[MS-ASNOTE]:
ActiveSync Notes Class Protocol Specification

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Revision Summary

Date	Revision History	Revision Class	Comments
04/10/2009	0.1.0	Major	Initial Availability.
07/15/2009	1.0.0	Major	Revised and edited for technical content.
11/04/2009	2.0.0	Major	Updated and revised the technical content.
02/10/2010	3.0.0	Major	Updated and revised the technical content.

Table of Contents

1 Introduction

This document specifies the Notes **class** protocol, which facilitates a mobile device synchronizing user notes with a server that supports the ActiveSync Protocol.

1.1 Glossary

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

class
collection
HTML
Inter-Personal Mail (IPM)
plain text
property
Rich Text Format (RTF)
synchronization
WAP Binary XML (WBXML)
XML
XML schema

The following terms are specific to this document:

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

1.2 References

1.2.1 Normative References

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-ASAIRS] Microsoft Corporation, "ActiveSync AirSyncBase Namespace Protocol Specification", December 2008.

[MS-ASCMD] Microsoft Corporation, "ActiveSync Command Reference Protocol Specification", December 2008.

[MS-ASDTYPE] Microsoft Corporation, "ActiveSync Data Types", December 2008.

[MS-ASWBXML] Microsoft Corporation, "ActiveSync WAP Binary XML (WBXML) Protocol Specification", December 2008.

[MS-OXGLOS] Microsoft Corporation, "Exchange Server Protocols Master Glossary", June 2008.

[XML] Bray, T., et al., "Extensible Markup Language (XML) 1.0 (Fifth Edition)", November 2008, http://www.w3.org/TR/REC-xml/.

1.2.2 Informative References

None.

1.3 Protocol Overview

The Notes class protocol specifies the **XML** representation of notes used for client and server communication, as specified in [MS-ASCMD].

1.4 Relationship to Other Protocols

The Notes class protocol specifies the XML representation of notes that are used by commands specified in [MS-ASCMD]. The protocol governing the transmission of these commands between the client and the server is specified in [MS-ASCMD].

All simple data types in this document conform to the data type definitions specified in [MS-ASDTYPE].

1.5 Prerequisites/Preconditions

None.

1.6 Applicability Statement

This protocol specifies a set of elements and complex types for use in communicating note data using the commands specified in [MS-ASCMD]. This set of elements and complex types is applicable when communicating note information between a mobile device and a server. Except where indicated, these elements and complex types are not applicable when sending other types of information 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

The Notes class consists of a series of XML elements that are embedded inside of a command or a **collection** sent in accordance with [MS-ASCMD]. The XML block containing the class elements is transmitted in either the request body of a request, or the response body of a response. The parent element of the Notes class elements depends upon the ActiveSync protocol command used to retrieve the class data. Commands and parent elements for the Notes class **XML schema** are specified in section 3.1.5.

The types and elements of the Notes class are defined in two namespaces: Notes, whose complex types and elements are specified in this document, and AirSyncBase, whose types and elements are specified in [MS-ASAIRS].

2.2 Message Syntax

The markup MUST be well-formed XML, as specified in [XML].

The XML markup that constitutes the request body or the response body is transmitted between the client and the server using **WAP Binary XML (WBXML)**. For more details, see [MS-ASWBXML].

The XML schema definition for the Notes class in ActiveSync is as follows. The following represents the full set of data that can be returned by the **Sync** command.

```
<?xml version="1.0" ?><xs:schema xmlns:tns="Notes:" attributeFormDefault="unqualified"
elementFormDefault="qualified"
targetNamespace="Notes:" xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:A="AirSyncBase:">

     <xs:element name="Subject" type="xs:string" />
     <xs:element name="Body" type="A:Body" />
     <xs:element name="MessageClass" type="xs:string" />
     <xs:element name="LastModifiedDate" type="xs:dateTime" />
     <xs:element name="Categories">
          <xs:complexType>
               <xs:sequence minOccurs=="0=">
                    <xs:element maxOccurs="300" name="Category" type="xs:string" />
               </xs:sequence>
          </xs:complexType>
     </xs:element>
</xs:schema>
```

2.2.1 Complex Types

The following table summarizes the set of common XML complex element definitions defined by this specification.

Complex Type	Description
Body	The text of the note.
Categories	The collection of categories applied to this note.

2.2.1.1 Body

The <Body> type is an optional type that specifies the text of the note.

The **Type** element of the <Body> type MUST be set to one of the following values.

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

For more details about the **Body** type, see [MS-ASAIRS] section 2.2.1.3.

2.2.1.2 Categories

The <Categories> type is an optional **container** ([MS-ASDTYPE] section 2.8) type that specifies a collection of categories for this note.

The <Categories> type can only have the following child element:

- <Categories.Category> (section 2.2.2.4): Zero or more instances of this element are allowed.

2.2.2 Elements

The following table summarizes the set of common XML schema element definitions defined by this specification. XML schema element definitions that are specific to a particular operation are described with the operation.

Element	Description
Subject	The subject of the note.
MessageClass	The form of the message.
LastModifiedDate	The day and time that this note was last changed by the user.
Categories.Category	One of the user-assigned labels applied to this note.

2.2.2.1 Subject

The <Subject> element is a required element that specifies the subject of the note.

2.2.2.2 MessageClass

The <MessageClass> element is a required element that specifies the **Inter-Personal Mail (IPM)** type of the note.

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.

2.2.2.3 LastModifiedDate

The <LastModifiedDate> element is an element that specifies when the note was last modified.

The role of this element in client requests and server responses is specified in sections 3.1.5.3.1 and 3.2.5.3.1.

The value of the <LastModifiedDate> element is a **Date/Time** type, as specified in [MS-ASDTYPE] section 2.6.

2.2.2.4 Categories.Category

The <Categories.Category> element is an optional element that specifies that a user-selected label has been applied to this note.

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 included by the server as part of a full XML response to the client commands specified in section 3.1.5. Notes class data is included in command requests sent to the server when notes need to be retrieved or synchronized. For more details about processing command requests, see section 3.1.5.

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 with a Server

A client initiates **synchronization** of Notes class data with the server by sending a **Sync** command request.

3.1.4.2 Searching a Server for Notes

A client searches for Notes class data by sending a **Search** command request to the server.

3.1.4.3 Requesting Details for One or More Notes

Notes class data for one or more individual notes is requested by the client using the **ItemOperations** command, which is a wrapper for the **Fetch** command. An **ItemOperations** command can contain multiple **Fetch** commands.

3.1.5 Message Processing Events and Sequencing Rules

3.1.5.1 ItemOperations Command Request

A client uses the **ItemOperations** command to retrieve specific Notes items from the server.

Any of the complex types and elements for the Notes class can be included in an **ItemOperations** command request.

Notes class complex types and elements are transmitted as children of the **Schema** type ([MS-ASCMD] section 2.2.1.8.2.13).

For more details about the **ItemOperations** command, see [MS-ASCMD] section 2.2.1.8.

3.1.5.1.1 Body Type

If a client cannot display the data type specified by the <Type> element of the **Body** type, then the client can ignore the **Body** type.

3.1.5.1.2 MessageClass Element

Clients are not permitted to change the value of the <MessageClass> element on an existing note.

3.1.5.2 Search Command Request

A client uses the **Search** command to retrieve Notes class items that match the criteria specified by the client.

The complex types and elements for the Notes class MUST NOT be included in a **Search** command request or the server will return a protocol error.

For more details about the **Search** command, see [MS-ASCMD] section 2.2.1.14.

3.1.5.3 Sync Command Request

A client uses the **Sync** command to synchronize its Notes class items for a specified user with the notes currently stored by the server.

Any of the complex types and elements for the Notes class can be included in a **Sync** command request.

Notes class complex types and elements are transmitted as children of the **ApplicationData** type ([MS-ASCMD] section 2.2.1.19.1.7).

The <Supported> element MUST NOT be included in a **Sync** command request for the Notes class. If it is included, the server will return a status error 4 (Protocol Error).

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

For more details about the **Sync** command, see [MS-ASCMD] section 2.2.1.19.

3.1.5.3.1 LastModifiedDate Element

The <LastModifiedDate> element can be excluded from a client request. If it is included in a client request, then the server will ignore it.

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 defined in section 2.2. It is returned by the server as part of a full XML response to the client commands specified in section 3.1.5.

The server can return zero or more Notes class 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 with a Server

A client initiates synchronization of Notes class data with the server by sending a **Sync** command request.

3.2.4.2 Searching a Server for Notes

A client searches for Notes class data by sending a **Search** command request to the server.

3.2.4.3 Requesting Details for One or More Notes

Notes class data for one or more individual notes is requested by the client using the **ItemOperations** command, which is a wrapper for the **Fetch** command. An **ItemOperations** command can contain multiple **Fetch** commands.

3.2.5 Message Processing Events and Sequencing Rules

3.2.5.1 ItemOperations Command Response

A client uses the **ItemOperations** command to retrieve specific Notes items from the server.

Any of the complex types and elements for the Notes class can be included in an **ItemOperations** command response. If a <Schema> element was included in the command request, then the complex types and elements returned MUST be restricted to the complex types and elements included in the command request's **ItemOperations** element.

Notes class complex types and elements are returned as children of the **Properties** type ([MS-ASCMD] section 2.2.1.8.3.10).

For more details about the **ItemOperations** command, see [MS-ASCMD] section 2.2.1.8.

3.2.5.2 Search Command Response

A client uses the **Search** command to retrieve Notes class items that match the criteria specified by the client.

Any of the complex types and elements for the Notes class can be included in a **Search** command response.

Notes class complex types are and elements returned as children of the **Properties** type ([MS-ASCMD] section 2.2.1.14.2.2).

For more details about the **Search** command, see [MS-ASCMD] section 2.2.1.14.

3.2.5.3 Sync Command Response

A client uses the **Sync** command to synchronize its Notes class items for a specified user with the notes currently stored by the server.

Any of the complex types and elements for the Notes class can be included in a **Sync** command response.

Notes class complex types and elements are returned as children of the **ApplicationData** type ([MS-ASCMD] section 2.2.1.19.2.2).

When an existing note is updated with a **Change** command in a **Sync** request, the command will contain all required complex types and elements of the note. If any element that was previously set is missing, then the server will delete that property from the note. The only exception is the **Body** type, whose absence in a **Change** command is not to be interpreted as an implicit delete.

Sync is specified in [MS-ASCMD] section 2.2.1.19.

3.2.5.3.1 LastModifiedDate Element

The <LastModifiedDate> element is not required in the client request, but is required in a server response.

If a client request includes a <LastModifiedDate> element, then the server ignores it and returns the actual time that the note was last modified.

4 Protocol Examples

The following example shows a Sync request and response where the client is creating one note, updating a second, and deleting a third.

XML request:

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns:A1="POOMCONTACTS:" xmlns:A2="POOMMAIL:" xmlns:A3="AirNotify:"
xmlns:A4="POOMCAL:" xmlns:A5="Move:" xmlns:A6="GetItemEstimate:"
xmlns:A7="FolderHierarchy:" xmlns:A8="MeetingResponse:" xmlns:A9="POOMTASKS:"
xmlns:A10="ResolveRecipients:" xmlns:A11="ValidateCert:"
xmlns:A12="POOMCONTACTS2:" xmlns:A13="Ping:" xmlns:A14="Provision:"
xmlns:A15="Search:" xmlns:A16="Gal:" xmlns:A17="AirSyncBase:"
xmlns:A18="Settings:" xmlns:A19="DocumentLibrary:"
xmlns:A20="ItemOperations:" xmlns:A21="ComposeMail:" xmlns:A22="POOMMAIL2:"
xmlns:A23="Notes:" xmlns="AirSync:">
  <Collections>
    <Collection>
      <SyncKey>398434774</SyncKey>
      <CollectionId>8</CollectionId>
      <DeletesAsMoves>1</DeletesAsMoves>
      <GetChanges>1</GetChanges>
      <WindowSize>512</WindowSize>
      <Options>
        <A17:BodyPreference>
          <A17:Type>2</A17:Type>
          <A17:TruncationSize>5120</A17:TruncationSize>
          <A17:AllOrNone>1</A17:AllOrNone>
        </A17:BodyPreference>
      </Options>
      <Commands>
        <Add>
          <ClientId>c212ac10-0465-4983-a898-076e152552ef</ClientId>
          <ApplicationData>
            <A17:Body>
              <A17:Type>2</A17:Type>
              <A17:Data>A new note I just created.</A17:Data>
            </A17:Body>
            <A23:Categories>
              <A23:Category>Business</A23:Category>
            </A23:Categories>
            <A23:Subject>New note</A23:Subject>
            <A23:MessageClass>IPM.StickyNote</A23:MessageClass>
          </ApplicationData>
        </Add>
        <Delete>
          <ServerId>8:1</ServerId>
        </Delete>
        <Change>
          <ServerId>bb18e2a7-3e65-41a1-b0b2-9815539f98ad</ServerId>
          <ApplicationData>
            <A17:Body>
              <A17:Type>2</A17:Type>
              <A17:Data>&lt;strong&gt;This is my second note.&lt;/strong&gt;</A17:Data>
            </A17:Body>
            <A23:Categories>
              <A23:Category>Business</A23:Category>
```

```
            </A23:Categories>
            <A23:Subject>Second Note</A23:Subject>
            <A23:MessageClass>IPM.StickyNote</A23:MessageClass>
          </ApplicationData>
        </Change>
      </Commands>
    </Collection>
  </Collections>
</Sync>
```

XML response:

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns:A1="POOMCONTACTS:" xmlns:A2="POOMMAIL:" xmlns:A3="AirNotify:" xmlns:A4="POOMCAL:"
xmlns:A5="Move:" xmlns:A6="GetItemEstimate:" xmlns:A7="FolderHierarchy:"
xmlns:A8="MeetingResponse:" xmlns:A9="POOMTASKS:" xmlns:A10="ResolveRecipients:"
xmlns:A11="ValidateCert:" xmlns:A12="POOMCONTACTS2:" xmlns:A13="Ping:" xmlns:A14="Provision:"
xmlns:A15="Search:" xmlns:A16="Gal:" xmlns:A17="AirSyncBase:" xmlns:A18="Settings:"
xmlns:A19="DocumentLibrary:" xmlns:A20="ItemOperations:" xmlns:A21="ComposeMail:"
xmlns:A22="POOMMAIL2:" xmlns:A23="Notes:" 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>
```

5 Security

5.1 Security Considerations for Implementers

None.

5.2 Index of Security Parameters

None.

6 Appendix A: Product Behavior

The information in this specification is applicable to the following product versions. References to product versions include released service packs.

- Microsoft Exchange Server 2010

Exceptions, if any, are noted below. If a service pack number appears with the product version, behavior changed in that service pack. The new behavior also applies to subsequent service packs of the product unless otherwise specified.

Unless otherwise specified, any statement of optional behavior in this specification 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 product does not follow the prescription.

7 Change Tracking

This section identifies changes made to [MS-ASNOTE] protocol documentation between November 2009 and February 2010 releases. Changes are classed as major, minor, or editorial.

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.
- A protocol is deprecated.
- The removal of a document from the documentation set.
- Changes made for template compliance.

Minor changes do not affect protocol interoperability or implementation. Examples are updates to fix technical accuracy or ambiguity at the sentence, paragraph, or table level.

Editorial changes apply to grammatical, formatting, and style issues.

No changes means that the document is identical to its last release.

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

- New content added.
- Content update.
- 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 always have the revision type "Editorially updated."

Some important terms used in revision 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.

Changes are listed in the following table. If you need further information, please contact protocol@microsoft.com.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Revision Type
2.2 Message Syntax	51655 Changed reference to [MS-ASWBXML] to indicate that it is a normative reference.	Y	Content update.
2.2.1.1 Body	54117 Added link to Body type in [MS-ASAIRS].	N	Content update.
2.2.1.1 Body	54122 Ensured that topic consistently refers to Body as a complex type.	N	Content update.
2.2.2.4 Categories.Category	51691 Clarified that this is an optional element.	Y	Content update.
3.1.1 Abstract Data Model	54291 Clarified that Notes class data is not sent in Search command requests.	N	Content update.
3.1.5.3 Sync Command Request	54239 Clarified that both complex types and elements can be sent in a Sync command request.	N	Content update.
3.1.5.3 Sync Command Request	54319 Noted that the Supported element is not supported for the Notes class.	Y	New content added.
3.2.1 Abstract Data Model	54293 Changed link to Section 3.2.5 into a link to Section 3.1.5.	N	Content update.
3.2.5.1 ItemOperations Command Response	54178 Clarified that both complex types and elements can be returned by the ItemOperations command.	N	Content update.
3.2.5.2 Search Command	54115 Corrected link to Search command.	N	Content update.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Revision Type
Response			
3.2.5.2 Search Command Response	54240 Clarified that both complex types and elements can be returned by the Search command.	N	Content update.
3.2.5.2 Search Command Response	54181 Changed reference to ItemOperations into a reference to Search.	N	Content update.
3.2.5.3 Sync Command Response	54242 Clarified that the Sync command can return both the complex types and elements of the Notes class.	N	Content update.
3.2.5.3 Sync Command Response	54319 Removed text about the Supported element, which is not supported by the Notes command.	Y	Content removed.

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