[MS-ASWBXML]:
Exchange ActiveSync:
WAP Binary XML (WBXML) Algorithm

Intellectual Property Rights Notice for Open Specifications Documentation

- **Technical Documentation.** Microsoft publishes Open Specifications documentation for protocols, file formats, languages, standards as well as overviews of the interaction among each of these technologies.

- **Copyrights.** This documentation is covered by Microsoft copyrights. Regardless of any other terms that are contained in the terms of use for the Microsoft website that hosts this documentation, you may make copies of it in order to develop implementations of the technologies described in the Open Specifications and may distribute portions of it in your implementations using these technologies or your documentation as necessary to properly document the implementation. You may also distribute in your implementation, with or without modification, any schema, IDL's, or code samples that are included in the documentation. This permission also applies to any documents that are referenced in the Open Specifications.

- **No Trade Secrets.** Microsoft does not claim any trade secret rights in this documentation.

- **Patents.** Microsoft has patents that may cover your implementations of the technologies described in the Open Specifications. Neither this notice nor Microsoft's delivery of the documentation grants any licenses under those or any other Microsoft patents. However, a given Open Specification may be covered by Microsoft Open Specification Promise or the Community Promise. If you would prefer a written license, or if the technologies described in the Open Specifications are not covered by the Open Specifications Promise or Community Promise, as applicable, patent licenses are available by contacting iplg@microsoft.com.

- **Trademarks.** The names of companies and products contained in this documentation may be covered by trademarks or similar intellectual property rights. This notice does not grant any licenses under those rights. For a list of Microsoft trademarks, visit www.microsoft.com/trademarks.

- **Fictitious Names.** The example companies, organizations, products, domain names, email addresses, logos, people, places, and events depicted in this documentation are fictitious. No association with any real company, organization, product, domain name, email address, logo, person, place, or event is intended or should be inferred.

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

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

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.
05/05/2010	6.0.0	Major	Updated and revised the technical content.
08/04/2010	7.0	Major	Significantly changed the technical content.
11/03/2010	8.0	Major	Significantly changed the technical content.
03/18/2011	8.1	Minor	Clarified the meaning of the technical content.
08/05/2011	9.0	Major	Significantly changed the technical content.
10/07/2011	10.0	Major	Significantly changed the technical content.
01/20/2012	11.0	Major	Significantly changed the technical content.
04/27/2012	11.1	Minor	Clarified the meaning of the technical content.
07/16/2012	12.0	Major	Significantly changed the technical content.
10/08/2012	12.1	Minor	Clarified the meaning of the technical content.
02/11/2013	12.1	No change	No changes to the meaning, language, or formatting of the technical content.
07/26/2013	13.0	Major	Significantly changed the technical content.
11/18/2013	13.0	No change	No changes to the meaning, language, or formatting of the technical content.
02/10/2014	13.0	No change	No changes to the meaning, language, or formatting of the technical content.

Release: February 10, 2014

Table of Contents

1 Introduction

The Exchange ActiveSync: WAP Binary XML (WBXML) Algorithm incorporates **Wireless Application Protocol (WAP) Binary XML (WBXML)** functionality into the ActiveSync protocols by mapping ActiveSync **XML schema** elements to numeric code page values. This enables ActiveSync clients to encode **XML** requests into WBXML for transmission to an ActiveSync server.

Section 2 of this specification is normative and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in RFC 2119. Section 1.6 is also normative but cannot contain those terms. All other sections and examples in this specification are informative.

1.1 Glossary

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

Hypertext Transfer Protocol (HTTP)
Secure Sockets Layer (SSL)
XML
XML namespace

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

contact
WBXML code page
Wireless Application Protocol (WAP) Binary XML (WBXML)
XML schema

The following terms are specific to this document:

WBXML 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

References to Microsoft Open Specifications documentation do not include a publishing year because links are to the latest version of the documents, which are updated frequently. References to other documents include a publishing year when one is available.

1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information.

[MS-ASCMD] Microsoft Corporation, "Exchange ActiveSync: Command Reference Protocol".

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

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

[WBXML1.2] Martin, B., and Jano, B., Eds., "WAP Binary XML Content Format", W3C Note, June 1999, http://www.w3.org/1999/06/NOTE-wbxml-19990624

1.2.2 Informative References

[MS-ASAIRS] Microsoft Corporation, "Exchange ActiveSync: AirSyncBase Namespace Protocol".

[MS-ASCAL] Microsoft Corporation, "Exchange ActiveSync: Calendar Class Protocol".

[MS-ASCNTC] Microsoft Corporation, "Exchange ActiveSync: Contact Class Protocol".

[MS-ASEMAIL] Microsoft Corporation, "Exchange ActiveSync: Email Class Protocol".

[MS-ASNOTE] Microsoft Corporation, "Exchange ActiveSync: Notes Class Protocol".

[MS-ASPROV] Microsoft Corporation, "Exchange ActiveSync: Provisioning Protocol".

[MS-ASRM] Microsoft Corporation, "Exchange ActiveSync: Rights Management Protocol".

[MS-ASTASK] Microsoft Corporation, "Exchange ActiveSync: Tasks Class Protocol".

[MS-GLOS] Microsoft Corporation, "Windows Protocols Master Glossary".

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

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

1.3 Overview

This algorithm maps ActiveSync XML schema elements to numeric code page values for use by the ActiveSync protocols, enabling ActiveSync clients to encode WBXML requests for transmission to an ActiveSync server.

This algorithm provides **WBXML tokens** and **WBXML code pages** that allow clients and servers to compress the XML tags in request and response messages. WBXML code pages are hard-coded on the server and cannot be changed by the client. The WBXML code pages correspond to **XML namespaces**.

1.4 Relationship to Protocols and Other Algorithms

The XML namespaces that are used by this algorithm are described in the ActiveSync protocol specifications, as shown in the following table.

The WBXML code page numbers in the table are listed in decimal format.

WBXML code page	Specification
WBXML code page 0: AirSync	[MS-ASCMD] section 2.2.2.19
WBXML code page 1: Contacts	[MS-ASCNTC]
WBXML code page 2: Email	[MS-ASEMAIL]
WBXML code page 3: AirNotify	(no longer used)
WBXML code page 4: Calendar	[MS-ASCAL]
WBXML code page 5: Move	[MS-ASCMD] section 2.2.2.10
WBXML code page 6: GetItemEstimate	[MS-ASCMD] section 2.2.2.7

WBXML code page	Specification
WBXML code page 7: FolderHierarchy	[MS-ASCMD] sections 2.2.2.2, 2.2.2.3, 2.2.2.4, and 2.2.2.5
WBXML code page 8: MeetingResponse	[MS-ASCMD] section 2.2.2.9
WBXML code page 9: Tasks	[MS-ASTASK]
WBXML code page 10: ResolveRecipients	[MS-ASCMD] section 2.2.2.13
WBXML code page 11: ValidateCert	[MS-ASCMD] section 2.2.2.20
WBXML code page 12: Contacts2	[MS-ASCNTC]
WBXML code page 13: Ping	[MS-ASCMD] section 2.2.2.11
WBXML code page 14: Provision	[MS-ASPROV]
WBXML code page 15: Search	[MS-ASCMD] section 2.2.2.14
WBXML code page 16: GAL	[MS-ASCMD] sections 2.2.2.13 and 2.2.2.14
WBXML code page 17: AirSyncBase	[MS-ASAIRS]
WBXML code page 18: Settings	[MS-ASCMD] section 2.2.2.16
WBXML code page 19: DocumentLibrary	[MS-ASCMD] sections 2.2.2.8 and 2.2.2.14
WBXML code page 20: ItemOperations	[MS-ASCMD] sections 2.2.2.8
WBXML code page 21: ComposeMail	[MS-ASCMD] sections 2.2.2.15, 2.2.2.17, and 2.2.2.18
WBXML code page 22: Email2	[MS-ASEMAIL]
WBXML code page 23: Notes	[MS-ASNOTE]
WBXML code page 24: Rights Management	[MS-ASRM]

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

1.5   Applicability Statement

WBXML is used as a compact transmission format for mobile clients, which typically have little memory and bandwidth. WBXML encoding of XML tags is appropriate for all messages sent and received by using the ActiveSync protocols.

1.6   Standards Assignments

This algorithm uses the global WBXML tokens listed in the following table.

Token name	Token	Reference
SWITCH_PAGE	0	[WBXML1.2]
END	1	[WBXML1.2]
ENTITY	2	[WBXML1.2]

Token name	Token	Reference
STR_I	3	[WBXML1.2]
LITERAL	4	[WBXML1.2]
EXT_I_0	40	[WBXML1.2]
EXT_I_1	41	[WBXML1.2]
EXT_I_2	42	[WBXML1.2]
PI	43	[WBXML1.2]
LITERAL_C	44	[WBXML1.2]
EXT_T_0	80	[WBXML1.2]
EXT_T_1	81	[WBXML1.2]
EXT_T_2	82	[WBXML1.2]
STR_T	83	[WBXML1.2]
LITERAL_A	84	[WBXML1.2]
EXT_0	C0	[WBXML1.2]
EXT_1	C1	[WBXML1.2]
EXT_2	C2	[WBXML1.2]
OPAQUE	C3	[WBXML1.2]
LITERAL_AC	C4	[WBXML1.2]

2   Algorithm Details

2.1   ActiveSync WBXML Algorithm Details

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

This section specifies the algorithm to encode XML request and response messages into WBXML format and to decode WBXML data into XML request and response messages. This algorithm is used by clients and servers.

2.1.1   Abstract Data Model

None.

2.1.2   Initialization

The XML tags in both request and response messages are encoded by using WBXML tokenization, as specified in [WBXML1.2]. WBXML uses WBXML code pages to map XML tags to WBXML tokens. WBXML parsers MUST use the WBXML code pages specified in the following sections.

2.1.2.1   Code Pages

This algorithm supports the following WBXML code pages.

Code page	XML namespace
0	AirSync
1	Contacts
2	Email
3	AirNotify
4	Calendar
5	Move
6	GetItemEstimate
7	FolderHierarchy
8	MeetingResponse
9	Tasks
10	ResolveRecipients
11	ValidateCert
12	Contacts2
13	Ping

Code page	XML namespace
14	Provision
15	Search
16	Gal
17	AirSyncBase
18	Settings
19	DocumentLibrary
20	ItemOperations
21	ComposeMail
22	Email2
23	Notes
24	RightsManagement

2.1.2.1.1 Code Page 0: AirSync

The tags and tokens in WBXML code page 0 are listed in the following table.

Tag name	Token
Sync	0x05
Responses	0x06
Add	0x07
Change	0x08
Delete	0x09
Fetch	0x0A
SyncKey	0x0B
ClientId	0x0C
ServerId	0x0D
Status	0x0E
Collection	0x0F
Class	0x10
CollectionId	0x12
GetChanges	0x13
MoreAvailable	0x14

Tag name	Token
WindowSize	0x15
Commands	0x16
Options	0x17
FilterType	0x18
Conflict	0x1B
Collections	0x1C
ApplicationData	0x1D
DeletesAsMoves	0x1E
Supported	0x20
SoftDelete	0x21
MIMESupport	0x22
MIMETruncation	0x23
Wait	0x24
Limit	0x25
Partial	0x26
ConversationMode<1>	0x27
MaxItems<2>	0x28
HeartbeatInterval<3>	0x29

2.1.2.1.2   Code Page 1: Contacts

The tags and tokens in WBXML code page 1 are listed in the following table.

Tag name	Token
Anniversary	0x05
AssistantName	0x06
AssistantPhoneNumber	0x07
Birthday	0x08
Business2PhoneNumber	0x0C
BusinessAddressCity	0x0D
BusinessAddressCountry	0x0E
BusinessAddressPostalCode	0x0F

Tag name	Token
BusinessAddressState	0x10
BusinessAddressStreet	0x11
BusinessFaxNumber	0x12
BusinessPhoneNumber	0x13
CarPhoneNumber	0x14
Categories	0x15
Category	0x16
Children	0x17
Child	0x18
CompanyName	0x19
Department	0x1A
Email1Address	0x1B
Email2Address	0x1C
Email3Address	0x1D
FileAs	0x1E
FirstName	0x1F
Home2PhoneNumber	0x20
HomeAddressCity	0x21
HomeAddressCountry	0x22
HomeAddressPostalCode	0x23
HomeAddressState	0x24
HomeAddressStreet	0x25
HomeFaxNumber	0x26
HomePhoneNumber	0x27
JobTitle	0x28
LastName	0x29
MiddleName	0x2A
MobilePhoneNumber	0x2B
OfficeLocation	0x2C
OtherAddressCity	0x2D

Tag name	Token
OtherAddressCountry	0x2E
OtherAddressPostalCode	0x2F
OtherAddressState	0x30
OtherAddressStreet	0x31
PagerNumber	0x32
RadioPhoneNumber	0x33
Spouse	0x34
Suffix	0x35
Title	0x36
WebPage	0x37
YomiCompanyName	0x38
YomiFirstName	0x39
YomiLastName	0x3A
Picture	0x3C
Alias<4>	0x3D
WeightedRank<5>	0x3E

2.1.2.1.3 Code Page 2: Email

The tags and tokens in WBXML code page 2 are listed in the following table.

Tag name	Token
DateReceived	0x0F
DisplayTo	0x11
Importance	0x12
MessageClass	0x13
Subject	0x14
Read	0x15
To	0x16
Cc	0x17
From	0x18
ReplyTo	0x19

Tag name	Token
AllDayEvent	0x1A
Categories<6>	0x1B
Category<7>	0x1C
DtStamp	0x1D
EndTime	0x1E
InstanceType	0x1F
BusyStatus	0x20
Location	0x21
MeetingRequest	0x22
Organizer	0x23
RecurrenceId	0x24
Reminder	0x25
ResponseRequested	0x26
Recurrences	0x27
Recurrence	0x28
Type	0x29
Until	0x2A
Occurrences	0x2B
Interval	0x2C
DayOfWeek	0x2D
DayOfMonth	0x2E
WeekOfMonth	0x2F
MonthOfYear	0x30
StartTime	0x31
Sensitivity	0x32
TimeZone	0x33
GlobalObjId	0x34
ThreadTopic	0x35
InternetCPID	0x39
Flag	0x3A

Tag name	Token
Status	0x3B
ContentClass	0x3C
FlagType	0x3D
CompleteTime	0x3E
DisallowNewTimeProposal<8>	0x3F

2.1.2.1.4 Code Page 3: AirNotify

WBXML code page 3 is no longer in use.

2.1.2.1.5 Code Page 4: Calendar

The tags and tokens in WBXML code page 4 are listed in the following table.

Tag name	Token
Timezone	0x05
AllDayEvent	0x06
Attendees	0x07
Attendee	0x08
Email	0x09
Name	0x0A
BusyStatus	0x0D
Categories	0x0E
Category	0x0F
DtStamp	0x11
EndTime	0x12
Exception	0x13
Exceptions	0x14
Deleted	0x15
ExceptionStartTime	0x16
Location	0x17
MeetingStatus	0x18
OrganizerEmail	0x19
OrganizerName	0x1A

Tag name	Token
Recurrence	0x1B
Type	0x1C
Until	0x1D
Occurrences	0x1E
Interval	0x1F
DayOfWeek	0x20
DayOfMonth	0x21
WeekOfMonth	0x22
MonthOfYear	0x23
Reminder	0x24
Sensitivity	0x25
Subject	0x26
StartTime	0x27
UID	0x28
AttendeeStatus	0x29
AttendeeType	0x2A
DisallowNewTimeProposal<9>	0x33
ResponseRequested<10>	0x34
AppointmentReplyTime<11>	0x35
ResponseType<12>	0x36
CalendarType<13>	0x37
IsLeapMonth<14>	0x38
FirstDayOfWeek<15>	0x39
OnlineMeetingConfLink<16>	0x3A
OnlineMeetingExternalLink<17>	0x3B

2.1.2.1.6   Code Page 5: Move

The tags and tokens in WBXML code page 5 are listed in the following table.

Tag name	Token
MoveItems	0x05

Tag name	Token
Move	0x06
SrcMsgId	0x07
SrcFldId	0x08
DstFldId	0x09
Response	0x0A
Status	0x0B
DstMsgId	0x0C

2.1.2.1.7   Code Page 6: GetItemEstimate

The tags and tokens in WBXML code page 6 are listed in the following table.

Tag name	Token
GetItemEstimate	0x05
Version<18>	0x06
Collections	0x07
Collection	0x08
Class<19>	0x09
CollectionId	0x0A
DateTime<20>	0x0B
Estimate	0x0C
Response	0x0D
Status	0x0E

2.1.2.1.8   Code Page 7: FolderHierarchy

The tags and tokens in WBXML code page 7 are listed in the following table.

Tag name	Token
DisplayName	0x07
ServerId	0x08
ParentId	0x09
Type	0x0A
Status	0x0C

Tag name	Token
Changes	0x0E
Add	0x0F
Delete	0x10
Update	0x11
SyncKey	0x12
FolderCreate	0x13
FolderDelete	0x14
FolderUpdate	0x15
FolderSync	0x16
Count	0x17

2.1.2.1.9   Code Page 8: MeetingResponse

The tags and tokens in WBXML code page 8 are listed in the following table.

Tag name	Token
CalendarId	0x05
CollectionId	0x06
MeetingResponse	0x07
RequestId	0x08
Request	0x09
Result	0x0A
Status	0x0B
UserResponse	0x0C
InstanceId	0x0E

2.1.2.1.10   Code Page 9: Tasks

The tags and tokens in WBXML code page 9 are listed in the following table.

Tag name	Token
Categories	0x08
Category	0x09
Complete	0x0A

Tag name	Token
DateCompleted	0x0B
DueDate	0x0C
UtcDueDate	0x0D
Importance	0x0E
Recurrence	0x0F
Type	0x10
Start	0x11
Until	0x12
Occurrences	0x13
Interval	0x14
DayOfMonth	0x15
DayOfWeek	0x16
WeekOfMonth	0x17
MonthOfYear	0x18
Regenerate	0x19
DeadOccur	0x1A
ReminderSet	0x1B
ReminderTime	0x1C
Sensitivity	0x1D
StartDate	0x1E
UtcStartDate	0x1F
Subject	0x20
OrdinalDate	0x22
SubOrdinalDate	0x23
CalendarType[21]	0x24
IsLeapMonth[22]	0x25
FirstDayOfWeek[23]	0x26

2.1.2.1.11   Code Page 10: ResolveRecipients

The tags and tokens in WBXML code page 10 are listed in the following table.

Tag name	Token
ResolveRecipients	0x05
Response	0x06
Status	0x07
Type	0x08
Recipient	0x09
DisplayName	0x0A
EmailAddress	0x0B
Certificates	0x0C
Certificate	0x0D
MiniCertificate	0x0E
Options	0x0F
To	0x10
CertificateRetrieval	0x11
RecipientCount	0x12
MaxCertificates	0x13
MaxAmbiguousRecipients	0x14
CertificateCount	0x15
Availability<24>	0x16
StartTime<25>	0x17
EndTime<26>	0x18
MergedFreeBusy<27>	0x19
Picture<28>	0x1A
MaxSize<29>	0x1B
Data<30>	0x1C
MaxPictures<31>	0x1D

2.1.2.1.12   Code Page 11: ValidateCert

The tags and tokens in WBXML code page 11 are listed in the following table.

Tag name	Token
ValidateCert	0x05

Tag name	Token
Certificates	0x06
Certificate	0x07
CertificateChain	0x08
CheckCRL	0x09
Status	0x0A

2.1.2.1.13 Code Page 12: Contacts2

The tags and tokens in WBXML code page 12 are listed in the following table.

Tag name	Token
CustomerId	0x05
GovernmentId	0x06
IMAddress	0x07
IMAddress2	0x08
IMAddress3	0x09
ManagerName	0x0A
CompanyMainPhone	0x0B
AccountName	0x0C
NickName	0x0D
MMS	0x0E

2.1.2.1.14 Code Page 13: Ping

The tags and tokens in WBXML code page 13 are listed in the following table.

Tag name	Token
Ping	0x05
AutdState (Not used)	0x06
Status	0x07
HeartbeatInterval	0x08
Folders	0x09
Folder	0x0A
Id	0x0B

Tag name	Token
Class	0x0C
MaxFolders	0x0D

2.1.2.1.15   Code Page 14: Provision

The tags and tokens in WBXML code page 14 are listed in the following table.

Tag name	Token
Provision	0x05
Policies	0x06
Policy	0x07
PolicyType	0x08
PolicyKey	0x09
Data	0x0A
Status	0x0B
RemoteWipe	0x0C
EASProvisionDoc	0x0D
DevicePasswordEnabled	0x0E
AlphanumericDevicePasswordRequired	0x0F
DeviceEncryptionEnabled	0x10
RequireStorageCardEncryption (equivalent to **DeviceEncryptionEnabled**)	0x10
PasswordRecoveryEnabled	0x11
AttachmentsEnabled	0x13
MinDevicePasswordLength	0x14
MaxInactivityTimeDeviceLock	0x15
MaxDevicePasswordFailedAttempts	0x16
MaxAttachmentSize	0x17
AllowSimpleDevicePassword	0x18
DevicePasswordExpiration	0x19
DevicePasswordHistory	0x1A
AllowStorageCard	0x1B
AllowCamera	0x1C

Tag name	Token
RequireDeviceEncryption	0x1D
AllowUnsignedApplications	0x1E
AllowUnsignedInstallationPackages	0x1F
MinDevicePasswordComplexCharacters	0x20
AllowWiFi	0x21
AllowTextMessaging	0x22
AllowPOPIMAPEmail	0x23
AllowBluetooth	0x24
AllowIrDA	0x25
RequireManualSyncWhenRoaming	0x26
AllowDesktopSync	0x27
MaxCalendarAgeFilter	0x28
AllowHTMLEmail	0x29
MaxEmailAgeFilter	0x2A
MaxEmailBodyTruncationSize	0x2B
MaxEmailHTMLBodyTruncationSize	0x2C
RequireSignedSMIMEMessages	0x2D
RequireEncryptedSMIMEMessages	0x2E
RequireSignedSMIMEAlgorithm	0x2F
RequireEncryptionSMIMEAlgorithm	0x30
AllowSMIMEEncryptionAlgorithmNegotiation	0x31
AllowSMIMESoftCerts	0x32
AllowBrowser	0x33
AllowConsumerEmail	0x34
AllowRemoteDesktop	0x35
AllowInternetSharing	0x36
UnapprovedInROMApplicationList	0x37
ApplicationName	0x38
ApprovedApplicationList	0x39
Hash	0x3A

2.1.2.1.16 Code Page 15: Search

The tags and tokens in WBXML code page 15 are listed in the following table.

Tag name	Token
Search	0x05
Store	0x07
Name	0x08
Query	0x09
Options	0x0A
Range	0x0B
Status	0x0C
Response	0x0D
Result	0x0E
Properties	0x0F
Total	0x10
EqualTo	0x11
Value	0x12
And	0x13
Or<32>	0x14
FreeText	0x15
DeepTraversal	0x17
LongId	0x18
RebuildResults	0x19
LessThan	0x1A
GreaterThan	0x1B
UserName	0x1E
Password	0x1F
ConversationId	0x20
Picture<33>	0x21
MaxSize<34>	0x22
MaxPictures<35>	0x23

Note that WBXML tokens 0x06 and 0x16 are not used.

2.1.2.1.17   Code Page 16: GAL

The tags and tokens in WBXML code page 16 are listed in the following table.

Tag name	Token
DisplayName	0x05
Phone	0x06
Office	0x07
Title	0x08
Company	0x09
Alias	0x0A
FirstName	0x0B
LastName	0x0C
HomePhone	0x0D
MobilePhone	0x0E
EmailAddress	0x0F
Picture<36>	0x10
Status<37>	0x11
Data<38>	0x12

2.1.2.1.18   Code Page 17: AirSyncBase

The tags and tokens in WBXML code page 17 are listed in the following table.

Tag name	Token
BodyPreference	0x05
Type	0x06
TruncationSize	0x07
AllOrNone	0x08
Body	0x0A
Data	0x0B
EstimatedDataSize	0x0C
Truncated	0x0D
Attachments	0x0E
Attachment	0x0F

Tag name	Token
DisplayName	0x10
FileReference	0x11
Method	0x12
ContentId	0x13
ContentLocation	0x14 (not used)
IsInline	0x15
NativeBodyType	0x16
ContentType	0x17
Preview<39>	0x18
BodyPartPreference<40>	0x19
BodyPart<41>	0x1A
Status<42>	0x1B

2.1.2.1.19   Code Page 18: Settings

The tags and tokens in WBXML code page 18 are listed in the following table.

Tag name	Token
Settings	0x05
Status	0x06
Get	0x07
Set	0x08
Oof	0x09
OofState	0x0A
StartTime	0x0B
EndTime	0x0C
OofMessage	0x0D
AppliesToInternal	0x0E
AppliesToExternalKnown	0x0F
AppliesToExternalUnknown	0x10
Enabled	0x11
ReplyMessage	0x12

Tag name	Token
BodyType	0x13
DevicePassword	0x14
Password	0x15
DeviceInformation	0x16
Model	0x17
IMEI	0x18
FriendlyName	0x19
OS	0x1A
OSLanguage	0x1B
PhoneNumber	0x1C
UserInformation	0x1D
EmailAddresses	0x1E
SMTPAddress	0x1F
UserAgent	0x20
EnableOutboundSMS<43>	0x21
MobileOperator<44>	0x22
PrimarySmtpAddress<45>	0x23
Accounts<46>	0x24
Account<47>	0x25
AccountId<48>	0x26
AccountName<49>	0x27
UserDisplayName<50>	0x28
SendDisabled<51>	0x29
RightsManagementInformation<52>	0x2B

2.1.2.1.20   Code Page 19: DocumentLibrary

The tags and tokens in WBXML code page 19 are listed in the following table.

Tag name	Token
LinkId	0x05
DisplayName	0x06

Tag name	Token
IsFolder	0x07
CreationDate	0x08
LastModifiedDate	0x09
IsHidden	0x0A
ContentLength	0x0B
ContentType	0x0C

2.1.2.1.21   Code Page 20: ItemOperations

The tags and tokens in WBXML code page 20 are listed in the following table.

Tag name	Token
ItemOperations	0x05
Fetch	0x06
Store	0x07
Options	0x08
Range	0x09
Total	0x0A
Properties	0x0B
Data	0x0C
Status	0x0D
Response	0x0E
Version	0x0F
Schema	0x10
Part	0x11
EmptyFolderContents	0x12
DeleteSubFolders	0x13
UserName	0x14
Password	0x15
Move<53>	0x16
DstFldId<54>	0x17
ConversationId<55>	0x18

Tag name	Token
MoveAlways<56>	0x19

2.1.2.1.22   Code Page 21: ComposeMail

The tags and tokens in WBXML code page 21<57> are listed in the following table.

Tag name	Token
SendMail	0x05
SmartForward	0x06
SmartReply	0x07
SaveInSentItems	0x08
ReplaceMime	0x09
Source	0x0B
FolderId	0x0C
ItemId	0x0D
LongId	0x0E
InstanceId	0x0F
Mime	0x10
ClientId	0x11
Status	0x12
AccountId<58>	0x13

2.1.2.1.23   Code Page 22: Email2

The tags and tokens in WBXML code page 22<59> are listed in the following table.

Tag name	Token
UmCallerID	0x05
UmUserNotes	0x06
UmAttDuration	0x07
UmAttOrder	0x08
ConversationId	0x09
ConversationIndex	0x0A
LastVerbExecuted	0x0B

Tag name	Token
LastVerbExecutionTime	0x0C
ReceivedAsBcc	0x0D
Sender	0x0E
CalendarType	0x0F
IsLeapMonth	0x10
AccountId<60>	0x11
FirstDayOfWeek<61>	0x12
MeetingMessageType<62>	0x13

2.1.2.1.24   Code Page 23: Notes

The tags and tokens in WBXML code page 23<63> are listed in the following table.

Tag name	Token
Subject	0x05
MessageClass	0x06
LastModifiedDate	0x07
Categories	0x08
Category	0x09

2.1.2.1.25   Code Page 24: RightsManagement

The tags and tokens in WBXML code page 24<64> are listed in the following table.

Tag name	Token
RightsManagementSupport	0x05
RightsManagementTemplates	0x06
RightsManagementTemplate	0x07
RightsManagementLicense	0x08
EditAllowed	0x09
ReplyAllowed	0x0A
ReplyAllAllowed	0x0B
ForwardAllowed	0x0C
ModifyRecipientsAllowed	0x0D

Tag name	Token
ExtractAllowed	0x0E
PrintAllowed	0x0F
ExportAllowed	0x10
ProgrammaticAccessAllowed	0x11
Owner	0x12
ContentExpiryDate	0x13
TemplateID	0x14
TemplateName	0x15
TemplateDescription	0x16
ContentOwner	0x17
RemoveRightsManagementDistribution	0x18

2.1.3 Processing Rules

The processing rules for this algorithm are specified in [WBXML1.2].

This algorithm uses the following features that are specified in [WBXML1.2]:

- WBXML tokens to encode XML tags

- WBXML code pages to support multiple XML namespaces

- Inline strings

- Opaque data

This algorithm does not use the following features that are specified in [WBXML1.2]:

- String tables

- Entities

- Processing instructions

- Attribute encoding

3   Algorithm Examples

The following example shows the WBXML encoding of a server response that contains a new **contact (3)** and provides a byte-by-byte description of the encoding.

The following XML represents a server response to a request to create a new contact.

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

The Exchange ActiveSync: WAP Binary XML (WBXML) Algorithm encodes this XML as the following 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 46 75 6E 6B 2C 20 44 6F 6E 00 01 5F 03 44 6F 6E 00 01 69 03 46 75 6E 6B 00 01
00 11 56 03 31 00 01 01 01 01 01 01 01
```

The following table explains each byte in the WBXML encoding.

Bytes	Description
03	Version number – WBXML version 1.3
01	Unknown public identifier
6A	Charset = UTF-8
00	String table length
45	<airsync:Sync>, with content (0x05 + 0x40)

Bytes	Description
5C	<airsync:Collections>, with content
4F	<airsync:Collection>, with content
50	<airsync: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	</airsync:Class>
4B	<airsync:SyncKey>, with content
03	Inline string follows
32 00	"2"
01	</airsync:SyncKey>
52	<airsync:CollectionID>, with content
03	Inline string follows
32 00	"2"
01	</airsync:CollectionID>
4E	<airsync:Status>, with content
03	Inline string follows
31 00	"1"
01	</airsync:Status>
56	<airsync:Commands>, with content
47	<airsync:Add>, with content
4D	<airsync:ServerId>, with content
03	Inline string follows
32 3A 31 00	"2:1"
01	</airsync:ServerId>
5D	<airsync:ApplicationData>, with content
00 11	Select WBXML code page 17 (AirSyncBase)
4A	<airsyncbase:Body>, with content
46	<airsyncbase:Type>, with content
03	Inline string follows
31 00	"1"

Bytes	Description
01	</airsyncbase:Type>
4C	<airsyncbase:EstimatedDataSize>, with content
03	Inline string follows
30 00	"0"
01	</airsyncbase:EstimatedDataSize>
4D	<airsyncbase:Truncated>, with content
03	Inline string follows
31 00	"1"
01	</airsyncbase:Truncated>
01	</airsyncbase:Body>
00 01	Select WBXML code page 1 (Contacts)
5E	<contacts:FileAs>, with content
03	Inline string follows
46 75 6E 6B 2C 20 44 6F 6E 00	"Funk, Don"
01	</contacts:FileAs>
5F	<contacts:FirstName>, with content
03	Inline string follows
44 6F 6E 00	"Don"
01	</contacts:FirstName>
69	<contacts:LastName>, with content
03	Inline string follows
46 75 6E 6B 00	"Funk"
01	</contacts:LastName>
00 11	Select WBXML code page 17 (AirSyncBase)
56	<airsyncbase:NativeBodyType>, with content
03	Inline string follows
31 00	"1"
01	</airsyncbase:NativeBodyType>
01	</airsync:ApplicationData>
01	</airsync:Add>

Bytes	Description
01	</airsync:Commands>
01	</airsync:Collection>
01	</airsync:Collections>
01	</airsync:Sync>

4 Security

4.1 Security Considerations for Implementers

In most cases, all communication between the client and server happens across an **HTTP** connection secured by the **Secure Sockets Layer (SSL)** protocol. 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.

4.2 Index of Security Parameters

None.

5   Appendix A: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include released service packs:

▪ Microsoft Exchange Server 2007 Service Pack 1 (SP1)

▪ Microsoft Exchange Server 2010

▪ Microsoft Exchange Server 2013

▪ Windows 8.1

▪ Windows Communication Apps

Exceptions, if any, are noted below. If a service pack or Quick Fix Engineering (QFE) number appears with the product version, behavior changed in that service pack or QFE. The new behavior also applies to subsequent service packs of the product unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification that is prescribed using the terms SHOULD or SHOULD NOT implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that the product does not follow the prescription.

<1> Section 2.1.2.1.1: The **ConversationMode** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<2> Section 2.1.2.1.1: The **MaxItems** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<3> Section 2.1.2.1.1: The **HeartbeatInterval** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<4> Section 2.1.2.1.2: The **Alias** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<5> Section 2.1.2.1.2: The **WeightedRank** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<6> Section 2.1.2.1.3: The **Categories** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<7> Section 2.1.2.1.3: The **Category** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<8> Section 2.1.2.1.3: The **DisallowNewTimeProposal** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<9> Section 2.1.2.1.5: The **DisallowNewTimeProposal** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<10> Section 2.1.2.1.5: The **ResponseRequested** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<11> Section 2.1.2.1.5: The **AppointmentReplyTime** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<12> Section 2.1.2.1.5: The **ResponseType** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<13> Section 2.1.2.1.5: The **CalendarType** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<14> Section 2.1.2.1.5: The **IsLeapMonth** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<15> Section 2.1.2.1.5: The **FirstDayOfWeek** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<16> Section 2.1.2.1.5: The **OnlineMeetingConfLink** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<17> Section 2.1.2.1.5: The **OnlineMeetingExternalLink** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<18> Section 2.1.2.1.7: The **Version** tag is supported only when the MS-ASProtocolVersion header is set to 12.1.

<19> Section 2.1.2.1.7: The **Class** tag is supported only when the MS-ASProtocolVersion header is set to 12.1. When the MS-ASProtocolVersion header is set to 14.0 or 14.1, the **Class** tag defined in WBXML code page 0 is used.

<20> Section 2.1.2.1.7: The **DateTime** tag is supported only when the MS-ASProtocolVersion header is set to 12.1.

<21> Section 2.1.2.1.10: The **CalendarType** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<22> Section 2.1.2.1.10: The **IsLeapMonth** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<23> Section 2.1.2.1.10: The **FirstDayOfWeek** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<24> Section 2.1.2.1.11: The **Availability** tag is not supported if the MS-ASProtocolVersion header is set to 12.1.

<25> Section 2.1.2.1.11: The **StartTime** tag is not supported if the MS-ASProtocolVersion header is set to 12.1.

<26> Section 2.1.2.1.11: The **EndTime** tag is not supported if the MS-ASProtocolVersion header is set to 12.1.

<27> Section 2.1.2.1.11: The **MergedFreeBusy** tag is not supported if the MS-ASProtocolVersion header is set to 12.1.

<28> Section 2.1.2.1.11: The **Picture** tag is not supported if the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<29> Section 2.1.2.1.11: The **MaxSize** tag is not supported if the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<30> Section 2.1.2.1.11: The **Data** tag is not supported if the MS-ASProtocolVersion header is set to 12.1 or 14.0.

Release: February 10, 2014

<31> Section 2.1.2.1.11: The **MaxPictures** tag is not supported if the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<32> Section 2.1.2.1.16: The **Or** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<33> Section 2.1.2.1.16: The **Picture** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<34> Section 2.1.2.1.16: The **MaxSize** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<35> Section 2.1.2.1.16: The **MaxPictures** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<36> Section 2.1.2.1.17: The **Picture** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<37> Section 2.1.2.1.17: The **Status** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<38> Section 2.1.2.1.17: The **Data** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<39> Section 2.1.2.1.18: The **Preview** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<40> Section 2.1.2.1.18: The **BodyPartPreference** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<41> Section 2.1.2.1.18: The **BodyPart** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<42> Section 2.1.2.1.18: The **Status** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<43> Section 2.1.2.1.19: The **EnableOutboundSMS** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<44> Section 2.1.2.1.19: The **MobileOperator** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<45> Section 2.1.2.1.19: The **PrimarySmtpAddress** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<46> Section 2.1.2.1.19: The **Accounts** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<47> Section 2.1.2.1.19: The **Account** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<48> Section 2.1.2.1.19: The **AccountId** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<49> Section 2.1.2.1.19: The **AccountName** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<50> Section 2.1.2.1.19: The **UserDisplayName** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<51> Section 2.1.2.1.19: The **SendDisabled** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<52> Section 2.1.2.1.19: The **RightsManagementInformation** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<53> Section 2.1.2.1.21: The **Move** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<54> Section 2.1.2.1.21: The **DstFldId** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<55> Section 2.1.2.1.21: The **ConversationId** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<56> Section 2.1.2.1.21: The **MoveAlways** tag is not supported when the MS-ASProtocolVersion header is set to 12.1.

<57> Section 2.1.2.1.22: WBXML code page 21 is not supported when the MS-ASProtocolVersion header is set to 12.1.

<58> Section 2.1.2.1.22: The **AccountId** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<59> Section 2.1.2.1.23: WBXML code page 22 is not supported when the MS-ASProtocolVersion header is set to 12.1.

<60> Section 2.1.2.1.23: The **AccountId** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<61> Section 2.1.2.1.23: The **FirstDayOfWeek** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<62> Section 2.1.2.1.23: The **MeetingMessageType** tag is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

<63> Section 2.1.2.1.24: WBXML code page 23 is not supported when the MS-ASProtocolVersion header is set to 12.1.

<64> Section 2.1.2.1.25: WBXML code page 24 is not supported when the MS-ASProtocolVersion header is set to 12.1 or 14.0.

Release: February 10, 2014

6 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.

7 Index