[MS-ASTASK]:
ActiveSync Tasks Class Protocol Specification

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Revision Summary

Date	Revision History	Revision Class	Comments
12/03/2008	1.0.0	Major	Initial Release.
04/10/2009	2.0.0	Major	Updated technical content and applicable product releases.
07/15/2009	3.0.0	Major	Revised and edited for technical content.
11/04/2009	4.0.0	Major	Updated and revised the technical content.
02/10/2010	5.0.0	Major	Updated and revised the technical content.

Table of Contents

1 Introduction

Mobile devices that communicate using the ActiveSync protocol need to exchange task list data. The Task **class** protocol specifies the ActiveSync protocol format for the interchange of task data.

1.1 Glossary

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

class
collection
Coordinated Universal Time (UTC)
reminder
store
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.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, http://www.ietf.org/rfc/rfc2119.txt.

[RFC822] Crocker, D.H., "STANDARD FOR THE FORMAT OF ARPA INTERNET TEXT MESSAGES", RFC 822, August 1982, http://www.ietf.org/rfc/rfc0822.txt.

[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 Task class protocol specifies an **XML** representation of task list data as used in various ActiveSync commands.

1.4 Relationship to Other Protocols

The Task class protocol specifies the XML representation of task list data that is used by commands specified in [MS-ASCMD].

All data types in this document conform to the data type definitions specified in [MS-ASDTYPE]. Common **XML schema** elements used by other classes are defined in [MS-ASAIRS].

1.5 Prerequisites/Preconditions

None.

1.6 Applicability Statement

This protocol specifies a set of elements and complex types for use in communicating task data using the commands specified in [MS-ASCMD]. This set of elements and complex types is applicable when communicating task data such as the task name, start and due dates, and recurrence options and exceptions between a mobile device and a server. These elements and complex types are not applicable when sending calendar, e-mail, note, contact, or document data between a mobile device and a server.

1.7 Versioning and Capability Negotiation

None.

1.8 Vendor-Extensible Fields

None.

1.9 Standards Assignments

None.

2 Messages

2.1 Transport

The Task class consists of a series of XML elements that are embedded inside of a **collection** transmitted according to the commands specified in [MS-ASCMD]. The XML block containing the class elements is transmitted in either the request body of a request, or in the response body of a response. The types and elements of the Task class are defined in the namespaces Task and AirSyncBase. All of the Task class types and elements are specified in this document; however, complex types and elements defined in the AirSyncBase namespace are specified in [MS-ASAIRS].

The parent element of the Task class elements depends upon the ActiveSync protocol command used to retrieve the class data. Commands for the Task class **XML schema** are specified in section 3.1.5 and section 3.2.5.

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)**, which is specified in [MS-ASWBXML].

The XML schema definition for the Task class in ActiveSync is as follows.

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="TASKS:" attributeFormDefault="unqualified"
elementFormDefault="qualified"
targetNamespace="TASKS:" xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:A="AirSyncBase:">
   <xs:element name="Body" type="A:Body" />
   <xs:element name="Rtf" type="xs:string" />
   <xs:element name="Subject" type="xs:string" />
   <xs:element name="Importance" type="xs:unsignedByte" />
   <xs:element name="UtcStartDate" type="xs:dateTime" />
   <xs:element name="StartDate" type="xs:dateTime" />
   <xs:element name="UtcDueDate" type="xs:dateTime" />
   <xs:element name="DueDate" type="xs:dateTime" />
   <xs:element name="Categories">
      <xs:complexType>
           <xs:sequence>
          <xs:element maxOccurs="unbounded" name="Category" type="xs:string" />
           </xs:sequence>
        </xs:complexType>
   </xs:element>
   <xs:element name="Recurrence">
      <xs:complexType>
         <xs:sequence>
            <xs:element name="Type" type="xs:unsignedByte" />
            <xs:element name="Start" type="xs:dateTime" />
            <xs:element name="Until" type="xs:dateTime" />
            <xs:element name="Occurrences" type="xs:unsignedByte" />
            <xs:element name="Interval" type="xs:unsignedByte" />
            <xs:element name="DayOfWeek" type="xs:unsignedByte" />
            <xs:element name="DayOfMonth" type="xs:unsignedByte" />
            <xs:element name="WeekOfMonth" type="xs:unsignedByte" />
            <xs:element name="MonthOfYear" type="xs:unsignedByte" />
            <xs:element name="Regenerate" type="xs:unsignedByte" />
            <xs:element name="DeadOccur" type="xs:unsignedByte" />
```

```
            <xs:element name="CalendarType" type="xs:unsignedByte" />
            <xs:element name="IsLeapMonth" type="xs:unsignedByte" />
          </xs:sequence>
        </xs:complexType>
    </xs:element>
    <xs:element name="Complete" type="xs:unsignedByte" />
    <xs:element name="DateCompleted" type="xs:dateTime" />
    <xs:element name="Sensitivity" type="xs:unsignedByte"  />
    <xs:element name="ReminderTime" type="xs:dateTime" />
    <xs:element name="ReminderSet" type="xs:unsignedByte" />
</xs:schema>
```

2.2.1 Complex Types

The following table summarizes the set of common XML schema complex type definitions defined or used by this specification.

Value	Description
Body	The text for this task.
Categories	A collection of user-selected labels assigned to the task.
Recurrence	Describes when and how often this task recurs.

2.2.1.1 Body

The <Body> type is an optional **container** ([MS-ASDTYPE] section 2.8) type that specifies the text for this task.

The <Body> type is specified in [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 user-managed labels assigned to this task.

A command request or response has a maximum of one <Categories> type per command.

The <Categories> type has the following child element:

- Categories.Category (section 2.2.2.7): At least one instance of this element is required.

If a <Categories> type contains no <Categories.Category> elements in a request or response, then the categories for the specified task have all been removed.

2.2.1.3 Recurrence

The <Recurrence> type is an optional **container** ([MS-ASDTYPE] section 2.8) type that specifies when and how often this task recurs.

A command request or response has a maximum of one <Recurrence> type per command.

The <Recurrence> type can have the following child elements:

- <Recurrence.Type> (section 2.2.2.8): This element is required.

- <Recurrence.Start> (section 2.2.2.9): This element is required.
- <Recurrence.Until> (section 2.2.2.10): This element is optional.
- <Recurrence.Occurrences> (section 2.2.2.11): This element is optional.
- <Recurrence.Interval> (section 2.2.2.12): This element is required.
- <Recurrence.DayOfWeek> (section 2.2.2.13): This element is optional.
- <Recurrence.DayOfMonth> (section 2.2.2.14): This element is optional.
- <Recurrence.WeekOfMonth> (section 2.2.2.15): This element is optional.
- <Recurrence.MonthOfYear> (section 2.2.2.16): This element is optional.
- <Recurrence.Regenerate> (section 2.2.2.17): This element is optional.
- <Recurrence.DeadOccur> (section 2.2.2.18): This element is optional.
- <Recurrence.CalendarType> (section 2.2.2.19): This element is required in monthly and yearly recurrences.
- <Recurrence.IsLeapMonth> (section 2.2.2.20): This element is optional.

2.2.2 Elements

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

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

Value	Description
Subject	The subject of the task item.
Importance	The importance or priority of the task item.
UtcStartDate	The **Coordinated Universal Time (UTC)** start date of the task item.
StartDate	The local start date of the task item.
UtcDueDate	The UTC due date of the task item.
DueDate	The local due date of the task item.
Categories.Category	The category of the calendar item, such as Business, Holiday, Personal, or Waiting.
Recurrence.Type	The recurrence type.
Recurrence.Start	The start time of a series of recurrence items.
Recurrence.Until	The end time of a series of recurrence items.
Recurrence.Occurrences	The number of occurrences before the series ends.
Recurrence.Interval	The interval between recurrences.

Value	Description
Recurrence.DayOfWeek	The day of the week for the recurrence.
Recurrence.DayOfMonth	The day of the month for the recurrence.
Recurrence.WeekOfMonth	The week of the month for the recurrence.
Recurrence.MonthOfYear	The month of the year for the recurrence.
Recurrence.Regenerate	Whether the task item regenerates after each task instance is complete.
Recurrence.DeadOccur	Whether the task is a recurring instance.
Recurrence.CalendarType	The calendar system used by this recurrence.
Recurrence.IsLeapMonth	Whether this recurrence takes place during a leap month.
Complete	Whether the task has been completed.
DateCompleted	The date on which the item was completed.
Sensitivity	The sensitivity of the task item.
ReminderTime	The time and date at which the **reminder** for the task item will appear.
ReminderSet	Whether a reminder for the task item has been set to appear.

2.2.2.1 Subject

The **Subject** element is a required element that specifies the subject of the task item.

2.2.2.2 Importance

The <Importance> element is an optional element that specifies the importance or priority of the task item.

The value of the <Importance> element MUST be one of the following:

Value	Description
0	Low
1	Normal (Default)
2	High

2.2.2.3 UtcStartDate

The <UtcStartDate> element is an optional element that specifies the UTC start date of the task item.

The value of this element is a **DateTime** type, as specified in [MS-ASDTYPE] section 2.6.

2.2.2.4 StartDate

The <StartDate> element is an optional element that specifies the local start date of the task item.

The value of this element is a **DateTime** value, as specified in [MS-ASDTYPE] section 2.6.

2.2.2.5 UtcDueDate

The <UtcDueDate> element is an optional element that specifies the UTC due date of the task item.

The value of this element is a **DateTime** value, as specified in [MS-ASDTYPE] section 2.6.

2.2.2.6 DueDate

The <DueDate> element is an optional element that specifies the local due date of the task item.

The value of this element is a **DateTime** value, as specified in [MS-ASDTYPE] section 2.6.

2.2.2.7 Categories.Category

The <Categories.Category> element is an optional child element of the **Categories** type that specifies the category of the **calendar** item, such as Business, Holiday, Personal, or Waiting.

There SHOULD be no more than 300 <Categories.Category> child elements in a **Categories** type.

2.2.2.8 Recurrence.Type

The <Recurrence.Type> element is a required child element of the **Recurrence** type that specifies the type of this recurrence item.

A command request or response has a minimum of one <Recurrence.Type> element per **Recurrence** element.

A command request or response has a maximum of one <Recurrence.Type> element per **Recurrence** element.

The value of the <Recurrence.Type> element MUST be one of the following.

Value	Description
0	Recurs daily.
1	Recurs weekly.
2	Recurs monthly.
3	Recurs monthly on the nth day.
5	Recurs yearly.
6	Recurs yearly on the nth day.

2.2.2.9 Recurrence.Start

The <Recurrence.Start> element is a required child element of the **Recurrence** type that specifies the local start date for the recurrence.

A command request or response has a minimum of one <Recurrence.Start> element per **Recurrence** element.

A command request or response has a maximum of one <Recurrence.Start> element per **Recurrence** element.

The value of this element is a **DateTime** type, as specified in [MS-ASDTYPE] section 2.6.

2.2.2.10 Recurrence.Until

The <Recurrence.Until> element is an optional child element of the **Recurrence** type (section 2.2.1.3) that specifies the end time of a series of recurrence items.

A command request or response has a maximum of one <Recurrence.Until> element per **Recurrence** element.

A command request or response has a maximum of one <Recurrence.Until> element per **Recurrence** element.

The value of this element is a **DateTime** type, as specified in [MS-ASDTYPE] section 2.6.

2.2.2.11 Recurrence.Occurrences

The <Recurrence.Occurrences> element is an optional child element of the **Recurrence** type that specifies the number of occurrences before the series ends.

A command request or response has a maximum of one <Recurrence.Occurrences> element per **Recurrence** element.

2.2.2.12 Recurrence.Interval

The <Recurrence.Interval> element is a required child element of the **Recurrence** type that specifies the interval between recurrences.

A command request or response has a minimum of one <Recurrence.Interval> element per **Recurrence** element. The <Recurrence.Interval> element is required in the response unless the value of the <Recurrence.Type> element is 0.

A command request or response has a maximum of one <Recurrence.Interval> element per **Recurrence** element.

The value of the <Recurrence.Interval> element is an integer. The maximum value is 999.

2.2.2.13 Recurrence.DayOfWeek

The <Recurrence.DayOfWeek> element is an optional child element of the **Recurrence** type that specifies the day of the week for the recurrence.

A command request or response has a minimum of one <Recurrence.DayOfWeek> element per **Recurrence** type if the value of the <Recurrence.Interval> element (section 2.2.2.12) is 1.

A command request or response has a maximum of one <Recurrence.DayOfWeek> element per **Recurrence** type.

The value of the <Recurrence.DayOfWeek> element MUST be either one of the following values, or the sum of more than one of the following values (in which case this task recurs on more than one day).

Value	Description
1	Sunday
2	Monday
4	Tuesday
8	Wednesday
16	Thursday
32	Friday
64	Saturday
127	Specifies the last day of the month when the value of the <Recurrence.WeekOfMonth> element (section 2.2.2.15) is 5.

The <Recurrence.DayOfWeek> element MUST only be included in requests or responses when the <Recurrence.Type> element is set to a value of 0, 1, 3, or 6. When a request is issued with the <Recurrence.DayOfWeek> element in other instances, the server responds with a status 6 error (conversion error).

2.2.2.14 Recurrence.DayOfMonth

The <Recurrence.DayOfMonth> element is an optional child element of the **Recurrence** type that specifies the day of the month for the recurrence.

A command request or response has a minimum of one <Recurrence.DayOfMonth> element per **Recurrence** element if the value of the <Recurrence.Interval> element is either 2 or 5.

A command request or response has a maximum of one <Recurrence.DayOfMonth> element per **Recurrence** type.

The <Recurrence.DayOfMonth> element MUST only be included in requests or responses when the <Recurrence.Type> element is set to a value of 2, 3, 5 or 6. When a request is issued with the <Recurrence.DayOfMonth> element in other instances, the server responds with a status 6 error (conversion error).

2.2.2.15 Recurrence.WeekOfMonth

The <Recurrence.WeekOfMonth> element is an optional child element of the **Recurrence** type that specifies the week of the month for the recurrence.

A command request or response has a minimum of one <Recurrence.WeekOfMonth> element per **Recurrence** type when the value of the <Recurrence.Interval> element is either 3 or 6.

A command request or response has a maximum of one <Recurrence.WeekOfMonth> element per **Recurrence** type.

The value of the <Recurrence.WeekOfMonth> element MUST be between 1 and 5. The value of 5 always designates the last week of the month.

The <Recurrence.WeekOfMonth> element MUST only be included in requests or responses when the <Recurrence.Type> element is set to a value of 3 or 6. When a client request is issued with the

<Recurrence.WeekOfMonth> element in other instances, the server responds with a status 6 error (conversion error).

2.2.2.16 Recurrence.MonthOfYear

The <Recurrence.MonthofYear> element is an optional child element of the **Recurrence** type that specifies the month of the year for the recurrence.

A command request or response has a minimum of one <Recurrence.MonthofYear> element per **Recurrence** element if the value of the <Recurrence.Interval> element is either 5 or 6.

A command request or response has a maximum of one <Recurrence.MonthofYear>element per **Recurrence** element.

The value of the <Recurrence.MonthofYear> element MUST be between 1 and 12.

2.2.2.17 Recurrence.Regenerate

The <Recurrence.Regenerate> element is an optional child element of the **Recurrence** type that specifies whether this task item regenerates after it is completed.

A command request or response has a maximum of one <Recurrence.Regenerate> element per **Recurrence** type.

When the <Recurrence.Regenerate> element is set to a value of 1, a proper <Recurrence.Interval> (section 2.2.2.12) MUST be included within the **Recurrence** type. Valid patterns include Daily, Weekly, Monthly, and Yearly patterns.

The value of the <Recurrence.Regenerate> element MUST be one of the following.

Value	Description
0	False (does not regenerate)
1	True (regenerates)

If the <Recurrence.Regenerate> element is not included in a response, then the client MUST assume that the default is 0 (False).

2.2.2.18 Recurrence.DeadOccur

The <Recurrence.DeadOccur> element is an optional child element of the **Recurrence** type that specifies whether the task is an instance of a recurring master task.

A command request or response has a maximum of one <Recurrence.DeadOccur> element per **Recurrence** type.

The value of the <Recurrence.DeadOccur> element MUST be one of the following.

Value	Description
0	False (recurring master task)
1	True (instance of a recurring master task)

Clients making command requests SHOULD set this value to 1 (True) when marking a task as complete.

The default value of the <Recurrence.DeadOccur> element is 0.

2.2.2.19 Recurrence.CalendarType

The <Recurrence.CalendarType> element<1> is a child element of the **Recurrence** type that specifies the calendar system used by the recurrence.

A command request has a maximum of one <Recurrence.CalendarType> element per **Recurrence** type when the <Recurrence.Type> element is set to a value of 2, 3, 5, or 6. If it is included in other instances, then the server responds with a status 6 error (conversion error).

A command response has a minimum of one <Recurrence.CalendarType> element per **Recurrence** type when the <Recurrence.Type> element is set to a value of 2, 3, 5, or 6; otherwise, this element is optional in command responses.

The value of the <Recurrence.CalendarType> element MUST be one of those listed in the following table.<2>

Value	Description
0	Default
1	Gregorian
2	Gregorian (United States)
3	Japanese Emperor Era
4	Taiwan
5	Korean Tangun Era
6	Hijri (Arabic Lunar)
7	Thai
8	Hebrew Lunar
9	Gregorian (Middle East French)
10	Gregorian (Arabic)
11	Gregorian (Transliterated English)
12	Gregorian (Transliterated French)
14	Japanese Lunar
15	Chinese Lunar
16	Saka Era
17	Chinese Lunar (Eto)
18	Korean Lunar (Eto)

Value	Description
19	Japanese Rokuyou Lunar
20	Korean Lunar
23	Um al-Qura

2.2.2.20 Recurrence.IsLeapMonth

The <Recurrence.IsLeapMonth> element <3> is an optional child element of the **Recurrence** type that specifies whether the recurrence patterns should occur within the leap month of the current year.

A command request has a maximum of one <Recurrence.IsLeapMonth> element per **Recurrence** type.

A command response has a maximum of one <Recurrence.IsLeapMonth> element per **Recurrence** type.

The value of the <Recurrence.IsLeapMonth> element MUST be one of the following.

Value	Description
0	False
1	True

The default value of the <Recurrence.IsLeapMonth> element is 0.

2.2.2.21 Complete

The <Complete> element is a required child element that specifies whether the task has been completed.

The value of the <Complete> element MUST be one of the following.

Value	Description
0	False (not completed)
1	True (completed)

2.2.2.22 DateCompleted

The <DateCompleted> element is an optional child element that specifies the date and time at which the task was completed.

The <DateCompleted> element MUST be included in the response if the <Complete> element is set to a value of 1.

The value of this element is a **DateTime** type, as specified in [MS-ASDTYPE] section 2.6.

2.2.2.23 Sensitivity

The <Sensitivity> element is an optional child element that specifies the sensitivity level of the task.

The value of the <Sensitivity> element MUST be one of the following.

Value	Description
0	Normal
1	Personal
2	Private
3	Confidential

The default value of the <Sensitivity> element is 0 (normal).

2.2.2.24 ReminderTime

The <ReminderTime> element is an optional element that specifies the time and date at which the reminder for the task item will appear.

The value of this element is a **DateTime** type, as specified in [MS-ASDTYPE] section 2.6.

2.2.2.25 ReminderSet

The <ReminderSet> element is an optional element that specifies whether a reminder for a task item has been set to appear.

The value of the <ReminderSet> element MUST be one of the following.

Value	Description
0	False (no reminder is set) (Default)
1	True (a reminder is set)

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.

Task class: A structured XML text block that adheres to the XML schema defined 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.

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 Task Data with a Server

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

3.1.4.2 Searching a Server for Task Data

A client searches a server for Task class data by sending a **Search** command request.

3.1.4.3 Requesting Details for One or More Specific Tasks

Task data for one or more individual task items is requested by the client using an **ItemOperations** command request, 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

The following section describes how various elements of the Task class are used in the context of specific ActiveSync commands. Command details are specified in [MS-ASCMD].

3.1.5.1 ItemOperations Command Request

A client uses the **ItemOperations** command to retrieve specific Task items from the server using the **Fetch** command. An **ItemOperations** request can contain multiple **Fetch** commands.

The elements returned by the **ItemOperations** command can be restricted by including top-level schema elements for the Task class as children of the **Schema** type ([MS-ASCMD] section 2.2.1.8.2.13). The following are the top-level types and elements for the Task class:

- Attachments
- Body

ItemOperations is specified in [MS-ASCMD] section 2.2.1.8.

3.1.5.2 Search Command Request

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

The Task class complex types and elements MUST NOT be included in a **Search** command request. If they are included, then the server MUST return a protocol error.

Search is specified in [MS-ASCMD] section 2.2.1.14.

3.1.5.3 Sync Command Request

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

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

Task class complex types and elements MUST be transmitted as children of the **ApplicationData** type ([MS-ASCMD] section 2.2.1.19.1.7)

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

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.

Task class: A structured XML text block that adheres to the XML schema defined in section 2.2. It is included by the server as part of a full XML response to the client commands specified in section 3.2.5.

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 Task Data with a Server

A client initiates synchronization of Task class data with the server by sending a **Sync** command request. The server responds with a **Sync** command response.

3.2.4.2 Searching a Server for Task Data

A client searches a server for Task class data by sending a **Search** command request. The server responds with a **Search** command response.

3.2.4.3 Requesting Details for One or More Specific Tasks

Task data for one or more individual task items is requested by the client using an **ItemOperations** command request, which is a wrapper for the **Fetch** command. An **ItemOperations** command can contain multiple **Fetch** commands. The server responds with an **ItemOperations** command response.

3.2.5 Message Processing Events and Sequencing Rules

The following section describes how various elements of the Task class are used in the context of specific ActiveSync commands. Command details are specified in [MS-ASCMD].

3.2.5.1 ItemOperations Command Response

A client uses the **ItemOperations** command to retrieve specific Task items from the server using the **Fetch** command. An **ItemOperations** request can contain multiple **Fetch** commands.

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

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

ItemOperations is specified in [MS-ASCMD] section 2.2.1.8.

3.2.5.2 Search Command Response

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

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

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

Search is specified in [MS-ASCMD] section 2.2.1.14.

3.2.5.3 Sync Command Response

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

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

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

3.2.5.3.1 Importance Element

If the <Importance> element is excluded from a **Change** command inside of a **Sync** request, the server MUST NOT delete the element from its **store**, but rather restore it to its default value.

3.2.5.3.2 ReminderSet Element

If the <ReminderSet> element is excluded from a **Change** command inside of a **Sync** request, the server MUST NOT delete the element from its store, but rather restore it to its default value.

3.2.6 Timer Events

None.

3.2.7 Other Local Events

None.

4 Protocol Examples

4.1 Synchronizing Tasks Between Client and Server

The following example synchronizes a task created on the client with the server.

Request:

```
POST /Microsoft-Server-
ActiveSync?Cmd=Sync&User=deviceuser1&DeviceId=111&DeviceType=SmartPhone HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 14.0
User-Agent: ASOM
Host: mailserver.contoso.com

<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns:A9="POOMTASKS:" xmlns:A17="AirSyncBase:" xmlns="AirSync:">
  <Collections>
    <Collection>
      <SyncKey>301865454</SyncKey>
      <CollectionId>11</CollectionId>
      <DeletesAsMoves>1</DeletesAsMoves>
      <GetChanges>1</GetChanges>
      <WindowSize>100</WindowSize>
      <Commands>
        <Add>
          <ClientId>4717a10e-492d-45af-9fe3-227f74385b13</ClientId>
          <ApplicationData>
            <A17:Body>
              <A17:Type>2</A17:Type>
              <A17:Data>&lt;strong&gt;Must&lt;/strong&gt; complete TPS reports using the new
cover sheet.</A17:Data>
            </A17:Body>
            <A9:Subject>TPS Reports for August 2009</A9:Subject>
            <A9:Importance>2</A9:Importance>
            <A9:Categories>
              <A9:Category>Business</A9:Category>
              <A9:Category>Reports</A9:Category>
            </A9:Categories>
            <A9:Complete>0</A9:Complete>
            <A9:DueDate>2009-09-03T13:00:00.000Z</A9:DueDate>
            <A9:UtcDueDate>2009-09-03T20:00:00.000Z</A9:UtcDueDate>
            <A9:ReminderSet>1</A9:ReminderSet>
            <A9:ReminderTime>2009-09-02T09:00:00.000Z</A9:ReminderTime>
            <A9:Sensitivity>1</A9:Sensitivity>
            <A9:StartDate>2009-09-03T09:00:00.000Z</A9:StartDate>
            <A9:UtcStartDate>2009-09-03T16:00:00.000Z</A9:UtcStartDate>
          </ApplicationData>
        </Add>
      </Commands>
    </Collection>
  </Collections>
</Sync>
```

Response:

```
HTTP/1.1 200 OK
```

```
Content-Type: application/vnd.ms-sync.wbxml
Date: Mon, 31 Aug 2009 18:42:05 GMT
Content-Length: 92

<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns="AirSync:">
  <Collections>
    <Collection>
      <SyncKey>1010751843</SyncKey>
      <CollectionId>11</CollectionId>
      <Status>1</Status>
      <Responses>
        <Add>
          <ClientId>4717a10e-492d-45af-9fe3-227f74385b13</ClientId>
          <ServerId>11:1</ServerId>
          <Status>1</Status>
        </Add>
      </Responses>
    </Collection>
  </Collections>
</Sync>
```

4.2 Synchronizing Tasks on the Client

The following request/response pair shows a client requesting synchronization of its Task data with a server without submitting any changes of its own, and the server responding with three changes: an Add, a Change, and a Delete. The types and elements of the Task class are included as children of the **Add**, **Change**, and **Delete** XML types.

Request:

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns="AirSync:">
  <Collections>
    <Collection>
      <SyncKey>761975125</SyncKey>
      <CollectionId>19</CollectionId>
      <DeletesAsMoves>1</DeletesAsMoves>
      <GetChanges>1</GetChanges>
      <WindowSize>100</WindowSize>
      <GetChanges/>
    </Collection>
  </Collections>
</Sync>
```

Response:

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns="AirSync:" xmlns:A="AirSyncBase:" xmlns:B="POOMTASKS:">
  <Collections>
    <Collection>
      <SyncKey>457669362</SyncKey>
      <CollectionId>19</CollectionId>
      <Status>1</Status>
      <Commands>
```

```
        <Change>
          <ServerId>19:1</ServerId>
          <ApplicationData>
            <A:Body>
              <A:Type>3</A:Type>
              <A:EstimatedDataSize>5731</A:EstimatedDataSize>
              <A:Truncated>1</A:Truncated>
            </A:Body>
            <B:Subject>Finish Q4 sales roll-up</B:Subject>
            <B:Importance>1</B:Importance>
            <B:UtcStartDate>2008-10-02T07:00:00.000Z</B:UtcStartDate>
            <B:StartDate>2008-10-02T00:00:00.000Z</B:StartDate>
            <B:UtcDueDate>2008-10-10T07:00:00.000Z</B:UtcDueDate>
            <B:DueDate>2008-10-10T00:00:00.000Z</B:DueDate>
            <B:Complete>0</B:Complete>
            <B:Sensitivity>0</B:Sensitivity>
            <B:ReminderTime>2008-10-10T19:30:00.000Z</B:ReminderTime>
            <B:ReminderSet>1</B:ReminderSet>
          </ApplicationData>
        </Change>
        <Add>
          <ServerId>19:3</ServerId>
          <ApplicationData>
            <A:Body>
              <A:Type>1</A:Type>
              <A:EstimatedDataSize>0</A:EstimatedDataSize>
              <A:Truncated>1</A:Truncated>
            </A:Body>
            <B:Subject>Email management team about next round of quarterlies</B:Subject>
            <B:Importance>1</B:Importance>
            <B:UtcStartDate>2008-10-02T07:00:00.000Z</B:UtcStartDate>
            <B:StartDate>2008-10-02T00:00:00.000Z</B:StartDate>
            <B:UtcDueDate>2008-10-02T07:00:00.000Z</B:UtcDueDate>
            <B:DueDate>2008-10-02T00:00:00.000Z</B:DueDate>
            <B:Complete>0</B:Complete>
            <B:Sensitivity>0</B:Sensitivity>
            <B:ReminderSet>0</B:ReminderSet>
          </ApplicationData>
        </Add>
        <Delete>
          <ServerId>19:2</ServerId>
        </Delete>
      </Commands>
    </Collection>
  </Collections>
</Sync>
```

4.3 Fetching Task Data with the ItemOperations Command

The following example demonstrates how the client uses the **ItemOperations** command ([MS-ASCMD] section 2.2.1.8) to retrieve information for a particular task. This example assumes that the server has assigned a CollectionID of 11 to the Tasks collection.

Request:

```
POST /Microsoft-Server-
ActiveSync?Cmd=ItemOperations&User=deviceuser&DeviceId=Device1&DeviceType=SmartPhone HTTP/1.1
```

```
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 14.0
User-Agent: ASOM
Host: mail.contoso.com
Content-Length: 62

<?xml version="1.0" encoding="utf-8"?>
<ItemOperations xmlns:airsync="AirSync:"
xmlns:airsyncbase="AirSyncBase:" xmlns="ItemOperations:">
  <Fetch>
    <Store>Mailbox</Store>
    <airsync:CollectionId>11</airsync:CollectionId>
    <airsync:ServerId>11:1</airsync:ServerId>
    <Options>
      <airsyncbase:BodyPreference>
        <airsyncbase:Type>1</airsyncbase:Type>
        <airsyncbase:TruncationSize>256</airsyncbase:TruncationSize>
        <airsyncbase:AllOrNone>0</airsyncbase:AllOrNone>
      </airsyncbase:BodyPreference>
    </Options>
  </Fetch>
</ItemOperations>
```

Response:

```
HTTP/1.1 200 OK
Content-Type: application/vnd.ms-sync.wbxml
Date: Tue, 10 Nov 2009 23:32:11 GMT
Content-Length: 261

<?xml version="1.0" encoding="utf-8"?>
<ItemOperations xmlns:A0="AirSync:" xmlns:A9="POOMTASKS:" xmlns:A17="AirSyncBase:"
xmlns="ItemOperations:">
  <Status>1</Status>
  <Response>
    <Fetch>
      <Status>1</Status>
      <A0:CollectionId>11</A0:CollectionId>
      <A0:ServerId>11:1</A0:ServerId>
      <A0:Class>Tasks</A0:Class>
      <Properties>
        <A17:Body>
          <A17:Type>1</A17:Type>
          <A17:EstimatedDataSize>0</A17:EstimatedDataSize>
        </A17:Body>
        <A9:Subject>Complete This Week's Test Run </A9:Subject>
        <A9:Importance>2</A9:Importance>
        <A9:UtcStartDate>2009-11-18T08:00:00.000Z</A9:UtcStartDate>
        <A9:StartDate>2009-11-18T00:00:00.000Z</A9:StartDate>
        <A9:UtcDueDate>2009-11-27T08:00:00.000Z</A9:UtcDueDate>
        <A9:DueDate>2009-11-27T00:00:00.000Z</A9:DueDate>
        <A9:Complete>0</A9:Complete>
        <A9:Sensitivity>2</A9:Sensitivity>
        <A9:ReminderTime>2009-11-27T16:00:00.000Z</A9:ReminderTime>
        <A9:ReminderSet>1</A9:ReminderSet>
      </Properties>
```

```
    </Fetch>
  </Response>
</ItemOperations>
```

4.4 Searching for Tasks

The following example demonstrates how the client uses the **Search** command ([MS-ASCMD] section 2.2.1.14) to find all tasks containing the word "Test." This example assumes that the server has assigned a CollectionId of 11 to the Tasks collection.

Request:

```
POST /Microsoft-Server-
ActiveSync?Cmd=Search&User=deviceuser&DeviceId=Device1&DeviceType=SmartPhone HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 14.0
User-Agent: ASOM
Host: mail.contoso.com
Content-Length: 62

<?xml version="1.0" encoding="utf-8"?>
<Search xmlns="Search:" xmlns:airsync="AirSync:"
xmlns:task="POOMTASK:">
<Store>
  <Name>Mailbox</Name>
    <Query>
      <And>
        <airsync:Class>Tasks</airsync:Class>
        <airsync:CollectionId>11</airsync:CollectionId>
        <FreeText>Test</FreeText>
      </And>
    </Query>
    <Options>
      <RebuildResults />
      <Range>0-4</Range>
    </Options>
  </Store>
</Search>
```

Response:

```
HTTP/1.1 200 OK
Content-Type: application/vnd.ms-sync.wbxml
Date: Wed, 11 Nov 2009 00:10:14 GMT
Content-Length: 378

<Search xmlns:A0="AirSync:" xmlns:A9="POOMTASKS:" xmlns:A17="AirSyncBase:" xmlns="Search:">
  <Status>1 Success</Status>
  <Response>
    <Store>
      <Status>1 Success</Status>
      <Result>
        <A0:Class>Tasks</A0:Class>
```

```
<LongId>RgAAAADl9NP3UFJNRpgIYBWT6lSUBwDqXN0OYiDySoYnY1igrbIlAAAAAAAqAADqXN0OYiDySoYnY1igrbIlA
AAAAGHBAAAT</LongId>
        <A0:CollectionId>11</A0:CollectionId>
        <Properties>
          <A17:Body>
            <A17:Type>1</A17:Type>
            <A17:EstimatedDataSize>0</A17:EstimatedDataSize>
            <A17:Truncated>1</A17:Truncated>
          </A17:Body>
          <A9:Subject>Complete This Week's Test Run </A9:Subject>
          <A9:Importance>2</A9:Importance>
          <A9:UtcStartDate>2009-11-18T08:00:00.000Z</A9:UtcStartDate>
          <A9:StartDate>2009-11-18T00:00:00.000Z</A9:StartDate>
          <A9:UtcDueDate>2009-11-27T08:00:00.000Z</A9:UtcDueDate>
          <A9:DueDate>2009-11-27T00:00:00.000Z</A9:DueDate>
          <A9:Complete>0</A9:Complete>
          <A9:Sensitivity>2</A9:Sensitivity>
          <A9:ReminderTime>2009-11-27T16:00:00.000Z</A9:ReminderTime>
          <A9:ReminderSet>1</A9:ReminderSet>
        </Properties>
      </Result>
      <Range>0-0</Range>
      <Total>1</Total>
    </Store>
  </Response>
</Search>
```

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 2007
- 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.

<1> Section 2.2.2.19: The <Recurrence.CalendarType> element is not supported in Exchange Server 2007 or Exchange Server 2003.

<2> Section 2.2.2.19: The following values are not supported by any versions of Exchange Server:

- Saka Era
- Chinese Lunar (Eto)
- Korean Lunar (Eto)
- Japanese Rokuyou Lunar
- Um al-Qura

<3> Section 2.2.2.20: The <Recurrence.IsLeapMonth> element was added in Exchange Server 2010, and is not present in Exchange Server 2007 or Exchange 2003.

7 Change Tracking

This section identifies changes made to [MS-ASTASK] 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
2.2.1.3 Recurrence	48067 Changed description osf Recurrence.Until element to indicate that it is optional.	N	Content update.
2.2.2.13 Recurrence.DayOfWeek	48192 Added content about the special value 127.	Y	New content added.
2.2.2.14 Recurrence.DayOfMonth	48192 Removed content about special value 127, which is used by DayOfWeek element and not DayOfMonth element.	Y	Content removed.
4 Protocol Examples	536767 Sample moved to Section 4.2.	Y	Content removed.
4.2 Synchronizing Tasks on the Client	53676 New topic	Y	New content added.
4.3 Fetching Task Data with the ItemOperations Command	53676 New topic.	Y	New content added.
4.4 Searching for Tasks	53676 New topic.	Y	New content added.

8 Index