

# [MS-ASHTTP]: ActiveSync HTTP Protocol Specification

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## Revision Summary

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# 1 Introduction

All communication between the client and server is initiated by the client and is based on request/response commands. When the client communicates with the server, the client sends a request to the server as an **HTTP POST**, by using UTF-8 encoding. The server sends back a response to the HTTP POST. The request and response each have a **header** and might have a body. The header format is dictated by the HTTP/1.1 standard. The HTTP **POST** request header contains certain parameters that are set by the client, as specified later in this document. The HTTP **POST** response header is created by the server, and its contents are specified later in this document. The format of the body for both request and response depends on the type of request. Generally, the request/response body contains **WAP Binary XML (WBXML)** formatted data.

In addition to the HTTP **POST** request/response commands, the HTTP **OPTIONS** command specifies the command to be implemented.

The ActiveSync protocol is designed to enable a client device to synchronize data with the data that is stored on the server.

## 1.1 Glossary

The following terms are defined in [\[MS-OXGLOS\]](#):

**collection**  
**GUID**  
**Hypertext Transfer Protocol (HTTP)**  
**MIME**  
**Out of Office (OOO)**  
**Secure Sockets Layer (SSL)**  
**S/MIME**  
**Uniform Resource Identifier (URI)**  
**Uniform Resource Locator (URL)**  
**WAP Binary XML (WBXML)**  
**Web server**  
**XML**  
**XML Schema Definition (XSD)**

The following terms are specific to this document:

**ActiveSync synchronization:** The process of reconciling differences between data that is stored on the client and the server.

**base64 encoding:** An encoding for binary data that represents the original bytes as a sequence of encoded bytes, where each encoded byte can be interpreted as a printable ASCII character. For details, see [\[RFC4648\]](#).

**Client Access server:** A **Web server** that is running the **ActiveSync synchronization** server software.

**server ID:** A unique identifier assigned by the server to each object that can be synchronized. The client stores the server ID for each object and is able to locate an object when given a server ID.

**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](mailto: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-ASCAL] Microsoft Corporation, "[ActiveSync Calendar Class Protocol Specification](#)", December 2008.

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

[MS-ASCNTC] Microsoft Corporation, "[ActiveSync Contact Class Protocol Specification](#)", December 2008.

[MS-ASDOC] Microsoft Corporation, "[ActiveSync Document Class Protocol Specification](#)", December 2008.

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

[MS-ASEMAIL] Microsoft Corporation, "[ActiveSync E-Mail Class Protocol Specification](#)", December 2008.

[MS-ASPROV] Microsoft Corporation, "[ActiveSync Provisioning Protocol Specification](#)", December 2008.

[MS-ASTASK] Microsoft Corporation, "[ActiveSync Tasks Class Protocol Specification](#)", 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.

[RFC1945] Berners, Lee T., Fielding, R., Frystyk, H., "Hypertext Transfer Protocol -- HTTP/1.0", RFC 1945, May 1996, <http://www.ietf.org/rfc/rfc1945.txt>.

[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>.

[RFC2616] Fielding, R., et al., "Hypertext Transfer Protocol -- HTTP/1.1", RFC 2616, June 1999, <http://www.ietf.org/rfc/rfc2616.txt>.

[RFC2818] Rescorla, E., "HTTP over TLS", RFC 2818, May 2000, <http://www.ietf.org/rfc/rfc2818.txt>.

[RFC2822] Resnick, P., Ed., "Internet Message Format", RFC 2822, April 2001, <http://www.ietf.org/rfc/rfc2822.txt>.

[RFC3280] Housley, R., Polk, W., Ford, W., and Solo, D., "Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile", RFC 3280, April 2002, <http://www.ietf.org/rfc/rfc3280.txt>.

[RFC4648] Josefsson, S., "The Base16, Base32, and Base64 Data Encodings", RFC 4648, October 2006, <http://www.ietf.org/rfc/rfc4648.txt>.

[RFC4985] Santesson, S., "Internet X.509 Public Key Infrastructure -- Subject Alternative Name for Expression of Service Name", RFC4985, August 2007, <http://www.ietf.org/rfc/rfc4985.txt>.

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

## 1.2.2 Informative References

[MSDN-APM] Microsoft Corporation, "ASP.NET Performance Monitoring, and When to Alert Administrators", <http://go.microsoft.com/fwlink/?LinkId=107389>.

## 1.3 Protocol Overview (Synopsis)

This specification describes the ActiveSync protocol, which is used to write software that will synchronize server data with a client mobile device. The protocol relies on a client/server architecture. The server is a **Web server** and is running the **ActiveSync synchronization** server software. The client is the mobile device. In this specification, the term client is used to refer to the software that is running on the device and communicating to the server by means of the ActiveSync protocol. The term server refers to the synchronization engine that communicates the synchronization protocol to the client.

The HTTP **POST** request header contains certain parameters that are set by the client, as specified later in this document. The HTTP **POST** response header is created by the server. Each HTTP **POST** contains a single command, such as the Sync command. A typical session includes several commands and, therefore, several HTTP **POSTs**.

## 1.4 Relationship to Other Protocols

The ActiveSync protocol uses an HTTP connection between the client and server. A TCP/IP network transports **messages** between a client and server by using the HTTP protocol, by means of a **series** of request and response calls. The protocols specified in [\[MS-ASAIRS\]](#), [\[MS-ASCAL\]](#), [\[MS-ASCMD\]](#), [\[MS-ASCNTC\]](#), [\[MS-ASDOC\]](#), [\[MS-ASDTYPE\]](#), [\[MS-ASEMAIL\]](#), [\[MS-ASPROV\]](#), [\[MS-ASTASK\]](#), and [\[MS-ASWBXML\]](#) use the ActiveSync protocol.

## 1.5 Prerequisites/Preconditions

When using an HTTP connection secured by the **Secure Sockets Layer (SSL)** as transport, this protocol assumes that authentication has been performed by the underlying protocols.

## 1.6 Applicability Statement

This protocol specifies the transport mechanism for the commands defined in [\[MS-ASCMD\]](#) and all data structures associated with those commands. It is applicable to any client or server that employs the ActiveSync protocol to communicate calendar, contact, email, task, note and other data between a mail server and a mobile device.

## 1.7 Versioning and Capability Negotiation

The HTTP OPTIONS command is used by the client to discover which versions of the ActiveSync protocol are supported by the server. See section [2.2.3](#) for a discussion of the HTTP **OPTIONS** command and section [4.2](#) for an example of an HTTP **OPTIONS** request and response. The latest supported version of the protocol is 14.0. Older supported versions include 2.0, 2.1, 2.5, 12.0, and 12.1. Not all commands and functionality described in the ActiveSync protocol documentation are supported by the older protocol versions. See the Product Behavior section in each document to determine which commands and capabilities are not available in older protocol versions.

## 1.8 Vendor-Extensible Fields

None

## 1.9 Standards Assignments

None

## 2 Messages

### 2.1 Transport

Messages are transported by using HTTP **POST**, as specified in [\[RFC2616\]](#). The query parameters in the request **URI** MAY be base64-encoded (see section [2.2.1.1.1](#)). The body of the HTTP message contains the **XML** that is required by the command being communicated in the message. The commands are specified in [\[MS-ASCMD\]](#).

### 2.2 Message Syntax

The XML markup that constitutes the Request Body or the Response Body is transmitted between client and server by using WAP Binary XML (WBXML) [\[WBXML\]](#).

The following are the three general types of messages:

- Request
- Response
- HTTP **OPTIONS**

#### 2.2.1 Request

The client creates a message by using the HTTP **POST** command to initiate communications between the client and the server.

##### 2.2.1.1 Request Format

Each command is sent from the client to the server as an HTTP **POST** containing command data. As specified by HTTP, the format is as follows:

```
Request-line  
Request-headers  
CR/LF  
Request Body
```

##### 2.2.1.1.1 Request Line

The request line consists of the method indicator, **POST**, followed by the URI, followed by the HTTP version, as follows:

```
POST <URI> HTTP/1.1
```

The URI consists of a scheme indicator and the host name, which are optional, and the path, followed by a query value that contains all the parameters and some of the request headers. The query value can be either **plain text** or a **base64-encoded** byte sequence.

Base64 encoding is optional. For details on base64 encoding, see [\[RFC4648\]](#).

The format of the URI is either of the following:

```
/Microsoft-Server-ActiveSync?<text query value>  
/Microsoft-Server-ActiveSync?<base64-encoded query value>
```

The following examples are equivalent:

```
POST /Microsoft-Server-  
ActiveSync?Cmd=Sync&User=rmjones&DeviceId=v140Device&DeviceType=SmartPhone  
Content-Type: application/vnd.ms-sync.wbxml  
MS-ASProtocolVersion: 14.0  
User-Agent: ASOM  
Accept-Language: en-us  
Content-Length: 868
```

```
POST /Microsoft-Server-ActiveSync?jAAJBap2MTQwRGV2aWNlAApTbWFydFBob25l HTTP/1.1  
Content-Type: application/vnd.ms-sync.wbxml  
User-Agent: ASOM  
Content-Length: 866
```

For more details about base64-encoded URIs, see section [2.2.1.1.1.1](#).

### 2.2.1.1.1.1 Base64-encoded URI

The following is an example of a base64-encoded URI query value:

```
/Microsoft-Server-ActiveSync?jAAJBap2MTQwRGV2aWNlAApTbWFydFBob25l
```

The base64-encoded sequence of bytes represents the URI request parameters. The following table provides the details of the base64-encoded sequence of bytes. This byte sequence is divided into fields in the same order as the following table.

Size	Field	Description
1 byte	Protocol version	An integer that specifies the version of the ActiveSync protocol that is being used. This value MUST be 140. <a href="#">&lt;1&gt;</a>
1 byte	Command code	An integer that specifies the command (see table of command codes in section <a href="#">2.2.1.1.1.3</a> ).
2 bytes	Locale	An integer that specifies the <b>locale</b> of the language that is used for the response.
1 byte	Device ID length	An integer that specifies the length of the device ID. A value of 0 indicates that the device ID field is absent.
0 - 16 bytes	Device ID	A string or a <b>GUID</b> that identifies the device. <a href="#">&lt;2&gt;</a>
1 byte	<b>Policy key</b> length	An integer that specifies the length of the policy key. The only valid values are 0 or 4. A value of 0 indicates that the policy key field is absent.
0 or 4 bytes	Policy key	An integer that indicates the <b>state</b> of policy settings on the client device.

Size	Field	Description
1 byte	Device type length	An integer that specifies the length of the device type value.
0 - 16 bytes	Device type	A string that specifies the type of client device. For details, see section <a href="#">2.2.1.1.1.6</a> .
Variable	Command parameters	A set of parameters that varies depending on the command. Each parameter consists of a tag, length, and value field in that order. For details, see section <a href="#">2.2.1.1.1.4</a> .

### 2.2.1.1.1.2 Command-Specific URI Parameters

The following URI parameters, also called command parameters, are specific to the ActiveSync commands. For more details about specific commands, see [\[MS-ASCMD\]](#).

Parameter	Description	Used by
AttachmentName	A string that specifies the name of the <b>attachment</b> file to be retrieved.	GetAttachment <a href="#">&lt;3&gt;</a>
CollectionId	A string that specifies the <b>server ID</b> of the <b>collection</b> that contains the Message to be forwarded or replied to.	SmartForward, SmartReply
ItemId	A string that specifies the server ID of the Message item to be forwarded or replied to.	SmartForward, SmartReply
LongId	A string that references a result set that was returned in the Search command response.	SmartForward, SmartReply
Occurrence	A string that specifies the ID of a particular occurrence in a recurring <b>meeting</b> .	SmartForward, SmartReply
SaveInSent	A character that specifies whether a copy of the Message will be saved in the <b>Sent Items folder</b> . Set this parameter to T to instruct the server to save the Message in the user's Sent Items folder; otherwise, set the parameter to F. The SaveInSent parameter is set to F by default.	SmartForward, SmartReply, SendMail

### 2.2.1.1.1.3 Command Codes

The following table provides the numeric codes that correspond to the ActiveSync commands. The numeric code is used in the command-code field of the URI to specify the command. For more details, see [\[MS-ASCMD\]](#).

Code	Command	Description
0	Sync	Synchronizes changes in a collection between the client and the server.
1	SendMail	Sends mail to the server. This command is issued in the HTTP POST command's Uniform Resource Identifier (URI), and does not contain an XML body. The body will instead contain the <b>MIME</b> -formatted message.
2	SmartForward	Forwards messages without retrieving the full message from the server.
3	SmartReply	Replies to messages without retrieving the full message from the server.

Code	Command	Description
4	GetAttachment	Retrieves an e-mail attachment from the server. <a href="#">&lt;4&gt;</a>
9	FolderSync	Synchronizes the collection hierarchy but does not synchronize the items in the collections.
10	FolderCreate	Creates an e-mail, <b>calendar</b> , or <b>contacts folder</b> on the server.
11	FolderDelete	Deletes a folder from the server.
12	FolderUpdate	Moves a folder from one location to another on the server and is used to rename folders.
13	MoveItems	Moves items from one folder to another.
14	GetItemEstimate	Gets an estimate of the number of items in a folder that is synchronized.
15	MeetingResponse	Used to accept, tentatively accept, or decline a <b>meeting request</b> in the user's <b>Inbox</b> .
16	Search	Finds and retrieves information about contacts and <b>recipients</b> in the <b>Global Address List</b> .
17	Settings	Supports getting and setting global <b>properties</b> , such as <b>Out of Office (OOO)</b> and device information.
18	Ping	Requests that the server monitor specified folders for changes that would require the client to resynchronize.
19	ItemOperations	Identifies the body of the request or response as containing a set of commands operating on items.
20	Provision	Gets the security policy settings set by the server administrator, such as the user's minimum password length requirement.
21	ResolveRecipients	Resolves a list of supplied recipients and optionally fetches their <b>S/MIME</b> certificates so that clients can send encrypted S/MIME e-mail messages.
22	ValidateCert	Validates a certificate that has been received through an S/MIME mail.

#### 2.2.1.1.1.4 Command Parameters

The following table lists the fields of a command parameter.

Size	Field	Description
1 byte	Tag	An integer that specifies the name of the parameter.
1 byte	Length of value	An integer that specifies the length of the parameter value, from 0 to 255 characters.
Variable	Value	The value of the parameter.

The following table lists the tag values that correspond to the names of the command parameters. For additional details about the AttachmentName, CollectionId, ItemId, LongId, and Occurrence command parameters, see section [2.2.1.1.1.2](#).

Tag	Parameter Name
0	AttachmentName
1	CollectionId
2	CollectionName
3	ItemId
4	LongId
5	ParentId
6	Occurrence
7	Options
8	User

The following table describes the Options and User command parameters.

Parameter	Description	Used By
Options	A single-byte bitmask that specifies command options. The following bits are valid: 0x01: SaveInSent 0x02: AcceptMultiPart	SmartReply, SmartForward, SendMail, ItemOperations
User	A string that specifies the user ID in a format that can be logged in the Web server log.	Any command

#### 2.2.1.1.1.5 Device ID

A string to specify the device. Each device MUST have a unique **DeviceId** string. Each request from the device MUST include the same **DeviceId** string.

#### 2.2.1.1.1.6 Device Types

Any string to specify a device type can be valid. "SP" specifies a SmartPhone and "PPC" specifies a PocketPC. Other devices send a unique string for their specific device type. Each request from the device MUST include the same **DeviceType** string.

#### 2.2.1.1.2 Request Headers

The HTTP/1.1 protocol defines several headers that can be sent from the client to the server on a HTTP **POST** request. The headers follow the request line in the HTTP portion of a request. The following headers MUST be supplied for ActiveSync synchronization protocol requests. Note that requests are UTF-8 encoded.

Header	Required	Value	Notes
Authorization	Yes	<b>String</b> ( <a href="#">[MS-ASDTYPE]</a> section 2.1)	Specifies that user credentials are sent by using HTTP basic authentication. For details, see section <a href="#">2.2.1.1.2.1</a> .

Header	Required	Value	Notes
Content-Type	Depends on the command.	<b>String</b> (Depends on the command. For details about individual commands, see <a href="#">[MS-ASCMD]</a> section 2.2.1.)	Specifies that the <b>media type</b> of the request body is WBXML. For more details, see <a href="#">[MS-ASWBXML]</a> Other types of content, such as <a href="#">[RFC2822]</a> , can also be specified, depending on the command.

### 2.2.1.1.2.1 Authorization

User credentials are sent from the client to the server by using HTTP basic authentication, in which the credentials are Base64-encoded. Secure Sockets Layer (SSL) SHOULD be enabled between the client and the server whenever this header is sent. For user *fakename* and password *Pa\$\$word!*, the Authorization header would be as follows:

```
Authorization: Basic anNtaXRoO1BhJCR3b3JkIQ==
```

For details about HTTP Basic authentication, see [\[RFC1945\]](#) section 11.1.

### 2.2.1.1.2.2 Content-Type

The Content-Type header indicates the format of the data sent in the request body. The request body is in WBXML format and a Content-Type header value of `application/vnd.ms-sync.WBXML` or the shortened string `application/vnd.ms-sync` would reflect the same information. For more details about Content-Type header, see [\[MS-ASCMD\]](#).

### 2.2.1.1.3 Request Body

The request body contains data sent to the server. The request body, if any, is in WBXML, except the Autodiscover command, which is in XML. Three commands have no body in certain contexts: GetAttachment, Sync, and Ping. For details about the request bodies of individual commands, see [\[MS-ASCMD\]](#) section 2.2.1.

## 2.2.2 Response

After receiving and interpreting a request Message, a server responds with an HTTP response Message that contains data returned from the server.

### 2.2.2.1 Response Format

Each command is sent from the server to the client as in the format of HTTP/1.1. Note that these responses are UTF-8 encoded. As specified by HTTP, the format is the same as for requests:

```
Status-line
Response-headers
CR/LF
Message Body
```

#### 2.2.2.1.1 Status Line

The status line consists of the HTTP version and a status code. The following is an example of a response status line:

HTTP/1.1 200 OK

The following table lists some common HTTP status codes.

Status code	Description
200 OK	The command succeeded.
400 Bad Request	The command request or at least one of the request headers was invalid.
401 Unauthorized	The resource requires authorization or authorization was refused. For details about how to troubleshoot this error, see section <a href="#">2.2.2.1.1.2</a> .
403 Forbidden	The user is not enabled for ActiveSync synchronization. For details about how to troubleshoot this error, see section <a href="#">2.2.2.1.1.2</a> .
404 Not found	The specified URI could not be found or the server is not a valid server with ActiveSync.
500 Internal Server Error	The server encountered an unexpected condition that prevented it from fulfilling the request. For details about how to troubleshoot this error, see section <a href="#">2.2.2.1.1.2</a> .
501 Not Implemented	The server does not support the functionality that is required to fulfill the request. This status code MUST be returned by the server when the server does not recognize the request method and is not able to support it for any resource.
502 Proxy Error	The specified server could not be found.
503 Service Unavailable	The service is unavailable. For details about how to troubleshoot this error, see section <a href="#">2.2.2.1.1.3</a> .
507 Insufficient Disk Space	The user's <b>mailbox</b> is full.

The following table lists another possible HTTP status code.

Status code	Description
451 Redirect	The device is trying to connect to a server that cannot access the user's mailbox, or there is a more efficient server to use to reach the user's mailbox. The device MUST redirect all future requests to the server specified by the X-MS-Location header in the response. For all other status codes (401, 403, 500), and if the MS-X-Location header <b>URL</b> value is not specified with the 451 status code, follow the full Autodiscover command process, as specified in <a href="#">[MS-ASCMD]</a> . For details about how to troubleshoot this error, see section <a href="#">2.2.2.1.1.4</a> .

### 2.2.2.1.1.1 HTTP Status Code Categories

The following table lists the **categories** for the HTTP status codes.

Status code range	Status type
100 - 199	Informational - Request received, processing is continuing.

Status code range	Status type
200 – 299	Success - The <b>action</b> was received, understood, and accepted.
300 – 399	Redirection - Further action <b>MUST</b> be taken to complete the request.
400 – 499	Client error - The request contains incorrect syntax or cannot be fulfilled by the client.
500 – 599	Server error - The server did not fulfill a syntactically valid request.

For more details about HTTP status codes, see [\[RFC2616\]](#) section 10. .

### 2.2.2.1.1.2 Troubleshooting Tip

The client **SHOULD** send an **Autodiscover** command request to the server if any of the following HTTP errors are encountered:

- 401
- 403
- 500

If the user's mailbox has moved, or if the client is trying to connect to a server that cannot access the user's mailbox, or there is a more efficient server to use to reach the user's mailbox, then the server **MUST** respond to any command request with error code 451, and include the URL of a preferred server in the **exception** message. The device **MUST** redirect all future requests to the preferred server by using the URL that was provided. For all other status codes (401, 403, 500), or if the URL is not specified with the 451 status code, then follow the full Autodiscover command process, as specified in [\[MS-ASCMD\]](#).

The HTTP **OPTIONS** command is the first command that is sent to the preferred server.

### 2.2.2.1.1.3 Troubleshooting HTTP Error 503

One of the causes of HTTP error 503 is that more users than allowed by the server's request queue limit have sent requests to a single server. The error returned by the server resembles the following:

```

OPTIONS /Microsoft-Server-ActiveSync
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 14.0

HTTP/1.1 503 Service Unavailable
Connection: close
Date: Mon, 02 Mar 2009 23:51:51 GMT
Server: Microsoft-IIS/7.0
X-Powered-By: ASP.NET
Content-Type: text/html

```

For details about ASP.NET performance monitoring properties, see [\[MSDN-APM\]](#).

#### 2.2.2.1.1.4 Troubleshooting HTTP Error 451

If the user is attempting to connect to the wrong server, that is, a server that cannot access the user's mailbox, or if there is a more efficient server to use to reach the user's mailbox, then a 451 Redirect error is returned. If the wrong server has the URL for a preferred server, then the wrong server provides that URL in its response back to the client, using the X-MS-Location header. If the wrong server does not provide an X-MS-Location header in its response to the client, then follow the full Autodiscover command process, as specified in [\[MS-ASCMD\]](#).

The error returned by the wrong server resembles the following:

```
OPTIONS /Microsoft-Server-ActiveSync
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 14.0

HTTP/1.1 451
Date: Tue, 08 Dec 2009 19:43:24 GMT
Server: Microsoft-IIS/7.0
X-Powered-By: ASP.NET
X-AspNet-Version: 2.0.50727
X-MS-Location: https://mail.exchange.microsoft.com/Microsoft-Server-ActiveSync
Cache-Control: private
Content-Length: 0
```

All subsequent requests to the X-MS-Location SHOULD use the specified URL.

#### 2.2.2.1.2 Response Headers

The ActiveSync protocols and [\[RFC2616\]](#) define several headers that can be sent from the server to the client in a HTTP **POST** response. The headers follow the status line in the HTTP part of a response. The following table lists the headers that are typically useful to the client and are usually sent in responses to the client.

Header	Example value	Notes
Content-Length	56	Required. Specifies the size of the response body in bytes.
Content-Encoding	gzip	Required when the content is base64-encoded; otherwise this header is not included. Specifies the HTTP compression format that is used in the response.
Cache-Control	private	Controls how the response is cached.
Content-Type	application/vnd.ms-sync.wbxml	Required. Specifies that the media-type of the request body is WBXML. Other types of content, such as <a href="#">[RFC2822]</a> , can also be specified.
Date	Tue, 17 Mar 2009 21:44:09 GMT	Optional. Indicates the date and time at which the response message originated.
Server	Microsoft-IIS/7.0	Optional. Indicates the software that was used by the server to handle the request.
MS-Server-ActiveSync	8.1	Optional. Indicates the version of the ActiveSync server that was used to handle the request.

Header	Example value	Notes
X-MS-RP	2.0,2.1,2.5,12.0,12.1,14.0	Optional. Indicates to the client that the client has to perform a full resynchronization because of a server upgrade.
X-MS-MV	14.0.255	Indicates the Server build version.

Some of the headers in the response can be eliminated when the response is to a HTTP **POST** request and the response has HTTP status 200. When these two conditions are met, only the following headers are necessary in the response:

- Content-Length
- Content-Type, only required if Content-Length is greater than zero.

### 2.2.2.1.3 Response Body

The response body contains data returned from the server. The response body is typically of WBXML content-type, but it varies by command. Some commands have no response body. For details about the response bodies of individual commands, see [\[MS-ASCMD\]](#) section 2.2.

## 2.2.3 HTTP OPTIONS

The HTTP **OPTIONS** command is used to discover what protocol versions are supported, and which protocol commands are supported on the server. The client can use the HTTP **OPTIONS** command to determine whether the server supports the same versions of the protocol that the client supports. If the client and server both support multiple versions of the protocol, the client **SHOULD** use the most recent version (the greatest numbered version) of the protocol that is available on the server. For an example, see section [4.2](#).

## 2.2.4 Namespace

This specification defines and references various XML namespaces by using the mechanisms specified in [\[MS-ASAIRS\]](#). Although this specification associates a specific XML namespace prefix for each XML namespace that is used, the choice of any particular XML namespace prefix is implementation-specific and not significant for interoperability.

## 2.2.5 Simple Types

None.

## 2.2.6 Complex Types

None.

## 2.2.7 Elements

None.

## 2.2.8 Attributes

None.

## **2.2.9 Groups**

None.

## **2.2.10 Attributes Groups**

None.

## **2.2.11 Messages**

None.

## **3 Protocol Details**

### **3.1 Common Details**

#### **3.1.1 Abstract Data Model**

None.

#### **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**

None.

#### **3.1.6 Timer Events**

None.

#### **3.1.7 Other Local Events**

None.

## 4 Protocol Examples

### 4.1 FolderSync Request and Response

The following is a typical ActiveSync protocol command request. The **FolderSync** command, user **alias**, device ID, and device type are specified as Uniform Resource Identifier (URI) query parameters. The Content-Type header specifies that the request body is WBXML. The MS-ASProtocolVersion header specifies that protocol 14.0 is being used. Some command requests contain additional URI query parameters or do not specify a request body. The HTTP **POST** URI command parameter is the same as the command in the topmost element of the request XML body. For details about the commands and associated **XML Schema Definitions (XSDs)**, see [\[MS-ASCMD\]](#). The WBXML-encoded body is decoded for clarity.

#### Request

```
POST /Microsoft-Server-ActiveSync?Cmd=FolderSync&User=fakename&DeviceId=v140Device&DeviceType=SmartPhone HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 14.0
User-Agent: ASOM
Host: Contoso.com

<?xml version="1.0" encoding="utf-8"?>
<FolderSync xmlns="FolderHierarchy:">
  <SyncKey>2</SyncKey>
</FolderSync>
```

The following is a typical FolderSync command response. The status line specifies the HTTP/1.1 protocol and that the command succeeded. The Content-Length header specifies that the response body is 56 bytes and the Content-Type header shows that the response body is in WBXML format. Some command responses do not contain WBXML bodies.

#### Response

```
HTTP/1.1 200 OK
Content-Type: application/vnd.ms-sync.wbxml
X-MS-MV: 14.0.511
Date: Thu, 12 Mar 2009 19:34:31 GMT
Content-Length: 25

<?xml version="1.0" encoding="utf-8"?>
<FolderSync xmlns:A0="AirSync:" xmlns:A1="POOMCONTACTS:" xmlns:A2="POOMMAIL:"
xmlns:A3="AirNotify:" xmlns:A4="POOMCAL:" xmlns:A5="Move:" xmlns:A6="GetItemEstimate:"
xmlns:A8="MeetingResponse:" xmlns:A9="POOMTASKS:" xmlns:A10="ResolveRecipients:"
xmlns:A11="ValidateCert:" xmlns:A12="POOMCONTACTS2:" xmlns:A13="Ping:" xmlns:A14="Provision:"
xmlns:A15="Search:" xmlns:A16="Gal:" xmlns:A17="AirSyncBase:" xmlns:A18="Settings:"
xmlns:A19="DocumentLibrary:" xmlns:A20="ItemOperations:" xmlns:A21="ComposeMail:"
xmlns:A22="POOMMAIL2:" xmlns:A23="Notes:" xmlns="FolderHierarchy:">
  <Status>1</Status>
  <SyncKey>2</SyncKey>
  <Changes>
    <Count>0</Count>
  </Changes>
</FolderSync>
```

## 4.2 HTTP OPTIONS Command Request and Response

The following example illustrates the use of the HTTP OPTIONS command. The MS-ASProtocolVersions header in the server response shows that versions 1.0, 2.0, 2.1, 2.5, 12.0, 12.1, and 14.0 of the protocol are supported on the server. The MS-ASProtocolCommands header in the server response lists the commands that are supported. [<5>](#)It is recommended that protocol clients not trigger on the build number of the protocol server, which can change because of server updates. The build number shown in the examples might differ from those seen in a development or production environment.

### Request

```
OPTIONS /Microsoft-Server-ActiveSync HTTP/1.1
Host: Contoso.com
```

### Response

```
HTTP/1.1 200 OK
Cache-Control: private
Allow: OPTIONS,POST
Server: Microsoft-IIS/7.0
MS-Server-ActiveSync: 14.00.0536.000
MS-ASProtocolVersions: 2.0,2.1,2.5,12.0,12.1,14.0
MS-ASProtocolCommands:
Sync,SendMail,SmartForward,SmartReply,GetAttachment,GetHierarchy,CreateCollection,DeleteCollection,MoveCollection,FolderSync,FolderCreate,FolderDelete,FolderUpdate,MoveItems,GetItemEstimate,MeetingResponse,Search,Settings,Ping,ItemOperations,Provision,ResolveRecipients,ValidateCertificate
MS-ASProtocolRevisions: 12.1r1
Public: OPTIONS,POST
X-MS-MV: 14.0.511
X-AspNet-Version: 2.0.50727
X-Powered-By: ASP.NET
Date: Thu, 12 Mar 2009 20:03:29 GMT
Content-Length: 0
```

## 4.3 SendMail Request and Response

The following example illustrates the command to send mail to a specific user.

### Request

```
POST /Microsoft-Server-ActiveSync?Cmd=SendMail&User=fakeusername&DeviceId=v140Device&DeviceType=SmartPhone HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 14.0
X-MS-PolicyKey: 2034202722
User-Agent: ASOM
Host: BIRSKK-dom.extest.microsoft.com

<?xml version="1.0" encoding="utf-8"?>
<SendMail xmlns:A0="AirSync:" xmlns:A1="POOMCONTACTS:" xmlns:A2="POOMMAIL:"
xmlns:A3="AirNotify:" xmlns:A4="POOMCAL:" xmlns:A5="Move:"
xmlns:A6="GetItemEstimate:" xmlns:A7="FolderHierarchy:"
xmlns:A8="MeetingResponse:" xmlns:A9="POOMTASKS:"
```

```
xmlns:A10="ResolveRecipients:" xmlns:A11="ValidateCert:"
xmlns:A12="POOMCONTACTS2:" xmlns:A13="Ping:" xmlns:A14="Provision:"
xmlns:A15="Search:" xmlns:A16="Gal:" xmlns:A17="AirSyncBase:"
xmlns:A18="Settings:" xmlns:A19="DocumentLibrary:"
xmlns:A20="ItemOperations:" xmlns="ComposeMail:">
  <ClientId>633724606026842453</ClientId>
  <Mime>From: fakeuser@Contoso.com
To: fakeuser@Contoso.com
Cc:
Bcc:
Subject: From NSync
MIME-Version: 1.0
Content-Type: text/plain; charset="iso-8859-1"
Content-Transfer-Encoding: 7bit
X-MimeOLE: Produced By Microsoft MimeOLE V6.00.2900.3350
This is the body text.</Mime>
</SendMail>
```

## Response

```
HTTP/1.1 200 OK
X-MS-MV: 14.0.511
Date: Thu, 12 Mar 2009 20:16:22 GMT
Content-Length: 0
```

## 4.4 CreateFolder Request and Response

The following example illustrates the command to create a new folder. For details about the associated XSD, see [\[MS-ASCMD\]](#).

### Request

```
POST /Microsoft-Server-
ActiveSync?Cmd=FolderCreate&User=fakename@Contoso.com&DeviceId=v140Device&DeviceType=SmartPho
ne HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 14.0
User-Agent: ASOM
Host: Contoso.com

<?xml version="1.0" encoding="utf-8"?>
<FolderCreate xmlns="FolderHierarchy:">
  <SyncKey>3</SyncKey>
  <ParentId>5</ParentId>
  <DisplayName>CreateNewFolder</DisplayName>
  <Type>12</Type>
</FolderCreate>
```

### Response

```
HTTP/1.1 200 OK
Content-Type: application/vnd.ms-sync.wbxml
X-MS-MV: 14.0.511
```

Date: Thu, 12 Mar 2009 20:26:06 GMT  
Content-Length: 24

```
<?xml version="1.0" encoding="utf-8"?>
<FolderCreate xmlns:A0="AirSync:" xmlns:A1="POOMCONTACTS:" xmlns:A2="POOMMAIL:"
xmlns:A3="AirNotify:" xmlns:A4="POOMCAL:" xmlns:A5="Move:" xmlns:A6="GetItemEstimate:"
xmlns:A8="MeetingResponse:" xmlns:A9="POOMTASKS:" xmlns:A10="ResolveRecipients:"
xmlns:A11="ValidateCert:" xmlns:A12="POOMCONTACTS2:" xmlns:A13="Ping:" xmlns:A14="Provision:"
xmlns:A15="Search:" xmlns:A16="Gal:" xmlns:A17="AirSyncBase:" xmlns:A18="Settings:"
xmlns:A19="DocumentLibrary:" xmlns:A20="ItemOperations:" xmlns:A21="ComposeMail:"
xmlns:A22="POOMMAIL2:" xmlns:A23="Notes:" xmlns="FolderHierarchy:">
  <Status>1</Status>
  <SyncKey>4</SyncKey>
  <ServerId>23</ServerId>
</FolderCreate>
```

## 5 Security

### 5.1 Security Considerations for Implementers

There are no special security considerations specific to this specification. It is recommended that communication between the client and server occur across an HTTP connection secured by the Secure Sockets Layer (SSL) protocol.

When connecting to a server using SSL, clients are required to support server certificates that use the Subject Alternative Name for domain names [\[RFC4985\]](#), as well as wildcard certificate names [\[RFC2818\]](#) [\[RFC3280\]](#).

### 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 2.2.1.1.1.1](#): For versions previous to Exchange 2010, the other allowed values are 20, 21, 25, 120, and 121. When using these older versions, not all the current ActiveSync commands and functionality are available. The Product Behavior section in each ActiveSync protocol document defines the commands and functionality that are supported by older versions.

[<2> Section 2.2.1.1.1.1](#): A Windows Mobile device will use a GUID.

[<3> Section 2.2.1.1.1.2](#): The GetAttachment command is only supported when the MS-ASProtocolVersion header is set to 12.1 or 12.0 in the GetAttachment command request. The GetAttachment command is not supported for MS-ASProtocolVersion 14.0 – use the Fetch element of the ItemOperations command instead.

[<4> Section 2.2.1.1.1.3](#): The GetAttachment command is only supported when the MS-ASProtocolVersion header is set to 12.1 or 12.0 in the GetAttachment command request. The GetAttachment command is not supported for MS-ASProtocolVersion 14.0 – use the Fetch element of the ItemOperations command instead.

[<5> Section 4.2](#): The GetHierarchy, CreateCollection, DeleteCollection, and MoveCollection commands are not supported when the MS-ASProtocolVersions HTTP header is set to 14.0.

## 7 Change Tracking

This section identifies changes made to [MS-ASHTTP] protocol documentation between July 2009 and November 2009 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](mailto:protocol@microsoft.com).

Section	Tracking number (if applicable) and description	Major change (Y or N)	Revision Type
<a href="#">1.1 Glossary</a>	49235 Added local term definition for "Client Access server".	Y	New content added.
<a href="#">1.1 Glossary</a>	48544 Added MS-OXGLOS term "Out of Office".	Y	New content added.
<a href="#">1.1 Glossary</a>	48562 Added MS-OXGLOS term "XML Schema Definition".	Y	New content added.
<a href="#">1.2.1 Normative References</a>	48901 Added SSL-related references for RFC2818, RFC3280, and RFC4985.	Y	New content added.
<a href="#">1.2.1 Normative References</a>	49296 Updated reference to RFC2822, from obsoleted RFC822.	Y	Content update.
<a href="#">1.3 Protocol Overview (Synopsis)</a>	48532 Clarified protocol description.	Y	Content update.
<a href="#">1.5 Prerequisites/Preconditions</a>	49237 Clarified HTTPS prerequisite.	Y	Content update.
<a href="#">1.6 Applicability Statement</a>	53817 Added applicability statement.	Y	New content added.
<a href="#">1.7 Versioning and Capability Negotiation</a>	49240 Added description.	Y	New content added.
<a href="#">2.1 Transport</a>	49234 Removed reference to RFC2518.	Y	Content removed.
<a href="#">2.2</a>	48296	N	Editorially

<b>Section</b>	<b>Tracking number (if applicable) and description</b>	<b>Major change (Y or N)</b>	<b>Revision Type</b>
<a href="#">Message Syntax</a>	Clarified "Options" as HTTP "OPTIONS".		updated.
<a href="#">2.2.1.1.1 Request Line</a>	48143 Revised examples to better show URIs in context.	Y	Content update.
<a href="#">2.2.1.1.1.1 Base64-encoded URI</a>	49169 Added note to Protocol version field regarding support for Exchange 2007 (value 121).	Y	New product behavior note added.
<a href="#">2.2.1.1.1.1 Base64-encoded URI</a>	48538 Moved Windows Mobile device ID description to Behavior Note.	Y	Product behavior note updated.
<a href="#">2.2.1.1.1.1 Base64-encoded URI</a>	48531 Updated example, and revised Behavior Note to Protocol version field regarding support for all versions.	Y	Product behavior note updated.
<a href="#">2.2.1.1.1.2 Command-Specific URI Parameters</a>	48543 Clarified description of URI/command parameters.	N	Editorially updated.
<a href="#">2.2.1.1.1.4 Command Parameters</a>	48541 Clarified command parameter length limitation.	Y	Content update.
<a href="#">2.2.1.1.1.4 Command Parameters</a>	48550 Removed sentence regarding Tag/Parameter table contents.	N	Content removed.
<a href="#">2.2.1.1.1.5 Device ID</a>	49530 Clarified requirements for using DeviceId.	Y	Content update.
<a href="#">2.2.1.1.1.6 Device Types</a>	49530 Clarified requirements for using DeviceType.	Y	Content update.
<a href="#">2.2.1.1.2 Request Headers</a>	49296 Updated reference to RFC2822, from obsoleted RFC822.	Y	Content update.
<a href="#">2.2.1.1.3 Request Body</a>	52878 Added section number to MS-ASCMD cross-reference.	N	Content update.
<a href="#">2.2.1.1.3 Request Body</a>	48551 Identified specific commands in request body description.	Y	Content update.
<a href="#">2.2.1.1.3 Request Body</a>	Added section reference for MS-ASCMD.	N	Editorially updated.

<b>Section</b>	<b>Tracking number (if applicable) and description</b>	<b>Major change (Y or N)</b>	<b>Revision Type</b>
<a href="#">2.2.2.1.1 Status Line</a>	49246 Added cross-reference to troubleshooting section for status code 451.	Y	New content added.
<a href="#">2.2.2.1.1 Status Line</a>	Updated term references.	N	Editorially updated.
<a href="#">2.2.2.1.1 Status Line</a>	48552 Clarified description of status code 400.	N	Content update.
<a href="#">2.2.2.1.1 Status Line</a>	48553 Clarified description of status code 501.	N	Content update.
<a href="#">2.2.2.1.1 Status Line</a>	48554 Clarified description of status code 451.	N	Content update.
<a href="#">2.2.2.1.1 Status Line</a>	49235 Clarified description of status code 451.	Y	Content update.
<a href="#">2.2.2.1.1.1 HTTP Status Code Categories</a>	48556 Clarified description of status codes 500-599.	Y	Content update.
<a href="#">2.2.2.1.1.1 HTTP Status Code Categories</a>	48555 Clarified description of status codes 400-499.	Y	Content update.
<a href="#">2.2.2.1.1.1 HTTP Status Code Categories</a>	Added section reference for RFC2616.	N	Editorially updated.
<a href="#">2.2.2.1.1.1 HTTP Status Code Categories</a>	Removed term "table".	N	Editorially updated.
<a href="#">2.2.2.1.1.2 Troubleshooting Tip</a>	48557 Clarified server requirement for responding to status code 451.	Y	Content update.
<a href="#">2.2.2.1.1.2 Troubleshooting Tip</a>	49235 Clarified terminology.	Y	Content update.
<a href="#">2.2.2.1.1.3 Troubleshooting HTTP Error 503</a>	48558 Clarified description of server's request queue limit.	Y	Content update.
<a href="#">2.2.2.1.1.3 Troubleshooting HTTP Error 503</a>	49235 Clarified terminology.	Y	Content update.
<a href="#">2.2.2.1.1.4 Troubleshooting HTTP Error 451</a>	49174 Clarified description.	Y	Content update.

<b>Section</b>	<b>Tracking number (if applicable) and description</b>	<b>Major change (Y or N)</b>	<b>Revision Type</b>
<a href="#">2.2.2.1.2 Response Headers</a>	49296 Updated reference to RFC2822, from obsoleted RFC822.	Y	Content update.
<a href="#">2.2.2.1.2 Response Headers</a>	48560 Clarified description of Server header.	Y	Content update.
<a href="#">2.2.2.1.2 Response Headers</a>	47767 Revised description of Content-Type header.	Y	Content update.
<a href="#">2.2.2.1.3 Response Body</a>	52878 Added section number to MS-ASCMD cross-reference.	N	Content update.
<a href="#">2.2.2.1.3 Response Body</a>	Added section reference for MS-ASCMD.	N	Editorially updated.
<a href="#">2.2.3 HTTP OPTIONS</a>	48296 Changed capitalization and bolding of "OPTIONS".	N	Editorially updated.
<a href="#">2.2.3 HTTP OPTIONS</a>	49240 Added cross-reference to HTTP OPTIONS example section.	Y	Content update.
<a href="#">3.1.1 Abstract Data Model</a>	49248 Revised data model description.	Y	Content update.
<a href="#">4.1 FolderSync Request and Response</a>	48562 Updated location of command XSDs, now in MS-ASCMD.	Y	Content update.
<a href="#">4.2 HTTP OPTIONS Command Request and Response</a>	53343 Added behavior note listing the four commands no longer supported in version 14.0.	Y	New product behavior note added.
<a href="#">4.4 CreateFolder Request and Response</a>	48562 Updated location of command XSD, now in MS-ASCMD.	Y	Content update.
<a href="#">5.1 Security Considerations for Implementers</a>	48901 Added SSL certificate requirements for clients.	Y	New content added.
<a href="#">6 Appendix A: Product Behavior</a>	52878 Revised section numbering from B to A.	N	Editorially updated.
6 Appendix A: XSDs	52878 Removed section listing XSDs, as this information is now in MS-ASCMD.	Y	Content removed.
	Moved former section 2.2.1.1.1.4	Y	Content update.

<b>Section</b>	<b>Tracking number (if applicable) and description</b>	<b>Major change (Y or N)</b>	<b>Revision Type</b>
6 Appendix A: XSDs	(Device Types) to be after Device ID section.		

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