 (**ModifyRow** flag is set)

PropertyValueCount: 0x0002 (two **TaggedPropertyValue** structures in the **PropertyValues** field)

PropertyValues:

TaggedPropertyValue structure #1 (beginning at address 0x0009 in the **RopModifyPermissions** ROP request buffer):

PropertyTag: 0x66710014 (**PidTagMemberId** property (section [2.2.5](#)))

PropertyValue: 0x0000001500000002

TaggedPropertyValue structure #2 (beginning at address 0x0015 in the **RopModifyPermissions** ROP request buffer):

PropertyTag: 0x66730003 (**PidTagMemberRights** property (section [2.2.7](#)))

PropertyValue: 0x00001800 (**FreeBusyDetailed** and **FreeBusySimple** flags are set)

The server returns the following ROP response buffer, which indicates that it successfully updated the permissions list for the folder.

The **RopModifyPermissions** ROP response buffer contains the following data (6 bytes).

```
0000: 40 00 00 00 00 00
```

RopId: 0x40

InputHandleIndex: 0 (HSOT=0x000001DA)

ReturnValue: 0x00000000 (success)

4.3 Removing an Entry from the Permissions List

In this example, the client is removing the entry for "user8" from the permissions list on the Calendar folder. First, the client retrieves the permissions list by sending the same **RopGetPermissionsTable** ([\[MS-OXCROPS\] section 2.2.10.2](#)), **RopSetColumns** ([\[MS-OXCROPS\] section 2.2.5.1](#)), and **RopQueryRows** ([\[MS-OXCROPS\] section 2.2.5.4](#)) ROP requests as in the example in section [4.1](#). The server returns the following three ROP response buffers with the current permissions list contained in the **RowData** field of the **RopQueryRows** ROP response buffer.

The **RopGetPermissionsTable** ROP response buffer contains the following data (6 bytes).

```
0000: 3E 01 00 00 00 00
```

RopId: 0x3E

OutputHandleIndex: 1 (HSOT=0x000000CA)

ReturnValue: 0x00000000 (success)

The **RopSetColumns** ROP response buffer contains the following data (7 bytes).

```
0000: 12 01 00 00 00 00 00
```

RopId: 0x12

InputHandleIndex: 1 (HSOT=0x000000CA)

ReturnValue: 0x00000000 (success)

TableStatus: 0x00 (**TBLSTAT_COMPLETE** flag is set)

The **RopQueryRows** ROP response buffer contains the following data (212 bytes).

```
0000: 15 01 00 00 00 00 02 03-00 00 00 00 00 00 00 00 .....
0010: 00 00 00 00 00 08 00 00-00 00 00 02 00 00 00 15 .....
0020: 00 00 00 75 00 73 00 65-00 72 00 38 00 00 00 00 ...u.s.e.r.8...
0030: 18 00 00 7C 00 00 00 00-00 DC A7 40 C8 C0 42 10 ...|.....@..B.
0040: 1A B4 B9 08 00 2B 2F E1-82 01 00 00 00 00 00 00 .....+/.....
0050: 00 2F 4F 3D 46 49 52 53-54 20 4F 52 47 41 4E 49 ./O=FIRST ORGANI
0060: 5A 41 54 49 4F 4E 2F 4F-55 3D 45 58 43 48 41 4E ZATION/OU=EXCHAN
0070: 47 45 20 41 44 4D 49 4E-49 53 54 52 41 54 49 56 GE ADMINISTRATIV
0080: 45 20 47 52 4F 55 50 20-28 46 59 44 49 42 4F 48 E GROUP (FYDIBOH
0090: 46 32 33 53 50 44 4C 54-29 2F 43 4E 3D 52 45 43 F23SPDLT)/CN=REC
00A0: 49 50 49 45 4E 54 53 2F-43 4E 3D 55 53 45 52 38 IPIENTS/CN=USER8
00B0: 00 00 FF FF FF FF FF FF-FF FF 41 00 6E 00 6F 00 .....A.n.o.
00C0: 6E 00 79 00 6D 00 6F 00-75 00 73 00 00 00 00 00 n.y.m.o.u.s.....
00D0: 00 00 00 00 .....

```

RopId: 0x15

InputHandleIndex: 1 (HSOT=0x000000CA)

ReturnValue: 0x00000000 (success)

Origin: 0x02 (**BOOKMARK_END** flag is set)

RowCount: 0x0003 (three **PropertyRow** structures in the **RowData** field)

RowData:

PropertyRow structure #1 (beginning at address 0x0009 in the **RopQueryRows** ROP response buffer):

Flag: 0x00 (no errors)

ValueArray:

0x0000000000000000 (default user)

0x0000 (Unicode null)

0x00000800 (**FreeBusySimple** flag is set)

0x0000 (byte count is zero bytes, indicating that no **PermanentEntryID** structure ([\[MS-OXNSPI\]](#) section 2.3.8.3) is present)

PropertyRow structure #2 (beginning at address 0x001A in the **RopQueryRows** ROP response buffer):

Flag: 0x00 (no errors)

ValueArray:

0x0000001500000002

"user8"

0x00001800 (**FreeBusyDetailed** and **FreeBusySimple** flags are set)

The last value in the **ValueArray** field is the value of the **PidTagEntryId** property (section 2.2.4). The value begins with the byte count, 0x007C (124), at address 0x0033 in the **RopQueryRows** ROP response buffer, followed by the 124-byte **PermanentEntryID** structure.

PropertyRow structure #3 (beginning at address 0x00B1 in the **RopQueryRows** ROP response buffer):

Flag: 0x00 (no errors)

ValueArray:

0xFFFFFFFFFFFFFFFF (anonymous user)

"Anonymous"

0x00000000 (no permissions flags are set)

0x0000 (byte count is zero bytes, indicating that no **PermanentEntryID** structure is present)

The permissions list on this folder now has an entry for "user8", which the client added as shown in the example in section 4.1 and modified as shown in the example in section 4.2. The client removes the permissions for "user8" from the permissions list by sending the following **RopModifyPermissions** ROP request ([MS-OXCROPS] section 2.2.10.1) with the **PermissionsData** field containing the entry to be removed.

The **RopModifyPermissions** ROP request buffer contains the following data (21 bytes).

```
0000: 40 00 00 02 01 00 04 01-00 14 00 71 66 02 00 00 @.....qf...
0010: 00 15 00 00 00 .....
.....
```

RopId: 0x40

LogonId: 0

InputHandleIndex: 0 (HSOT=0x000001DA)

ModifyFlags: 0x02 (**IncludeFreeBusy** flag is set)

ModifyCount: 0x0001 (one **PermissionData** structure in the **PermissionsData** field)

PermissionsData:

PermissionData structure (beginning at address 0x0006 in the **RopModifyPermissions** ROP request buffer):

PermissionDataFlags: 0x04 (**RemoveRow** flag is set)

PropertyValueCount: 0x0001 (one **TaggedPropertyValue** structure in the **PropertyValues** field)

PropertyValues:

TaggedPropertyValue structure #1 (beginning at address 0x0009 in the **RopModifyPermissions** ROP request buffer):

PropertyTag: 0x66710014 (**PidTagMemberId** property (section [2.2.5](#)))

PropertyValue: 0x0000001500000002

The server returns the following ROP response buffer, indicating that it has successfully updated the permissions list for the folder.

The **RopModifyPermissions** ROP response buffer contains the following data (6 bytes).

```
0000: 40 00 00 00 00 00
```

RopId: 0x40

InputHandleIndex: 0 (HSOT=0x000001DA)

ReturnValue: 0x00000000 (success)

5 Security

5.1 Security Considerations for Implementers

Implementers of this protocol have to manage the folder permissions specified by the **FolderVisible**, **FolderContact**, and **FolderOwner** flags properly. General security considerations pertaining to the underlying ROP-based transport apply.

5.2 Index of Security Parameters

None.

6 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 15 Technical Preview
- Microsoft® Office Outlook® 2003
- Microsoft® Office Outlook® 2007
- Microsoft® Outlook® 2010
- Microsoft® Outlook® 15 Technical Preview

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 2.2.2.1](#): Office Outlook 2003 and Office Outlook 2007 do not set the **ReplaceRows** flag in the **RopModifyPermissions** ROP request buffer ([\[MS-OXCROPS\]](#) section 2.2.10.1.1).

<2> [Section 2.2.3](#): Outlook 2010 and Outlook 15 Technical Preview do not use the **PidTagAccessControlListData** property (section [2.2.3](#)).

<3> [Section 2.2.7](#): Exchange 15 Technical Preview does not ignore the **FolderContact** bit and does apply the bit to the reserved entries.

<4> [Section 2.2.7](#): Exchange 2007, Exchange 2010, and Exchange 15 Technical Preview include the **FreeBusySimple** flag by default on the Calendar folder for any entry in the permissions list except the anonymous user and add the **FreeBusyDetailed** flag to any entries that have the **ReadAny** flag set. Exchange 2007, Exchange 2010, and Exchange 15 Technical Preview use these defaults until the client modifies the permissions list with the **IncludeFreeBusy** flag set in the **RopModifyPermissions** ROP request to override the default value.

<5> [Section 3.1.4.2](#): Office Outlook 2003 and Office Outlook 2007 do not set the **ReplaceRows** flag in the **RopModifyPermissions** ROP request buffer ([\[MS-OXCROPS\]](#) section 2.2.10.1.1).

7 Change Tracking

This section identifies changes that were made to the [MS-OXCPERM] protocol document between the January 2012 and April 2012 releases. Changes are classified as New, Major, Minor, Editorial, or No change.

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

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

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

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

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

The revision class **No change** means that no new technical or language changes were introduced. The technical content of the document is identical to the last released version, but minor editorial and formatting changes, as well as updates to the header and footer information, and to the revision summary, may have been made.

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

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

- Protocol syntax updated due to protocol revision.
- Protocol syntax removed due to protocol revision.
- New content added for template compliance.
- Content updated for template compliance.
- Content removed for template compliance.
- Obsolete document removed.

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

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

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

The changes made to this document are listed in the following table. For more information, please contact protocol@microsoft.com.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
1.7 Versioning and Capability Negotiation	Removed the product behavior note concerning the version number returned by the server.	N	Product behavior note removed.
2.2.1.1 RopGetPermissionsTable ROP Request Buffer	Moved the description of the TableFlags field from the TableFlags section.	N	Content updated.
2.2.1.1 RopGetPermissionsTable ROP Request Buffer	Changed "client MUST ignore the values of those bits" to "the server MUST NOT include the values of those flags in the returned permissions list" in the description of the IncludeFreeBusy flag.	N	Content updated.
2.2.1.2 RopGetPermissionsTable ROP Response Buffer	Moved the description of the ReturnValue field from the ReturnValue section.	N	Content updated.
2.2.1.2 RopGetPermissionsTable ROP Response Buffer	Added [MS-OXCADATA] reference to the description of the ReturnValue field.	N	Content updated.
2.2.2.1 RopModifyPermissions ROP Request Buffer	Moved the description of the ModifyFlags field from the ModifyFlags section.	N	Content updated.
2.2.2.1 RopModifyPermissions ROP Request Buffer	Added the descriptions of the ModifyCount and PermissionsData fields.	N	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
2.2.2.1 RopModifyPermissions ROP Request Buffer	Changed normative language from "SHOULD NOT" to "SHOULD" for setting of the ReplaceRows bit.	Y	Content updated.
2.2.2.1 RopModifyPermissions ROP Request Buffer	Specified that the client SHOULD set the ReplaceRows bit when copying the access control list (ACL) from the Calendar folder to the Freebusy Data folder.	Y	Content updated.
2.2.2.1 RopModifyPermissions ROP Request Buffer	Removed Outlook 2010 from the product behavior note about the ReplaceRows bit.	Y	Product behavior note updated.
2.2.2.1 RopModifyPermissions ROP Request Buffer	Revised the description of the ReplaceRows flag to clarify the behavior that applies when the flag is not set.	N	Content updated.
2.2.2.1.1 PermissionData Structure	Added new section to specify the PermissionData structure.	Y	New content added.
2.2.2.2 RopModifyPermissions ROP Response Buffer	Moved the description of the ReturnValue field from the ReturnValue section.	N	Content updated.
2.2.2.2 RopModifyPermissions ROP Response Buffer	Added [MS-OXCADATA] reference to the description of the ReturnValue field.	N	Content updated.
2.2.3 PidTagAccessControlListData Property	Added Outlook 15 Technical Preview to the product behavior note about the PidTagAccessControlListData property.	Y	Product behavior note updated.
2.2.4 PidTagEntryId Property	Moved the statement about including the property in the RopSetColumns request to the "Retrieving Folder Permissions" section.	N	Content updated.
2.2.5 PidTagMemberId Property	Moved the statement about including the property in the RopSetColumns request to the "Retrieving Folder Permissions" section.	N	Content updated.
2.2.6 PidTagMemberName Property	Removed the product behavior note about the names that the server provides for reserved entries in the permissions list and incorporated the details into the body of the document.	N	Product behavior note removed.
2.2.6 PidTagMemberName Property	Moved the statement about including the property in the RopSetColumns request to the "Retrieving Folder Permissions" section.	N	Content updated.
2.2.7 PidTagMemberRights Property	Removed product behavior note about the effect of the FolderOwner and FolderContact bits on the client's display of the permissions	N	Product behavior note

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
	list and incorporated the details into the body of the document.		removed.
2.2.7 PidTagMemberRights Property	Added new product behavior note specifying that Exchange 15 Technical Preview does not ignore the FolderContact bit and does apply the bit to the reserved entries.	Y	New product behavior note added.
2.2.7 PidTagMemberRights Property	Changed "for the default user and for any non-reserved user entries" to "for any entry in the permissions list except the anonymous user" in the product behavior note.	N	Product behavior note updated.
2.2.7 PidTagMemberRights Property	Revised product behavior note about the FreeBusySimple bit to include Exchange 15 Technical Preview.	Y	Product behavior note updated.
3.1.1 Abstract Data Model	Added statement specifying that the abstract data model for the client is the same as that specified in [MS-OXCFOld].	N	Content updated.
3.1.4.1 Retrieving Folder Permissions	Deleted statement specifying that client is required to extract the permissions list from the RopQueryRows response.	N	Content updated.
3.1.4.1 Retrieving Folder Permissions	Moved the diagram that shows the sequence for retrieving folder permissions from the "Permissions Table" subsection of the "Overview" section.	N	Content updated.
3.1.4.1 Retrieving Folder Permissions	Moved details about including the PidTagEntryId, PidTagMemberId, and PidTagMemberName properties from the "PidTagEntryId Property", "PidTagMemberId Property", and "PidTagMemberName Property" sections.	N	Content updated.
3.1.4.1 Retrieving Folder Permissions	Removed product behavior note about Outlook sending the RopOpenStream request and depending on it failing.	N	Product behavior note removed.
3.1.4.2 Adding Folder Permissions	Changed "MAY" to "SHOULD" for setting of the ReplaceRows bit.	Y	Content updated.
3.1.4.2 Adding Folder Permissions	Specified that the client SHOULD set the ReplaceRows bit when copying the ACL from the Calendar folder to the Freebusy Data folder.	Y	Content updated.
3.1.4.2 Adding Folder Permissions	Removed Outlook 2010 from the product behavior note about the ReplaceRows bit.	Y	Product behavior note updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
3.1.4.2 Adding Folder Permissions	Deleted the last statement of the last paragraph about the client not including the ReplaceRows flag.	N	Content updated.
3.2.5.1 Processing a RopGetPermissionsTable ROP Request	Specified the error code that is returned if the user does not have permission to view the folder.	N	Content updated.
3.2.5.2 Processing a RopModifyPermissions ROP Request	Added statement about how the server handles a request to update nonexistent permissions in the permissions list.	N	Content updated.
3.2.5.2 Processing a RopModifyPermissions ROP Request	Specified the error code that is returned if the user does not have permission to modify the folder's properties.	N	Content updated.
4 Protocol Examples	Updated the names of fields and added explanations in all examples.	Y	Content updated.
	Removed the "TableFlags" and "ReturnValue" sections from the RopGetPermissionsTable ROP section.	N	Content removed.
	Removed the "ModifyFlags", "PermissionDataFlags", "PropertyValues", and "ReturnValue" sections from the RopModifyPermissions ROP section.	N	Content removed.
	Removed the subsection "Permissions Table" from the "Overview" section.	N	Content removed.

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