

[MS-ASNOTE]:

Exchange ActiveSync: Notes Class Protocol

Intellectual Property Rights Notice for Open Specifications Documentation

- **Technical Documentation.** Microsoft publishes Open Specifications documentation for protocols, file formats, languages, standards as well as overviews of the interaction among each of these technologies.
- **Copyrights.** This documentation is covered by Microsoft copyrights. Regardless of any other terms that are contained in the terms of use for the Microsoft website that hosts this documentation, you may make copies of it in order to develop implementations of the technologies described in the Open Specifications and may distribute portions of it in your implementations using these technologies or your documentation as necessary to properly document the implementation. You may also distribute in your implementation, with or without modification, any schema, IDL's, or code samples that are included in the documentation. This permission also applies to any documents that are referenced in the Open Specifications.
- **No Trade Secrets.** Microsoft does not claim any trade secret rights in this documentation.
- **Patents.** Microsoft has patents that may cover your implementations of the technologies described in the Open Specifications. Neither this notice nor Microsoft's delivery of the documentation grants any licenses under those or any other Microsoft patents. However, a given Open Specification may be covered by Microsoft [Open Specification Promise](#) or the [Community Promise](#). If you would prefer a written license, or if the technologies described in the Open Specifications are not covered by the Open Specifications Promise or Community Promise, as applicable, patent licenses are available by contacting iplg@microsoft.com.
- **Trademarks.** The names of companies and products contained in this documentation may be covered by trademarks or similar intellectual property rights. This notice does not grant any licenses under those rights. For a list of Microsoft trademarks, visit www.microsoft.com/trademarks.
- **Fictitious Names.** The example companies, organizations, products, domain names, e-mail addresses, logos, people, places, and events depicted in this documentation are fictitious. No association with any real company, organization, product, domain name, email address, logo, person, place, or event is intended or should be inferred.

Reservation of Rights. All other rights are reserved, and this notice does not grant any rights other than specifically described above, whether by implication, estoppel, or otherwise.

Tools. The Open Specifications do not require the use of Microsoft programming tools or programming environments in order for you to develop an implementation. If you have access to Microsoft programming tools and environments you are free to take advantage of them. Certain Open Specifications are intended for use in conjunction with publicly available standard specifications and network programming art, and assumes that the reader either is familiar with the aforementioned material or has immediate access to it.

Preliminary Documentation. This Open Specification provides documentation for past and current releases and/or for the pre-release version of this technology. This Open Specification is final documentation for past or current releases as specifically noted in the document, as applicable; it is preliminary documentation for the pre-release versions. Microsoft will release final documentation in connection with the commercial release of the updated or new version of this technology. As the documentation may change between this preliminary version and the final version of this technology, there are risks in relying on preliminary documentation. To the extent that you incur additional

development obligations or any other costs as a result of relying on this preliminary documentation, you do so at your own risk.

Preliminary

Revision Summary

Date	Revision History	Revision Class	Comments
4/10/2009	0.1.0	Major	Initial Availability.
7/15/2009	1.0.0	Major	Revised and edited for technical content.
11/4/2009	2.0.0	Major	Updated and revised the technical content.
2/10/2010	3.0.0	Major	Updated and revised the technical content.
5/5/2010	4.0.0	Major	Updated and revised the technical content.
8/4/2010	5.0	Major	Significantly changed the technical content.
11/3/2010	5.1	Minor	Clarified the meaning of the technical content.
3/18/2011	5.2	Minor	Clarified the meaning of the technical content.
8/5/2011	6.0	Major	Significantly changed the technical content.
10/7/2011	6.1	Minor	Clarified the meaning of the technical content.
1/20/2012	7.0	Major	Significantly changed the technical content.
4/27/2012	7.0	No Change	No changes to the meaning, language, or formatting of the technical content.
7/16/2012	7.0	No Change	No changes to the meaning, language, or formatting of the technical content.
10/8/2012	7.1	Minor	Clarified the meaning of the technical content.
2/11/2013	7.1	No Change	No changes to the meaning, language, or formatting of the technical content.
7/26/2013	8.0	Major	Significantly changed the technical content.
11/18/2013	8.0	No Change	No changes to the meaning, language, or formatting of the technical content.
2/10/2014	8.0	No Change	No changes to the meaning, language, or formatting of the technical content.
4/30/2014	9.0	Major	Significantly changed the technical content.
7/31/2014	9.0	No Change	No changes to the meaning, language, or formatting of the technical content.
10/30/2014	9.0	No Change	No changes to the meaning, language, or formatting of the technical content.
5/26/2015	10.0	Major	Significantly changed the technical content.

Table of Contents

1	Introduction	6
1.1	Glossary	6
1.2	References	6
1.2.1	Normative References	7
1.2.2	Informative References	7
1.3	Overview	7
1.4	Relationship to Other Protocols	7
1.5	Prerequisites/Preconditions	8
1.6	Applicability Statement	8
1.7	Versioning and Capability Negotiation	8
1.8	Vendor-Extensible Fields	8
1.9	Standards Assignments.....	8
2	Messages.....	9
2.1	Transport.....	9
2.2	Message Syntax.....	9
2.2.1	Namespaces	9
2.2.2	Elements	9
2.2.2.1	Body	10
2.2.2.2	Categories	11
2.2.2.3	Category.....	11
2.2.2.4	LastModifiedDate	12
2.2.2.5	MessageClass	12
2.2.2.6	Subject.....	13
3	Protocol Details.....	14
3.1	Client Details.....	14
3.1.1	Abstract Data Model.....	14
3.1.2	Timers	14
3.1.3	Initialization.....	14
3.1.4	Higher-Layer Triggered Events	14
3.1.4.1	Synchronizing Notes Data Between Client and Server	14
3.1.4.2	Searching a Server for Notes.....	14
3.1.4.3	Requesting Details for One or More Notes	14
3.1.5	Message Processing Events and Sequencing Rules	15
3.1.5.1	ItemOperations Command Request	15
3.1.5.1.1	airsyncbase:Body Element.....	15
3.1.5.2	Search Command Request	15
3.1.5.3	Sync Command Request	15
3.1.5.3.1	LastModifiedDate Element	15
3.1.5.3.2	MessageClass Element	15
3.1.6	Timer Events.....	15
3.1.7	Other Local Events.....	16
3.2	Server Details.....	16
3.2.1	Abstract Data Model.....	16
3.2.2	Timers	16
3.2.3	Initialization.....	16
3.2.4	Higher-Layer Triggered Events	16
3.2.4.1	Synchronizing Notes Data Between Client and Server	16
3.2.4.2	Searching for Notes Data	16
3.2.4.3	Retrieving Details for One or More Notes.....	16
3.2.5	Message Processing Events and Sequencing Rules	17
3.2.5.1	ItemOperations Command Response	17
3.2.5.2	Search Command Response	17

3.2.5.3	Sync Command Response	17
3.2.5.3.1	LastModifiedDate Element	17
3.2.5.3.2	MessageClass Element	18
3.2.6	Timer Events.....	18
3.2.7	Other Local Events.....	18
4	Protocol Examples	19
5	Security	21
5.1	Security Considerations for Implementers	21
5.2	Index of Security Parameters	21
6	Appendix A: Full XML Schema.....	22
7	Appendix B: Product Behavior	23
8	Change Tracking.....	24
9	Index.....	26

Preliminary

1 Introduction

The Exchange ActiveSync: Notes Class Protocol enables the communication of notes data between a mobile device and the server in the ActiveSync 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 [\[RFC2119\]](#). Sections 1.5 and 1.9 are also normative but do not contain those terms. All other sections and examples in this specification are informative.

1.1 Glossary

The following terms are specific to this document:

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 [\[HTML\]](#).

Inter-Personal Mail (IPM): Typical user messaging items, such as email and calendar items.

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

Rich Text Format (RTF): Text with formatting as described in [\[MSFT-RTF\]](#).

Wireless Application Protocol (WAP) Binary XML (WBXML): A compact binary representation of **XML** that is designed to reduce the transmission size of XML documents over narrowband communication channels.

XML: The Extensible Markup Language, as described in [\[XML1.0\]](#).

XML element: An **XML** structure that typically consists of a start tag, an end tag, and the information between those tags. Elements can have attributes (1) and can contain other elements.

XML namespace: A collection of names that is used to identify elements, types, and attributes in XML documents identified in a URI reference [\[RFC3986\]](#). A combination of XML namespace and local name allows XML documents to use elements, types, and attributes that have the same names but come from different sources. For more information, see [\[XMLNS-2ED\]](#).

XML schema: A description of a type of XML document that is typically expressed in terms of constraints on the structure and content of documents of that type, in addition to the basic syntax constraints that are imposed by **XML** itself. An XML schema provides a view of a document type at a relatively high level of abstraction.

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.

- [MS-ASAIRS] Microsoft Corporation, "[Exchange ActiveSync: AirSyncBase Namespace Protocol](#)".
- [MS-ASCMD] Microsoft Corporation, "[Exchange ActiveSync: Command Reference Protocol](#)".
- [MS-ASDTYPE] Microsoft Corporation, "[Exchange ActiveSync: Data Types](#)".
- [MS-ASHTTP] Microsoft Corporation, "[Exchange ActiveSync: HTTP Protocol](#)".
- [MS-ASWBXML] Microsoft Corporation, "[Exchange ActiveSync: WAP Binary XML \(WBXML\) Algorithm](#)".
- [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>
- [XMLNS] Bray, T., Hollander, D., Layman, A., et al., Eds., "Namespaces in XML 1.0 (Third Edition)", W3C Recommendation, December 2009, <http://www.w3.org/TR/2009/REC-xml-names-20091208/>
- [XMLSCHEMA1] Thompson, H., Beech, D., Maloney, M., and Mendelsohn, N., Eds., "XML Schema Part 1: Structures", W3C Recommendation, May 2001, <http://www.w3.org/TR/2001/REC-xmlschema-1-20010502/>
- [XML] World Wide Web Consortium, "Extensible Markup Language (XML) 1.0 (Fourth Edition)", W3C Recommendation 16 August 2006, edited in place 29 September 2006, <http://www.w3.org/TR/2006/REC-xml-20060816/>

1.2.2 Informative References

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

1.3 Overview

This protocol describes the **XML** representation of notes that are used for client and server communication as described in [\[MS-ASCMD\]](#). The notes data is included in protocol command requests when notes data is sent from the client to the server, and is included in protocol command responses when notes data is returned from the server to the client.

1.4 Relationship to Other Protocols

This protocol describes the XML representation of notes that is used by the command requests and command responses that are described in [\[MS-ASCMD\]](#). The protocol governing the transmission of these commands between the client and the server is described in [\[MS-ASCMD\]](#). The **Wireless Application Protocol (WAP) Binary XML (WBXML)**, as described in [\[MS-ASWBXML\]](#), is used to transmit the XML markup that constitutes the request body and the response body.

All simple data types in this document conform to the data type definitions that are described in [\[MS-ASDTYPE\]](#).

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

1.5 Prerequisites/Preconditions

None.

1.6 Applicability Statement

This protocol describes a set of **XML elements** that are used to communicate notes data when using the commands that are described in [\[MS-ASCMD\]](#). This set of elements is applicable when communicating notes information between a mobile device and a server. Except where indicated, these elements are not applicable when communicating other types of information that are supported by the ActiveSync protocol.

1.7 Versioning and Capability Negotiation

None.

1.8 Vendor-Extensible Fields

None.

1.9 Standards Assignments

None.

2 Messages

2.1 Transport

This protocol consists of a series of XML elements that are embedded inside of a command request or command response, as specified in [\[MS-ASCMD\]](#).

The XML markup that constitutes the request body or the response body that is transmitted between the client and the server uses Wireless Application Protocol (WAP) Binary XML (WBXML), as specified in [\[MS-ASWBXML\]](#).

2.2 Message Syntax

The **XML schema** for the Notes namespace is described in section [6](#).

The markup that is used by this protocol MUST be well-formed XML, as specified in [\[XML\]](#).

2.2.1 Namespaces

This specification defines and references various **XML namespaces** using the mechanisms specified in [\[XMLNS\]](#). Although this specification associates a specific XML namespace prefix for each XML namespace that is used, the choice of any particular XML namespace prefix is implementation-specific and is not significant for interoperability.

Prefix	Namespace URI	Reference
airsyncbase	AirSyncBase	[MS-ASAIRS]
(none)	Notes	
airsync	AirSync	[MS-ASCMD] section 2.2.2.20
itemoperations	ItemOperations	[MS-ASCMD] section 2.2.2.9
search	Search	[MS-ASCMD] section 2.2.2.15
xs	http://www.w3.org/2001/XMLSchema	[XMLSCHEMA1]

2.2.2 Elements

Elements of the **Notes** class are defined in two namespaces: **Notes** and **AirSyncBase**. All **Notes** class elements are specified in this document; elements defined in the **AirSyncBase** namespace are further specified in [\[MS-ASAIRS\]](#).

Except where otherwise specified in the following sections, each element of the **Notes** class is used in ActiveSync command requests and responses as follows:

- As an optional child element of the **itemoperations:Schema** element ([\[MS-ASCMD\]](#) section 2.2.3.154) in **ItemOperations** command requests ([\[MS-ASCMD\]](#) section 2.2.2.9)
- As an optional child element of the **itemoperations:Properties** element ([\[MS-ASCMD\]](#) section 2.2.3.135.1) in **ItemOperations** command responses

- As an optional child element of the **search:Properties** element ([MS-ASCMD] section 2.2.3.135.2) in **Search** command responses ([MS-ASCMD] section 2.2.2.15)
- As an optional child element of the **airsync:ApplicationData** element ([MS-ASCMD] section 2.2.3.11) in **Sync** command requests ([MS-ASCMD] section 2.2.2.20)
- As an optional child element of the **airsync:ApplicationData** element ([MS-ASCMD] section 2.2.3.11) in **Sync** command responses

The following table summarizes the set of common XML schema element definitions defined by this specification. XML schema element definitions that are specific to one or more particular operations are specified further in sections [3.1.5.1](#), [3.1.5.2](#), [3.1.5.3](#), [3.2.5.1](#), [3.2.5.2](#), and [3.2.5.3](#).

Element name	Description
airsyncbase:Body (section 2.2.2.1)	The text of the note.
Subject (section 2.2.2.6)	The subject of the note.
MessageClass (section 2.2.2.5)	The form of the message.
LastModifiedDate (section 2.2.2.4)	The day and time that the note was last changed by the user.
Categories (section 2.2.2.2)	A collection of labels assigned to the note.
Category (section 2.2.2.3)	One of the user-assigned labels applied to the note.

2.2.2.1 Body

The **airsyncbase:Body** element is a **container** ([MS-ASDTYPE] section 2.2) element that specifies the text of the note. It is defined as an element in the **AirSyncBase** namespace and is used in ActiveSync command requests and responses as specified in section [2.2.2](#).

The **airsyncbase:Type** element ([MS-ASAIRS] section 2.2.2.40.1) (a required child element of the **airsyncbase:Body** element) MUST be set to one of the following values.

Value	Meaning
1	Plain text
2	HTML
3	Rich Text Format (RTF)

When the **airsyncbase:Body** element is used in a **Sync** command request or response ([MS-ASCMD] section 2.2.2.20), the **airsyncbase:Data** element ([MS-ASAIRS] section 2.2.2.20.1) is a required child element of the **airsyncbase:Body** element.

For more details about the **airsyncbase:Body** element, see [MS-ASAIRS] section 2.2.2.9.

Protocol Versions

The following table specifies the protocol versions that support this element. The client indicates the protocol version being used by setting either the MS-ASProtocolVersion header, as specified in [\[MS-ASHTTP\] section 2.2.1.1.2.4](#), or the **Protocol version** field, as specified in [MS-ASHTTP] section 2.2.1.1.1.1, in the request.

Protocol version	Element support
2.5	
12.0	
12.1	
14.0	X
14.1	X
16.0	X

2.2.2.2 Categories

The **Categories** element is a **container** ([MS-ASDTYPE] section 2.2) element that specifies a collection of labels assigned to the note. It is defined as an element in the **Notes** namespace and is used in ActiveSync command requests and responses as specified in section 2.2.2.

The **Categories** element has the following child element:

- **Category** (section 2.2.2.3): Zero or more instances of this element are allowed.

Protocol Versions

The following table specifies the protocol versions that support this element. The client indicates the protocol version being used by setting either the MS-ASProtocolVersion header, as specified in [MS-ASHTTP] section 2.2.1.1.2.4, or the **Protocol version** field, as specified in [MS-ASHTTP] section 2.2.1.1.1.1, in the request.

Protocol version	Element support
2.5	
12.0	
12.1	
14.0	X
14.1	X
16.0	X

2.2.2.3 Category

The **Category** element is an optional child element of the **Categories** element (section 2.2.2.2) that specifies a user-selected label that has been applied to the note. It is defined as an element in the **Notes** namespace.

The value of this element is a **string** data type, as specified in [MS-ASDTYPE] section 2.7.

Protocol Versions

The following table specifies the protocol versions that support this element. The client indicates the protocol version being used by setting either the MS-ASProtocolVersion header, as specified in [\[MS-ASHTTP\]](#) section 2.2.1.1.2.4, or the **Protocol version** field, as specified in [\[MS-ASHTTP\]](#) section 2.2.1.1.1.1, in the request.

Protocol version	Element support
2.5	
12.0	
12.1	
14.0	X
14.1	X
16.0	X

2.2.2.4 LastModifiedDate

The **LastModifiedDate** element specifies when the note was last changed. It is defined as an element in the **Notes** namespace and is used in ActiveSync command requests and responses as specified in section [2.2.2](#).

The value of the **LastModifiedDate** element is a **string** data type represented as a **Compact DateTime** ([\[MS-ASDTYPE\]](#) section 2.7.5).

Protocol Versions

The following table specifies the protocol versions that support this element. The client indicates the protocol version being used by setting either the MS-ASProtocolVersion header, as specified in [\[MS-ASHTTP\]](#) section 2.2.1.1.2.4, or the **Protocol version** field, as specified in [\[MS-ASHTTP\]](#) section 2.2.1.1.1.1, in the request.

Protocol version	Element support
2.5	
12.0	
12.1	
14.0	X
14.1	X
16.0	X

2.2.2.5 MessageClass

The **MessageClass** element is a required element that specifies the **Inter-Personal Mail (IPM)** type of the note. It is defined as an element in the **Notes** namespace.

The value of this element is a **string** data type, as specified in [\[MS-ASDTYPE\]](#) section 2.7.

The value of the **MessageClass** element MUST be either "IPM.StickyNote" or "IPM.StickyNote.*", where "*" represents an arbitrary string chosen by the client or server.

Protocol Versions

The following table specifies the protocol versions that support this element. The client indicates the protocol version being used by setting either the MS-ASProtocolVersion header, as specified in [\[MS-ASHTTP\]](#) section 2.2.1.1.2.4, or the **Protocol version** field, as specified in [\[MS-ASHTTP\]](#) section 2.2.1.1.1.1, in the request.

Protocol version	Element support
2.5	
12.0	
12.1	
14.0	X
14.1	X
16.0	X

2.2.2.6 Subject

The **Subject** element specifies the subject of the note. It is defined as an element in the **Notes** namespace and is used in ActiveSync command requests and responses as specified in section [2.2.2](#).

The value of this element is a **string** data type, as specified in [\[MS-ASDTYPE\]](#) section 2.7.

Protocol Versions

The following table specifies the protocol versions that support this element. The client indicates the protocol version being used by setting either the MS-ASProtocolVersion header, as specified in [\[MS-ASHTTP\]](#) section 2.2.1.1.2.4, or the **Protocol version** field, as specified in [\[MS-ASHTTP\]](#) section 2.2.1.1.1.1, in the request.

Protocol version	Element support
2.5	
12.0	
12.1	
14.0	X
14.1	X
16.0	X

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.

Notes class: A structured XML text block that adheres to the XML schema definition specified in section 2.2. It is returned by the server to the client as part of a full XML response to the client command requests that are specified in section 3.1.5. It is included in command requests that are sent from the client to the server to retrieve or synchronize notes.

Command request: A WBXML-formatted message that adheres to the command schemas specified in [\[MS-ASCMD\]](#).

3.1.2 Timers

None.

3.1.3 Initialization

None.

3.1.4 Higher-Layer Triggered Events

3.1.4.1 Synchronizing Notes Data Between Client and Server

A client initiates synchronization of **Notes** class data with the server by sending a **Sync** command request ([\[MS-ASCMD\]](#) section 2.2.2.20) to the server.

3.1.4.2 Searching a Server for Notes

A client searches for **Notes** class data by sending a **Search** command request ([\[MS-ASCMD\]](#) section 2.2.2.15) to the server.

3.1.4.3 Requesting Details for One or More Notes

A client requests **Notes** class data for one or more individual notes by sending an **ItemOperations** command request ([\[MS-ASCMD\]](#) section 2.2.2.9) to the server that contains one or more **itemoperations:Fetch** elements ([\[MS-ASCMD\]](#) section 2.2.3.63.1).

3.1.5 Message Processing Events and Sequencing Rules

3.1.5.1 ItemOperations Command Request

A client uses an **ItemOperations** command request ([\[MS-ASCMD\]](#) section 2.2.2.9) to retrieve data from the server for one or more specific **Notes** class items.

Notes class elements cannot be included in an **ItemOperations** command request.

3.1.5.1.1 airsynbase:Body Element

If a client cannot display the data type specified by the **airsynbase:Type** element (a required child element of the **airsynbase:Body** element (section [2.2.2.1](#)) in the **ItemOperations** command response ([\[MS-ASCMD\]](#) section 2.2.2.9)), as specified in [\[MS-ASAIRS\]](#) section 2.2.2.40.1), the client can ignore the **airsynbase:Body** element.

3.1.5.2 Search Command Request

A client uses the **Search** command request ([\[MS-ASCMD\]](#) section 2.2.2.15) to retrieve **Notes** class items that match the criteria specified by the client.

Elements that belong to the **Notes** class, as specified in section [2.2.2](#), MUST NOT be included in a **Search** command request.

3.1.5.3 Sync Command Request

A client uses the **Sync** command request ([\[MS-ASCMD\]](#) section 2.2.2.20) to synchronize its **Notes** class items for a specified user with the notes currently stored by the server.

Any of the elements that belong to the **Notes** class, as specified in section [2.2.2](#), can be included in a **Sync** command request as child elements of the **airsync:ApplicationData** element ([\[MS-ASCMD\]](#) section 2.2.3.11) within either an **airsync:Add** element ([\[MS-ASCMD\]](#) section 2.2.3.7.2) or an **airsync:Change** element ([\[MS-ASCMD\]](#) section 2.2.3.24).

The **airsync:Supported** element ([\[MS-ASCMD\]](#) section 2.2.3.174) MUST NOT be included in a **Sync** command request for the **Notes** class.

When an existing note is updated with an **airsync:Change** element in a **Sync** command, the command will contain all required elements of the note.

3.1.5.3.1 LastModifiedDate Element

The client can omit the **LastModifiedDate** element (section [2.2.2.4](#)) from the **Sync** command request ([\[MS-ASCMD\]](#) section 2.2.2.20). If it is included in a **Sync** command request, the server will ignore it.

3.1.5.3.2 MessageClass Element

If a client changes the **MessageClass** element (section [2.2.2.5](#)) value on an existing note, the **MessageClass** element value MUST conform to the requirements specified in section 2.2.2.5.

3.1.6 Timer Events

None.

3.1.7 Other Local Events

None.

3.2 Server Details

3.2.1 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.

Notes class: A structured XML text block that adheres to the XML schema specified in section [2.2](#). It is returned by the server as part of a full XML response to the client requests specified in section [3.1.5](#).

The server can return zero or more **Notes** class XML blocks in its response, depending on how many notes match the criteria specified by the client command request. The server returns a **Notes** class XML block for every note that matches the criteria specified by the client command request.

Command response: A WBXML-formatted message that adheres to the command schemas specified in [\[MS-ASCMD\]](#).

3.2.2 Timers

None

3.2.3 Initialization

None.

3.2.4 Higher-Layer Triggered Events

3.2.4.1 Synchronizing Notes Data Between Client and Server

Synchronization of **Notes** class data between client and server is initiated by the client, as specified in section [3.1.4.1](#). The server responds with a **Sync** command response ([\[MS-ASCMD\]](#) section 2.2.2.20).

3.2.4.2 Searching for Notes Data

Searching for **Notes** class data is initiated by the client, as specified in section [3.1.4.2](#). The server responds with a **Search** command response ([\[MS-ASCMD\]](#) section 2.2.2.15).

3.2.4.3 Retrieving Details for One or More Notes

Retrieval of **Notes** class data for one or more individual notes is initiated by the client, as specified in section [3.1.4.3](#). The server responds with an **ItemOperations** command response ([\[MS-ASCMD\]](#) section 2.2.2.9).

3.2.5 Message Processing Events and Sequencing Rules

3.2.5.1 ItemOperations Command Response

When a client uses an **ItemOperations** command request ([MS-ASCMD] section 2.2.2.9) to retrieve data from the server for one or more notes items, as specified in section 3.1.5.1, the server responds with an **ItemOperations** command response.

Any of the elements that belong to the **Notes** class, as specified in section 2.2.2, can be included in an **ItemOperations** command response. If an **itemoperations:Schema** element ([MS-ASCMD] section 2.2.3.154) is included in the **ItemOperations** command request, then the elements returned in the **ItemOperations** command response MUST be restricted to the elements that were included as child elements of the **ItemOperations:Schema** element in the command request.

Notes class elements are returned as child elements of the **itemoperations:Properties** element ([MS-ASCMD] section 2.2.3.135) in the **ItemOperations** command response.

3.2.5.2 Search Command Response

When a client uses the **Search** command request ([MS-ASCMD] section 2.2.2.15) to retrieve **Notes** class items that match the criteria specified by the client, as specified in section 3.1.5.2, the server responds with a **Search** command response.

Any of the elements that belong to the **Notes** class, as specified in section 2.2.2, can be included in a **Search** command response.

Notes class elements are returned as child elements of the **search:Properties** element ([MS-ASCMD] section 2.2.3.135) in the **Search** command response.

3.2.5.3 Sync Command Response

When a client uses the **Sync** command request ([MS-ASCMD] section 2.2.2.20) to synchronize its **Notes** class items for a specified user with the notes currently stored by the server, as specified in section 3.1.5.3, the server responds with a **Sync** command response.

Any of the elements for the **Notes** class, as specified in section 2.2.2, can be included in a **Sync** command response as child elements of the **airsync:ApplicationData** element ([MS-ASCMD] section 2.2.3.11) within either an **airsync:Add** element ([MS-ASCMD] section 2.2.3.7.2) or an **airsync:Change** element ([MS-ASCMD] section 2.2.3.24).

When an existing note is updated by using an **airsync:Change** element in a **Sync** command request, the command request will contain required all elements of the note. If the **Categories** element (section 2.2.2.2) or a child of the **Categories** element (section 2.2.2.3) that was previously set is missing, the server will delete that property from the note. The absence of an **airsyncbase:Body** element (section 2.2.2.1) or a **Subject** element (section 2.2.2.6) within an **airsync:Change** element is not to be interpreted as an implicit delete.

If the **airsync:Supported** element ([MS-ASCMD] section 2.2.3.174) is included in a **Sync** command request for **Notes** class data, the server returns a **Status** element with a value of 4, as specified in [MS-ASCMD] section 2.2.3.172.16.

3.2.5.3.1 LastModifiedDate Element

The **LastModifiedDate** element (section 2.2.2.4) is not required in the **Sync** command request, but it is required in the **Sync** command response ([MS-ASCMD] section 2.2.2.20).

If a **Sync** command request includes the **LastModifiedDate** element, the server ignores the element and returns the actual time that the note was last modified.

3.2.5.3.2 MessageClass Element

If a client submits a **Sync** command request ([\[MS-ASCMD\]](#) section 2.2.2.20) that contains a **MessageClass** element value that does not conform to the requirements specified in section [2.2.2.5](#), the server MUST respond with a **Status** element with a value of 6, as specified in [\[MS-ASCMD\]](#) section 2.2.3.172.16.

3.2.6 Timer Events

None.

3.2.7 Other Local Events

None.

Preliminary

4 Protocol Examples

The following example demonstrates a client request to synchronize notes data with the server, and the server response. In this example, the client uses the **Sync** command request ([\[MS-ASCMD\]](#) section 2.2.2.20) to create one note, update one note, and delete one note.

Request:

```
<?xml version="1.0" encoding="utf-8"?>
<Sync
  xmlns:airsynbase="AirSyncBase"
  xmlns:notes="Notes" xmlns="AirSync">
  <Collections>
    <Collection>
      <SyncKey>398434774</SyncKey>
      <CollectionId>8</CollectionId>
      <DeletesAsMoves>1</DeletesAsMoves>
      <GetChanges>1</GetChanges>
      <WindowSize>512</WindowSize>
      <Options>
        <airsynbase:BodyPreference>
          <airsynbase:Type>2</airsynbase:Type>
          <airsynbase:TruncationSize>5120</airsynbase:TruncationSize>
          <airsynbase:AllOrNone>1</airsynbase:AllOrNone>
        </airsynbase:BodyPreference>
      </Options>
      <Commands>
        <Add>
          <ClientId>c212ac10-0465-4983-a898-076e152552ef</ClientId>
          <ApplicationData>
            <airsynbase:Body>
              <airsynbase:Type>2</airsynbase:Type>
              <airsynbase:Data>A new note I just created.</airsynbase:Data>
            </airsynbase:Body>
            <notes:Categories>
              <notes:Category>Business</notes:Category>
            </notes:Categories>
            <notes:Subject>New note</notes:Subject>
            <notes:MessageClass>IPM.StickyNote</notes:MessageClass>
          </ApplicationData>
        </Add>
        <Delete>
          <ServerId>8:1</ServerId>
        </Delete>
        <Change>
          <ServerId>bb18e2a7-3e65-41a1-b0b2-9815539f98ad</ServerId>
          <ApplicationData>
            <airsynbase:Body>
              <airsynbase:Type>2</airsynbase:Type>
              <airsynbase:Data>&lt;strong>This is my second
note.&lt;/strong></airsynbase:Data>
            </airsynbase:Body>
            <notes:Categories>
              <notes:Category>Business</notes:Category>
            </notes:Categories>
            <notes:Subject>Second Note</notes:Subject>
            <notes:MessageClass>IPM.StickyNote</notes:MessageClass>
          </ApplicationData>
        </Change>
      </Commands>
    </Collection>
  </Collections>
</Sync>
```

Response:

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns="AirSync">
  <Collections>
    <Collection>
      <SyncKey>1960353427</SyncKey>
      <CollectionId>8</CollectionId>
      <Status>1</Status>
      <Responses>
        <Add>
          <ClientId>c212ac10-0465-4983-a898-076e152552ef</ClientId>
          <ServerId>8:3</ServerId>
          <Status>1</Status>
        </Add>
        <Change>
          <ServerId>bb18e2a7-3e65-41a1-b0b2-9815539f98ad</ServerId>
          <Status>8</Status>
        </Change>
      </Responses>
    </Collection>
  </Collections>
</Sync>
```

Preliminary

5 Security

5.1 Security Considerations for Implementers

None.

5.2 Index of Security Parameters

None.

Preliminary

6 Appendix A: Full XML Schema

For ease of implementation, this section contains the contents of the Notes.xsd file, which represents the full XML schema for this protocol.

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns="Notes"
  targetNamespace="Notes" elementFormDefault="qualified"
  attributeFormDefault="unqualified">
  <xs:element name="Subject" type="xs:string"/>
  <xs:element name="MessageClass" type="xs:string"/>
  <xs:element name="LastModifiedDate" type="xs:string"/>
  <xs:element name="Categories">
    <xs:complexType>
      <xs:sequence minOccurs="0">
        <xs:element name="Category" type="xs:string" maxOccurs="300"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

Preliminary

7 Appendix B: 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 2010
- Microsoft Exchange Server 2013
- Microsoft Exchange Server 2016 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.

Preliminary

8 Change Tracking

This section identifies changes that were made to this document since the last release. Changes are classified as New, Major, Minor, Editorial, or No change.

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

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

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

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

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

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

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

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

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

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

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

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

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
2.2.2 Elements	Updated details and the "Protocol Versions" table at the end of each subsection to specify support of the element by protocol version 16.0.	Y	Content update.
Z Appendix B: Product Behavior	Added Exchange 2016 to the list of applicable products.	Y	Content update.

Preliminary

9 Index

A

Abstract data model

[client](#) 14
[server](#) 16

[Applicability](#) 8

C

[Capability negotiation](#) 8

[Change tracking](#) 24

Client

[abstract data model](#) 14

[initialization](#) 14

[other local events](#) 16

[timer events](#) 15

[timers](#) 14

D

Data model - abstract

[client](#) 14
[server](#) 16

E

Elements

[Body](#) 10

[Categories](#) 11

[Category](#) 11

[LastModifiedDate](#) 12

[MessageClass](#) 12

[Subject](#) 13

[Elements message](#) 9

[Examples](#) 19

F

[Fields - vendor-extensible](#) 8

[Full XML schema](#) 22

G

[Glossary](#) 6

I

[Implementer - security considerations](#) 21

[Index of security parameters](#) 21

[Informative references](#) 7

Initialization

[client](#) 14

[server](#) 16

[Introduction](#) 6

M

Messages

[Elements](#) 9

[Namespaces](#) 9

[syntax](#) 9

[transport](#) 9

N

[Namespaces message](#) 9

[Normative references](#) 7

O

Other local events

[client](#) 16

[server](#) 18

[Overview \(synopsis\)](#) 7

P

[Parameters - security index](#) 21

[Preconditions](#) 8

[Prerequisites](#) 8

[Product behavior](#) 23

R

[References](#) 6

[informative](#) 7

[normative](#) 7

[Relationship to other protocols](#) 7

S

Security

[implementer considerations](#) 21

[parameter index](#) 21

Server

[abstract data model](#) 16

[initialization](#) 16

[other local events](#) 18

[timer events](#) 18

[timers](#) 16

[Standards assignments](#) 8

T

Timer events

[client](#) 15

[server](#) 18

Timers

[client](#) 14

[server](#) 16

[Tracking changes](#) 24

[Transport](#) 9

V

[Vendor-extensible fields](#) 8

[Versioning](#) 8

X

[XML schema](#) 22

Preliminary