[MS-ASWBXML]: ActiveSync WAP Binary XML (WBXML) Protocol Specification

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Revision Summary			
Author	Date	Version	Comments
Microsoft Corporation	December 3, 2008	1.0	Initial Release.
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Table of Contents

1   Introduction

This document specifies a protocol for the **Wireless Application Protocol (WAP) binary XML (WBXML)** features utilized by the ActiveSync protocols. This document specifies which WBXML functionality is used by the protocol and which is not. It also specifies the **token** codes and **code pages** used by the ActiveSync protocols.

1.1   Glossary

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

> **protocol**
> **server**
> **WAP**
> **WAP binary XML (WBXML)**
> **XML**

code page: A numeric encoding specifier used to tokenize XML tags.

token: A single-byte code that represents a specific XML tag.

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

[MS-ASHTTP] Microsoft Corporation, "ActiveSync HTTP 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.

[WBXML] W3C, "WAP Binary XML Content Format", June 1999, http://www.w3.org/TR/wbxml/.

1.2.2 Informative References

[RFC2068] Fielding, R., et al., "Hypertext Transfer Protocol -- HTTP/1.1", RFC 2068, January 1997, http://www.ietf.org/rfc/rfc2068.txt.

1.3 Protocol Overview

This document specifies how **WBXML** functionality is utilized by the ActiveSync protocols. This document also specifies the **tokens** and **code pages** used to perform the WBXML encoding.

1.4 Relationship to Other Protocols

The **WBXML tokens** and **code pages** specified in this protocol are used to compress the **XML** tags in request and response messages. The following table defines the ActiveSync protocol that specifies the XML namespace that corresponds to each of the code pages. Code pages are hard-coded on the server, and cannot be changed by the client.

Code Page	Specification
Code page 0: AirSync	MS-ASCMD section 2.2.2.22
Code page 1: Contacts	MS-ASCNTC
Code page 2: Email	MS-ASEMAIL
Code page 3: Air Notify (not used)	(no longer used)
Code page 4: Calendar	MS-ASCAL
Code page 5: Move	MS-ASCMD section 2.2.2.12
Code page 6: ItemEstimate	MS-ASCMD section 2.2.2.9
Code page 7: FolderHierarchy	MS-ASCMD sections 2.2.2.2, 2.2.2.3, 2.2.2.4, 2.2.2.5, and 2.2.2.6
Code page 8: MeetingResponse	MS-ASCMD section 2.2.2.11
Code page 9: Tasks	MS-ASTASK
Code page 10: ResolveRecipients	MS-ASCMD section 2.2.2.16
Code page 11: ValidateCert	MS-ASCMD section 2.2.2.23
Code page 12: Contacts2	MS-ASCNTC
Code page 13: Ping	MS-ASCMD section 2.2.2.14
Code page 14: Provision	MS-ASCMD section 2.2.2.15
Code page 15: Search	MS-ASCMD section 2.2.2.17
Code page 16: GAL	MS-ASCMD sections 2.2.2.17 and 2.2.2.16
Code page 17: AirSyncBase	MS-ASAIRS
Code page 18: Settings	MS-ASCMD section 2.2.2.19
Code page 19: DocumentLibrary	MS-ASCMD sections 2.2.2.17 and 2.2.2.10
Code page 20: ItemOperations	MS-ASCMD section 2.2.2.10
Code page 21: ComposeMail	MS-ASCMD sections 2.2.1.15, 2.2.1.17, and 2.2.1.18

Code page 22: Email2	MS-ASEMAIL
Code page 23: Notes	MS-ASNOTES

1.5 Prerequisites/Preconditions

None.

1.6 Applicability Statement

WBXML encoding of **XML** tags is appropriate for all messages sent and received by the ActiveSync protocol. This specification assumes that the reader is familiar with the WBXML standard. For more information about WBXML, see [WBXML].

1.7 Versioning and Capability Negotiation

None.

1.8 Vendor-Extensible Fields

None.

1.9 Standards Assignments

Token Name	Token	Reference
SWITCH_PAGE	0	[WBXML]
END	1	[WBXML]
ENTITY	2	[WBXML]
STR_I	3	[WBXML]
LITERAL	4	[WBXML]
EXT_I_0	40	[WBXML]
EXT_I_1	41	[WBXML]
EXT_I_2	42	[WBXML]
PI	43	[WBXML]
LITERAL_C	44	[WBXML]
EXT_T_0	80	[WBXML]
EXT_T_1	81	[WBXML]
EXT_T_2	82	[WBXML]
STR_T	83	[WBXML]
LITERAL_A	84	[WBXML]
EXT_0	C0	[WBXML]
EXT_1	C1	[WBXML]
EXT_2	C2	[WBXML]
OPAQUE	C3	[WBXML]

LITERAL_AC	C4	[WBXML]

2 Messages

2.1 Transport

ActiveSync messages are transported as HTTP POST messages, where the body of the message contains **WBXML** formatted data. The HTTP POST message header is specified in [MS-ASHTTP]. The body of the HTTP message contains the **XML** required by the command being communicated in the message. The ActiveSync commands are specified in [MS-ASCMD].

2.2 Message Syntax

2.2.1 WBXML

The **XML** tags in both request and response messages are encoded by using **WBXML** tokenization. WBXML is a standard for compressing an XML data stream for efficient transmission over a low bandwidth connection, such as wireless. The format used by the ActiveSync protocol is a subset of the WBXML standard.

2.2.1.1 WBXML Features Used in the Protocol

The **XML** format that is used by the ActiveSync protocol is a subset of the **WBXML** standard, as specified in [WBXML]. However, not all of the WBXML features specified in [WBXML] are used by this specification.
The ActiveSync protocol uses the following [WBXML] features:

- **Tokens** to encode XML tags
- **Code pages** to support multiple XML namespaces
- Inline strings

The ActiveSync protocol notifications use the following [WBXML] features:

- Attribute encoding
- Opaque data

The ActiveSync protocols do not use the following [WBXML] features:

- String tables
- Entities
- Processing instructions

2.2.1.2 Code Pages

The ActiveSync protocol supports the following **code pages**.

Code Page	XML Namespace
0x0	**AirSync**

Code Page	XML Namespace
0x1	**Contacts**
0x2	**Email**
0x3	**AirNotify**
0x4	**Cal**
0x5	**Move**
0x6	**ItemEstimate**
0x7	**FolderHierarchy**
0x8	**MeetingResponse**
0x9	**Tasks**
0xA	**ResolveRecipients**
0xB	**ValidateCert**
0xC	**Contacts2**
0xD	**Ping**
0xE	**Provision**
0xF	**Search**
0x10	**Gal**
0x11	**AirSyncBase**
0x12	**Settings**
0x13	**DocumentLibrary**
0x14	**ItemOperations**
0x15	**ComposeMail**
0x16	**Email2**
0x17	**Notes**

2.2.1.2.1 Code Page 0: AirSync

The following table lists the tags in **code page** 0.

Tag	Token
Sync	05
Responses	06
Add	07
Change	08
Delete	09
Fetch	0A
SyncKey	0B
ClientId	0C
ServerId	0D
Status	0E
Collection	0F
Class	10
Version	11

Tag	Token
CollectionId	12
GetChanges	13
MoreAvailable	14
WindowSize	15
Commands	16
Options	17
FilterType	18
Truncation	19
RTFTruncation	1A
Conflict	1B
Collections	1C
ApplicationData	1D
DeletesAsMoves	1E
NotifyGUID	1F
Supported	20
SoftDelete	21
MIMESupport	22
MIMETruncation	23
Wait	24<6>
Limit	25<6>
Partial	26<6>
ConversationMode	27 <1>
MaxItems	28 <2>
HeartbeatInterval	29 <2>

2.2.1.2.2 Code Page 1: Contacts

The following table lists the tags in **code page** 1.

Tag	Token
Anniversary	05
AssistantName	06
AssistantTelephoneNumber	07
Birthday	08
Body	09
BodySize	0A
BodyTruncated	0B
Business2TelephoneNumber	0C
BusinessAddressCity	0D
BusinessAddressCountry	0E
BusinessAddressPostalCode	0F

Tag	Token
BusinessAddressState	10
BusinessAddressStreet	11
BusinessFaxNumber	12
BusinessTelephoneNumber	13
CarTelephoneNumber	14
Categories	15
Category	16
Children	17
Child	18
CompanyName	19
Department	1A
Email1Address	1B
Email2Address	1C
Email3Address	1D
FileAs	1E
FirstName	1F
Home2TelephoneNumber	20
HomeAddressCity	21
HomeAddressCountry	22
HomeAddressPostalCode	23
HomeAddressState	24
HomeAddressStreet	25
HomeFaxNumber	26
HomeTelephoneNumber	27
JobTitle	28
LastName	29
MiddleName	2A
MobilePhoneNumber	2B
OfficeLocation	2C
OtherAddressCity	2D
OtherAddressCountry	2E
OtherAddressPostalCode	2F
OtherAddressState	30
OtherAddressStreet	31
PagerNumber	32
RadioTelephoneNumber	33
Spouse	34
Suffix	35
Title	36
Webpage	37
YomiCompanyName	38

Tag	Token
YomiFirstName	39
YomiLastName	3A
CompressedRTF	3B
Picture	3C
Alias	3D <2>
WeightedRank	3E <2>

2.2.1.2.3 Code Page 2: Email

The following table lists the tags in **code page** 2.

Tag	Token
Attachment	05 <2>
Attachments	06 <3>
AttName	07 <3>
AttSize	08 <3>
Att0Id	09 <3>
AttMethod	0A <3>
AttRemoved	0B <3>
Body	0C <3>
BodySize	0D <3>
BodyTruncated	0E <3>
DateReceived	0F <3>
DisplayName	10 <3>
DisplayTo	11 <3>
Importance	12 <3>
MessageClass	13 <3>
Subject	14 <3>
Read	15 <3>
To	16 <3>
CC	17 <3>
From	18 <3>
ReplyTo	19 <3>
AllDayEvent	1A <3>
Categories	1B <3>
Category	1C <3>
DTStamp	1D <3>
EndTime	1E <3>
InstanceType	1F <3>
IntDBusyStatus	20 <3>
Location	21 <3>
MeetingRequest	22 <3>
Organizer	23 <3>

Tag	Token
RecurrenceId	24 <3>
Reminder	25 <3>
ResponseRequested	26 <3>
Recurrences	27 <3>
Recurrence	28 <3>
Recurrence_Type	29 <3>
Recurrence_Until	2A <3>
Recurrence_Occurrences	2B <3>
Recurrence_Interval	2C <3>
Recurrence_DayOfWeek	2D <3>
Recurrence_DayOfMonth	2E <3>
Recurrence_WeekOfMonth	2F <3>
Recurrence_MonthOfYear	30 <3>
StartTime	31 <3>
Sensitivity	32 <3>
TimeZone	33 <3>
GlobalObjId	34 <3>
ThreadTopic	35 <3>
MIMEData	36 <3>
MIMETruncated	37 <3>
MIMESize	38 <3>
InternetCPID	39 <3>
Flag	3A <3>
FlagStatus	3B <4>
ContentClass	3C <4>
FlagType	3D <4>
CompleteTime	3E <4>
DisallowNewTimeProposal	3F <2>

2.2.1.2.4 Code Page 3: AirNotify

The following table lists the tags in **code page** 3. This code page is no longer in use, however, tokens 05 through 17 have been defined.

2.2.1.2.5 Code Page 4: Calendar

The following table lists the tags in **code page** 4.

Tag	Token
TimeZone	05 <3>
AllDayEvent	06 <3>
Attendees	07 <3>
Attendee	08 <3>

Tag	Token
Attendee_Email	09 <3>
Attendee_Name	0A <3>
Body	0B <3>
BodyTruncated	0C <3>
BusyStatus	0D <3>
Categories	0E <3>
Category	0F <3>
Compressed_RTF	10 <3>
DTStamp	11 <3>
EndTime	12 <3>
Exception	13 <3>
Exceptions	14 <3>
Exception_IsDeleted	15 <3>
Exception_StartTime	16 <3>
Location	17 <3>
MeetingStatus	18 <3>
Organizer_Email	19 <3>
Organizer_Name	1A <3>
Recurrence	1B <3>
Recurrence_Type	1C <3>
Recurrence_Until	1D <3>
Recurrence_Occurrences	1E <3>
Recurrence_Interval	1F <3>
Recurrence_DayOfWeek	20 <3>
Recurrence_DayOfMonth	21 <3>
Recurrence_WeekOfMonth	22 <3>
Recurrence_MonthOfYear	23 <3>
Reminder_MinsBefore	24 <3>
Sensitivity	25 <3>
Subject	26 <3>
StartTime	27 <3>
UID	28 <3>
Attendee_Status	29 <4>
Attendee_Type	2A <4>
Attachment	2B <6>
Attachments	2C <6>
AttName	2D <6>
AttSize	2E <6>
AttOid	2F <6>
AttMethod	30 <6>
AttRemoved	31 <6>
DisplayName	32 <6>

Tag	Token
DisallowNewTimeProposal	33 <2>
ResponseRequested	34 <2>
AppointmentReplyTime	35 <2>
ResponseType	36 <2>

2.2.1.2.6 Code Page 5: Move

The following table lists the tags in **code page** 5.

Tag	Token
MoveItems	05
Move	06
SrcMsgId	07
SrcFldId	08
DstFldId	09
Response	0A
Status	0B
DstMsgId	0C

2.2.1.2.7 Code Page 6: ItemEstimate

The following table lists the tags in **code page** 6.

Tag	Token
GetItemEstimate	05
Version	06
Collections	07
Collection	08
Class	09
CollectionId	0A
DateTime	0B
Estimate	0C
Response	0D
Status	0E

2.2.1.2.8 Code Page 7: FolderHierarchy

The following table lists the tags in **code page** 7.

Tag	Token
Folders	05
Folder	06
DisplayName	07
ServerId	08
ParentId	09

Tag	Token
Type	0A
Response	0B
Status	0C
ContentClass	0D
Changes	0E
Add	0F
Delete	10
Update	11
SyncKey	12
FolderCreate	13
FolderDelete	14
FolderUpdate	15
FolderSync	16
Count	17
Version	18

2.2.1.2.9 Code Page 8: MeetingResponse

The following table lists the tags in **code page** 8.<1>

Tag	Token
CalId	05
CollectionId	06
MeetingResponse	07
ReqId	08
Request	09
Result	0A
Status	0B
UserResponse	0C
Version	0D

2.2.1.2.10 Code Page 9: Tasks

The following table lists the tags in **code page** 9.<1>

Tag	Token
Body	05 <3>
BodySize	06 <3>
BodyTruncated	07 <3>
Categories	08 <3>
Category	09 <3>
Complete	0A <3>
DateCompleted	0B <3>
DueDate	0C <3>

Tag	Token
UTCDueDate	0D <3>
Importance	0E <3>
Recurrence	0F <3>
RecurrenceType	10 <3>
RecurrenceStart	11 <3>
RecurrenceUntil	12 <3>
RecurrenceOccurrences	13 <3>
RecurrenceInterval	14 <3>
RecurrenceDayOfMonth	15 <3>
RecurrenceDayOfWeek	16 <3>
RecurrenceWeekOfMonth	17 <3>
RecurrenceMonthOfYear	18 <3>
RecurrenceRegenerate	19 <3>
RecurrenceDeadOccur	1A <3>
ReminderSet	1B <3>
ReminderTime	1C <3>
Sensitivity	1D <3>
StartDate	1E <3>
UTCStartDate	1F <3>
Subject	20 <3>
CompressedRTF	21 <3>
OrdinalDate	22 <4>
SubOrdinalDate	23 <4>

2.2.1.2.11 Code Page 10: ResolveRecipients

The following table lists the tags in **code page** 10.**<1>**

Tag	Token
ResolveRecipients	05
Response	06
Status	07
Type	08
Recipient	09
DisplayName	0A
EmailAddress	0B
Certificates	0C
Certificate	0D
MiniCertificate	0E
Options	0F
To	10

Tag	Token
CertificateRetrieval	11
RecipientCount	12
MaxCertificates	13
MaxAmbiguousRecipients	14
CertificateCount	15

2.2.1.2.12 Code Page 11: ValidateCert

The following table lists the tags in **code page** 11.<1>

Tag	Token
ValidateCert	05
Certificates	06
Certificate	07
CertificateChain	08
CheckCRL	09
Status	0A

2.2.1.2.13 Code Page 12: Contacts2

The following table lists the tags in **code page** 12.<1>

Tag	Token
CustomerId	05
GovernmentId	06
IMAddress	07
IMAddress2	08
IMAddress3	09
ManagerName	0A
CompanyMainPhone	0B
AccountName	0C
NickName	0D
MMS	0E

2.2.1.2.14 Code Page 13: Ping

The following table lists the tags in **code page** 13.<1>

Tag	Token
Ping	05
AutdState (Not used by protocol)	06

Tag	Token
Status	07
HeartbeatInterval	08
Folders	09
Folder	0A
Id	0B
Class	0C
MaxFolders	0D

2.2.1.2.15 Code Page 14: Provision

The following table lists the tags in **code page** 14.<1>

Tag	Token
Provision	05 <3>
Policies	06 <3>
Policy	07 <3>
PolicyType	08 <3>
PolicyKey	09 <3>
Data	0A <3>
Status	0B <3>
RemoteWipe	0C <3>
EASProvisionDoc	0D <4>
DevicePasswordEnabled	0E <4>
AlphanumericDevicePasswordRequired	0F <4>
DeviceEncryptionEnabled	10 <4>
RequireStorageCardEncryption (equivalent to **DeviceEncryptionEnabled**)	10 <4>
PasswordRecoveryEnabled	11 <4>
DocumentBrowseEnabled	12 <4>
AttachmentsEnabled	13 <4>
MinDevicePasswordLength	14 <4>
MaxInactivityTimeDeviceLock	15 <4>
MaxDevicePasswordFailedAttempts	16 <4>
MaxAttachmentSize	17 <4>
AllowSimpleDevicePassword	18 <4>
DevicePasswordExpiration	19 <4>
DevicePasswordHistory	1A <4>
AllowStorageCard	1B <4>
AllowCamera	1C <6>
RequireDeviceEncryption	1D <6>
AllowUnsignedApplications	1E <6>
AllowUnsignedInstallationPackages	1F <6>
MinDevicePasswordComplexCharacters	20 <6>

Tag	Token
AllowWiFi	21 <6>
AllowTextMessaging	22 <6>
AllowPOPIMAPEmail	23 <6>
AllowBluetooth	24 <6>
AllowIrDA	25 <6>
RequireManualSyncWhenRoaming	26 <6>
AllowDesktopSync	27 <6>
MaxCalendarAgeFilter	28 <6>
AllowHTMLEmail	29 <6>
MaxEmailAgeFilter	2A <6>
MaxEmailBodyTruncationSize	2B <6>
MaxEmailHTMLBodyTruncationSize	2C <6>
RequireSignedSMIMEMessages	2D <6>
RequireEncryptedSMIMEMessages	2E <6>
RequireSignedSMIMEAlgorithm	2F <6>
RequireEncryptionSMIMEAlgorithm	30 <6>
AllowSMIMEEncryptionAlgorithmNegotiation	31 <6>
AllowSMIMESoftCerts	32 <6>
AllowBrowser	33 <6>
AllowConsumerEmail	34 <6>
AllowRemoteDesktop	35 <6>
AllowInternetSharing	36 <6>
UnapprovedInROMApplicationList	37 <6>
ApplicationName	38 <6>
ApprovedApplicationList	39 <6>
Hash	3A <6>

2.2.1.2.16 Code Page 15: Search

The following table lists the tags in **code page** 15.**<1>**

Tag	Token
Search	05 <3>
Store	07 <3>
Name	08 <3>
Query	09 <3>
Options	0A <3>
Range	0B <3>
Status	0C <3>
Response	0D <3>
Result	0E <3>
Properties	0F <3>

Tag	Token
Total	10 <3>
EqualTo	11 <4>
Value	12 <4>
And	13 <4>
Or	14 <4>
FreeText	15 <4>
DeepTraversal	17 <4>
LongId	18 <4>
RebuildResults	19 <4>
LessThan	1A <4>
GreaterThan	1B <4>
Schema	1C <4>
Supported	1D <4>
UserName	1E <6>
Password	1F <6>
ConversationId	20 <2>

Note that tokens 06 and 16 are not supported.

2.2.1.2.17 Code Page 16: GAL

The following table lists the tags in **code page** 16.**<1>**

Tag	Token
DisplayName	05
Phone	06
Office	07
Title	08
Company	09
Alias	0A
FirstName	0B
LastName	0C
HomePhone	0D
MobilePhone	0E
EmailAddress	0F

2.2.1.2.18 Code Page 17: AirSyncBase

The following table lists the tags in **code page** 17.**<5>**

Tag	Token
BodyPreference	05
Type	06
TruncationSize	07

Tag	Token
AllOrNone	08
Body	0A
Data	0B
EstimatedDataSize	0C
Truncated	0D
Attachments	0E
Attachment	0F
DisplayName	10
FileReference	11
Method	12
ContentId	13
ContentLocation	14
IsInline	15
NativeBodyType	16
ContentType	17
Preview	18 <2>

2.2.1.2.19 Code Page 18: Settings

The following table lists the tags in **code page** 18.**<7>**

Tag	Token
Settings	05
Status	06
Get	07
Set	08
Oof	09
OofState	0A
StartTime	0B
EndTime	0C
OofMessage	0D
AppliesToInternal	0E
AppliesToExternalKnown	0F
AppliesToExternalUnknown	10
Enabled	11
ReplyMessage	12
BodyType	13
DevicePassword	14
Password	15
DeviceInformaton	16
Model	17
IMEI	18
FriendlyName	19

Tag	Token
OS	1A
OSLanguage	1B
PhoneNumber	1C
UserInformation	1D
EmailAddresses	1E
SmtpAddress	1F
UserAgent	20 <6>
EnableOutboundSMS	21 <2>
MobileOperator	22 <2>

2.2.1.2.20 Code Page 19: DocumentLibrary

The following table lists the tags in **code page** 19.**<7>**

Tag	Token
LinkId	05
DisplayName	06
IsFolder	07
CreationDate	08
LastModifiedDate	09
IsHidden	0A
ContentLength	0B
ContentType	0C

2.2.1.2.21 Code Page 20: ItemOperations

The following table lists the tags in **code page** 20.**<7>**

Tag	Token
ItemOperations	05
Fetch	06
Store	07
Options	08
Range	09
Total	0A
Properties	0B
Data	0C
Status	0D
Response	0E

Tag	Token
Version	0F
Schema	10
Part	11
EmptyFolderContents	12
DeleteSubFolders	13
UserName	14 <6>
Password	15 <6>
Move	16 <2>
DstFldId	17 <2>
ConversationId	18 <2>
MoveAlways	19 <2>

2.2.1.2.22 Code Page 21: ComposeMail

The following table lists the tags in **code page** 21. <6>

Tag	Token
SendMail	05
SmartForward	06
SmartReply	07
SaveInSentItems	08
ReplaceMime	09
Type	0A
Source	0B
FolderId	0C
ItemId	0D
LongId	0E
InstanceId	0F
Mime	10
ClientId	11
Status	12

2.2.1.2.23 Code Page 22: Email2

The following table lists the tags in **code page** 22. <8>

Tag	Token
UmCallerID	05
UmUserNotes	06
UmAttDuration	07
UmAttOrder	08
ConversationId	09

Tag	Token
ConversationIndex	0A
LastVerbExecuted	0B
LastVerbExecutionTime	0C
ReceivedAsBcc	0D
Sender	0E
CalendarType	0F
IsLeapMonth	10

2.2.1.2.24 Code Page 23: Notes

The following table lists the tags in **code page** 23. <8>

Tag	Token
Subject	05
MessageClass	06
LastModifiedDate	07
Categories	08
Category	09

3   Protocol Details

3.1   Common Details

3.1.1   Abstract Data Model

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

The abstract data model follows what is specified in [WBXML].

3.1.2   Timers

None.

3.1.3   Initialization

None.

3.1.4   Higher-Layer Triggered Events

None.

3.1.5 Message Processing Events and Sequencing Rules

Message processing is specified in [WBXML], in the Document Tokenisation section.

3.1.6 Timer Events

None.

3.1.7 Other Local Events

None.

4 Protocol Examples

The following examples show the **WBXML** encoding of the messages, and provide a byte-by-byte description of the encoding.

4.1 Example 1

The following example shows the **WBXML** encoding of a server response that contains a new contact.

4.1.1 XML Message

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns="AirSync:" xmlns:A="AirSyncBase:" xmlns:B="POOMCONTACTS:">
  <Collections>
    <Collection>
      <Class>Contacts</Class>
      <SyncKey>2</SyncKey>
      <CollectionId>2</CollectionId>
      <Status>1</Status>
      <Commands>
        <Add>
          <ServerId>2:1</ServerId>
          <ApplicationData>
            <A:Body>
              <A:Type>1</A:Type>
              <A:EstimatedDataSize>0</A:EstimatedDataSize>
              <A:Truncated>1</A:Truncated>
            </A:Body>
            <B:FileAs>Hall, Don</B:FileAs>
            <B:FirstName>Don</B:FirstName>
```

```
            <B:LastName>Hall</B:LastName>

            <A:NativeBodyType>1</A:NativeBodyType>

          </ApplicationData>

        </Add>

      </Commands>

    </Collection>

  </Collections>

</Sync>
```

4.1.2 WBXML Encoding

```
03 01 6A 00 45 5C 4F 50 03 43 6F 6E 74 61 63 74 73 00 01 4B 03 32 00 01
52 03 32 00 01 4E 03 31 00 01 56 47 4D 03 32 3A 31 00 01 5D 00 11 4A 46
03 31 00 01 4C 03 30 00 01 4D 03 31 00 01 01 00 01 5E 03 48 61 6C 6C 2C
20 44 6F 6E 00 01 5F 03 44 6F 6E 00 01 69 03 48 61 6C 6C 00 01 00 11 56
03 31 00 01 01 01 01 01 01 01
```

```
..j.E\OP.Contacts..K.2..R.2..N.1..VGM.2:1..]..JF.1..L.0..M.1.....^.Hall
, Don.._.Don..i.Hall....V.1........
```

4.1.3 Byte Encoding

Bytes	Description
03	Version number – **WBXML** version 1.3
01	Unknown public identifier
6A	Charset = UTF-8
00	String table length
45	<Sync>, with content (0x05 + 0x40)
5C	<Collections>, with content
4F	<Collection>, with content
50	<Class>, with content
03	Inline string follows
43 6F 6E 74 61 63 74 73 00	"Contacts" (the 00 is the end of the string)
01	</Class>
4B	<SyncKey>, with content
03	Inline string follows
32 00	"2"
01	</SyncKey>
52	<CollectionID>, with content
03	Inline string follows
32 00	"2"

Bytes	Description
01	</CollectionID>
4E	<Status>, with content
03	Inline string follows
31 00	"1"
01	</Status>
56	<Commands>, with content
47	<Add>, with content
4D	<ServerId>, with content
03	Inline string follows
32 3A 31 00	"2:1"
01	</ServerId>
5D	<ApplicationData>, with content
00 11	Select **code page** 17 (**AirSyncBase**)
4A	<Body>, with content
46	<Type>, with content
03	Inline string follows
31 00	"1"
01	</Type>
4C	<EstimatedDataSize>, with content
03	Inline string follows
30 00	"0"
01	</EstimatedDataSize>
4d	<Truncated>, with content
03	Inline string follows
31 00	"1"
01	</Truncated>
01	</Body>
00 01	Select code page 1 (Contacts)
5E	<FileAs>, with content
03	Inline string follows
48 61 6C 6C 2C 20 44 6F 6E 00	"Hall, Don"
01	</FileAs>
5F	<FirstName>, with content
03	Inline string follows
44 6F 6E 00	"Don"
01	</FirstName>
69	<LastName>, with content
03	Inline string follows
48 61 6C 6C 00	"Hall"
01	</LastName>
00 11	Select code page 17 (AirSyncBase)
56	<NativeBodyType>, with content

Bytes	Description
03	Inline string follows
31 00	"1"
01	</NativeBodyType>
01	</ApplicationData>
01	</Add>
01	</Commands>
01	</Collection>
01	</Collections>
01	</Sync>

5 Security

5.1 Security Considerations for Implementers

In most cases, all communication between the **client** and **server** happens across a HTTP connection secured by the Secure Sockets Layer (SSL) protocol as specified in [RFC2068]. The SSL connection is assumed to be secure enough to transmit confidential data, such as user credentials and sensitive e-mail. The SSL certificate on the server is assumed to be trusted by the client application.

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 2007
- 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.

<1> Section 2.2.1.2.11: This token is only supported by ActiveSync protocol version 14.0.

<2> Section 2.2.1.2.3: This token is supported by ActiveSync protocol versions 12.0, 12.1, and 14.0.

<3> Section 2.2.1.2.3: This token is supported by ActiveSync protocol versions 12.0, 12.1, and 14.0.

<4> Section 2.2.1.2.15: This token is supported by ActiveSync protocol version 12.1 and 14.0.

<5> Section 2.2.1.2.19: This code page is supported by ActiveSync protocol versions 12.0, 12.1, and 14.0.

<6> Section 2.2.1.2.22: This code page is only supported by ActiveSync protocol version 14.0.

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