

[MS-ASNOTE]: ActiveSync Notes Class Protocol Specification

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Preliminary

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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
Coordinated Universal Time (UTC)
protocol
server
synchronization
WAP Binary XML (WBXML)

The following definitions are specific to this specification:

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

[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 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)", <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

None.

1.7 Versioning and Localization

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 information, 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>
        <xs:element 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 element 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].

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.

Notes **class** elements MUST NOT have child elements in either the command request or response.

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 categories to which this note belongs.

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 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 a required element that specifies when the note was last modified.

2.2.2.4 Categories.Category

The **Categories.Category** element is an optional element that specifies a category assigned 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 2.1. It is included by the server as part of a full XML response to the client commands specified in section 3.1.4. Notes **class** data is included in command requests sent to the server when notes need to be retrieved, searched, 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 2.2.1.8.2.12).

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.

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 for the Notes **class** can be included in a **Sync** command request.

Notes **class** complex types are transmitted as children of the **ApplicationData** type ([MS-ASCMD] section 2.2.1.19.1.11).

When an existing note is updated with a CHANGE command in a Sync, 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 2.1. It is returned by the server as part of a full XML response to the client commands specified in section 3.1.4.

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 MUST return 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 **Schema** element.

Notes **class** complex types are returned as children of the **Properties** type ([MS-ASCMD] section 2.2.1.8.3.8).

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 for the Notes **class** can be included in a **Search** command response.

Notes **class** complex types are 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 2.2.2.14.

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 for the Notes **class** can be included in a **Sync** command response. If a **Supported** element was included in the command request, then the complex types returned is restricted to the complex types included in the command request's **Supported** element.

Notes **class** complex types are returned as children of the **ApplicationData** type ([MS-ASCMD] section 2.2.1.19.1.11).

When an existing note is updated with a CHANGE command in a **Sync**, the command will contain all required 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 request 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 return 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: Office/Exchange Behavior

The information in this specification is applicable to the following versions of Office/Exchange:

- Microsoft Exchange Server 2010

Exceptions, if any, are noted below. Unless otherwise specified, any statement of optional behavior in this specification prescribed using the terms SHOULD or SHOULD NOT implies Office/Exchange behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies Office/Exchange does not follow the prescription.

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