[MS-ASCMD]: ActiveSync Command Reference Protocol Specification

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Revision Summary			
Author	Date	Version	Comments
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Table of Contents

1 Introduction

This document specifies the ActiveSync protocol, which is used by a client, typically a mobile device, to synchronize objects with a server. These objects include e-mail and attachments, contact information, calendar data, and documents.<1>

1.1 Glossary

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

client
eXtensible Markup Language (XML)
Hypertext Transfer Protocol (HTTP)
server
Simple Mail Transfer Protocol (SMTP)
Universal Naming Convention (UNC)
XML schema definition (XSD)
WAP binary XML (WBXML)

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

[AUTODISCOVER] Microsoft Corporation, "White Paper: Exchange 2007 Autodiscover Service", November 2007, http://technet.microsoft.com/en-us/library/bb332063.aspx.

[DNS-SRV] Microsoft Corporation, "A new feature is available that enables Outlook 2007 to use DNS Service Location (SRV) records to locate the Exchange Autodiscover service", August 2007, http://go.microsoft.com/fwlink/?linkid=3052&kbid=940881.

[MS-ASAIRS] Microsoft Corporation, "ActiveSync AirSyncBase Namespace Protocol Specification", December 2008.

[MS-ASDTYPE] Microsoft Corporation, "ActiveSync Data Type Protocol Specification", December 2008.

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

[MS-ASWBXML] Microsoft Corporation, "ActiveSync WAP Binary XML(WBXML) Protocol Specification", December 2008.

[MS-OXDISCO] Microsoft Corporation, "Autodiscover HTTP Service Protocol Specification", June 2008.

[MS-OXGLOS] Microsoft Corporation, "Exchange Server Protocols Master Glossary", June 2008.

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

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

[RFC822] Crocker, D.H., "Standard for ARPA Internet Text Messages", RFC 822, August 1982, http://www.ietf.org/rfc/rfc0822.txt.

[W3C-XML] World Wide Web Consortium, "XML Schema (Second Edition)", October 2004, http://www.w3.org/XML/Schema.

[XMLNS] World Wide Web Consortium, "Namespaces in XML 1.0 (Second Edition)", August 2006, http://www.w3.org/TR/REC-xml-names/.

1.2.2 Informative References

None.

1.3 Protocol Overview

This protocol consists of a set of XML-based commands that are used by an ActiveSync client device to synchronize its e-mail, files, and data with a server

.

The client first calls the **Autodiscover** command to get a user's account configuration. The client can then view and modify server data related to that account, including e-mail messages and attachments, folders, contacts, and calendar requests.

1.4 Relationship to Other Protocols

The commands in this specification are used over an HTTP connection, as specified in [RFC2616].

All simple data types in this document conform to the data type definitions specified in [MS-ASDTYPE].

1.5 Prerequisites/Preconditions

None.

1.6 Applicability Statement

This protocol is applicable in scenarios where an ActiveSync client needs to synchronize its messages and files with a server.

1.7 Versioning and Capability Negotiation

None.

1.8 Vendor-Extensible Fields

None.

1.9 Standards Assignments

None.

2 Messages

2.1 Transport

This protocol consists of a series of XML elements transmitted as specified in [MS-OXPROTO]. The XML block containing the command and parameters elements is transmitted in either the Request Body of a Request, or in the Response Body of a Response. All command messages use WAP binary XML (WBXML), except for the **Autodiscover** command, which uses plain XML. For more details about WAP binary XML, see [MS-ASWBXML].

2.2 Message Syntax

2.2.1 Commands

2.2.1.1 Autodiscover

The **Autodiscover** command facilitates the discovery of core account configuration information by using the user's Simple Mail Transfer Protocol (SMTP) address as the primary input. For more information, see [MS-OXDISCO].

Note: The **Culture** element that is included in the **Autodiscover** command response always returns en:en, regardless of the culture that is sent by the client.

Note: The **Autodiscover** command request and response messages are sent in XML format, not WAP binary XML (WBXML) format. The messages are sent to the Auto Discovery service, which does not use WBXML.

For more detailed information about how to configure a client to connect with the Autodiscover service, see [AUTODISCOVER].

2.2.1.1.1 Request

2.2.1.1.1.1 Request

The **Request** element contains the **Autodiscover** command request parameters.

Parent elements	<Autodiscover>
Child elements	<EmailAddress> <AcceptableResponseSchema>
Data type	**Container**
Number allowed	1..1 (Required)

2.2.1.1.1.2 AcceptableResponseSchema

The **AcceptableResponseSchema** element indicates the schema in which the server should send the response.

Parent elements	<Request> (Request only) <Response> (Response only)
Child elements	None
Data type	**String**
Number allowed	1..1 (Required)

The only acceptable schema is http://schemas.microsoft.com/exchange/autodiscover/mobilesync/responseschema/2006.

2.2.1.1.1.3 EmailAddress

The **EmailAddress** element contains the SMTP e-mail address of the user and is used to identify the user's mailbox in the network.

Parent elements	<Request> (Request only) <User> (Response only)
Child elements	None
Data type	**String**
Number allowed	1..1 (Required)

If the user has multiple addresses, then the primary e-mail address is returned in the **Autodiscover** command response. This address may be the same as the e-mail address that was sent in the request. The client device is expected to record this address and use this string for all additional communication.

2.2.1.1.2 Response

Autodiscover (variable): Container. This element is the top-level element in the XML stream. It indicates that the body of the HTTP POST response contains an **Autodiscover** command.

The **Autodiscover** command facilitates the discovery of core account configuration information by using the user's Simple Mail Transfer Protocol (SMTP) address as the primary input.

Note: The **Autodiscover** command request and response messages are sent in XML format, not WAP binary XML (WBXML) format. The messages are sent to the AutoDiscovery service, which does not use WBXML.

For more detailed information about how to configure a client to connect with the Autodiscover service, see [AUTODISCOVER].

Request XML Body Outline

```
<Autodiscover
xmlns="http://schemas.microsoft.com/exchange/autodiscover/mobilesync/re
questschema/2006">
   <Request>
      <EMailAddress>…</EMailAddress>
      <AcceptableResponseSchema>
      http://schemas.microsoft.com/exchange/autodiscover/mobilesync/
      responseschema/2006
   </AcceptableResponseSchema>
   </Request>
</Autodiscover>
```

Response XML Body Outline

```
<Autodiscover
xmlns:A="http://schemas.microsoft.com/exchange/autodiscover/mobilesync/
responseschema/2006">
    <A:Response>
        <A:Culture>en:en</A:Culture>
        <A:User>
            <A:DisplayName>…</A:DisplayName>
            <A:EMailAddress>…</A:EMailAddress>
        </A:User>
        <A:Action>
            <A:Settings>
                <A:Server>
```

```
                    <A:Type>MobileSync</A:Type>
                    <A:Url>…</A:Url>
                    <A:Name>…</A:Name>
                </A:Server>
                <A:Server>
                    <A:Type>CertEnroll</A:Type>
                    <A:Url>… </A:Url>
                    <A:Name>…</A:Name>
                    <A:ServerData>…</A:ServerData>
                </A:Server>
            </A:Settings>
            <A:Redirect>… </A:Redirect>
            <A:Error Time="…" Id="…">
                <A:ErrorCode>…</ErrorCode>
                <A:Message>…</Message>
                <A:DebugData />
            </A:Error>
        </A:Action>
    </A:Response>
</A:Autodiscover>
```

The ActiveSync protocol significantly simplifies the configuration of mobile devices by providing support for account autodiscovery through the **Autodiscover** command. The **Autodiscover** command facilitates the discovery of core account configuration information by using the user's SMTP address as the primary input by means of the following process:

1. The end-user enters his or her e-mail address and domain credentials, for example, kim@contoso.com.
2. The client uses the domain information in the user's e-mail address, that is, contoso.com, and tries to locate the Autodiscover service by sending an **Autodiscover** command request to the following predefined URLs:
   https://<*smtp-address-domain*>/autodiscover/autodiscover.xml
   https://autodiscover.<*smtp-address-domain*>/autodiscover/autodiscover.xml
3. In this example, these URLs map to https://contoso/autodiscover/autodiscover.xml and https://autodiscover.contoso/autodiscover/autodiscover.xml.
4. If DNS contains a host record that maps one of these URLs to a Client Access server where the Autodiscover service is hosted, then the Autodiscover service responds with the settings that are required for the device to begin synchronizing.

This response includes values for the Server type, the URL, and the **Name** element.

5. If redirection to another Autodiscover service is required, then the <Redirect> element is present and contains a URL to the Autodiscover Client Access server that should be queried for the desired information. The device should then re-create a partnership with the new Client Access server, and send an **Autodiscover** command request to that server.
6. If the response included the settings that are required for the device to begin synchronization, then the device applies the settings and initiates synchronization.
7. If the Autodiscover command request in step 3 fails, then the device should perform a DNS SRV lookup for _autodiscover._tcp. <*smtp-address-domain*>.com, which in this example maps to _autodiscover._tcp.contoso.com. If the DNS lookup is successful, then "mail.<*smtp-address-domain*>.com" is returned, which maps to "mail.contoso.com". The device then applies the settings and initiates synchronization. For more information about performing the DNS SRV lookup, see [DNS-SRV].

The following example includes success and error response messages.

Example:
Account autodiscovery uses an e-mail address to look up information that is required to configure software. Given an e-mail name (such as EduardDell@Woodgrovebank.com), a list of possible Autodiscover servers is generated. The client contacts the name autodiscover.domainname to provide the information. If that information is not found, the client tries to send the request to the domain name. If the information still is not retrieved, the client can use a manual configuration. For example, the client tries these servers:

- autodiscover.woodgrovebank.com
- woodgrovebank.com

Each server is sent an HTTP Post command. The post data is an XML request for a certain type of information. E-mail account configuration will be the first use. The XML contains information that helps execute the request. For mail, the information includes the e-mail address, the protocols that the client software supports, the Web browser that is installed, the type of proxy that is being used, and the types of authentication that can be used.

The post is sent for servername/Autodiscover/Autodiscover.xml. The servername is defined according to the process described earlier in this topic.

Request XML Body Outline

```
<Autodiscover
xmlns="http://schemas.microsoft.com/exchange/autodiscover/mobilesync/requestschema/2006">
   <Request>
```

```
      <EMailAddress>eduarddell@woodgrovebank.com</EMailAddress>
      <AcceptableResponseSchema>
      http://schemas.microsoft.com/exchange/autodiscover/mobilesync/
      responseschema/2006
   </AcceptableResponseSchema>
   </Request>
</Autodiscover>
```

Response XML Body Outline - Case Error

```
<Autodiscover
xmlns:A="http://schemas.microsoft.com/exchange/autodiscover/mobilesync/
responseschema/2006">
    <A:Response>
        <A:Culture>en:en</A:Culture>
        <A:User>

<A:EMailAddress>eduarddell@woodgrovebank.com</A:EMailAddress>
       </A:User>
       <A:Action>
           <A:Error>
               <Status>1</Status>
               <Message>The Active Directory could not be
reached</Message>
               <DebugData>MailUser</DebugData>
           </A:Error>
       </A:Action>
    </A:Response>
</Autodiscover>
```

Response XML Body Outline - Case Redirect

In the following redirect example, assume that the **Autodiscover** command request was sent to autodiscover.woodgrovebank.com. The redirect node indicates that the client should try autodiscover.loandept.woodgrovebank.com.

```
<Autodiscover
xmlns:A="http://schemas.microsoft.com/exchange/autodiscover/mobilesync/
responseschema/2006">
```

```
    <A:Response>
        <A:Culture>en:en</A:Culture>
        <A:User>
           <A:DisplayName>Eduard Dell</A:DisplayName>

<A:EMailAddress>eduarddell@woodgrovebank.com</A:EMailAddress>
        </A:User>
        <A:Action>
           <A:Redirect>eduarddell@loandept.woodgrovebank.com
</A:Redirect>
        </A:Action>
    </A:Response>
</Autodiscover>
```

Response XML Body Outline - Case Server Settings

In the following success response, the Autodiscover service has provided server URL information for two services: MobileSync and CertEnroll. The client can use the MobileSync URL to configure the settings for ActiveSync. The client can also optionally use the CertEnroll information to obtain a client certificate for Secure Sockets Layer (SSL) negotiation. All this information is retrieved from Active Directory directory service information on the ActiveSync virtual directory object. <1>

```
<Autodiscover
xmlns:A="http://schemas.microsoft.com/exchange/autodiscover/mobilesync/
responseschema/2006">
    <A:Response>
        <A:Culture>en:en</A:Culture>
        <A:User>
            <A:DisplayName>Eduard Dell</A:DisplayName>

<A:EMailAddress>eduarddell@woodgrovebank.com</A:EMailAddress>
        </A:User>
        <A:Action>
            <A:Settings>
                <A:Server>
                    <A:Type>MobileSync</A:Type>
                    <A:Url>
```

```
                        https://loandept.woodgrovebank.com/Microsoft-
Server-ActiveSync
                    </A:Url>
                    <A:Name>
                 https://loandept.woodgrovebank.com/Microsoft-Server-
ActiveSync
             </A:Name>
                </A:Server>
                <A:Server>
                    <A:Type>CertEnroll</A:Type>

<A:Url>https://cert.woodgrovebank.com/CertEnroll</A:Url>
                    <A:Name />
                   <A:ServerData>CertEnrollTemplate</A:ServerData>
                </A:Server>
            </A:Settings>
        </A:Action>
    </A:Response>
</A:Autodiscover>
```

Response XML Body Outline - Case Framework Error

If the provider cannot be found, or if the **AcceptableResponseSchema** cannot be matched, then the following XML fragment will be returned to the client.

The error code 600 means an invalid request was sent to the service, and 601 means that a provider could not be found to handle the **AcceptableResponseSchema** that was specified.

```
<Autodiscover
xmlns:A="http://schemas.microsoft.com/exchange/autodiscover/mobilesync/
responseschema/2006">
   <A:Response>
      <A:Error Time="16:56:32.6164027" Id="1054084152">
          <A:ErrorCode>600</ErrorCode>
          <A:Message>Invalid Request</Message>
          <A:DebugData />
      </A:Error>
```

```
   </A:Response>
</Autodiscover>
```

Response XML – Case Framework Default

For unauthenticated requests, the server may serve a static page with contents, such as the following. This page is configurable by using the 401-1.htm Web page that is installed in the Help subdirectory of the Autodiscover physical directory.

```
<Autodiscover >
  <Account>
    <AccountType>default e-mail</AccountType>
    <Action>settings</Action>
    <Image>http://www.abcd.com/def.jpg</Image>
    <ServiceHome>http://www.microsoft.com</ServiceHome>
    <RedirectUrl>…</RedirectUrl>

    <Protocol>
      <Type>POP</Type>
      <Server>popserverFQDN</Server>
      <Port>110</Port>
    </Protocol>

    <Protocol>
      <Type>SMTP</Type>
      <Server>smtpserverFQDN</Server>
      <Port>25</Port>
    </Protocol>

    <Protocol>
      <Type>IMAP</Type>
      <Server>imapserver1FQDN</Server>
    </Protocol>

    <Protocol>
      <Type>IMAP</Type>
      <Server>imapserver2FQDN</Server>
```

```
      <Port>143</Port>
    </Protocol>
  </Account>
</Autodiscover>
```

The **Autodiscover** command should be used as an initial response to the common HTTP errors in the following table. If a mailbox has been moved, or if a user is trying to connect to the wrong Client Access server, then the **Autodiscover** command may be able to retrieve the updated URL.

Status code	Description
401 Unauthorized	The resource requires authorization or authorization was refused.
403 Forbidden	The user is not enabled for synchronization.
451	The device is trying to connect to the wrong Client Access server. If the X-MS-Location header contains a redirect URL, then the client should permanently redirect future requests to the new URL. This status code is sent to optimize the Autodiscover experience.
500 Internal Server Error	The server encountered an unexpected condition that prevented it from fulfilling the request.

After a successful **Autodiscover** command response, an **Options** command should be sent to the new Client Access server, as the supported protocol versions and commands may have changed.

2.2.1.1.2.1 Action

The **Action** element encapsulates the server action type for this request, which may be one of the following: Redirect, Settings, or Error.

Parent elements	None
Child elements	<Redirect> (Response only) <Settings> (Response only) <Error> (Response only)
Data type	**Container**
Number allowed	1..1 (Required)

2.2.1.1.2.2 Culture

The **Culture** element specifies the client culture, which is used to localize error messages.

Parent elements	<Response>

Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The string will be of the form "en:en".

2.2.1.1.2.3 DebugData

The **DebugData** element represents more information about the failure that can help the system administrator debug the source of the problem.

Parent elements	<Error>
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

Note that developers should not use this element for debugging.

2.2.1.1.2.4 DisplayName

The **DisplayName** element contains the user's display name in Active Directory.

Parent elements	<User>
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The client may choose to display or store this value on the device.

2.2.1.1.2.5 EmailAddress

The **EmailAddress** element contains the SMTP e-mail address of the user and is used to identify the user’s mailbox in the network.

Parent elements	<Request> (Request only) <User> (Response only)
Child elements	None
Data type	**String**
Number allowed	1..1 (Required)

If the user has multiple addresses, then the primary e-mail address is returned in the **Autodiscover** command response. This address may be the same as the e-mail address that was sent in the request. The client device is expected to record this address and use this string for all additional communication.

2.2.1.1.2.6 Error

The **Error** element contains the error that was encountered while processing the request.

Parent elements	<Action> (Response only)
Child elements	<Status> <Message>

	<DebugData>
Data type	**Container**
Number allowed	0..1 (Optional)

2.2.1.1.2.7 Message

The **Message** element contains the error string localized using the **Culture** specified in the **Response** element, enabling the client to display error status to the end-user.

Parent elements	<Error>
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

2.2.1.1.2.8 Name

The **Name** element specifies a URL if the **Type** element is set to **MobileSync**.

Parent elements	<Server> (Response only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

If the **Type** element value is **MobileSync**, then the **Name** element specifies the URL that conveys the protocol. If the **Type** element value is CertEnroll, then the **Name** value is NULL.

2.2.1.1.2.9 Redirect

The **Redirect** element specifies the SMTP address of the requested user.

Parent elements	<Action>
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The **Redirect** element is an optional child of the **Action** element in the **Autodiscover** response message. The domain part of the address should be used by the client device to send a new **Autodiscover** command request.

2.2.1.1.2.10 Response

The **Response** element contains the **Autodiscover** command response parameters.

Parent elements	<Autodiscover>
Child elements	<User> <Culture> <Action> <Error>
Data type	**Container**
Number allowed	1..n (Required)

If an error occurs in the **Autodiscover** command framework that hosts the ActiveSync Autodiscovery implementation, then the **Response** element will have an **Error** child node. More than one **Response** element may be encapsulated in an **Autodiscover** command response. The server will service requests in the order specified and mirror the order in the response. In this case, the order of the **Response** elements will match the order of the corresponding **Request** elements in the **Autodiscover** command request.

2.2.1.1.2.11 Server

The **Server** element encapsulates settings that apply to a particular server in the **Autodiscover** command response.

Parent elements	<Settings> (Response only)
Child elements	<Type> <Url> <Name> <ServerData>
Data type	**Container**
Number allowed	1..n (Required)

One or more **Server** elements may be present in the response as a child of the **Settings** element.

2.2.1.1.2.12 ServerData

The **ServerData** element contains the value that is retrieved from the **MobileClientCertTemplateName** attribute of the ActiveSync virtual directory object.

Parent elements	<Server> (Response only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The **ServerData** element is a string that is present only when the **Type** element value is set to **CertEnroll**. The element contains the value that is retrieved from the **MobileClientCertTemplateName** attribute of the **ActiveSync** virtual directory object in Active Directory that is a child object of the Exchange Client Access server that services the user's mailbox.

2.2.1.1.2.13 Settings

The **Settings** element contains the settings for the specified user or schema.

Parent elements	<Action> (Response only)
Child elements	Settings that are specific to requested service
Data type	**Container**
Number allowed	0..1 (Optional)

2.2.1.1.2.14 Status

The **Status** element provides a status code that corresponds to the error.

Parent elements	<Error>
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

The following table specifies valid values for the **Status** element in the context of the **Settings** element.

Value	Meaning
1	Success
2	Protocol error

Remarks
The client device may implement custom recovery logic pertaining to the status code. The client device is expected to handle all unknown status codes effectively.

2.2.1.1.2.15 Type

The **Type** element specifies the server type.

Parent elements	<Server> (Response only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The following are the valid values for the **Type** element:

- MobileSync. Indicates that the URL that is returned by the URL element can be accessed by clients. The URL is retrieved from the **ExternalUrl** attribute of the ActiveSync virtual directory object in Active Directory.
- CertEnroll. Indicates that the URL that is returned by the URL element can be accessed by clients that have a valid certificate over SSL. The URL value for the CertEnroll **Type** is retrieved from the **MobileClientCertificateAuthorityURL** attribute of the ActiveSync virtual directory object in Active Directory.

If the server supports both MobileSync and CertEnroll, the response buffer will include multiple **Server** elements that contain a **URL** value for each **Type** value.

For more information about certificate support and setup, see [AUTODISCOVER].

2.2.1.1.2.16 Url

The **Url** element contains a URL string that conveys the protocol, port, resource location, and other information.

Parent elements	<Server> (Response only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The **Url** element is a child of the **Server** element. The value is a URL string that conveys the protocol, port, resource location, and other information. If the **Type** element value is MobileSync, then the **Url** element value is retrieved from the **ExternalUrl** attribute of the **ActiveSync** virtual directory object in Active Directory that is a child object of the Exchange Client Access server that services the user's mailbox. If the **Type** element value is CertEnroll, then the **Url** value is retrieved from the **MobileClientCertificateAuthorityURL** attribute of the **ActiveSync** virtual directory object in Active Directory that is a child object of the Exchange Client Access server that services the user's mailbox.

2.2.1.1.2.17 User

The **User** element encapsulates information about the user to whom this response element relates.

Parent elements	<Response>
Child elements	<DisplayName> <EmailAddress>
Data type	**Container**
Number allowed	1..1 (Required)

2.2.1.2 FolderCreate

A **FolderCreate** command request that includes these characters in the folder name returns an error.

A parent ID of "0" signifies the mailbox root folder.

2.2.1.2.1 Request

2.2.1.2.1.1 FolderCreate

The **FolderCreate** element is the top-level element in the XML document. It identifies the body of the HTTP Post as containing a **FolderCreate** command.

Parent elements	None
Child elements	<SyncKey> <ParentId> (Request only) <DisplayName> (Request only) <Type> (Request only) <ServerId> (Response only) <Status> (Response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.2.1.2 SyncKey

The **SyncKey** element specified in the **FolderCreate** command request is used by the server to mark the synchronization state of a collection. After a successful **FolderCreate** command,

the server sends a synchronization key to the client in a response. The client stores this key and sends it back to the server the next time the folder hierarchy is synchronized or updated. The server checks the value of the key to make sure the synchronized state is okay and gives an error if the synchronization state is not okay.

Parent elements	<FolderCreate>
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	Request: 1 (Required) Response: 0|1

The client should store the synchronization key as a string of up to 64 characters. The client should make no assumptions about the format of the synchronization key.

The **SyncKey** element is returned if the **FolderCreate** command request was successful and the element is not returned if the **FolderCreate** command request fails.

2.2.1.2.1.3 ParentId

The **ParentId** element specifies the server ID of the parent folder and is used in **FolderCreate** command requests only. The server ID of the parent folder is obtained from the **ServerId** element of a previous **FolderSync** command. A parent ID of "0" signifies the mailbox root folder.

Parent elements	<FolderCreate> (Request only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

2.2.1.2.1.4 DisplayName

The **DisplayName** element specifies the name of the folder that will be shown to the user.

Parent elements	<FolderCreate> (Request only)
Child elements	None
Data type	**String** (Between 1 and 256 characters)
Number allowed	1 (Required)

2.2.1.2.1.5 Type

The **Type** element specifies the type of the folder to be created.

Parent elements	<FolderCreate> (Request only)
Child elements	None
Data type	**Integer**
Number allowed	1 (Required)

The folder type values are listed in the following table. Folder types 2–11 are reserved for default folder types.

Type	Definition
1	User-created folder (generic)
12	User-created mail folder
13	User-created calendar folder
14	User-created contacts folder
15	User-created tasks folder
16	User-created journal folder
17	User-created notes folder
18	Unknown folder

2.2.1.2.2 Response

2.2.1.2.2.1 FolderCreate

The **FolderCreate** element is the top-level element in the XML document. It identifies the body of the HTTP Post as containing a **FolderCreate** command.

Parent elements	None
Child elements	<SyncKey> <ParentId> (Request only) <DisplayName> (Request only) <Type> (Request only) <ServerId> (Response only) <Status> (Response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.2.2.2 ServerId

The server ID of the new collection is returned to the client after a successful **FolderCreate** command request. The server ID can also be used in the **ServerId** element of future **FolderDelete** and **FolderUpdate** command requests. The **ServerId** element specifies a unique identifier assigned by the server to the new folder and is returned to the client in the server response if the request is successful. The client must store the server ID for each object and be able to locate an object given a server ID.

Parent elements	<FolderCreate> (Response only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	0…1 (Optional)

The client should store the server ID as a string of up to 64 characters. The client should make no assumptions about the format of the ID.

The **ServerId** element is used only in response from the server to the client.

The **ServerId** element is returned if the **FolderCreate** command request was successful and the element is not returned if the **FolderCreate** command request fails.

2.2.1.2.2.3 Status

The **Status** element indicates in the **FolderCreate** command response the success or failure of a **FolderCreate** command request. If the command failed, the **Status** element contains a code indicating the type of failure. The values are summarized in the following table.

Parent elements	<FolderCreate> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	1 (required)

The following table shows valid values for the element.

Value	Meaning
1	Success.
2	A folder with that name already exists.
5	The specified parent folder was not found.
6	An error on the computer that is running the Exchange server occurred.
7	Access denied.
8	The request timed out.
9	Synchronization key mismatch or invalid synchronization key.
10	Incorrectly formatted request.
11	An unknown error occurred.

The **Status** element is sent only in responses from the server to the client.

2.2.1.2.2.4 SyncKey

The **SyncKey** element specified in the **FolderCreate** command request is used by the server to mark the synchronization state of a collection. After a successful **FolderCreate** command, the server sends a synchronization key to the client in a response. The client stores this key and sends it back to the server the next time the folder hierarchy is synchronized or updated. The server checks the value of the key to make sure the synchronized state is okay and gives an error if the synchronization state is not okay.

Parent elements	<FolderCreate>
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	Request: 1 (Required) Response: 0|1

The client should store the synchronization key as a string of up to 64 characters. The client should make no assumptions about the format of the synchronization key.
The **SyncKey** element is returned if the **FolderCreate** command request was successful and the element is not returned if the **FolderCreate** command request fails.

2.2.1.3 FolderDelete

The **FolderDelete** command deletes a folder from the server. The server ID of the folder is passed to the server in the **FolderDelete** command request, which deletes the collection with the matching identifier. The server then sends a response indicating the status of the deletion.

2.2.1.3.1 Request

2.2.1.3.1.1 FolderDelete

The **FolderDelete** element is the top-level element in the XML document. It identifies the body of the HTTP Post as containing a **FolderDelete** command.

Parent elements	None
Child elements	<SyncKey> <ServerId> (Request only) <Status> (Response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.3.1.2 SyncKey

The **SyncKey** element is used by the server to mark the synchronization state of a folder hierarchy.

Parent elements	<FolderDelete>
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	Request: 1 (Required) Response: 0|1

After a successful **FolderDelete** command request, the server sends a synchronization key to the client in the response. The client stores this key and sends it back to the server the next time the folder hierarchy is synchronized or updated. The server checks the value of the key to make sure the synchronization state is okay and gives an error if the synchronization state is not okay.

The client should store the synchronization key as a string of up to 64 characters. The client should make no assumptions about the format of the synchronization key.

The **SyncKey** element is returned if the **FolderDelete** command request was successful and the element is not returned if the **FolderDelete** command request fails.

2.2.1.3.1.3 ServerId

The **ServerId** element specifies the folder on the server to be deleted, and it is a unique identifier assigned by the server to each object that can be synchronized.

Parent elements	<FolderDelete> (Request only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

The server ID of the folder to be deleted is returned to the client in the **ServerId** element of a previous **FolderSync** or **FolderCreate** command. The client must store the server ID for each object and be able to locate an object given a server ID.

The client should store the server ID as a string of up to 64 characters. The client should make no assumptions about the format of the ID.

2.2.1.3.2 Response

2.2.1.3.2.1 FolderDelete

The **FolderDelete** element is the top-level element in the XML document. It identifies the body of the HTTP Post as containing a **FolderDelete** command.

Parent elements	None
Child elements	<SyncKey> <ServerId> (Request only) <Status> (Response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.3.2.2 SyncKey

The **SyncKey** element is used by the server to mark the synchronization state of a folder hierarchy.

Parent elements	<FolderDelete>
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	Request: 1 (Required) Response: 0|1

After a successful **FolderDelete** command request, the server sends a synchronization key to the client in the response. The client stores this key and sends it back to the server the next

time the folder hierarchy is synchronized or updated. The server checks the value of the key to make sure the synchronization state is okay and gives an error if the synchronization state is not okay.

The client should store the synchronization key as a string of up to 64 characters. The client should make no assumptions about the format of the synchronization key.

The **SyncKey** element is returned if the **FolderDelete** command request was successful and the element is not returned if the **FolderDelete** command request fails.

2.2.1.3.2.3 Status

The **Status** element indicates the success or failure of the **FolderDelete** command request. If the command failed, the Status element in the server response contains a code indicating the type of failure.
Summary

Parent elements	<FolderDelete> (Response)
Child elements	None
Data type	**Integer**
Number allowed	1 (Required)

The following table lists the valid values for this element.

Value	Meaning
1	Success.
3	The specified folder is the Inbox, Outbox, Contacts, or Drafts folder.
4	The specified folder does not exist.
6	An error occurred on the computer that is running the Exchange server.
7	Access denied.
8	The request timed out.
9	Synchronization key mismatch or invalid synchronization key.
10	Incorrectly formatted request.
11	An unknown error occurred.

2.2.1.4 FolderSync

The **FolderSync** command synchronizes the collection hierarchy but does not synchronize the items in the collections themselves.

This command works similarly to the **Sync** command. An initial **FolderSync** command with a synchronization key of 0 (value of 0 in **SyncKey** element) is required in order to obtain the list of folders and the synchronization key associated with that list. The synchronization key is returned in the **SyncKey** element of the response. This synchronization key can be used in subsequent **FolderSync** commands to obtain folder hierarchy changes.

There is no **GetChanges** element submitted in the **FolderSync** request, as in a **Sync** request, to get changes from the server. All folders are returned to the client when initial folder synchronization is done with a synchronization key of 0.

2.2.1.4.1 Request

2.2.1.4.1.1 FolderSync

The **FolderSync** element is the top-level element in the XML stream. It indicates that the body of the HTTP POST contains a **FolderSync** command.

Parent elements	None
Child elements	<SyncKey> <Status> (Response only) <Changes> (Response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.4.1.2 SyncKey

The **SyncKey** element is used by the server to track the current state of the client.

Parent elements	<FolderSync>
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

After successful folder synchronization, the server sends a synchronization key to the client. The client must store this key and send the key back to the server the next time the folder hierarchy is synchronized or updated. The server checks the value of the key to make sure the synchronization state is okay and gives an error if it is not.

The client must store the synchronization key as a string of up to 64 characters. The client should make no assumptions about the format of the synchronization key.

If a synchronization error occurs, the client should restart the synchronization process with a synchronization key of "0". The client data can then be merged with the data returned by the server, or the client data can be completely deleted and replaced with the data from the server.

2.2.1.4.2 Response

2.2.1.4.2.1 FolderSync

The **FolderSync** element is the top-level element in the XML stream. It indicates that the body of the HTTP POST contains a **FolderSync** command.

Parent elements	None
Child elements	<SyncKey> <Status> (Response only) <Changes> (Response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.4.2.2 Status

The **Status** element indicates the success or failure of a **FolderSync** command request.

Parent elements	<FolderSync> (Response only)
Child elements	None
Data type	**Integer** (See values in the following table)
Number allowed	1 (Required)

If the command fails, the **Status** element contains a code that indicates the type of failure. The **Status** element is global for all returned **Collection** elements. If one collection fails, a failure status is returned for all collections.

The following table lists the valid values for this element.

Value	Meaning
1	Success.
6	An error occurred on the computer that is running the Exchange server.
7	Access denied.
8	The request timed out.
9	Synchronization key mismatch or invalid synchronization key.
10	Incorrectly formatted request.
11	An unknown error occurred.

2.2.1.4.2.3 SyncKey

The **SyncKey** element is used by the server to track the current state of the client.

Parent elements	<FolderSync>
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

After successful folder synchronization, the server sends a synchronization key to the client. The client must store this key and send the key back to the server the next time the folder hierarchy is synchronized or updated. The server checks the value of the key to make sure the synchronization state is okay and gives an error if it is not.

The client must store the synchronization key as a string of up to 64 characters. The client should make no assumptions about the format of the synchronization key.

If a synchronization error occurs, the client should restart the synchronization process with a synchronization key of "0". The client data can then be merged with the data returned by the server, or the client data can be completely deleted and replaced with the data from the server.

2.2.1.4.2.4 Changes

The **Changes** element is a container for changes to the folder hierarchy. It is used in the FolderSync command response to update the client with folder additions, deletions, and updates on the server.

The server will try to maintain the same set of folder data being returned across synchronization key "0", in terms of **ServerId** and **DisplayName** mapping. However, if some severe error happens, the server may return a totally different set.

Parent elements	<FolderSync> (Response only)
Child elements	<Count> <Add> <Delete> <Update>
Data type	**Container**
Number allowed	1 (Required)

2.2.1.4.2.5 Count

The **Count** element is used in the FolderSync command response to list the number of added, deleted, and updated folders on the server since the last folder synchronization. These changes are listed in the Changes element. If there are no changes since the last folder synchronization, a count of 0 is returned.

Parent elements	<Changes> (Response only)

Child elements	None
Data type	**Unsigned Integer**
Number allowed	1 (Required)

2.2.1.4.2.6 Delete

The **Delete** element is used in the FolderSync command response to specify that a folder on the server was deleted since the last folder synchronization.

Parent elements	<Changes> (Response only)
Child elements	<ServerId>
Data type	**Container**
Number allowed	0..n (Optional)

2.2.1.4.2.7 Add

The **Add** element is used in a FolderSync command response to create a new folder on the client. Child elements of the Add element specify the server ID of the folder, the server ID of the parent folder, the display name of the folder, and the type of folder.

Parent elements	<Changes> (Response only)
Child elements	<ServerId/> <ParentId/> <DisplayName/> <Type/>
Data type	**Container**
Number allowed	0..n (Optional)

2.2.1.4.2.8 ServerId

The **ServerId** element specifies the server-unique identifier for a folder on the server.

Parent elements	<Add> (Response only) <Delete> (Response only) <Update> (Response only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

The ServerId element is used to identify folders that have been added, deleted, or updated on the server in the FolderSync command response. The client should store the server ID as a string of up to 64 characters. The client should make no assumptions about the format of the ID.

2.2.1.4.2.9 ParentId

The **ParentId** element specifies the server ID of the parent of the folder on the server that has been added or updated.

Parent elements	<Add> (Response only) <Update> (Response only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

The client should store the server ID as a string of up to 64 characters. The client should have no rules about the format of the ID.

2.2.1.4.2.10 DisplayName

The **DisplayName** element specifies the name of the folder that will be shown to the user.

Parent elements	<Add> (Response only) <Update> (Response only)
Child elements	None
Data type	**String**
Number allowed	1 (Required)

The DisplayName element is used in the Add and Update elements of FolderSync responses when a folder has been added or updated on the server. A folder is not allowed to have multiple subfolders with the same display name.

2.2.1.4.2.11 Type

The **Type** element specifies the type of the folder that was added or updated (renamed or moved) on the server.

Parent elements	<Add> (Response only) <Update> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	1 (Required)

The folder type values are listed in the following table.

Value	Meaning
1	User-created folder (generic)
2	Default Inbox folder
3	Default Drafts folder
4	Default Deleted Items folder

Value	Meaning
5	Default Sent Items folder
6	Default Outbox folder
7	Default Tasks folder
8	Default Calendar folder
9	Default Contacts folder
10	Default Notes folder
11	Default Journal folder
12	User-created Mail folder
13	User-created Calendar folder
14	User-created Contacts folder
15	User-created Tasks folder
16	User-created Journal folder
17	User-created Notes folder
18	Unknown folder type

2.2.1.4.2.12 Update

The **Update** element is used in a **FolderSync** command response to identify a folder on the server that has been updated (renamed or moved).

Parent elements	<Changes> (Response only)
Child elements	<ServerId/> <ParentId/> <DisplayName/> <Type/>
Data type	**Container**
Number allowed	0..n (Optional)

The child elements of the **Update** element identify the server ID of the folder that was updated, the server ID of its parent folder, the new display name of the updated folder, and the folder type.

2.2.1.5 FolderUpdate

The **FolderUpdate** command moves a folder from one location to another on the server. The command is also used to rename a folder.

2.2.1.5.1 Request

2.2.1.5.1.1 FolderUpdate

The **FolderUpdate** element is the top-level element in the XML stream. It indicates that the body of the HTTP POST contains a **FolderUpdate** command.

Parent elements	None

Child elements	<SyncKey> <ServerId> (Request only) <ParentId> (Request only) <DisplayName> (Request only) <Status> (Response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.5.1.2 SyncKey

The **SyncKey** element is used by the server to track the current state of the client.

Parent elements	<FolderUpdate>
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

After a successful synchronization, the server sends a synchronization key to the client. The client stores this key and sends the key back to the server the next time the folder hierarchy is synchronized or updated. The server compares the value of the key to make sure the synchronization state is okay and gives an error if the synchronization state is not okay. A new synchronization key is returned to the client if the **FolderUpdate** command request was successful.

The client must store the synchronization key as a string of up to 64 characters. The client should have no rules about the format of the synchronization key.

2.2.1.5.1.3 ServerId

The **ServerId** element identifies the folder on the server to be renamed or moved.

Parent elements	<FolderUpdate> (Request only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

The server ID is obtained from the ServerId element of a previous FolderSync or FolderUpdate command. The server ID specifies a unique identifier assigned by the server to each object that can be synchronized. The client must store the server ID for each object and be able to locate an object given a server ID.

The client should store the ServerId element as a string of up to 64 characters. The client should make no assumptions about the format of the ID.

2.2.1.5.1.4 ParentId

The **ParentId** element specifies the server ID of the parent of the folder to be renamed or the destination folder of the folder to be moved.

Parent elements	<FolderUpdate> (Request only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

The parent ID is obtained from the ServerId element of a previous FolderSync or FolderCreate command. The client should store the server ID as a string of up to 64 characters. The client should make no assumptions about the format of the ID. A parent ID of "0" signifies the mailbox root folder.

2.2.1.5.1.5 DisplayName

The **DisplayName** element specifies the name of the folder that will be shown to the user.

Parent elements	<FolderUpdate> (Request only)
Child elements	None
Data type	**String**
Number allowed	1 (Required)

2.2.1.5.2 Response

2.2.1.5.2.1 FolderUpdate

The **FolderUpdate** element is the top-level element in the XML stream. It indicates that the body of the HTTP POST contains a **FolderUpdate** command.

Parent elements	None
Child elements	<SyncKey> <ServerId> (Request only) <ParentId> (Request only) <DisplayName> (Request only) <Status> (Response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.5.2.2 Status

The **Status** element indicates the success or failure of a **FolderSync** command request.

Parent elements	<FolderUpdate> (Response only)
Child elements	None
Data type	**Integer** (See values in the following table)
Number allowed	1 (Required)

If the command fails, the **Status** element contains a code that indicates the type of failure. The **Status** element is global for all returned **Collection** elements. If one collection fails, a failure status is returned for all collections.

The following table lists the valid values for this element.

Value	Meaning
1	Success.
2	A folder with that name already exists.
3	The specified folder is the Inbox, Outbox, Contacts, or Drafts folder.
4	The specified folder does not exist.
5	The specified parent folder was not found.
6	An error occurred on the computer that is running the Exchange server.
7	Access denied.
8	The request timed out.
9	Synchronization key mismatch or invalid synchronization key.
10	Incorrectly formatted request.
11	An unknown error occurred.

2.2.1.5.2.3 SyncKey

The **SyncKey** element is used by the server to track the current state of the client.

Parent elements	<FolderUpdate>
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

After a successful synchronization, the server sends a synchronization key to the client. The client stores this key and sends the key back to the server the next time the folder hierarchy is synchronized or updated. The server compares the value of the key to make sure the synchronization state is okay and gives an error if the synchronization state is not okay. A new synchronization key is returned to the client if the **FolderUpdate** command request was successful.

The client must store the synchronization key as a string of up to 64 characters. The client should have no rules about the format of the synchronization key.

2.2.1.6 GetAttachment

The **GetAttachment** command retrieves an e-mail attachment from the server.

Attachments are not automatically included with e-mail messages in a synchronization; they must be explicitly retrieved by using this command.

This command is issued in the HTTP **POST** command, and it does not specify any additional information in an XML body. The name of the attachment to be retrieved is specified in the *AttachmentName* command parameter. The content of the attachment is returned in the response body and the content type is specified in the response Content-Type header. When the Content Type header is missing, this indicates that the default encoding of 7-bit ASCII has been used.

If the **GetAttachment** command is used to retrieve an attachment that has been deleted on the server, a 500 status code is returned in the HTTP **POST** response.

2.2.1.6.1 Request

No XML body is included in the **GetAttachment** command request.

2.2.1.6.2 Response

No XML body is included in the **GetAttachment** command response.

2.2.1.7 GetHierarchy (Deprecated)

The **GetHierarchy** command is used to get only the list of e-mail folders from the server and is used to get a static view of the e-mail folder hierarchy. For each folder, this command provides the folder type, display name, and collection ID.

Note: The **GetHierarchy** command has been deprecated. It is recommended that implementations use the **FolderSync** command instead of the **GetHierarchy** command.

The **GetHierarchy** command does not return contact or calendar collections. Because the **GetHierarchy** command does not return a synchronization key for a folder hierarchy, the **FolderSync** command should be used if the client will manipulate the folder hierarchy. The **GetHierarchy** command can be used if the client has limited support for multiple folders and must obtain the collection ID of a folder that does not change and cannot be deleted, such as Sent Items or Deleted Items.

The **GetHierarchy** command should not be used in a polling mode at the start of each synchronization, as was done in version 1.0 of the protocol. The **FolderSync** command should be used to get the complete folder hierarchy.

The Content-Type header should be omitted from the **GetHierarchy** command request.

A 500 status code is returned in the HTTP **POST** response if the request fails.

2.2.1.7.1 Request

No XML body is included in the **GetHierarchy** command request.

2.2.1.7.2 Response

2.2.1.7.2.1 Folders

The **Folders** element is a container for one or more Folder elements, which list the display name, server ID, type, and parent ID of the folder.

Parent elements	None
Child elements	<Folder>
Data type	**Container**
Number allowed	1 (Required)

2.2.1.7.2.2 Folder

The **Folder** element is a container for folder information elements that are returned to the client. Its child elements list the display name, server ID, type, and parent ID of the e-mail folder.

Parent elements	<Folders> (Response only)
Child elements	<DisplayName> <ServerId> <Type> <ParentId>
Data type	**Container**
Number allowed	1…n (Required)

2.2.1.7.2.3 DisplayName

The **DisplayName** element specifies the name of the folder that will be shown to the user.

Parent elements	<Folder> (Response only)
Child elements	None
Data type	**String**
Number allowed	1 (Required)

Only one **DisplayName** element can be included in each Folder element, but more than one Folder element may be returned in a response.

2.2.1.7.2.4 ServerId

The **ServerId** element specifies a unique identifier that is assigned by the server to each object that can be synchronized.

Parent elements	<Folder> (Response only)
Child elements	None

Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

The client must store the server ID for each object and be able to locate an object given a server ID. The client should store the server ID as a string of up to 64 characters. The client should make no assumptions about the format of the ID.

2.2.1.7.2.5 Type

The **Type** element specifies the type of the folder.

Parent elements	<Folder> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	1 (Required)

The valid values are listed in the following table.

Value	Meaning
1	User-created folder (generic)
2	Standard Inbox folder
3	Standard Drafts folder
4	Standard Deleted Items folder
5	Standard Sent Items folder
6	Standard Outbox folder

2.2.1.7.2.6 ParentId

This element specifies the server ID of the parent folder. A parent ID of 0 means the folder is one level below the root.

Parent elements	<Folder> (Response only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

2.2.1.8 GetItemEstimate

This command gets an estimate of the number of items in a collection/folder on the server that need to be synchronized.

2.2.1.8.1 Request

2.2.1.8.1.1 GetItemEstimate

The **GetItemEstimate** element is the top-level element in the XML stream. It indicates that the body of the HTTP POST contains a **GetItemEstimate** command.

Parent elements	None
Child elements	<Collections> (Request only) <Response> (Response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.8.1.2 Collections

The **Collections** element serves as a container for one to 300 **Collection** elements.

Parent elements	<GetItemEstimate> (Request only)
Child elements	<Collection>
Data type	**Container**
Number allowed	1 (Required)

2.2.1.8.1.3 Collection

The **Collection** element wraps elements that apply to a particular collection. A maximum of 300 **Collection** elements can be included in a single **Collections** element.

Parent elements	<Collections> (Request only) <Response> (Response only)
Child elements	<Class/> (No longer supported) <SyncKey/> (Request only) <CollectionId/> <FilterType/> (Request only) <Estimate/> (Response only)
Data type	**Container**
Number allowed	1…n (Required)

2.2.1.8.1.4 Class (not supported)

Important: This element is no longer supported in the ActiveSync protocol.

For Calendar, Tasks, or Contacts collections, the server will determine the collection type from the folder's Intelligent Process Flow (IPF) class. An e-mail collection type is assumed for generic folders.

If the client sends a Class element, then the server responds with a status code 4 (protocol error).

2.2.1.8.1.5 CollectionId

The required element **CollectionId** specifies the server ID of the collection from which the item estimate is being obtained.

Parent elements	<Collection>
Child elements	None

Data type	**String** (Up to 64 characters)
Number allowed	1..1 (Required)

The collection ID is obtained from the ServerId element of a previous FolderSync or FolderCreate command. The CollectionId element is used in both GetItemEstimate command requests and responses.

2.2.1.8.1.6 FilterType

The **FilterType** element specifies an optional time window in the GetItemEstimate command request for the objects sent from the server to the client.

Parent elements	<Collection> (Request only)
Child elements	None
Data type	**Integer**
Number allowed	0…1 (Optional)

The filter type applies to e-mail and calendar collections. If a filter type is specified, the server sends an estimate of the items within the filter specifications.

If the FilterType element is present in the request, the server manages objects on the client to maintain the specified time window. New objects are added to the client when they are within the time window. If the FilterType element is omitted, all objects are sent from the server.

Calendar items that are in the future or that have recurrence, but no end date, are sent to the client regardless of the filter type value

The valid values are listed in the following table.

Value	Meaning	Applies to e-mail	Applies to calendar
0	No filter	Yes	Yes
1	1 day ago	Yes	No
2	3 days ago	Yes	No
3	1 week ago	Yes	No
4	2 weeks ago	Yes	Yes
5	1 month ago	Yes	Yes
6	3 months ago	No	Yes
7	6 months ago	No	Yes

2.2.1.8.1.7 SyncKey

The **SyncKey** element specifies the current state of a collection. The value of the element is examined by the server to determine the state of the synchronization process.

Parent elements	<Collection> (Request only)

Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

2.2.1.8.2 Response

2.2.1.8.2.1 GetItemEstimate

The **GetItemEstimate** element is the top-level element in the XML stream. It indicates that the body of the HTTP POST contains a **GetItemEstimate** command.

2.2.1.8.2.2 Response

The **Response** element wraps elements that describe estimated changes. Its child elements specify the status of the **GetItemEstimate** command request and information about the collection on which the estimate was made.

Parent elements	<GetItemEstimate> (Response only)
Child elements	<Collection> <Status/>
Data type	**Container**
Number allowed	1 (Required)

2.2.1.8.2.3 Status

The **Status** element indicates the success or failure of a **GetItemEstimate** command request.

Parent elements	<Response> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	1 (Required)

Remarks

If the command fails, the **Status** element contains a code that indicates the type of failure. The **Status** element is global for all returned **Collection** elements. If one collection fails, a failure status is returned for all collections.

The following table lists the valid values for the element.

Value	Meaning
1	Success.
2	A collection was invalid or one of the specified collection IDs was invalid.
3	Synchronization state has not

Value	Meaning
	been primed yet. The **Sync** command must be performed first.
4	The specified synchronization key was invalid

2.2.1.8.2.4 Collection

The **Collection** element wraps elements that apply to a particular collection. A maximum of 300 **Collection** elements can be included in a single **Collections** element.

Parent elements	<Collections> (Request only) <Response> (Response only)
Child elements	<Class/> (No longer supported) <SyncKey/> (Request only) <CollectionId/> <FilterType/> (Request only) <Estimate/> (Response only)
Data type	**Container**
Number allowed	1…n (Required)

2.2.1.8.2.5 Class

The **Class** element specifies the type of a collection. The valid values are listed in the following table.

Value	Meaning
"Tasks"	A collection of tasks.
"Email"	A collection of e-mail messages.
"Calendar"	A collection of calendar items.
"Contacts"	A collection of contacts.
"Document"	A collection of file-share documents.

2.2.1.8.2.6 CollectionId

The **CollectionId** required element specifies the server ID of the collection from which the item estimate is being obtained.

The collection ID is obtained from the ServerId element of a previous FolderSync or FolderCreate command. The CollectionId element is used in both GetItemEstimate command requests and responses.

2.2.1.8.2.7 Estimate

The **Estimate** element specifies the estimated number of items in the collection/folder that need to be synchronized.

Parent elements	<Collection> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	1 (Required)

2.2.1.9 ItemOperations

The **ItemOperations** command acts as a container for the **Fetch** command and the **EmptyFolderContents** command to provide batched online operations of these commands against the computer that is running Microsoft® Exchange Server 2007.
Remarks

Operations that are contained within the **ItemOperations** node are executed by Exchange 2007 in the specified order. Exchange 2007 reports the status per operation to the client. Accordingly, the client correlates these responses to the initial operation and proceeds appropriately.

The **Fetch** operation is intended to be used on Microsoft Windows® SharePoint® Services technology or Universal Naming Convention (UNC) document metadata, search results, and items and attachments. The **EmptyFolderContents** operation enables the client to empty a folder of all its items. Clients will use **EmptyFolderContents** specifically to clear out all items in the Deleted Items folder if the user runs out of storage quota.

2.2.1.9.1 Delivery of Content Requested by Fetch

Because the **ItemOperations** response potentially contains large amounts of binary data, the client can choose a delivery method that is most efficient for its implementation by providing the following two methods for delivering the content that is requested by the **Fetch** command:

- Inline
- Multipart

Inline
The inline method of delivering binary content is content is Base64-encoded and included inside the WBXML. The inline approach generally requires the client to read the whole response into memory in order to parse it, thereby consuming a large amount of memory.

Multipart
The multipart method of delivering content is a multipart structure with the WBXML being the first part, and the requested data populating the subsequent parts. This format enables a client to handle large files without consuming large amounts of RAM, because a file is read in pieces, one piece at a time.

The multipart approach allows the client to parse the small WBXML part, obtain references to the binary parts, and handle the binary parts as needed, without reading the entire response into memory.

Multipart Request

If the client wants to have the document or documents returned in multipart format, the only difference between this request and the inline content request is the addition of the following HTTP header:

```
MS-ASAcceptMultiPart: T
```

If this header is not present, then the server uses the default of **FALSE**, and returns content inline. If the header is set to **TRUE**, then the server returns the document contents by using the multipart format.

The following is a sample request for the test.txt document in a UNC share:

```
POST /Microsoft-Server-
ActiveSync?Cmd=ItemOperations&User=administrator&DeviceId=v120Device&De
viceType=PocketPC
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 12.1
MS-ASAcceptMultiPart: T
<ItemOperations>
 <Fetch>
  <Store>DocumentLibrary</Store>
  <LinkId>\\feod31\public\test.txt</LinkId>
 </Fetch>
</ItemOperations>
```

Multipart Response

At a high level, the multipart response consists of several key elements:

- HTTP headers that specify the content type (HTTP 'Content-Type' header) of the multipart response: application/vnd.ms-sync.multipart.
- Metadata consisting of a list of [integer, integer] tuples that specify the start and count of bytes, respectively, of each body part. The following is the format of the metadata:

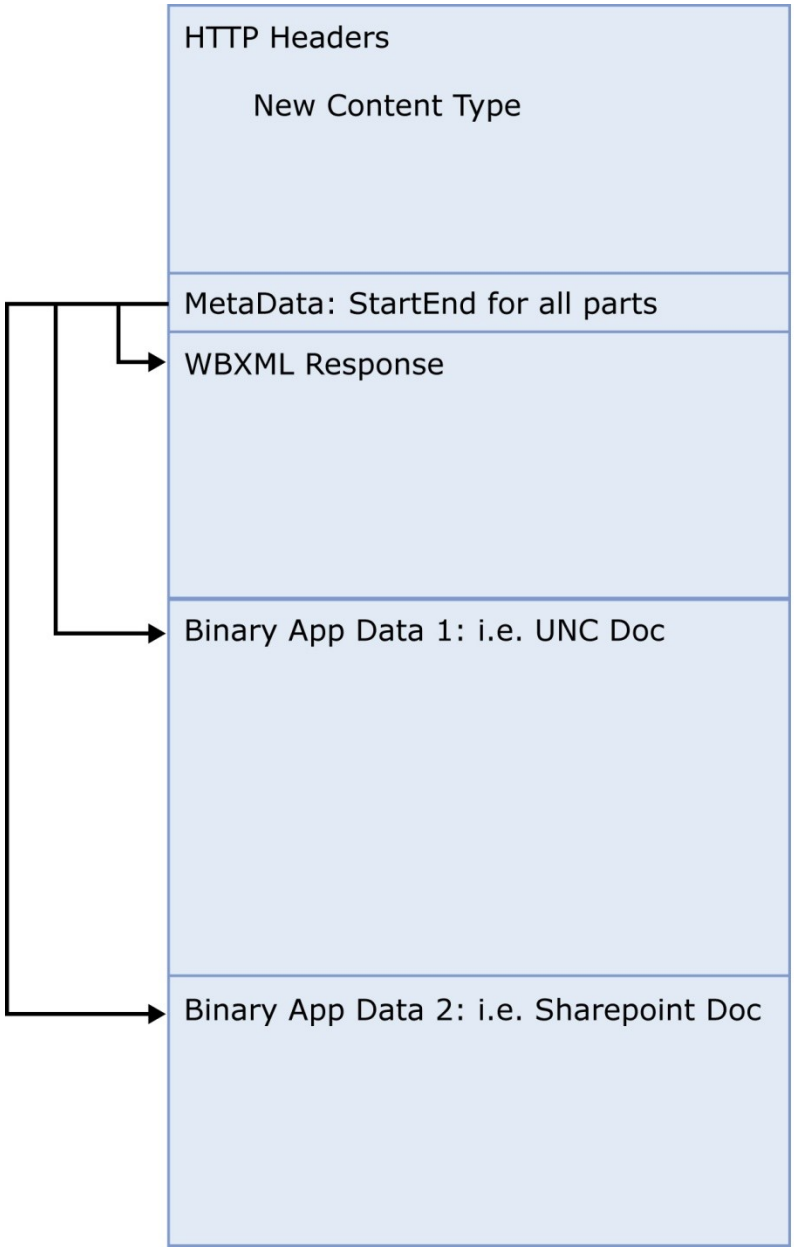
  ```
  'Number of Parts :' <number of body parts, including WBXML>
  'Part' <part #> ':' <range>
  ```

  Range specifies a [start, count] value that indicates the start and count of bytes for each body part. There is always at least one tuple, pointing to the WBXML response.
- The WBXML response, which contains status and application data for all requested items. The ActiveSync WBXML response is always the first part in the response. Items composed of binary content have a Part element that indicates the index (base

0) of the body part that corresponds to that item in the multipart structure. This index is used by the client to find the appropriate [start, count] entry in the metadata.

- Binary application data, which includes one or more binary data parts, the start and end byte of each of which is indicated in the WBXMLEX-Ranges header.

The following figure shows the elements of the multipart response.



2.2.1.9.2 Request

2.2.1.9.2.1 ItemOperations

The **ItemOperations** element is the top-level element in the XML document. The element identifies the body of the HTTP Post as containing a **ItemOperations** command.

Parent elements	None
Child elements	<Fetch> (request only) <EmptyFolderContents> (request only) <Response> <response only) <Status> (response only)
Data type	**Container**
Number allowed	1…1 (Required)

2.2.1.9.2.2 Fetch

The **Fetch** element retrieves an item from the server.

Parent elements	<ItemOperations> (request) <Response> (response)
Child elements	<Store> (request only) <LinkID/> (optional) <CollectionId> (optional) <ServerId> (optional) <Options/> <Status/> (response only) <Class/> (response only) <Properties/> (response only) <FileReference> (request only) <LongId> (request only)
Data type	**Container**
Number allowed	0..n (Optional)

The **Fetch** operation is intended to be used on Microsoft Windows® SharePoint® Services technology or Universal Naming Convention (UNC) document metadata, search results, and items and attachments.

Because the **ItemOperations** response potentially contains large amounts of binary data, the client can choose a delivery method that is most efficient for its implementation by providing the following two methods to deliver content that is requested by the **Fetch** command:

- Inline—The binary content is Base64-encoded and is included inside the WAP binary XML (WBXML).
- Multipart—This method involves a multipart structure in which the WBXML is the first part, and the requested data populates the subsequent parts. This format enables a client to handle large files without consuming large amounts of RAM.

The inline approach generally requires the client to read the WBXML part into memory in order to parse it, thereby consuming a large amount of memory. The multipart approach enables the client to parse the small WBXML part, obtain references to the binary parts, and handle the binary parts as needed, without reading the whole response into memory.

In the request, the client specifies the location and a byte range for the item. The location is indicated by either a link ID (**LinkId** element) if the target item is identified by a Uniform Resource Identifier (URI), a server ID (**ServerId** element) if an ActiveSync ID is being used to identify the item, or a file reference (**FileReference** element) if the client is retrieving an e-mail attachment.

The **Fetch** command supports several options, including:

- Byte ranges—The range of bytes for an item that is contained in a given **Fetch** command response. The specified range facilitates a checkpoint to improve the reliability of large data downloads. This option is supported for document library items and attachments; it is not supported for other item types.
- Body preference—Per-class settings on preferred body format. It is supported only for e-mail, contact, calendar, and task items; it is not supported for document library items or attachments.
- Schema—Per-class settings on format for search results. It is supported only for e-mail, contact, calendar, and task items; it is not supported for document library items or attachments.

The response will contain either the requested byte range of the item, or an error code that indicates why the fetch failed. If the client tries to fetch a resource that is not an item (such as a document folder), it will receive an error.

Multiple **Fetch** operations may be included within one **ItemOperations** request. In this case, the **Fetch** operations are executed in the order that is specified.

2.2.1.9.2.3 EmptyFolderContents

The **EmptyFolderContents** element identifies the body of the request or response as containing the operation that deletes the contents of a folder.
Summary

Parent elements	<ItemOperations> (request only) <Response> (response only)
Child elements	<CollectionId> <Options> (request only) <Status> (response only)
Data type	**Container**
Number allowed	0..N (optional)

The **EmptyFolderContents** element enables the client to empty a folder of all its items. The element supports a single option, which is whether to delete subfolders contained in the folder (the default is not to delete subfolders).

Specifically, clients will use **EmptyFolderContents** to empty the Deleted Items folder. The client should clear out all items in the Deleted Items folder when the user runs out of storage quota (generally indicated by the return of an HTTP 507 status code from the computer running Exchange Server 2007).

2.2.1.9.2.4 CollectionId

The **CollectionId** element enables a client to specify the folder to be emptied or the item to be fetched.

Parent elements	<EmptyFolderContents> <Fetch> (request only)
Child elements	None
Data type	**String**
Number allowed	0..1

2.2.1.9.2.5 Options

The **Options** element contains the options for its parent element. The child elements of **Options** will, therefore, depend on its parent element and the store/item type that is being acted upon.

Parent elements	<EmptyFolderContents>, <Fetch>
Child elements, <EmptyFolderContents> parent	<Range> <DeleteSubFolders>
Child elements, <Fetch> parent	<Range> <Schema> <airsyncbase:BodyPreference> <airsync:MIMESupport>
Data type	**Container**
Number allowed	0..1 (Optional)

The following options are supported for **Fetch**:

- Byte ranges
  - Facilitates a checkpoint to improve the reliability of large data downloads.
  - ActiveSync supports ranges for document library items and attachments; it does not support ranges for other item types—that is, Personal Information Manager (PIM) items, such as e-mail, contact, calendar, or task items.
  - For attachments, the range applies to the file content.
  - For document library items, this applies to the file content.
- Body preference
  - Per-class settings on preferred body format.
  - ActiveSync supports body preferences for PIM items only; it does not support body preferences for document library items or attachments.

- Schema
  - Per-class settings on format for search results.
  - ActiveSync supports schemas for PIM items only; it does not support schemas for document library items or attachments.
  - Supports all top-level property nodes.

If you specify an option that is invalid for the parent command, ActiveSync returns a protocol error.

2.2.1.9.2.6 DeleteSubFolders

The **DeleteSubFolders** element is a flag that indicates whether to delete the subfolders of the specified folder.

Parent elements	<Options>
Child elements	None
Data type	**Flag**
Number allowed	1..1 (required)

If the **DeleteSubFolders** element is not present in the request, the default behavior is to not delete subfolders

2.2.1.9.2.7 Store

The **Store** element specifies the name of the store to which the parent operation applies.

Parent elements	<Fetch> (request only)
Child elements	None
Data type	**Container**
Number allowed	1..1 (Optional)

The following values are valid for the **Store** element:

- Document Library (SharePoint and UNC links)
- Mailbox (items and attachments)

2.2.1.9.2.8 MIMESupport

The **MIMESupport** element is included in the **Options** element of a client **Fetch** command request to enable MIME support for e-mail items that are sent from the server to the client.

Parent elements	<Options> (Request only)
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

The following table lists the valid values for this element.

Value	Meaning
0	Never send MIME data.
1	Send MIME data for Security/MIME (S/MIME) messages only. Send regular body for all other messages.
2	Send MIME data for all messages. This flag could be used by clients to build a more rich and complete Inbox solution.

Remarks

To support fetching of the full S/MIME message, the **Fetch** request must include the following elements in the **Options** element:

- The **MIMESupport** element to indicate to the server to return MIME for S/MIME-only/All/None messages.
- The **BodyPreference** element with its child element, **Type** having a value of 4 to inform the server that the device can read the MIME binary large object (BLOB).

The server's response must include the **Body** element, which is a child of the **Properties** element. The **Body** element is a complex element and must contain the following child nodes in an S/MIME fetch response:

- The **Type** element with a value of 4 to inform the device that the data is a MIME binary large object (BLOB).
- The **EstimatedDataSize** element to specify the rough total size of the data.
- The **Data** element that contains the full MIME binary large object (BLOB).

For more information about the **Body** element or the **BodyPreference** element, see [MS-ASAIRS].

Example:

Request

```
<?xml version="1.0" encoding="utf-8"?>
<ItemOperations xmlns="ItemOperations:" xmlns:A="AirSync:"
xmlns:B="AirSyncBase:">
   <Fetch>
      <Store>Mailbox</Store>
      <A:CollectionId>17</A:CollectionId>
      <A:ServerId>17:11</A:ServerId>
      <Options>
         <MIMESupport xmlns="AirSync:">1</MIMESupport>
         <B:BodyPreference>
```

```
            <B:Type>4</B:Type>
         </B:BodyPreference>
      </Options>
   </Fetch>
</ItemOperations>
```

Response

```
<?xml version="1.0" encoding="utf-8"?>
<ItemOperations xmlns="ItemOperations:" xmlns:A="AirSync:"
xmlns:B="POOMMAIL:" xmlns:C="AirSyncBase:">
   <Status>1</Status>
   <Response>
      <Fetch>
         <Status>1</Status>
         <A:CollectionId>17</A:CollectionId>
         <A:ServerId>17:11</A:ServerId>
         <A:Class>Email</A:Class>
         <Properties>
            <B:To>"Mike Phipps" &lt;mike@contoso.com&gt;</B:To>
            <B:From>"Arlene Huff" &lt;arlene@contoso.com&gt;</B:From>
            <B:Subject>opaque s + e</B:Subject>
            <B:DateReceived>2007-02-01T06:42:46.015Z</B:DateReceived>
            <B:DisplayTo>Mike Phipps</B:DisplayTo>
            <B:ThreadTopic>opaque s + e</B:ThreadTopic>
            <B:Importance>1</B:Importance>
            <B:Read>1</B:Read>
            <C:Attachments>
               <C:Attachment>
                  <C:DisplayName>smime.p7m</C:DisplayName>

<C:FileReference>RgAAAAA4u8%2fWvU8lQ7GtLlC7V9V3BwCdyWYIRkOHRp2ozB%2f0DX
QsAHgM%2bwAFAAA6pk60fqkEQbWH4Wm%2bnjh7AHgNBA%2bgAAAJ%3a0</C:FileReferen
ce>
                  <C:Method>1</C:Method>
                  <C:EstimatedDataSize>9340</C:EstimatedDataSize>
```

```
            </C:Attachment>
         </C:Attachments>
         <C:Body>
            <C:Type>4</C:Type>
            <C:EstimatedDataSize>13813</C:EstimatedDataSize>
            <C:Data>Received: from contoso.com ([157.55.97.121])
 by contoso.com ([157.55.97.121]) with mapi;
 Wed, 31 Jan 2007 22:42:45 -0800
From: Arlene Huff &lt;arlene@contoso.com&gt;
To: Mike Phipps &lt;mike@contoso.com&gt;
Content-Class: urn:content-classes:message
Date: Wed, 31 Jan 2007 22:42:41 -0800
Subject: opaque s + e
Thread-Topic: opaque s + e
Thread-Index: AcdFzCv5tyCXieBuTd2I5APpEvS+iQ==
Message-ID:
 &lt;3AA64EB47EA90441B587E169BE9E387B780D00C326@contoso.com&gt;
Accept-Language: en-US
Content-Language: en-US
X-MS-Exchange-Organization-AuthAs: Internal
X-MS-Exchange-Organization-AuthMechanism: 04
X-MS-Exchange-Organization-AuthSource:
 contoso.com
X-MS-Has-Attach: yes
X-MS-Exchange-Organization-SCL: -1
X-MS-TNEF-Correlator:
acceptlanguage: en-US
Content-Type: application/x-pkcs7-mime; smime-type=enveloped-data;
name="smime.p7m"
Content-Disposition: attachment; filename="smime.p7m"
Content-Transfer-Encoding: base64
MIME-Version: 1.0
```

```
MIAGCSqGSIb3DQEHA6CAMIACAQAxggJEMIIBHgIBADCBhjB4MRMwEQYKCZImiZPyLGQBGRY
DY29t
MRkwFwYKCZImiZPyLGQBGRYJbWljcm9zb2Z0MRYwFAYKCZImiZPyLGQBGRYGZXh0ZXN0MR0
wGwYK
CZImiZPyLGQBGRYNamluZ2h1YWMwMURPTTEPMA0GA1UEAxMGVGVzdENBAgonJIo2AAAAAAA
HMA0G
(Large section of sample data removed)
               </C:Data>
            </C:Body>
            <B:MessageClass>IPM.Note.SMIME</B:MessageClass>
            <B:InternetCPID>20127</B:InternetCPID>
            <B:Flag/>
            <B:ContentClass>urn:content-
classes:message</B:ContentClass>
            <C:NativeBodyType>1</C:NativeBodyType>
         </Properties>
      </Fetch>
   </Response>
</ItemOperations>
```

2.2.1.9.2.9 LinkId

The **LinkId** element specifies a URI that is assigned by the server to certain resources, such as Windows SharePoint Services or UNC documents.

Parent elements	<Fetch>
Child elements	None
Data type	**URI**
Number allowed	0..1 (Optional)

The client must store the **LinkID** that is retrieved by the **Sync** or **Search** command if the client will make calls by using the **LinkID** in the future. In an **ItemOperations** request, the **LinkId** element may be used by the **Fetch** command to refer to the location of an item.

2.2.1.9.2.10 ServerId

The **ServerId** element specifies a unique identifier that is assigned by the server to each object that can be synchronized or have an item operation applied to it.

Parent	<Fetch>

elements	
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The client must store the server ID for any item that is retrieved by means of the **Sync** or **Search** command. In an **ItemOperations** request, the **ServerId** element may be used by the **Fetch** command to refer to the location of the item in question.

2.2.1.9.2.11 FileReference

The **FileReference** element specifies a unique identifier that is assigned by the server to each attachment to a given item.

Parent elements	<Fetch> (request only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The client must store the file reference for any item that is retrieved by means of the **Sync** or **Search** command. In an **ItemOperations** request, only one **FileReference** identifier can exist per **Fetch** node. Violation of this constraint will result in an error. The client may, however, retrieve multiple attachments by using one **Fetch** node per attachment.

2.2.1.9.2.12 Schema

The **Schema** element specifies the schema of the item to be fetched.

Parent elements	<Options> (request only)
Child elements	None
Data type	**Container**
Number allowed	0..1 (Optional)

The **Schema** element is supported within options for PIM **Fetch** requests. It is not supported when you are retrieving items from a document library or retrieving an attachment.
If **Schema** is not specified, the ActiveSync server will allow all properties of the current Exchange version and item type to be retrieved.

2.2.1.9.2.13 Range

In an **ItemOperations** request, the **Range** element specifies the range of bytes that the client can receive in response to the **Fetch** operation for a document library item. In an **ItemOperations** response, the **Range** element specifies the actual range of bytes for an item that is contained in a given **Fetch** operation.

Parent elements	<Options> (request) <properties> (response)
Child elements	None
Data type	String in the format 0-n, where n is the maximum value
Number allowed	0..1 (Optional)

The server provides a best effort at fulfilling the request. Therefore, the client must not assume that the byte-range that is specified in the request will exactly match the byte-range that is returned in the response. The byte-range that is specified by the server in the response should be treated as the authoritative value.
If **Range** is omitted in the **Fetch** request, the whole item will be fetched.

2.2.1.9.3 Response

2.2.1.9.3.1 ItemOperations

The **ItemOperations** element is the top-level element in the XML document. The element identifies the body of the HTTP Post as containing a **ItemOperations** command.

Parent elements	None
Child elements	<Fetch> (request only) <EmptyFolderContents> (request only) <Response> <response only) <Status> (response only)
Data type	**Container**
Number allowed	1…1 (Required)

2.2.1.9.3.2 Response

The **Response** element is a container for the operation responses.

Parent elements	<ItemOperations> (response only)
Child elements	<EmptyFolderContents> <Fetch>
Data type	**Container**
Number	1…1 (Required)

allowed	

2.2.1.9.3.3 EmptyFolderContents

The **EmptyFolderContents** element identifies the body of the request or response as containing the operation that deletes the contents of a folder.

Parent elements	<ItemOperations> (request only) <Response> (response only)
Child elements	<CollectionId> <Options> (request only) <Status> (response only)
Data type	**Container**
Number allowed	0..N (optional)

2.2.1.9.3.4 CollectionId

The **CollectionId** element enables a client to specify the folder to be emptied.

Parent elements	<EmptyFolderContents>
Child elements	None
Data type	**String**
Number allowed	1..1

2.2.1.9.3.5 Fetch

The **Fetch** element retrieves an item from the server.

Parent elements	<ItemOperations> (request) <Response> (response)
Child elements	<Store> (request only) <LinkID/> (optional) <CollectionId> (optional) <ServerId> (optional) <Options/> <Status/> (Response only) <Class/> (Response only) <Properties/> (Response only) <FileReference> (request only)
Data type	**Container**
Number allowed	0..n (Optional)

The **Fetch** operation is intended to be used on Microsoft Windows® SharePoint® Services technology or Universal Naming Convention (UNC) document metadata, search results, and items and attachments.

Because the **ItemOperations** response potentially contains large amounts of binary data, the ActiveSync protocol enables the client to choose a delivery method that is most efficient for its implementation by providing the following two methods to deliver content that is requested by the **Fetch** command:

- Inline—The binary content is Base64-encoded and is included inside the WAP binary XML (WBXML).
- Multipart—This method involves a multipart structure in which the WBXML is the first part, and the requested data populates the subsequent parts. This format enables a client to handle large files without consuming large amounts of RAM.

The inline approach generally requires the client to read the WBXML part into memory in order to parse it, thereby consuming a large amount of memory. The multipart approach enables the client to parse the small WBXML part, obtain references to the binary parts, and handle the binary parts as needed, without reading the whole response into memory.

In the request, the client specifies the location and a byte range for the item. The location is indicated by either a link ID (**LinkId** element) if the target item is identified by a Uniform Resource Identifier (URI), a server ID (**ServerId** element) if an ActiveSync ID is being used to identify the item, or a file reference (**FileReference** element) if the client is retrieving an e-mail attachment.

The **Fetch** command supports several options, including:

- Byte ranges—The range of bytes for an item that is contained in a given **Fetch** command response. The specified range facilitates a checkpoint to improve the reliability of large data downloads. This option is supported for document library items and attachments; it is not supported for other item types.
- Body preference—Per-class settings on preferred body format. It is supported only for e-mail, contact, calendar, and task items; it is not supported for document library items or attachments.
- Schema—Per-class settings on format for search results. It is supported only for e-mail, contact, calendar, and task items; it is not supported for document library items or attachments.

The response will contain either the requested byte range of the item, or an error code that indicates why the fetch failed. If the client tries to fetch a resource that is not an item (such as a document folder), it will receive an error.

Multiple **Fetch** operations may be included within one **ItemOperations** request. In this case, the **Fetch** operations are executed in the order that is specified.

2.2.1.9.3.6 LinkId

The **LinkId** element specifies a URI that is assigned by the server to certain resources, such as Windows SharePoint Services or UNC documents.

Parent elements	<Fetch>
Child elements	None
Data type	**URI**
Number allowed	0..1 (Optional)

The client must store the **LinkID** that is retrieved by the **Sync** or **Search** command if the client will make calls by using the **LinkID** in the future. In an **ItemOperations** request, the **LinkId** element may be used by the **Fetch** command to refer to the location of an item.

2.2.1.9.3.7 Class

In a response, the **Class** element indicates the class of the content of the fetched item.

Parent elements	<Schema> (request only) <Fetch> (request only <Content> (response only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The following are valid values for the **Class** element in a request or response:

- E-mail
- Contacts
- Calendar
- Tasks

2.2.1.9.3.8 Properties

The **Properties** element contains a list of the schema properties for the item that the client wants to have returned in the **Fetch** response.

Parent elements	<Schema> (request only) <Fetch> (response only)
Child elements	The schema properties of the item being fetched (request only) <Data> (response only) <Part> (response only) <Version> (response only) <Total> (response only) <airsyncbase:Body> (response only)

Data type	Container
Number allowed	1…1 (Required)

If an unsupported property is specified by the client, the server will return an error. If **Properties** is not specified, the server will use the synchronized schema for that item class for **Fetch** results.

2.2.1.9.3.9 Range

In an **ItemOperations** request, the **Range** element specifies the range of bytes that the client can receive in response to the **Fetch** operation for a document library item. In an **ItemOperations** response, the **Range** element specifies the actual range of bytes for an item that is contained in a given **Fetch** operation.

Summary

Parent elements	<Options> (request) <Properties> (response)
Child elements	None
Data type	String in the format 0-n, where n is the maximum value
Number allowed	0..1 (Optional)

The server provides a best effort at fulfilling the request. Therefore, the client must not assume that the byte-range that is specified in the request will exactly match the byte-range that is returned in the response. The byte-range that is specified by the server in the response should be treated as the authoritative value.
If **Range** is omitted in the **Fetch** request, the whole item will be fetched.

2.2.1.9.3.10 Status

The **Status** element contains a code that indicates the success or failure of the **ItemOperations** command and the operations within the **ItemOperations** command.

Parent elements	<EmptyFolderContents> <Fetch> <ItemOperations>
Child elements	None
Data type	**Integer**
Number allowed	0…1

The following table lists the different status codes.

Status	Meaning

Code	
1	Success.
2	Protocol error - protocol violation/XML validation error.
3	Server error.
4	Document library access - The specified URI is bad.
5	Document library - Access denied.
6	Document library - The object was not found.
7	Document library - Failed to connect to the server.
8	Document library - The byte-range is invalid or too large.
9	Document library - The store is unknown or unsupported.
10	Document library - The file is empty.
11	Document library - The requested data size is too large.
12	Document library - Failed to download file because of input/output (I/O) failure.
13	Mailbox fetch provider - The body preference option is invalid.
14	Mailbox fetch provider - The item failed conversion.
15	Attachment fetch provider - Attachment or attachment ID is invalid.
16	Policy-related - Server blocked access.
17	Empty folder contents - Partial success; the command completed partially.
18	Credentials required.

The status is specified for the **ItemOperations** response, and for each fetch operation or empty-folder-contents operation within the **ItemOperations** command. If the status is not returned for an operation, the client assumes success.

2.2.1.9.3.11 Data

The **Data** element is part of the response for the **Fetch** command and contains the item content for inline content responses.

Parent elements	<Properties> (response only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The content of the **Data** element is a Base64-encoding of the binary document, attachment, or body data. The size of the data (in bytes) that is contained within the **Data** element is indicated by the **Range** element in the fetch response. The total size of the item (in bytes) is indicated by the **Total** element.

2.2.1.9.3.12 Part

The **Part** element specifies an integer index into the metadata of the multipart response.

Parent elements	<Properties> (response only)
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

The **Part** element is present only in a multipart **ItemOperations** response.
The **Part** element can be used to locate the [start, end] tuple that specifies the starting byte and ending byte for this item's binary content in the command response.

2.2.1.9.3.13 Version

The **Version** element is a date/time stamp that indicates the time at which a document item was last modified.

Parent elements	<Properties> (response only)
Child elements	None
Data type	**DateTime**
Number allowed	0..1 (Optional)

The **Version** element will be present only in the response and only when **ItemOperations** is used to access a Windows SharePoint Services or UNC resource.

2.2.1.9.3.14 Total

The **Total** element indicates the total size of an item on the server, in bytes.

Parent elements	<Properties> (response only)
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

2.2.1.10 MeetingResponse

The **MeetingResponse** command is used to accept, tentatively accept, or decline a meeting request in the user's Inbox.

The **MeetingResponse** command can only be used if synchronizing by using the **CollectionId** element is being performed on the folder that contains the meeting request item.

The **SendMail** command can be used to send a message back to the meeting organizer, notifying him or her that the meeting request was accepted or declined.

2.2.1.10.1 Request

2.2.1.10.1.1 CollectionId

The **ElementName** element specifies the folder that contains the meeting request.

Parent elements	<Request> (Request only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	0..1 (Required, or optional if **LongId** is specified)

The **CollectionId** element specifies the Inbox folder in most implementations.
The collection ID is obtained from the **ServerId** element of a previous **FolderSync** or **FolderCreate** command.

2.2.1.10.1.2 Request

The **Request** element is a container for elements in a **MeetingResponse** command request. Its child elements specify the meeting request that is being responded to, the response to that meeting request, and the folder on the server that the meeting request is located in.

Parent elements	<MeetingResponse> (Request only)
Child elements	<UserResponse/> <CollectionId/> <RequestId/> <LongId/>
Data type	**Container**
Number allowed	1…n (Required)

2.2.1.10.1.3 RequestId

The **RequestId** element specifies the server ID of the meeting request message item.

Parent elements	<Request> (Request only) <Result> (Response only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	0..1 (Required, or optional if **LongId** is specified)

When the client sends a **MeetingResponse** command request, the client includes a **RequestId** element to identify which meeting request is being responded to. The **RequestId** element is also returned in the response to the client along with the status of the user's response to the meeting request.

The following example shows a meeting request, which is identified on the server by the **RequestId** element, being declined.

Request

```
<Request>
  <UserResponse>3</UserResponse>
  <CollectionId> 1</CollectionId>
  <RequestId>2:6</RequestId>
</Request>
```

Response

```
<Result>
  <RequestId>2:6</RequestId>
  <Status>1</Status>
</Result>
```

2.2.1.10.1.4 UserResponse

The **UserResponse** element indicates in the **MeetingResponse** command request whether the meeting is being accepted, tentatively accepted, or declined.

Parent elements	<Request> (Request only)
Child elements	None
Data type	**Integer**
Number allowed	1 (Required)

The following table shows valid values for the element.

Value	Meaning
1	Accepted
2	Tentatively accepted
3	Declined

2.2.1.10.2 Response

2.2.1.10.2.1 CalendarId

The **CalendarId** element specifies the server ID of the calendar item.

Parent elements	<Result> (Response only)

Child elements	None
Data type	String (Up to 64 characters)
Number allowed	0..1

The following table shows valid values for the element.

Value	Meaning
1	Success

The **CalendarId** element is included in the **MeetingResponse** command response that is sent to the client if the meeting request was not declined. If the meeting is accepted or tentatively accepted, the server adds a new item to the calendar and returns its server ID in the **CalendarId** element in the response. If the client created a tentative meeting calendar item, the client should update that item with the server ID. The client should also change the busy status from tentative to busy. When a meeting is accepted, the server also creates a new calendar item with the same server ID. This means there will be a conflict that will be resolved the next time the calendar is synchronized.

If the meeting is declined, the response does not contain a calendar ID.

2.2.1.10.2.2 RequestId

The **RequestId** element specifies the server ID of the meeting request message item.

Parent elements	<Request> (Request only) <Result> (Response only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

When the client sends a **MeetingResponse** command request, the client includes a **RequestId** element to identify which meeting request is being responded to. The **RequestId** element is also returned in the response to the client along with the status of the user's response to the meeting request.

The following example shows a meeting request, which is identified on the server by the **RequestId** element, being declined.

Request

```
<Request>
  <UserResponse>3</UserResponse>
  <CollectionId> 1</CollectionId>
  <RequestId>2:6</RequestId>
</Request>
```

Response

```
<Result>
  <RequestId>2:6</RequestId>
  <Status>1</Status>
</Result>
```

2.2.1.10.2.3 Result

The **Result** element is a container for elements that are sent to the client in a **MeetingResponse** command response.

Parent elements	<MeetingResponse> (Response only)
Child elements	<RequestId/> <Status/> <CalendarId/>
Data type	**Container**
Number allowed	1…n (Required)

The **Result** element's child elements identify the meeting request message item on the server and the status of the response to the meeting request. If the meeting request is accepted, the server ID of the calendar item is also returned.

2.2.1.10.2.4 Status

The **Status** element indicates the success or failure of the **MeetingResponse** command request.

Parent elements	<Result> (Response only)
Child elements	None
Data type	Integer
Number allowed	1…n (Required)

The following table shows valid values for the element.

Value	Meaning
1	Success.
2	Invalid meeting request.
3	An error occurred on the mailbox.
4	Error occurred on Exchange server.

The **Status** element is sent only in responses from the server to the client.
The values for the **Status** element when sent in a response to the **MeetingResponse** command are the same as for the **Sync** command.

2.2.1.11 MoveItems

The **MoveItems** command moves an item or items from one folder on the server to another.

The item to be moved is identified by its server ID in the **MoveItems** command request. The source and destination folders are also identified by their server IDs in the command request. The **MoveItems** command response shows the status of the move, the message that was moved, and the new message ID.

When items are moved between folders on the server, the client receives **Delete** and **Add** operations the next time the client synchronizes the affected folders.
An item that has been successfully moved to a different folder can be assigned a new server ID by the server.

2.2.1.11.1 Request

2.2.1.11.1.1 DstFldId

The **DstFldId** element specifies the server ID of the destination folder (that is, the folder to which the items will be moved).

Parent elements	<Move> (Request only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

The server ID of the destination folder is obtained from the **ServerId** element of a previous **FolderSync** or **FolderCreate** command.

2.2.1.11.1.2 MoveItems

The **MoveItems** element is the top-level element in the XML document. It identifies the body of the HTTP **Post** as containing a **MoveItems** command.

Parent elements	None
Child elements	<Move> (Request only) <Response> (Response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.11.1.3 Move

The **Move** element is a container for elements that describe details of the items to be moved.

Parent elements	<MoveItems> (Request only)
Child elements	<SrcMsgId/> <SrcFldId/> <DstFldId/>
Data type	**Container**
Number allowed	1..n (Required)

The **Move** element's child elements specify the item to be moved, the folder it's currently located in, and the folder it will be moved to.

2.2.1.11.1.4 SrcFldId

The **SrcFldId** element specifies the server ID of the source folder (that is, the folder that contains the items to be moved).

Parent elements	<Move>
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

The server ID of the source folder is obtained from the **ServerId** element of a previous **FolderSync** or **FolderCreate** command.

2.2.1.11.2 Response

2.2.1.11.2.1 DstMsgId

The **DstMsgId** element specifies the new server ID of the item after the item is moved to the destination folder.

Parent elements	<Response> (response only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (required)

2.2.1.11.2.2 MoveItems

The **MoveItems** element is the top-level element in the XML document. It identifies the body of the HTTP **Post** as containing a **MoveItems** command.

Parent elements	None
Child elements	<Move> (Request only) <Response> (Response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.11.2.3 Response

The **Response** element serves as a container for elements that describe the moved items.

Parent elements	<MoveItems> (response only)
Child elements	<SrcMsgId/> <Status/> <DstMsgId/>
Data type	**Container**
Number allowed	1 (Required)

2.2.1.11.2.4 SrcMsgId

The **SrcMsgId** element specifies the server ID of the item to be moved.

Parent elements	<Move> (Request only) <Response> (Response only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

2.2.1.11.2.5 Status

The **Status** element indicates the success or failure of an item moved. If the command failed, **Status** contains a code indicating the type of failure.

Parent elements	<Response> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	1 (Required)

The following table shows valid values for the element.

Value	Meaning
1	Invalid source collection ID.
2	Invalid destination collection ID.
3	Success.
4	Source and destination collection IDs are the same.
5	A failure occurred during the **MoveItem** operation.
6	An item with that name already exists at the destination.
7	Source or destination item was locked.

The **Status** element is sent only in responses from the server to the client.

2.2.1.12 Notify (not supported)

The **Notify** command is no longer supported in the ActiveSync protocol. Instead, use the **Ping** command to monitor folders for new items, and the **Settings** command to set device information.

2.2.1.13 Ping

The **Ping** command is used to request that the server monitor specified folders for changes that would require the client to resynchronize.

The body of the request contains a list of folders on the server about which the client is requesting notifications and an interval of time that specifies how long the server should wait before responding.

The server does not immediately issue a response to the client's **Ping** request. Instead, the server waits until one of two events occur: Either the time-out that is specified by the client

elapses or changes occur in one of the folders that the client specifies. The response that the server issues indicates which of these events has happened so that the client can react appropriately.

In the case of no changes on the server, the client reissues the **Ping** request. In the case of changes, the response indicates in which folders those changes occurred and the client can resynchronize these folders.

Note that, if no changes occur in any of the folders that are specified by the client for a significant length of time, the client runs in a loop in which it issues a **Ping** request, receives a response indicating that there are no changes, and then reissues the **Ping** request. This loop is called *the heartbeat*. The length of time that the server should wait before issuing a response is called *the heartbeat interval*.

To reduce the amount of data that must be sent in a **Ping** command request, the server caches the heartbeat interval and folder list. The client may omit the heartbeat interval, the folder list, or both from subsequent **Ping** requests if those parameters have not changed from the previous **Ping** request. If neither the heartbeat interval nor the folder list has changed, the client can issue a **Ping** request that does not contain an XML body. If the **Ping** element is specified in an XML request body, either the **HeartbeatInterval** element or the **Folders** element or both must be specified.

2.2.1.13.1 Request

2.2.1.13.1.1 Class

The **Class** element specifies the content class of the folder to be monitored. The possible content classes are **Email**, **Calendar**, **Contacts**, and **Tasks**.

Parent elements	<Folder> (Request only)
Child elements	None
Data type	**String**
Number allowed	1 (Required)

2.2.1.13.1.2 Folder

The **Folder** element contains the **Id** and **Class** elements in the **Ping** command request, which identifies the folder and folder type to be monitored by the client. The **Folder** element is also returned by the server with the **Status** element, where the element identifies the folder that is being described by the returned status code.

Parent elements	<Folders>
Child elements	<Id> (Request only) <Class> (Request only) None (Response only)
Data type	**Container** (Request only) **String** (Response only)

Number allowed	1…N (Optional)

2.2.1.13.1.3 Folders

The **Folders** element serves as a container for the **Folder** element.

Parent elements	<Ping>
Child elements	<Folder>
Data type	**Container**
Number allowed	0…1 (Optional)

2.2.1.13.1.4 HeartbeatInterval

The **HeartbeatInterval** element is specifies the length of time, in seconds, that the server should wait before notifying the client of changes in a folder on the server. The **HeartbeatInterval** element is also returned by the server with a status code of 5 and specifies either the minimum or maximum interval that is allowed when the client has requested a heartbeat interval that is outside the acceptable range.

Parent elements	<Ping>
Child elements	None
Data type	**Integer**
Number allowed	Request- 1 (Required in first request only) Response- 0…1 (Optional)

The **HeartbeatInterval** element is only required in the first **Ping** command request from a device by a given user. The server then caches the heartbeat interval value so that in later requests the **HeartbeatInterval** element is necessary only if the client is changing the interval.

2.2.1.13.1.5 Id

The **Id** element specifies the server ID of the folder to be monitored.

Parent elements	<Folder> (Request only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

The server ID of the folder is obtained from the **ServerId** element of a previous **FolderSync** or **FolderCreate** command.

2.2.1.13.1.6 Ping

The **Ping** element is the top-level element in the XML document. It identifies the body of the HTTP **POST** as containing a **Ping** command.

Parent elements	None
Child elements	<Folders> <HeartbeatInterval> <MaxFolders> (response only) <Status> (response only)
Data type	**Container**
Number allowed	1 (Required)

The **Ping** element can also include one or more explicit namespace attributes.

The following is an example of the **Ping** element in a **Ping** command request or response.

Request/Response

```
<?xml version="1.0" encoding="utf-8"?>
<Ping xmlns="Ping:">
  <Folders>
  ...
  </Folders>
</Ping>
```

2.2.1.13.2 Response

2.2.1.13.2.1 Folder

The **Folder** element contains the **Id** and **Class** elements in the **Ping** command request, which identifies the folder and folder type to be monitored by the client. The **Folder** element is also returned by the server with the **Status** element, where the element identifies the folder that is being described by the returned status code.

Parent elements	<Folders>
Child elements	<Id> (Request only) <Class> (Request only) None (Response only)
Data type	**Container** (Request only) **String** (Response only)
Number allowed	1…N (Optional)

2.2.1.13.2.2 Folders

The **Folders** element serves as a container for the **Folder** element.

Parent elements	<Ping>
Child elements	<Folder>
Data type	**Container**

Number allowed	0…1 (Optional)

2.2.1.13.2.3 HeartbeatInterval

The **HeartbeatInterval** element is specifies the length of time, in seconds, that the server should wait before notifying the client of changes in a folder on the server. The **HeartbeatInterval** element is also returned by the server with a status code of 5 and specifies either the minimum or maximum interval that is allowed when the client has requested a heartbeat interval that is outside the acceptable range.

Parent elements	<Ping>
Child elements	None
Data type	**Integer**
Number allowed	Request- 1 (Required in first request only) Response- 0…1 (Optional)

The **HeartbeatInterval** element is only required in the first **Ping** command request from a device by a given user. The server then caches the heartbeat interval value so that in later requests the **HeartbeatInterval** element is necessary only if the client is changing the interval.

2.2.1.13.2.4 MaxFolders

The **MaxFolders** element specifies the maximum number of folders that can be monitored.

Parent elements	<Ping> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	0…1 (Optional)

The **MaxFolders** element is returned in a response with a status code of 6.

2.2.1.13.2.5 Ping

The **Ping** element is the top-level element in the XML document. It identifies the body of the HTTP **POST** as containing a **Ping** command.

Parent elements	None
Child elements	<Folders> <HeartbeatInterval> <MaxFolders> (response only) <Status> (response only)
Data type	**Container**
Number allowed	1 (Required)

The **Ping** element can also include one or more explicit namespace attributes.

The following is an example of the **Ping** element in a **Ping** command request or response.

Request/Response

```
<?xml version="1.0" encoding="utf-8"?>
<Ping xmlns="Ping:">
  <Folders>
  ...
  </Folders>
</Ping>
```

2.2.1.13.2.6 Status

The **Status** element indicates the success or failure of the **Ping** command request. If the command failed, the **Status** element contains a code that indicates the type of failure. Certain status codes have additional information that is included in the response.

Parent elements	<Ping> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	1 (Required)

The following table lists valid values for the element.

Value	Meaning
1	The heartbeat interval expired before any changes occurred in the folders that are being monitored. The client should reissue the **Ping** command request.
2	Changes occurred in at least one of the folders that were being monitored. The response includes the folders in which these changes have occurred.
3	The client **Ping** command request did not specify all the necessary parameters. The client is expected to issue a **Ping** request that includes both the heartbeat interval and the folder list.
4	There is a general error in the **Ping** request that was issued by the client, which can be caused by poorly formatted WAP binary XML (WBXML).
5	The heartbeat interval that was specified by the client is outside the range that was set by the server administrator. If the specified interval was too great, the returned interval will be the maximum allowed value. If the specified interval was too low, the returned interval will be the minimum allowed value.

6	The **Ping** command request specified more folders to monitor for changes than is allowed by the limit that was configured by the server administrator. The response specifies the limit in the **MaxFolders** element.
7	The client specified a folder that has been moved or deleted. The client should issue a **FolderSync** request.
8	An error has occurred. The client should reissue the **Ping** request.

The **Status** element is sent only in responses from the server to the client.

The following example shows a typical response to a **Ping** command request, when the heartbeat interval that was specified by the client has expired and there were no changes in any of the specified folders.

Response

```
<Ping xmlns="Ping:">
  <Status>1</Status>
</Ping>
```

The following example shows that changes have occurred in two folders that were being monitored. The client is expected to synchronize the specified folders. The next **Ping** command should not be reissued until the folders have been synchronized.

Response

```
<Ping xmlns="Ping:">
  <Status>2</Status>
  <Folders>
    <Folder>1234</Folder>
    <Folder>5678</Folder>
  </Folders>
</Ping>
```

The following example shows a response to a **Ping** command request that specified a heartbeat interval outside the acceptable range. The returned heartbeat interval will be either the minimum or maximum allowed value. The client is expected to compare the requested interval with the returned interval and determine whether the requested heartbeat interval was either too great or too small.

Response

```
<Ping xmlns="Ping:">
  <Status>5</Status>
  <HeartbeatInterval>60</HeartbeatInterval>
</Ping>
```

Example

The following example shows a response to a **Ping** command request where the number of folders that was specified was greater than the maximum number of folders that are allowed to be monitored. The maximum number of folders that are allowed to be monitored is returned in the **MaxFolders** element.

Response

```
<Ping xmlns="Ping:">
  <Status>6</Status>
  <MaxFolders>200</MaxFolders>
</Ping>
```

2.2.1.14 Provision

The **Provision** command enables client devices to request from the server the security policy settings that the Microsoft® Exchange Server administrator sets, such as the minimum personal identification number (PIN) password length requirement.

The software on the client device ensures that the security policy settings are actually enforced. The server can only enforce that the client device has requested the policy settings before the client is allowed to synchronize with the server. The server must rely on the client to apply the policy settings on the client device.

The **Provision** command also supports *remote wipe*. At the request of an administrator, a given device can have its memory wiped. On the next request, the device will receive a prompt to refresh its policy settings. The policy settings will include a request from the server to wipe the local memory of the client device.

The server tracks a shared policy key, which identifies the policy for the client. The policy key is provided to the server after the policy has been generated. If there is a mismatch between the server and client policy keys or if the administrator has directed that the device be wiped, the server returns a custom HTTP 449 Need Provisioning response. When the client receives the custom HTTP 449 response, the client will execute the **Provision** command to update the policy, thereby obtaining the policy settings, a remote wipe directive, or both.

There are two phases to the **Provision** command: request and download of policy settings, and acknowledgement that the policy settings have been received and applied. Before synchronizing with the server, the client device requests the policy settings from the server. After it receives the policy settings or remote wipe directive from the server in the **Provision**

command response, the client device must issue an acknowledgement that indicates success or failure in receipt and intent to comply with the settings. The acknowledgement phase of the **Provision** command request varies depending on the context.

Devices should not use the **Provision** command without having unsuccessfully tried to communicate with the server. For example, a device might request provisioning after it receives a 449 response to a **Sync** request.

The current policy information on the client is encoded in a policy key, which is sent to the server in the X-MS-PolicyKey of the HTTP header of all protocol commands except for the **Ping** and **Options** commands. If the policy key of the client is out of date, the server returns an HTTP 449 status code. The client must then issue a new **Provision** command to obtain the latest policy key.

Note that the only **PolicyKey** element value that the client can successfully use is the key that it obtained from the most recent server response to the acknowledgement phase of the provisioning session. The **PolicyKey** from the initial **Provision** command is temporary and can only be used to obtain a more permanent key. This temporary policy key cannot be used to verify that the client has complied with the policy that is set on the server.

2.2.1.14.1 Request

2.2.1.14.1.1 Policies

The **Policies** element is a container object for one or more **Policy** elements.

Parent elements	<Provision>
Child elements	<Policy>
Data type	**Container**
Number allowed	1 (Required)

2.2.1.14.1.2 Policy

The **Policy** element serves as the container for the **Data**, **PolicyKey**, **PolicyType**, and **Status** elements.

Parent elements	<Policies>
Child elements	<Data>, <PolicyKey>, <PolicyType>, <Status>
Data type	**Container**
Number allowed	1…N

2.2.1.14.1.3 PolicyKey

The **PolicyKey** element is used by the server to mark the state of policy settings on the client device in the settings download phase of the **Provision** command. In the acknowledgement phase, the **PolicyKey** element is used by the client and server to correlate acknowledgements to a particular policy setting.

Parent elements	<Policy>
Child elements	None
Data type	**String** (64 characters maximum)
Number allowed	1 (Optional)

The **PolicyKey** element is a random unit.

When you issue an initial **Provision** command, omit the **PolicyKey** tag and X-MS-PolicyKey line in the HTTP header.

2.2.1.14.1.4 PolicyType

In the download policy settings phase, the **PolicyType** element specifies the format in which the policy settings are to be provided to the client device.

Parent elements	<Policy>
Child elements	None
Data type	**String**
Number allowed	0…1 (Optional)

The following table lists valid values for the **PolicyType** element.

Value	Meaning
MS-WAP-Provisioning-XML	The policy settings are formatted according to the WAP provisioning schema.
MS-EAS-Provisioning-WBXML	The policy settings are formatted according to the ActiveSync WBXML provisioning schema.

Note: The WAP provisioning schema has been deprecated in the ActiveSync protocol.

2.2.1.14.1.5 Provision

The **Provision** element is the top-level element in the XML document. The element identifies the body of the HTTP Post as containing a **Provision** command.

Parent elements	None
Child elements	<Policies>, <RemoteWipe>, <Status>
Data type	**Container**
Number allowed	1 (Required)

2.2.1.14.2 Response

2.2.1.14.2.1 Data

The **Data** element contains policy settings for the device.

Parent elements	<Policy> (response only)
Child elements	<eas-provisioningdoc>
Data type	**Container**
Number allowed	0…1 (Optional)

The policy settings are specified in a format that is defined by one of the following provisioning schemas:

- Wireless Application Protocol (WAP)**.** Note: The WAP provisioning schema has been deprecated in the ActiveSync protocol.
- ActiveSync WAP binary XML (WBXML). For more information, see [MS-ASWBXML].

The format of the policy settings is specified by the **PolicyType** element.

The **Data** element is optional and is only sent if policy information must be conveyed.

2.2.1.14.2.2 Policies

The **Policies** element is a container object for one or more **Policy** elements.

Parent elements	<Provision>
Child elements	<Policy>
Data type	**Container**
Number allowed	1 (Required)

2.2.1.14.2.3 Policy

The **Policy** element serves as the container for the **Data**, **PolicyKey**, **PolicyType**, and **Status** elements.

Parent elements	<Policies>
Child elements	<Data>, <PolicyKey>, <PolicyType>, <Status>
Data type	**Container**
Number allowed	1…N

2.2.1.14.2.4 PolicyKey

The **PolicyKey** element is used by the server to mark the state of policy settings on the client device in the settings download phase of the **Provision** command. In the acknowledgement phase, the **PolicyKey** element is used by the client and server to correlate acknowledgements to a particular policy setting.

Parent elements	<Policy>
Child elements	None
Data type	**String** (64 characters maximum)
Number allowed	1 (Optional)

The **PolicyKey** element is a random unit.
When you issue an initial **Provision** command, omit the **PolicyKey** tag and X-MS-PolicyKey line in the HTTP header.

2.2.1.14.2.5 PolicyType

In the download policy settings phase, the **PolicyType** element specifies the format in which the policy settings are to be provided to the client device.

Parent elements	<Policy>
Child elements	None
Data type	**String**
Number allowed	0…1 (Optional)

The following table lists valid values for the **PolicyType** element.

Value	Meaning
MS-WAP-Provisioning-XML	The policy settings are formatted according to the WAP provisioning schema.
MS-EAS-Provisioning-WBXML	The policy settings are formatted according to the ActiveSync WBXML provisioning schema.

Note: The WAP provisioning schema has been deprecated in the ActiveSync protocol.

2.2.1.14.2.6 Provision

The **Provision** element is the top-level element in the XML document. The element identifies the body of the HTTP Post as containing a **Provision** command.

Parent elements	None
Child elements	<Policies>, <RemoteWipe>, <Status>
Data type	**Container**
Number allowed	1 (Required)

2.2.1.14.2.7 RemoteWipe

The **RemoteWipe** element is used by the server to request a remote wipe of the client device or by the client to acknowledge a remote wipe request from the server.

Parent elements	<Provision>
Child elements	<Status>
Data type	**Container**
Number allowed	0…1 (Optional)

2.2.1.14.2.8 Status

The **Status** element indicates success of the command in two different locations in the response. The **Status** element that is returned as a direct child of the **Provision** element indicates whether the **Provision** command was handled correctly. The **Status** element that is returned as a child of a **Policy** element indicates whether the policy settings were applied correctly.

Parent elements	<Provision>, <Policy>, <RemoteWipe>
Child elements	None
Data type	**Integer**
Number allowed	0…1 (Optional)

The following table lists valid values for the **Status** element as a child of the **Provision** element in the response from the server to the client. This is the status at the top level.

Value	Meaning
1	Success
2	Protocol error
3	General server error

The following table lists valid values for the **Status** element as a child of the **Policy** element in the response from the server to the client.

Value	Meaning
1	Success.
2	There is no policy for this client.
3	Unknown <PolicyType> value.
4	The policy data on the server is corrupted (possibly tampered with).
5	The client is acknowledging the wrong policy key.

The following table lists valid values for the **Status** element as a child of the **Policy** element in the response from the client to the server.

Value	Meaning
1	Success.
2	Partial success (at least the PIN was enabled).

3	The client did not apply the policy at all.
4	The device is externally managed.

The following table lists valid values for the **Status** element as a child of the **RemoteWipe** element in the response from the client to the server.

Value	Meaning
1	Success
2	Failure

In the **Status** element that is returned as a direct child of the **Provision** element, a value of 1 indicates that no errors were detected in the **Provision** command request. Errors can be detected within individual **Policy** elements. These errors are reported in the lower-level **Status** element values and they do not represent errors in processing the command.
In the **Status** element that is returned as a child of a **Policy** element, a value of 1 indicates that either the policy settings were successfully applied on the client device, or the client has received the remote wipe directive from the server.

2.2.1.15 ResolveRecipients

The **ResolveRecipients** command is used by clients to resolve a list of supplied recipients and, optionally, to retrieve their Security/Multipurpose Internet Mail Extensions (S/MIME) certificates so that clients can send encrypted S/MIME e-mail messages.

2.2.1.15.1 Request

2.2.1.15.1.1 CertificateRetrieval

The **CertificateRetrieval** element specifies whether S/MIME certificates should be returned by the server for each resolved recipient.
Summary

Parent elements	<Options> (Request only)
Child elements	None
Data type	**Integer**
Number allowed	1…1

The following table shows valid values for the **CertificateRetrieval**.

Value	Meaning
1	Do not retrieve certificates for the recipient (default).
2	Retrieve x509 certificate(s) for each resolved recipient.
3	Retrieve the certificate for each resolved recipient.

2.2.1.15.1.2 MaxAmbiguousRecipients

The **MaxAmbiguousRecipients** element limits the number of suggestions that will be returned for each ambiguous recipient node in the response.

Parent elements	<Options> (Request only)
Child elements	None
Data type	**Integer**
Number allowed	0…1

The value of **MaxAmbiguousRecipients** is limited to a range of 0–9999. Each ambiguous recipient node will receive only this many suggestions and no more. The recipient count, returned in the **RecipientCount** element, can be used by the client to determine the total number of suggestions available for that recipient.

2.2.1.15.1.3 Options

The **Options** element contains the options for resolving the list of recipients.

Parent elements	<ResolveRecipients> (Request only)
Child elements	<CertificateRetrieval>, <MaxCertificates>, <MaxAmbiguousRecipients>
Data type	**Container**
Number allowed	0…1 (Optional)

2.2.1.15.1.4 MaxCertificates

The **MaxCertificates** element limits the total number of certificates that will be returned by the server.

Parent elements	<Options>
Child elements	None
Data type	**Integer**
Number allowed	0…1

The value of **MaxCertificates** is limited to a range of 0–9999. This limit guarantees that no individual recipient will receive an incomplete set of certificates. For example, if the limit is reached while enumerating certificates for an address list, that address list won't get back any certificates and an appropriate certificate status code will be returned. The client can then use the certificate count returned to determine the number of certificates that are available for that recipient node.

2.2.1.15.1.5 ResolveRecipients

The **ResolveRecipients** element is the top-level element in the XML document. It identifies the body of the HTTP Post as containing a **ResolveRecipients** command.

Parent	None

elements	
Child elements	<To>, <Options> (Request only) <Status>, <Response> (Response only)
Data type	**Container**
Number allowed	1 (required)

Remarks
The **ResolveRecipients** element can also include one or more explicit namespace attributes.

2.2.1.15.1.6 To

The **To** element specifies a recipient to be resolved and is an ambiguous name resolution (ANR) search field.

Parent elements	<ResolveRecipients> (request only) <Response> (response only)
Child elements	None
Data type	**String**, limited to 256 characters.
Number allowed	0…1000 (optional)

The server will attempt to match the To value specified in a request to common Active Directory directory service user attributes, and then return the matches. The **To** element(s) that are returned in the response correspond directly to the **To** element(s) that are specified in the request.
Some fields that are ANR-indexed in Active Directory by default are as follows: **Name**, **Alias**, **Email**, **Office**. The ANR property set that can be indexed is definable by the Exchange administrator and it can be extended to include other fields.

2.2.1.15.2 Response

2.2.1.15.2.1 Certificate

The **Certificate** element contains the Base64-encoded x509 certificate binary large object (BLOB).

Parent elements	<Certificates>
Child elements	None
Data type	**String** (Base64-encoded)
Number allowed	0…N

This element will be returned by the server only if the client specified a value of 2 in the **CertificateRetrieval** element in the request.

2.2.1.15.2.2 CertificateCount

The **CertificateCount** element specifies the number of valid certificates that were found for the recipient.

Parent elements	<Certificates> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	1…N

If a status code of 8 is returned with the **Certificates** element, the **CertificateCount** element specifies the number of recipient certificates that was not returned.

2.2.1.15.2.3 Certificates

The **Certificates** element contains information about the certificates for a recipient.

Parent elements	<Recipient> (Response only)
Child elements	<Status>, <CertificateCount>, <RecipientCount>, <MiniCertificate>, <Certificate>
Data type	**Container**
Number allowed	0…N

Example

```
<Certificates>
    <Status>1</Status>
    <CertificateCount>2</CertificateCount>
    <RecipientCount>3</RecipientCount>
    <MiniCertificate>AAAAAEfXfBA=</MiniCertificate>
</Certificates>
```

2.2.1.15.2.4 DisplayName

The **DisplayName** element contains the display name of the recipient.

Parent elements	<Recipient> (Response only)
Child elements	None
Data type	**String**
Number allowed	1…N

2.2.1.15.2.5 EmailAddress

The **EmailAddress** element contains the e-mail address, in Simple Mail Transfer Protocol (SMTP) format, of the recipient.

Parent elements	<Recipient> (Response only)
Child elements	None

Data type	**String**
Number allowed	1…N

2.2.1.15.2.6 MiniCertificate

The **MiniCertificate** element contains the Base64-encoded mini-certificate BLOB.

Parent elements	<Certificates>
Child elements	None
Data type	String (Base64-encoded)
Number allowed	0…N

This element will be returned only if the client specified a value of 3 in the **CertificateRetrieval** element in the request.

2.2.1.15.2.7 Recipient

The **Recipient** element represents a single recipient that has been resolved.

Parent elements	<Response>
Child elements	<Type>, <DisplayName>, <EmailAddress>, <Certificates>
Data type	**Container**
Number allowed	0…N

One or more **Recipient** elements are returned to the client in a **Response** element by the server if the **To** element specified in the request was either resolved to a distribution list or found to be ambiguous. The status code returned in the **Response** element can be used to determine if the recipient was found to be ambiguous. The recipient would be a suggested match if the recipient specified in the request was found to be ambiguous.

A **Certificates** element will be returned as a child of **Recipient** if the client requested certificates to be returned in the response.

2.2.1.15.2.8 RecipientCount

The **RecipientCount** element specifies the number of recipients that are returned in the **ResolveRecipients** command response or the count of members belonging to a distribution list.

Parent elements	<Response>, <Certificates>
Child elements	None
Data type	**Integer**
Number allowed	1…1 (Required)

Remarks

As a child of the **Response** element, the recipient count specifies the number of recipients that are returned in the **ResolveRecipients** command response. As a child of the **Certificates** element, the recipient count specifies the number of members belonging to a distribution list. When returned in the **Certificates** element, the recipient count may be used to determine whether all recipients belonging to a distribution list have valid certificates by comparing values of the **CertificateCount** and **RecipientCount** elements.

The following example shows two recipients that are being returned to the client. In the "Testers" distribution list, there are three recipients but only two have valid certificates.

```
<?xml version="1.0" encoding="utf-8"?>
<ResolveRecipients xmlns="ResolveRecipients:">
  <Status>1</Status>
  <Response>
    <To>Testers</To>
    <Status>1</Status>
    <RecipientCount>2</RecipientCount>
    <Recipient>
      <Type>1</Type>
      <DisplayName>Testers</DisplayName>
      <EmailAddress>testers@example.com</EmailAddress>
      <Certificates>
        <Status>1</Status>
        <CertificateCount>2</CertificateCount>
        <RecipientCount>3</RecipientCount>
        <MiniCertificate>AAAAAEfXfBA=</MiniCertificate>
      </Certificates>
    </Recipient>
    <Recipient>
     ...
    </Recipient>
  </Response>
<ResolveRecipients>
```

2.2.1.15.2.9 ResolveRecipients

The **ResolveRecipients** element is the top-level element in the XML document. It identifies the body of the HTTP Post as containing a **ResolveRecipients** command.
Summary

Parent elements	None
Child elements	<To>, <Options> (Request only) <Status>, <Response> (Response only)
Data type	**Container**
Number allowed	1 (required)

The **ResolveRecipients** element can also include one or more explicit namespace attributes.

2.2.1.15.2.10 Response

The **Response** element contains information as to whether the recipient was resolved; if the recipient was resolved, the element also contains the type of recipient, the e-mail address that the recipient resolved to, and, optionally, the S/MIME certificate for the recipient.

Parent elements	<ResolveRecipients>
Child elements	<To>, <Status>, <RecipientCount>, <Recipient>
Data type	**Container**
Number allowed	1..N

Example:

```
<Response>
  <To>Contact</To>
  <Status>1</Status>
  <RecipientCount>1</RecipientCount>
  <Recipient>
    <Type>2</Type>
    <DisplayName>James Smith</DisplayName>
    <EmailAddress>jsmith@example.com</EmailAddress>
  </Recipient>
</Response>
```

2.2.1.15.2.11 Status

The **Status** element is returned by the server to provide a status code. The meaning of the returned status code depends on whether the **Status** element was returned as a child of the **ResolveRecipients** element, the **Response** element, or the **Certificates** element.

Parent elements	<ResolveRecipients>, <Response>, <Certificates> (Response only)
Child elements	None
Data type	**Integer**

Number allowed	1…N

The following table shows valid values for the **Status** element when it is returned as a child of the **ResolveRecipients** element.

Value	Meaning
1	Success.
5	Protocol error. Either an invalid parameter was specified or the range exceeded limits.
6	An error on the server occurred. The client should retry.

The following table shows valid values for the **Status** element when it is returned as a child of the **Response** element.

Value	Meaning
1	The recipient was resolved successfully. For details, see the **Recipients** element.
2	The recipient was found to be ambiguous. The returned list of recipients are suggestions. No certificate nodes were returned.
3	The recipient was found to be ambiguous. The returned list is a partial list of suggestions. The total count of recipients can be obtained from the **RecipientCount** element. No certificate nodes were returned.
4	The recipient did not resolve to any contact or GAL entry.

The following table shows valid values for the **Status** element when it is returned as a child of the **Certificates** element.

Value	Meaning
1	One or more certificates were successfully returned.
7	The recipient does not have a valid S/MIME certificate. No certificates were returned.
8	The global certificate limit was reached and the recipient's certificate could not be returned. The count of certificates not returned can be obtained from the **CertificateCount** element.
9	Expansion or enumeration of certificates for the members of the distribution list failed. The distribution list may have membership over the limit that is set on the server.

The **Status** element is sent only in responses from the server to the client.

If a status code is not returned for a command, the client should assume success.

Example:

```
<?xml version="1.0" encoding="utf-8"?>
<ResolveRecipients xmlns="ResolveRecipients:">
  <Status>1</Status>
  <Response>
    <To>cdl</To>
    <Status>1</Status>
    <RecipientCount>2</RecipientCount>
    <Recipient>
      <Type>1</Type>
      <DisplayName>ADL</DisplayName>
      <EmailAddress>ADL@example.com</EmailAddress>
      <Certificates>
        <Status>1</Status>
        <CertificateCount>2</CertificateCount>
        <RecipientCount>3</RecipientCount>
        <MiniCertificate>AAAAAEfXfBA=</MiniCertificate>
      </Certificates>
    </Recipient>
  </Response>
</ResolveRecipients>
```

2.2.1.15.2.12 To

The **To** element specifies a recipient to be resolved and is an ambiguous name resolution (ANR) search field.

Parent elements	<ResolveRecipients> (request only) <Response> (response only)
Child elements	None
Data type	**String**, limited to 256 characters.
Number allowed	1…1 (Required)

The server will attempt to match the To value specified in a request to common Active Directory directory service user attributes, and then return the matches. The **To** element(s) that

are returned in the response correspond directly to the **To** element(s) that are specified in the request.
Some fields that are ANR-indexed in Active Directory by default are as follows: **Name**, **Alias**, **Email**, **Office**. The ANR property set that can be indexed is definable by the Exchange administrator and it can be extended to include other fields.

2.2.1.15.2.13 Type

The **Type** element indicates the type of recipient, either a contact entry ("2") or a GAL entry ("1").

Parent elements	<Recipient> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	1…1 (Required)

2.2.1.16 Search

The **Search** command is used to find entries in an address book or mailbox.

Searching the GAL
The **Search** command is used to find contacts and recipients in the global address list (GAL), and to retrieve information about them. When a search query matches more than one GAL entry, the **Search** command can return as many entries as requested, up to a total of 100 entries by default.

For each GAL entry that is found, the **Search** command returns all the non-empty properties that are indexed by the online ambiguous name resolution (ANR) in the global catalog server—for example, e-mail alias, display name, first and last names, company name, and so on.

The client can optionally specify the maximum number of entries to retrieve in the **Search** command request by specifying the range. The computer that is running Exchange Server will return entries up to the number that is requested, and also indicate the total number of entries that are found.

The text query string that is provided to the **Search** command is used in a prefix-string match. For example, if the device performs a **Search** with a **Query** element value of "Michael A.," the command will return the entries that contain the search string in any text field, such as "Michael Alexander," "Michael Allen." Because the **Search** command matches the **Query** element value against all ANR-indexed GAL text properties, you can also search by e-mail address, company name, and so on.

The ANR system indexes the following properties:

- Display name

- Phone
- Office
- Title
- Company
- Alias
- FirstName
- LastName
- HomePhone
- MobilePhone
- EmailAddress

Note: The list above contains the currently supported properties. There may be other properties indexed in future releases that will not be included in the response. Any property not supported in future releases will be ignored.

The **Search** command results are sorted by the server according to their ordering in the GAL (that is, by the display name property). Because of how the search results are sorted, the device may have to sort the results to achieve a meaningful list. For example, a search for "123" might return all GAL entries that have mailing addresses, or e-mail addresses that begin with 123.

The **Range** option is a zero-based index specifier in the form of "0-n." For more information about the meaning of these values, see the **Range** element. The **Search** command will not return more than 1,000 entries.

Searching Other Exchange Stores <2>

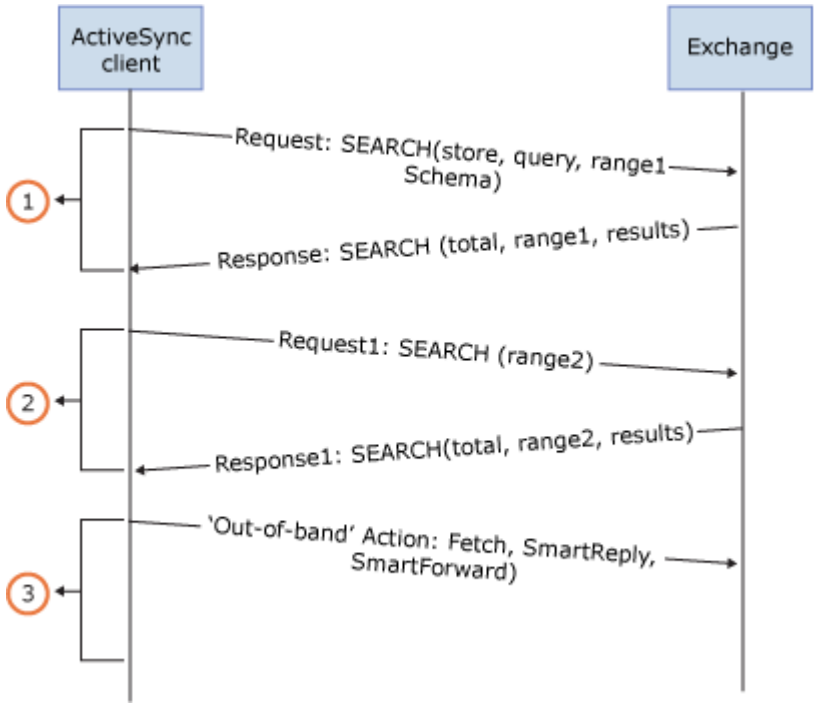
Typical Usage

Essentially, search involves the following three phases:

1. The client issues a request for windowed search results.
2. The client uses subsequent requests to retrieve more results as needed by incrementing the range.
3. Any actions on the search results are carried out by using other protocol verbs, such as **ItemOperations, Fetch**, **SmartReply**, or **SmartForward**.

The following figure shows the typical usage of the **Search** command to retrieve successive result sets from the server and then perform some action based on those results (for example, retrieve the full message body for an e-mail search result).

Note: The Accept-Language header is currently used to define the locale of the client so that the search is relevant. If the accept language is not specified, search will be conducted by using the server language.



2.2.1.16.1 Request

2.2.1.16.1.1 Name

The **Name** element in the **Search** command request specifies which store to search.

Parent elements	<Store>
Child elements	None
Data type	**String**
Number allowed	1..1 (Required)

The following values are also valid:

- Mailbox—The client should specify "Mailbox" when it intends to search the Exchange store.
- Document Library—The client should specify "DocumentLibrary" when it intends to search a Windows SharePoint Services or UNC library.
- GAL – The client should specify “GAL” when it intends to search the Global Address List.

2.2.1.16.1.2 Query

The **Search** command request XML **Query** element specifies the keywords to use for matching the entries in the store that is being searched.

Parent elements	<Query>

Child elements	<And> <Or> <FreeText> <Class> <CollectionId> <EqualTo> <GreaterThan> <LessThan>
Data type	**String**
Number allowed	1..1 (Required, request only)

The value of the **Query** element is used as a prefix-string matching pattern, and will return entries that match the beginning of the string. For example, searching for "John" would match "John Frum" or "Barry Johnson", but would not match "James Littlejohn".

All nonempty ANR-indexed text properties in the GAL are compared with the **Query** element value. Search comparisons are performed by using case-insensitive matching.
For a Windows SharePoint Services document library search, the ActiveSync protocol supports queries of the following form: `LinkId == value`, where *value* specifies the URL of the item or folder and *LinkId* indicates that the value should be compared to the link ID property.

For mailbox search, the query syntax is as follows:

- Folders can be specified in the following ways:
  - Specified ID
  - Specified folder and subfolders
  - All e-mail folders, including Draft, Inbox and subfolders, Outbox, and Sent Items
- The basic keyword query can be composed of the following:
  - The basic operators **And** and **Or**

    Note While the **Or** keyword is supported in the protocol, Exchange 2007 does not support the **Or** keyword and will always return a SearchTooComplex, status 7. **And** or **Or** operations can only be used as the top level node (immediately under **Query**) – this is currently a server-side limitation.
  - Date/Time filter specified by using the **GreaterThan** and **LessThan** operators
  - **FreeText** elements that contain keywords

The basic keyword query is executed against all properties that are indexed by Exchange 2007 Content Indexing (CI).

2.2.1.16.1.3 Options

The **Search** command request XML **Options** element is a container for search options.

Parent elements	<Options>

Child elements	<airsyncbase:BodyPreference> (Request only) <airsync:MIMESupport> (Request only) <Schema> <Range> <DeepTraversal> <RebuildResults> <UserName> <Password>
Data type	**Container**
Number allowed	0..1 (Optional, Request only)

Note: The **UserName** and **Password** may only be sent in the request after receiving a status 14. The server needs these credentials to access the requested resources. The device MUST only send these over a secure or trusted connection, and only in response to a status 14. **UserName** and **Password** are defined as strings consisting of at most 100 characters.

The supported options vary according to the store that is being searched. The following table lists the valid options for each store.

Options	Store
Range **UserName** **Password**	GAL
Range **Schema** **DeepTraversal** **RebuildResults** **Airsyncbase:BodyPreference** **UserName** **Password**	Mailbox
Range **UserName** **Password**	Document Library

2.2.1.16.1.4 Range

The **Search** command XML **Range** element is used in both the request and response XML documents. In the request XML, the **Range** element specifies the maximum number of matching entries to return. In the response XML, the **Range** element specifies the number of matching entries that are being returned.

Parent elements	<Options> (Request) <Store> (Response)
Child elements	None

Data type	Zero-based range in the form m-n
Number allowed	0..1 (Optional)

The **Range** element value specifies a number of entries, but indicates different things depending on whether the element is in the request or the response XML.

The format of the **Range** element value is in the form of a zero-based index specifier, formed with a zero, a hyphen, and another numeric value: "m-n." The *m* indicates the lowest index of a zero-based array that would hold the items. The *n* indicates the highest index of a zero-based array that would hold the items. For example, a **Range** element value of 0–9 indicates 10 items, and 0–10 indicates 11 items. A **Range** element value of 0–0 indicates 1 item.

If the request does not include a **Range** element, the default range of 0–99 is assumed.

In the request XML, the **Range** element value specifies the maximum number of entries to be returned to the client.

In the response XML, the **Range** element value specifies the actual number of entries that are returned in the response. The **Total** element in the response XML indicates the total number of entries that matched the **Query** element value.

Search results are stored in a search folder on the server. This way, when a client comes back with the same query but a new row range, rows are pulled from the result set that is currently stored in the search folder. The entire result set does not have to be rebuilt.

2.2.1.16.1.5 Properties

In a **Search** request, the **Properties** element encapsulates the schema in which the client wants to have search results formatted. In a **Search** response, the **Properties** element encapsulates the properties for each search result.

Note: The **Properties** element is accepted but currently ignored by the server.

Parent elements	<Schema> (Request only) <Result> (Response only)
Child elements	Named ActiveSync properties <airsyncbase:Body> (Response only)
Data type	**Container**
Number allowed	0…1 (Optional, request only) 1..1 (Required, response only)

The **Search** command response XML **Properties** element is a container for properties that apply to an individual ActiveSync entry that matches the **Query** element search string. For example, the **Properties** element contains an element for each nonempty, text-valued GAL property that is attached to the matching GAL entry. Only those properties that are attached to the specific GAL entry are returned; therefore different sets of properties might be returned in

the response XML for different matching GAL entries. For an example of the response XML, see the section that describes the **Search** command in general earlier in this section. (The example follows the "Request XSD" heading.)
Each element in the **Properties** container will be scoped to the appropriate namespace that is specified in the top-level **Search** element.

2.2.1.16.1.6 MIMESupport

The **MIMESupport** element is included in the **Options** element of a client **Search** command request to enable Multipurpose Internet Mail Extensions (MIME) support for e-mail items that are sent from the server to the client.

Parent elements	<Options> (Request only)
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

The following table lists the valid values for the element.

Value	Meaning
0	Never send MIME data.
1	Send MIME data for Security/MIME (S/MIME) messages only. Send regular body for all other messages.
2	Send MIME data for all messages. This flag could be used by clients to build a more rich and complete Inbox solution.

The version of the ActiveSync protocol that is being used determines whether the **Search** command supports S/MIME.

The **Search** response can include the S/MIME binary large object (BLOB) of a signed/encrypted message.
The **Search** request may include the following in the **Options** element:

- The **MIMESupport** element to tell the server to return MIME for S/MIME-only/All/None messages.
- The **BodyPreference** element with its child element, **Type**, containing a value of 4 to inform the server that the device can read the MIME BLOB.

The response from the server must include the **Body** element, which is a child of the **Properties** element. The **Body** element is a complex element and must contain the following child nodes in an S/MIME search response:

- The **Type** element with a value of 4 to inform the device that the data is a MIME BLOB.
- The **EstimatedDataSize** element to specify the rough total size of the data.
- The **Truncated** element to indicate whether the MIME BLOB is truncated.
- The **Data** element that contains the full MIME BLOB.

For more information about the **Body** element or the **BodyPreference** element, see [MS-ASAIRS].

Request

```
<?xml version="1.0" encoding="utf-8"?>
<Search xmlns="Search:" xmlns:A="AirSyncBase:" xmlns:B="AirSync:"
xmlns:C="Email:">
   <Store>
      <Name>Mailbox</Name>
      <Query>
         <And>
            <B:Class>Email</B:Class>
               <FreeText>text</FreeText>
         </And>
      </Query>
      <Options>
         <RebuildResults/>
         <DeepTraversal/>
         <Range>0-999</Range>
         <A:BodyPreference>
            <A:Type>4</A:Type>
            <A:TruncationSize>1024</A:TruncationSize>
         </A:BodyPreference>
         <B:MIMESupport>2</B:MIMESupport>
      </Options>
   </Store>
</Search>
```

Response

```
<Search 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:A16="Gal:" xmlns:A17="AirSyncBase:"
```

```
xmlns:A18="Settings:" xmlns:A19="DocumentLibrary:"
xmlns:A20="ItemOperations:" xmlns="Search:">
   <Status>1</Status>
   <Response>
      <Store>
         <Status>1</Status>
         <Result>
            <A0:Class>Email</A0:Class>

<LongId>RgAAAAAaty%2f%2b4QxHTJOZnIR0P9qkBwA6pk60fqkEQbWH4Wm%2bnjh7AJKAU
Qo6AAA6pk60fqkEQbWH4Wm%2bnjh7AJKAURrEAAAJ</LongId>
            <A0:CollectionId>6</A0:CollectionId>
            <Properties>
               <A2:To>"NSyncUser1" &lt;NSyncUser1@contoso.com></A2:To>
               <A2:From>"NSyncUser1"
&lt;NSyncUser1@contoso.com></A2:From>
               <A2:Subject>Subject</A2:Subject>
               <A2:DateReceived>2007-04-
02T19:20:32.000Z</A2:DateReceived>
               <A2:DisplayTo>NSyncUser1</A2:DisplayTo>
               <A2:Read>1</A2:Read>
               <A17:Body>
                  <A17:Type>4</A17:Type>
                  <A17:EstimatedDataSize>2288</A17:EstimatedDataSize>
                  <A17:Truncated>1</A17:Truncated>
                  <A17:Data>Received: from 157.55.97.120
([157.55.97.120]) by contoso.com ([157.55.97.121]) with Microsoft
Exchange Server HTTP-DAV ; Mon, 2 Apr 2007 19:20:32 +0000 From:
NSyncUser1 &lt;NSyncUser1@contoso.com> To: NSyncUser1
&lt;NSyncUser1@contoso.com> Content-Class: urn:content-classes:message
Date: Mon, 27 Apr 1998 13:05:29 -0700 Subject: Subject Thread-Topic:
Topic Message-ID:
&lt;3AA64EB47EA90441B587E169BE9E387B9280511AC4@contoso.com> Accept-
Language: en-US X-MS-Has-Attach: X-MS-TNEF-Correlator: Content-Type:
text/plain; charset="iso-8859-1" Content-Transfer-Encoding: quoted-
printable MIME-Version: 1.0
Body12345678901234567890123456789012345678901234567890123456789012345678901234567
```

```
8901=
234567890123456789012345678901234567890123456789012345678901234567890123
3456=
789012345678901234567890123456789012345678901234567890123456789012345678
8901=
234567890123456789012345678901234567890123456789012345678901234567890123456789</A
17:Data>
                </A17:Body>
                <A2:MessageClass>IPM.Note</A2:MessageClass>
                <A2:InternetCPID>28591</A2:InternetCPID>
                <A2:Flag/>
                <A2:ContentClass>urn:content-
classes:message</A2:ContentClass>
                <A17:NativeBodyType>1</A17:NativeBodyType>
             </Properties>
          </Result>
          <Range>0-0</Range>
          <Total>1</Total>
       </Store>
   </Response>
</Search>
```

2.2.1.16.1.7 Search

The **Search** element is the top-level element in the XML document for the **Search** command. The element identifies the body of the HTTP Post as containing a **Search** command.

Parent elements	None
Child elements	<Store> (Request) <Status>, <Response> (Response)
Data type	**Container**
Number allowed	1..1 (Required)

2.2.1.16.1.8 Store

In the **Search** command request XML, the **Store** element is a container for elements that specify the location, string, and options for the search. In the **Search** command response XML, the **Store** element contains the **Status**, **Result**, **Range**, and **Total** elements that contain the returned mailbox entries.

Parent elements	<Search> (Request)

	<Response> (Response)
Child elements	<Name>, <Query>, <Options> (Request) <Status>, <Result>, <Range>, <Total> (Response)
Data type	**Container**
Number allowed	1..1 (Required)

2.2.1.16.1.9 And

The **And** element is a container that specifies items on which to perform an **AND** operation.

Parent elements	<Query> <And> <Or>
Child elements	<And> <Or> <FreeText> <Class> <CollectionId> <EqualTo> <GreaterThan> <LessThan>
Data type	**Container**
Number allowed	0..1 (Optional, request only)

Note: **And** operations can only be used as the top level node (immediately under **Query**) – this is currently a server-side limitation. The server will respond with SearchTooComplex, status 7.

The server performs an **AND** operation on the child nodes of the **And** element.

2.2.1.16.1.10 Or

The **Or** element is a container that specifies items on which to perform an **OR** operation.

Parent elements	<Query> <And> <Or>
Child elements	<And> <Or> <FreeText> <Class> <CollectionId> <EqualTo> <GreaterThan>

	<LessThan>
Data type	**Container**
Number allowed	0..1 (Optional, request only)

Note: **And** or **Or** operations can only be used as the top level node (immediately under **Query**) – this is currently a server-side limitation. The server will respond with SearchTooComplex, status 7.

The server performs an **OR** operation on the child nodes of the **Or** element.

2.2.1.16.1.11 Class

The **Class** element specifies the item classes that the client wants returned for a given collection.

Parent elements	<Query> <And> <Or> <Schema>
Child elements	None
Data type	**String**
Number allowed	0…4

Note: The **Class** element cannot be under a **Query** or **Or** node, but rather must be under the topmost **And –** this is currently a server-side limitation. The server will respond with SearchTooComplex, status 7.

The **Search** request may specify multiple **Class** elements, each of which is observed by the server when it sends the **Search** response to the client.

If one or more **Class** elements are not specified, the server will return all supported ActiveSync classes.<4>

2.2.1.16.1.12 DeepTraversal

The **DeepTraversal** element indicates that the client wants the server to search all subfolders for the folders that are specified in the query.

Parent elements	<Options>
Child elements	None
Data type	Empty tag
Number allowed	0..1 (optional)

If the **DeepTraversal** element is not present, the subfolders are not searched.

2.2.1.16.1.13 EqualTo

The **EqualTo** element is a container that specifies a property and a value that are compared for equality during a search.

Parent elements	<Query> <And> <Or>
Child elements	<LinkId> <Value>
Data type	**Container**
Number allowed	0..1 (optional, Request only)

Note: The **EqualTo** element cannot be under a **Query** or **Or** node, but rather must be under the topmost **And –** this is currently a server-side limitation. The server will respond with SearchTooComplex, status 7.

The comparison is made between the value of the **Value** element and the link ID.

2.2.1.16.1.14 GreaterThan

The **GreaterThan** element is a container that specifies a property and a value that are compared for a "greater than" condition during a search.

Parent elements	<Query> <And> <Or>
Child elements	<DateReceived> <Value>
Data type	**Container**
Number allowed	0..1 (optional, Request only)

Note: The **GreaterThan** element cannot be under a **Query** or **Or** node, but rather must be under the topmost **And –** this is currently a server-side limitation. The server will respond with SearchTooComplex, status 7.

The **GreaterThan** element is supported only in mailbox searches. It is not supported for document library searches. The comparison is made between the value of the **Value** element and the date that a mailbox item was received. The **DateRecieved** element MUST be present before the **Value** element.

Typically, this element will be used to filter results by the date on which they were received so that the date received is greater than the specified value, as shown in the following example:

```
<GreaterThan>
    <B:DateReceived/>
```

```
    <Value>2006-03-27T21:04:20.000Z</Value>
</GreaterThan>
```

2.2.1.16.1.15 LessThan

The **LessThan** element is a container that specifies a property and a value that are compared for a "less than" condition during a search.

Parent elements	<Query> <And> <Or>
Child elements	<DateReceived> <Value>
Data type	**Container**
Number allowed	0..1 (Optional, request only)

Note: The **GreaterThan** element cannot be under a **Query** or **Or** node, but rather must be under the topmost **And –** this is currently a server-side limitation. The server will respond with SearchTooComplex, status 7.

The **LessThan** element is supported only in mailbox searches. It is not supported for document library searches. The comparison is made between the value of the **Value** element and the date that a mailbox item was received. The **DateRecieved** element MUST be present before the **Value** element.

Typically, this element will be used to filter results by the date on which they were received so that the date received is less than the specified value, as shown in the following example:

```
<LessThan>
    <B:DateReceived />
    <Value>2006-03-27T21:04:20.000Z</Value>
</LessThan>
```

2.2.1.16.1.16 Value

The **Value** element specifies the value that is to be used in a comparison.

Parent elements	<EqualTo> <GreaterThan> <LessThan>
Child elements	None
Data type	**String** (1,024 bytes maximum length)
Number allowed	0..1 (Optional, request only)

The **Value** element is used in the query together with an element that specifies the name of a property. The value that is specified by the **Value** element is compared with the value of the specified property.

2.2.1.16.1.17 FreeText

The **FreeText** element specifies a string for which to search.

Parent elements	<Query> <And> <Or>
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional, request only)

Note: The **FreeText** element cannot be under a **Query** or **Or** node, but rather must be under the topmost **And** – this is currently a server-side limitation. The server will respond with SearchTooComplex, status 7.

The **FreeText** element is used together with the **And** and **Or** elements to build the query.

2.2.1.16.1.18 CollectionId

The **CollectionId** element specifies the folder in which to search.

Parent elements	<Query> <And> <Or>
Child elements	None
Data type	**String**
Number allowed	0..n (optional, Request only)

Note: The **CollectionId** element cannot be under a **Query** or **Or** node, but rather must be under the topmost **And** – this is currently a server-side limitation. The server will respond with SearchTooComplex, status 7.

Multiple folders can be specified by including multiple **CollectionId** elements.

If the **DeepTraversal** element is present, it applies to all folders under each CollectionId.

2.2.1.16.1.19 RebuildResults

The **RebuildResults** element is used within the **Search** request to force the server to rebuild the search folder that corresponds to a given query.

Parent elements	<Options> (Request)

Child elements	None
Data type	Empty tag
Number allowed	0..1 (Optional)

The search results (that is, the result set) are stored in a search folder on the server. This way, when a client comes back with the same query but a new row range, rows are pulled from the result set that is currently stored in the search folder. The entire result set does not have to be rebuilt.
The search folder remains unchanged until the client does one of the following to update the result set:

- Sends a **Search** request, specifying a new query. In this case, the search folder is automatically rebuilt. The **RebuildResults** node does not have to be included.
- Sends a **Search** request that includes the **RebuildResults** node. In this case, the server is forced to rebuild the search folder.
- Enough time (order of days) has passed since the folder was first accessed (see three sentences down)

If a new item is added, the item does not appear in the result set until the result set is updated.
If an item is deleted, the server will filter the deleted item out of the result set.
If a long period of time has elapsed since a given query was issued, you should send a new **Search** request with the given query and include the **RebuildResults** option to ensure accurate results for that query.

2.2.1.16.1.20 LinkId

The **LinkId** element specifies a Uniform Resource Identifier (URI) that identifies a resource.

Parent elements	<EqualTo>
Child elements	None
Data type	**URI**
Number allowed	1..1 (Required)

The link ID is a URI that is assigned by the server to certain resources, such as Windows SharePoint Services or UNC documents. The client must store the link ID that is associated with the items that are retrieved by using the **Search** command if it wants to act upon them later.

2.2.1.16.1.21 DateReceived

The **DateReceived** element specifies the date that a mailbox item was received.

Parent elements	<GreaterThan> <LessThan>
Child elements	None
Data type	**DateTime**
Number allowed	1..1 (required)

2.2.1.16.2 Response

2.2.1.16.2.1 LongId

The **LongId** element specifies a unique identifier that is assigned by the server to each result set that is being returned in the **Search** response.

Parent elements	<Result> (response only)
Child elements	None
Data type	**String (up to 256 characters)**
Number allowed	0..1 (optional)

The value of the **LongId** element can be used in the *LongId* parameter of the **ItemOperations**, **SmartReply** , **SmartForward** , or **MeetingResponse** command requests to reference the result set.

The client should store the value of **LongId** as a string of up to 256 characters. The client should make no assumptions about the format of the ID.

2.2.1.16.2.2 Properties

In a **Search** request, the **Properties** element encapsulates the schema in which the client wants to have search results formatted. In a **Search** response, the **Properties** element encapsulates the properties for each search result.

Parent elements	<Schema> (Request only) <Result> (Response only)
Child elements	Named ActiveSync properties <airsyncbase:Body> (Response only)
Data type	**Container**
Number allowed	0…1 (Optional, request only) 1..1 (Required, response only)

The **Search** command response XML **Properties** element is a container for properties that apply to an individual ActiveSync entry that matches the **Query** element search string. For example, the **Properties** element contains an element for each nonempty, text-valued GAL property that is attached to the matching GAL entry. Only those properties that are attached to the specific GAL entry are returned; therefore different sets of properties might be returned in the response XML for different matching GAL entries. For an example of the response XML, see the section that describes the **Search** command in general earlier in this section. (The example follows the "Request XSD" heading.)

Each element in the **Properties** container will be scoped to the appropriate namespace that is specified in the top-level **Search** element.

2.2.1.16.2.3 Range

The **Search** command XML **Range** element is used in both the request and response XML documents. In the request XML, the **Range** element specifies the range of matching entries to return. In the response XML, the **Range** element specifies the number of matching entries that are being returned.

Parent elements	<Options> (Request) <Store> (Response)
Child elements	None
Data type	Zero-based range in the form m-n
Number allowed	0..1 (Optional)

The **Range** element value specifies a number of entries, but indicates different things depending on whether the element is in the request or the response XML.

The format of the **Range** element value is in the form of a zero-based index specifier, formed with a numeric value, a hyphen, and another numeric value: "m-n." The *m* and *n* indicates the lowest and highest index of a zero-based array that would hold the items. For example, a **Range** element value of 0–9 indicates 10 items, and 0–10 indicates 11 items. A **Range** element value of 0–0 indicates 1 item.

In the request XML, the **Range** element value specifies the range of entries to be returned to the client.

In the response XML, the **Range** element value specifies the actual number of entries that are returned in the response. The **Total** element in the response XML indicates the total number of entries that matched the **Query** element value.

Search results are stored in a search folder on the server. This way, when a client comes back with the same query but a new row range, rows are pulled from the result set that is currently stored in the search folder. The entire result set does not have to be rebuilt.

2.2.1.16.2.4 Response

The **Response** element is a container for the results that are returned from the server.

Parent elements	<Search> (response only)
Child elements	<Store> (response only)
Data type	**Container**
Number allowed	1..1 (Required)

2.2.1.16.2.5 Result

The **Search** command response XML **Result** element is a container for an individual matching mailbox item.

Parent elements	<Store> <Response>
Child elements	<Properties> <Class> LongId ParentId
Data type	**Container**
Number allowed	1..n (Required)

One **Result** element will be present for each match that is found. If no matches are found, an empty **Result** element will be present in the **Store** container element of the response XML. Inside the **Result** element, the **Properties** element contains a list of nonempty text properties on the entry.

When the store being searched is the Mailbox:

- There will be one **Result** element for each match that is found in the mailbox. If no matches are found, an empty **Result** element will be present in the **Store** container element of the response XML.
- Inside the **Result** element, the **Properties** element contains a list of requested properties for the mailbox item.

When the store that is being searched is the document library:

- The first result that is returned in the **Search** response is the metadata for the root folder or item to which the **LinkId** is pointing. The client may choose to ignore this entry if it does not need it.
- If the **LinkId** in the request points to a folder, the metadata properties of the folder are returned as the first item, and the contents of the folder are returned as subsequent results. The **Range** element would apply to these results with no difference; for example, the index 0 would always be for the root item to which the link is pointing.
- If the **LinkId** in the request points to an item, only one result is returned: the metadata for the item.
- Inside the **Result** element, the **Properties** element contains a list of requested properties for the mailbox item.

2.2.1.16.2.6 Search

The **Search** element is the top-level element in the XML document for the **Search** command. The element identifies the body of the HTTP Post as containing a **Search** command.

Parent elements	None
Child elements	<Store> (Request) <Status>, <Response> (Response)
Data type	**Container**
Number allowed	1..1 (Required)

2.2.1.16.2.7 Status

The **Search** command response XML **Status** element indicates whether the server encountered an error while it was processing the search query.

Parent elements	<Store>, <Response> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	1..1 (Required)

The following table specifies valid values for the **Status** element as a child of the **Search** node in the search response.

Value	Meaning
1	Success
3	Server error

The following table specifies valid values for the **Status** element as a child of the **Store** element in the search response.

Value	Meaning
1	Success.
2	Protocol violation/XML validation error.
3	Server error.
4	Bad Link
5	Access Denied
6	Not Found
7	Connection Failed (try again)
8	The search query is too complex.
9	Unable to execute this query because Content Indexing is not loaded.
10	Search timed out.
11	Bad **CollectionId** (must do a **FolderSync**).
12	Server reached the end of the range that is retrievable by synchronization.
13	Access Blocked (policy restriction)
14	Credentials Required to Continue

The **Status** element value indicates only that the **Search** command was processed correctly. It does not indicate whether any matches were found. The **Total** and **Range** response XML elements indicate how many matches were found and returned, respectively.

The response will contain multiple **Status** elements. The **Status** element indicates the processing status of the overall **Search** command when the **Search** element is the immediate parent of the **Status** element. When the immediate parent of the **Status** command is the **Store** element, that **Status** element indicates the processing status for only that store. This structure

was chosen to enable possible future expansion of the command to searching multiple locations, address lists, and contacts folders.

2.2.1.16.2.8 Store

In the **Search** command request XML, the **Store** element is a container for elements that specify the location, string, and options for the search. In the **Search** command response XML, the **Store** element contains the **Status**, **Result**, **Range**, and **Total** elements that contain the returned mailbox entries.

Parent elements	<Search> (Request) <Response> (Response)
Child elements	<Name>, <Query>, <Options> (Request) <Status>, <Result>, <Range>, <Total> (Response)
Data type	**Container**
Number allowed	1..1 (Required)

2.2.1.16.2.9 Total

The **Search** command response XML element **Total** indicates the total number of mailbox entries that matched the search **Query** element value.

Parent elements	Store
Child elements	None
Data type	**Integer**
Number allowed	1..1 (Required)

The value of the **Total** element does not always equal the number of entries that are returned. To determine the number of entries that are returned by the **Search** command, use the **Range** element value.

The **Total** element indicates the number of entries that are available. In cases where all the results are returned in the response XML, the value of the **Total** element will be one more than the end-index value that is provided in the **Range** element. For example, if the **Search** command returns 15 entries, the value of the **Range** element will be 0–14, while the value of the **Total** element will be 15.

The **Total** element should be used by clients to determine whether more matching entries were found in the mailbox than have been returned by the **Search** command. For example, a device might perform an initial search and specify a requested **Range** of 0–4 (return 5 entries maximum). If the **Total** element indicates that there are actually 25 matching items, the device might then enable the user to retrieve the full results.

2.2.1.17 SendMail

The **SendMail** command is used by clients to send Multipurpose Internet Mail Extensions (MIME)-formatted e-mail messages to the server.

2.2.1.17.1 Request

This command is issued in the HTTP Post command Uniform Resource Identifier (URI), and does not contain an XML body. The body will instead contain the MIME-formatted message. The *SaveInSent* HTTP Post command parameter provides the option of storing a copy of the message in the Sent Items folder. Attachments can also be included in the message as a MIME part.

Note: The Content-Type MIME header field must be set to "message/rfc822".

For more information about the RFC 822 format, see [RFC822]. RFC 821-formatted messages are not supported.

Messages should not be saved directly to the local Sent Items folder by the client; instead, messages can use the *SaveInSent* parameter to automatically have the messages saved on the server. It is not possible to reconcile the local Sent Items folder with the server's Sent Items folder by using the **Sync** command. Items in the server's Sent Items folder can be added to the client by using the **Sync** command, but it is not possible to add items that are in the local Sent Items folder to the server.

To instruct the server to save the outgoing e-mail message in the user's Sent Items folder in the Exchange mailbox, include the *SaveInSent* parameter in the HTTP POST command URI and set the parameter to 'T'. To instruct the server not to save the outgoing e-mail message in the user's Sent Items folder, omit the *SaveInSent* parameter. The *SaveInSent* parameter is set to 'F' by default.

Note: Explicitly setting the *SaveInSent* parameter to 'F' currently results in an error.

The From: header in the outgoing message will be set on the server to the primary e-mail address of the logged-on user. If the message might be overwritten on the server, the client can choose to not send the message to the server. The same is true for the **SmartReply** and **SmartForward** commands.

2.2.1.17.2 Response

The response from the server contains the HTTP status code.

2.2.1.18 Settings

The **Settings** command supports get and set operations on global properties. <5>
The **Get** and **Set** operations act on named properties. In the context of the **Get** and **Set** operations, each named property may contain a set of property-specific data nodes.

The **Settings** command may contain multiple get and set requests and responses in any order. The implication of this batching mechanism is that commands will be executed in the order in

which they are received and that the ordering of get and set responses will match the order of those commands in the request.

The following is the generic form of the **Settings** request:

```
<Settings>
    <PropertyName>
        Data nodes
    </PropertyName>
    ...
</Settings>
```

The **PropertyName** is a named property (that is, the actual name of the property). The **Settings** command can be used on the following named properties:

- OOF
- Device Password
- Device Information
- User Information

The argument or data nodes are **Get** or **Set**, which may also have their own arguments. It is up to the individual property handlers to parse and interpret them as necessary.

It is possible to have many **PropertyName** nodes. Each property must be processed in order. There may be cases in which one property call affects another property call or the same property is in the **Settings** request twice. The responses will come back in the same order in which they were requested.

Each response has a global status response, which is mainly for protocol errors, as shown in the following example:

```
<Settings>
    <Status>StatusValue</Status> (This is a global status code)
    Property responses (0 or more occurrences)
</Settings>
```

The **Status** node should return Success if **Settings** is returning property responses. If the command was not successful, the processing of the request cannot begin, no property responses will be returned, and **Status** should indicate a protocol error.

Any error other than a protocol error will be returned in the status codes of the individual property responses. All property responses, regardless of the property, must contain a status tag to indicate success or failure. This status node must be the first node in the property response, as shown in the following example:

```
<PropertyName>
```

```
    <Status>StatusValue</Status>
    Return data
</PropertyName>
```

The *Return data* is specified by the individual properties.

2.2.1.18.1 Request

2.2.1.18.1.1 Settings

The **Settings** element is the top-level element in the XML document for the **Settings** command.

Parent elements	None
Child elements	Named Property nodes <Status/> (response only)
Data type	**Container**
Number allowed	1..1 (Required)

The **Settings** element encapsulates one or more named property nodes that contain actions and arguments that apply to those properties.

The **Settings** command can be used on the following named properties:

- **Oof**
- **DevicePassword**
- **DeviceInformation**
- **UserInformation**

It is possible to have many **PropertyName** nodes. Each property must be processed in order. There may be cases in which one property call affects another property call or the same property is in the **Settings** request twice. The responses will come back in the same order in which they were requested.

2.2.1.18.1.2 Oof

The **Oof** element specifies a named property node for retrieving and setting Out of Office (OOF) information.

Parent elements	<Settings>
Child elements	<Get> <Set> (request only) <Status> (response only)
Data type	**Container**
Number allowed	0..1

The **Settings** command will support **Get** and **Set** operations for the OOF property. The OOF property enables a user to do the following:

- Specify whether the user is currently out of office.
- Schedule an out of office message to be sent between a particular start date and end date.
- Specify the message that is to be shown to various audiences when the mobile device user is out of office.

OOF Get Request and Response

The **Get** command within the **Oof** element enables the client to retrieve OOF information from the server. The client specifies the **BodyType** to be retrieved and the server will return all OOF information and messages.

There is one **OofMessage** node per audience in an OOF **Get** response. If a sender group is not allowed and is disabled (an unknown external sender can be disabled by the administrator), an **OofMessage** node is not reported to the client in a **Get** response. If the sender group is allowed, but is disabled and has no Reply message (specified by the **ReplyMessage** element), an **OofMessage** node is still reported to the client.

If the client does not receive a group, it is presumably because the client does not have permission to enter settings for that group; in such a case, it is expected that any attempt to set those properties will result in an Access Denied status code.

OOF Set Request and Response

The **Set** command allows the client to set the OOF status, time OOF, and OOF messages for one or more of the following groups:

- Internal
- External Known Senders (such as contacts)
- External Unknown Senders

The following example shows an OOF **Get** request and response.

Request

```
<Settings>
    <Oof>
        <Get>
            <BodyType>...</BodyType>
        </Get>
    </Oof>
</Settings>
```

Response

```
<Settings xmlns="Settings:">
    <Status>1</Status>
    <Oof>
        <Status>1</Status>
        <Get>
            <OofState>2</OofState>
            <StartTime>...</StartTime>
            <EndTime>...</EndTime>
            <OofMessage>
                <AppliesToInternal/>
                <Enabled>1</Enabled>
                <ReplyMessage>...</ReplyMessage>
                <BodyType>...</BodyType>
            </OofMessage>
            <OofMessage>
                <AppliesToExternalKnown/>
                <Enabled>1</Enabled>
                <ReplyMessage>...</ReplyMessage>
                <BodyType>...</BodyType>
            </OofMessage>
            <OofMessage>
                <AppliesToExternalUnknown/>
                <Enabled>1</Enabled>
                <ReplyMessage>...</ReplyMessage>
                <BodyType>...</BodyType>
            </OofMessage>
        </Get>
    </Oof>
</Settings>
```

The following example shows an OOF **Set** request and response.

Request

```
<Settings>
```

```
    <Oof>
        <Set>
            <OofState>0</OofState>
            <OofMessage>
                <AppliesToInternal/>
                <Enabled>1</Enabled>
                <ReplyMessage>...</ReplyMessage>
                <BodyType>...</BodyType>
            </OofMessage>
            <OofMessage>
                <AppliesToExternalKnown/>
                <Enabled>0</Enabled>
            </OofMessage>
            <OofMessage>
                <AppliesToExternalUnknown/>
                <Enabled>0</Enabled>
            </OofMessage>
        </Set>
    </Oof>
</Settings>
```

Response

```
<Settings>
    <Status>1</Status>
    <Oof>
        <Status>1</Status>
    </Oof>
</Settings>
```

2.2.1.18.1.3 Get

The **Get** command enables the client to retrieve information from the server for any named property that supports **Get**.

Parent elements	<Oof> <UserInformation> (request only)
Child elements in an <Oof> request	<BodyType>

Child elements in an <Oof> response	<OofState) <StartTime> <EndTime> <OofMessage>
Child elements in a <UserInformation> request or response	< EmailAddresses> (Response only)
Data type	**Container**
Number allowed	0..1

Only the OOF and User Information named properties support **Get**.

In an **Oof** request, the client specifies the body type to be retrieved and the server will return all OOF settings and messages for that body type.

2.2.1.18.1.4 Set

The **Set** command enables the client to set information on the server for any named property that supports **Set**.

Parent elements	<Oof> (request only) <DeviceInformation> <DevicePassword>
Child elements in an <Oof> request	<OofState> <StartTime> <EndTime> <OofMessage>
Child elements in an <Oof> response	None
Child elements in a <DeviceInformation> request	<Model> <IMEI> <FriendlyName> <OS> <OSLanguage> <PhoneNumber>
Child elements in a <DeviceInformation> response	<Status>
Child elements in an <DevicePassword> request	<Password>
Child elements in an <DevicePassword> response	<Status>
Data type	**Container**
Number allowed	0..1 (Required)

The named properties that support **Set** are OOF, Device Information, and Device Password.

OOF Property

The **Set** command enables the client to set the following in the OOF property:

- OOF state
- Start time and end time, if the user wants to schedule an OOF message
- OOF message or messages for one or more of the supported audiences

Device Information Property

Set enables the client to specify values for any of the Device Information parameters. The following statements apply to the **Set** command request implementation:

- The client must specify all supported Device Information parameters in the **Set** request.
- The client or server makes no assumptions about ordering. The Device Information parameters may be specified in any order.
- To delete a given Device Information value, the client is expected to send the **Set** command with an empty element for that parameter. Active Sync will set that parameter to **NULL**.

Device Password Property

The **Set** command enables the client to set or clear the recovery password of the device.

2.2.1.18.1.5 OofState

The **OofState** element specifies the availability of the OOF property.

Parent elements	<Get> (**Oof** response only) <Set> (**Oof** request only)
Child elements	None
Data type	**Integer**
Number allowed	0…1 (optional)

The following table lists the valid values for **OofState**.

Value	Meaning
0	The OOF property is disabled.
1	The OOF property is global.
2	The OOF property is time-based.

The values of **OofState** match those of the Availabilities Service enumeration. **OofState** must be set to 2 if the **StartTime** and **EndTime** elements are present.

2.2.1.18.1.6 StartTime

The **StartTime** element is used with the **EndTime** element to specify the range of time during which the user will be out of office.

Parent elements	<Get> (**Oof** response only) <Set> (**Oof** request only)
Child elements	None
Data type	**DateTime**
Number allowed	1…1 (Required)

The **StartTime** element may be present within the **Get** element of the **Settings** response for the OOF property, or within the **Set** element of the **Settings** request for the OOF property. If **StartTime** is present, the **EndTime** element must be present also; otherwise, the client will receive a protocol error. In addition, **OofState** must be set to 2.

2.2.1.18.1.7 EndTime

The **EndTime** element is used with the **StartTime** element to specify the range of time during which the user will be out of office.

Parent elements	<Get> (**Oof** response only) <Set> (**Oof** request only)
Child elements	None
Data type	**DateTime**
Number allowed	1…1 (Required)

The **EndTime** element may be present within the **Get** element of the **Settings** response for the OOF property, or within the **Set** element of the **Settings** request for the OOF property.

If **EndTime** is present, the **StartTime** element must be present also. Otherwise, the client will receive a protocol error. In addition, **OofState** must be set to 2.

2.2.1.18.1.8 OofMessage

The **OofMessage** element contains a set of elements that specify the OOF message for a particular audience.

Parent elements	<Get> (**Oof** response only) <Set> (**Oof** request only)
Child elements	<AppliesToInternal> <AppliesToExternalKnown> <AppliesToExternalUnknown> <Enabled> <ReplyMessage> <BodyType>
Data type	**Container**

Number allowed	0…3

The OOF property supports the following three audiences for an OOF message: <6>

- Internal—A user who is in the same organization as the sending user.
- Known external—A user who is outside the sending user's organization, but is represented in the sending user's contacts.
- Unknown external—A user who is outside the sending user's organization and is not represented in the sending user's contacts.

The presence of one of the following elements, which are mutually exclusive, indicates the audience to which an OOF message pertains:

- **AppliesToInternal**—The OOF message is relevant to an internal audience.
- **AppliesToExternalKnown**—The OOF message is relevant to a known external audience.
- **AppliesToExternalUnknown**—The OOF message is relevant to an unknown external audience.

There is one **OofMessage** node per audience in an OOF **Get** response. If a sender group is not allowed and is disabled (an unknown external sender can be disabled by the administrator), an **OofMessage** node is not reported to the client in a **Get** response. If a sender group is allowed, but is disabled and has no reply message (specified by the **ReplyMessage** element), an **OofMessage** node is still reported to the client.

If the client does not receive a group, it is presumably because the client does not have permission to enter settings for that group; in such a case, it is expected that any attempt to set those properties will result in an Access Denied status code.

In an OOF **Set** request, the client must not include the same *AppliesTo**** element in more than one **OofMessage** element.

2.2.1.18.1.9 BodyType

The **BodyType** element is a string that specifies the format of the OOF message.

Parent elements	<Get> (request only) <OofMessage>
Child elements	None
Data type	**String**
Number allowed	1…1 (required) (On Gets) 0…1 (optional) under OofMessage, required if a message is set

The following are the permitted values for the **BodyType** element:

- Text
- HTML

If **BodyType** has the value HTML, all message strings are sent in the HTML format. If **BodyType** has the value Text, the message strings are sent in plain text. Because there is no default value, the **BodyType** node must be present on all Gets and on any OofMessage where the ReplyMessage has been set.

2.2.1.18.1.10 AppliesToInternal

The **AppliesToInternal** element indicates that the OOF message applies to internal users. (An internal user is a user who is in the same organization as the sending user.)

Parent elements	<OofMessage>
Child elements	None
Data type	**Flag**
Number allowed	0…1 (Choice)

When the **AppliesToInternal** element is present, its peer elements (that is, the other elements within the **OofMessage** element) specify the OOF settings with regard to internal users. The following are the peer elements of the **AppliesToInternal** element:

- **Enabled**—Specifies whether an OOF message is sent to this audience while the sending user is OOF.
- **ReplyMessage**—Specifies the OOF message itself.
- **BodyType**—Specifies the format of the OOF message.

The **AppliesToInternal**, **AppliesToExternalKnown**, and **AppliesToExternalUnknown** elements, each of which indicates the audience to which an OOF message pertains, are mutually exclusive.

2.2.1.18.1.11 AppliesToExternalKnown

The **AppliesToExternalKnown** element indicates that the OOF message applies to known external users. (A known external user is a user who is outside the sending user's organization, but is represented in the sending user’s contacts.)

Parent elements	<OofMessage>
Child elements	None
Data type	**Flag**
Number allowed	0…1 (Choice)

When the **AppliesToExternalKnown** element is present, its peer elements (that is, the other elements within the **OofMessage** element) specify the OOF settings with regard to known external users.

The following are the peer elements of the **AppliesToExternalKnown** element:

- **Enabled**—Specifies whether an OOF message is sent to this audience while the sending user is OOF.
- **ReplyMessage**—Specifies the OOF reply message. Exchange 2007 requires that the reply message for unknown external and known external audiences is the same.
- **BodyType**—Specifies the format of the OOF message.

The **AppliesToInternal**, **AppliesToExternalKnown**, and **AppliesToExternalUnknown** elements, each of which indicates the audience to which an OOF message pertains, are mutually exclusive.

2.2.1.18.1.12 AppliesToExternalUnknown

The **AppliesToExternalUnknown** element indicates that the OOF message applies to unknown external users. (An unknown external user is a user who is outside the sending user's organization and is not represented in the sending user’s contacts.)

Parent elements	<OofMessage>
Child elements	None
Data type	**Flag**
Number allowed	0…1 (Optional

When the **AppliesToExternalKnown** element is present, its peer elements (that is, the other elements within the **OofMessage** element) specify the OOF settings with regard to unknown external users.

The following are the peer elements of the **AppliesToExternalKnown** element:

- **Enabled**—Specifies whether an OOF message is sent to this audience while the sending user is OOF.
- **ReplyMessage**—Specifies the OOF reply message. Exchange 2007 requires that the reply message for unknown external and known external audiences is the same.
- **BodyType**—Specifies the format of the OOF message.

The **AppliesToInternal**, **AppliesToExternalKnown**, and **AppliesToExternalUnknown** elements, each of which indicates the audience to which an OOF message pertains, are mutually exclusive.

2.2.1.18.1.13 Enabled

The **Enabled** element specifies whether an OOF message is sent to this audience while the sending user is OOF.

Parent elements	<OofMessage>
Child	None

elements	
Data type	**Integer**
Number allowed	0…1 (optional)

The **Enabled** element is used in the OOF **Get** response to retrieve the current value. The **Enabled** element is used in the OOF **Set** request to set the value.

The value of **Enabled** is 1 if an OOF message is sent while the sending user is OOF; otherwise, the value is 0.

2.2.1.18.1.14 ReplyMessage

The **ReplyMessage** element specifies the message to be shown to a particular audience when the user is OOF.

Parent elements	<OofMessage>
Child elements	None
Data type	**String**
Number allowed	0…1 (optional)

The **ReplyMessage** may be used in an OOF **Get** response to convey the requested OOF message, or in an OOF **Set** request to set the message that the client wants to send to a particular audience. In a Set, the existence of a ReplyMessage requires that a BodyType also be specified.

The OOF property supports the following three audiences for an OOF message:

- Internal—A user who is in the same organization as the sending user.
- Known external—A user who is outside the sending user's organization, but is represented in the sending user’s contacts.
- Unknown external—A user who is outside the sending user's organization and is not represented in the sending user’s contacts.

The presence of one of the following elements, which are mutually exclusive, indicates the audience to which an OOF message pertains <7>:

- **AppliesToInternal**—The OOF message is relevant to an internal audience.
- **AppliesToExternalKnown**—The OOF message is relevant to a known external audience.
- **AppliesToExternalUnknown**—The OOF message is relevant to an unknown external audience.

2.2.1.18.1.15 DeviceInformation

The **DeviceInformation** element is the container node that is used for sending the client device's properties of the client device to the computer that is running Exchange Server.

Parent elements	<Settings>
Child elements	<Set>
Data type	**Container**
Number allowed	0..1 (Required)

It is important to have pertinent information about a user's device for monitoring and troubleshooting ActiveSync. The **DeviceInformation** element is used in the **Settings** command to send the following information about a client device to the server:

- Device model
- International Mobile Equipment Identity (IMEI)
- Device friendly name
- Device operating system
- Telephone number
- Device operating system language
- User Agent

This information is reflected both in the Microsoft Office Outlook® Web Access mobile device console and the output to Exchange administrative tasks (for example, reporting). The device information is represented as a flat list of settings under the <DeviceInformation> node in the **Settings** command. **DeviceInformation** has only one child element, **Set**, which contains the list of device information items in the request and the status in the response. The **DeviceInformation** property supports only the **Set** operation because this information is write-only from the device.

The following example shows a device-information request and response.

Request

```
<Settings xmlns="Settings:">
    <DeviceInformation>
        <Set>
            <Model>...</Model>
            <IMEI>...</IMEI>
            <FriendlyName>...</FriendlyName>
            <OS>...</OS>
            <OSLanguage>...</OSLanguage>
            <PhoneNumber>...</PhoneNumber>
            <UserAgent>...</UserAgent>
        </Set>
```

```
    </DeviceInformation>
</Settings>
```

Response

```
<Settings xmlns="Settings:">
    <Status>1</Status>
    <DeviceInformation>
        <Set>
            <Status>...</Status>
        </Set>
    </DeviceInformation>
</Settings>
```

2.2.1.18.1.16 Model

The **Model** element specifies a name that generally describes the device of the client.

Parent elements	<Set> (**DeviceInformation** request only)
Child Elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The descriptive name of the device may be any string that the client chooses, but it should be a general description of the device. For example, the name of the manufacturer, the model name, or the model number may be used. ActiveSync will not perform any validation of this string, so the client can submit any string.

2.2.1.18.1.17 IMEI

The **IMEI** element specifies a 15-digit code that uniquely identifies a device.

Parent elements	<Set> (**DeviceInformation** request only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

ActiveSync does not validate the IMEI format.

The device ID parameter that is currently included in the request URL is not precisely defined; licensees are free to populate the field as they want. To allow for workable inventory-type report generation, an ID that uniquely identifies a device in the space of all devices is required. The **IMEI** element satisfies this requirement.

2.2.1.18.1.18 FriendlyName

The **FriendlyName** element specifies a name that uniquely describes the device of the client.

Parent elements	<Set> (**DeviceInformation** request only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The friendly name of the device should be a string that is meaningful to the user. ActiveSync will not validate this value.

The friendly name of the device is typically specified during partnership creation if the user cradles the device to the desktop.

2.2.1.18.1.19 OS

The **OS** element specifies the operating system of the client device.

Parent elements	<Set> (**DeviceInformation** request only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

Some information about the operating system of the device can be collected from the user agent string that is associated with requests from that client. The mapping from user agent to operating system is not one to one, however, and therefore does not provide sufficient information to troubleshoot and establish an inventory.

The **OS** element is a string value that enables the client to precisely specify the operating system of the device. ActiveSync does not perform any validation of this value, but it is recommended that clients use the following convention:
<Operating System Product Name> <Operating System Major Version> <Operating System Minor Version>

2.2.1.18.1.20 OSLanguage

The **OSLanguage** element specifies the language that is used by the operating system of the client device.

Parent elements	<Set> (**DeviceInformation** request only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

Knowledge of the user's language facilitates localization if the server must send localizable content to the client device. ActiveSync does not validate the value of the **OSLanguage** element.

2.2.1.18.1.21 PhoneNumber

The **PhoneNumber** element specifies a unique number that identifies the client device.

Parent elements	<Set> (**DeviceInformation** request only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The telephone number facilitates troubleshooting and device management by providing a well-known and unique identifier for the client device. ActiveSync does not validate the value of the **PhoneNumber** element.

2.2.1.18.1.22 UserAgent

The **UserAgent** element specifies the user agent.

Parent elements	<Set> (**DeviceInformation** request only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The **UserAgent** element SHOULD contain the information in the User-Agent header. The User-Agent header SHOULD be removed from the HTTP request. ActiveSync does not validate the value of the **UserAgent** element.

2.2.1.18.1.23 DevicePassword

The **DevicePassword** element is a container node that is used to send the recovery password of the client device to the Exchange server.

Parent elements	<Settings>
Child elements	<Set>
Data type	**Container**
Number allowed	0..1 (Optional)

ActiveSync supports the **Set** operation on the **DevicePassword** property to enable the device to send or store a recovery password on the server. The recovery password will be stored in the user's mailbox and can be retrieved by the administrator or the end-user if the user forgets his or her password.

The following example shows a device-password request and response.

Request

```
<Settings>
    <DevicePassword>
        <Set>
            <Password>bar</Password>
        </Set>
    </DevicePassword>
</Settings>
```

Response

```
<Settings>
    <Status>1</Status>
    <DevicePassword>
        <Set>
            <Status>...</Status>
        </Set>
    </DevicePassword>
</Settings>
```

2.2.1.18.1.24 Password

The **Password** element specifies the recovery password of the client device, which is stored by the server.

Parent elements	<Set> (**DevicePassword** request only)
Child elements	None
Data type	**String**
Number allowed	1..1 (Required)

The value of the **Password** element has a maximum length of 255 characters.
To clear an existing recovery password, the client should send a **Set** request with an empty **Password** element.

2.2.1.18.1.25 UserInformation

The **UserInformation** element is a container node that is used to request a list of a user's e-mail addresses from the Exchange server.

Parent elements	<Settings>
Child elements	<Get> (**UserInformation** request only) <Status> (**UserInformation** response only)
Data type	**Container**
Number allowed	0..1 (Optional)

The list of a user's e-mail addresses can be useful, for example, for ensuring that the user is not included when performing a Reply to All operation to an e-mail message.

In a request, the **UserInformation** element contains the **Get** command to indicate that the server is to return all available e-mail addresses for the user.

The **Settings** command supports read-only access to the list of a user's various e-mail addresses via the **Get** command. The client will be unable to write this information.
The following example shows a user-information request and response.

Request

```
<Settings>
    <UserInformation>
        <Get/>
    </UserInformation>
</Settings>
```

Response

```
<Settings>
```

```
    <Status>1</Status>
    <UserInformation>
        <Status>1</Status>
        <Get>
            <EmailAddresses>
                <SMTPAddress>nameA@microsoft.com</SMTPAddress>
                <SMTPAddress>firstB.lastB@microsoft.com</SMTPAddress>
            </EmailAddresses>
        </Get>
    </UserInformation>
</Settings>
```

2.2.1.18.2 Response

2.2.1.18.2.1 Settings

The **Settings** element is the top-level element in the XML document for the **Settings** command.

Parent elements	None
Child elements	Named Property nodes <Status/> (response only)
Data type	**Container**
Number allowed	1..1 (Required)

The **Settings** element encapsulates one or more named property nodes that contain actions and arguments that apply to those properties.

The **Settings** command can be used on the following named properties:

- **Oof**
- **DevicePassword**
- **DeviceInformation**
- **UserInformation**

It is possible to have many **PropertyName** nodes. Each property must be processed in order. There may be cases in which one property call affects another property call or the same property is in the **Settings** request twice. The responses will come back in the same order in which they were requested.

2.2.1.18.2.2 Status

The **Status** element contains a code that indicates the success or failure of the **Settings** command and the success or failure of actions that are associated with a specific property node (**Oof**, **DeviceInformation**, **DevicePassword**, **UserInformation**).

Parent elements (response only)	<Settings> <Oof> <Set> (only in a **DeviceInformation** or **DevicePassword** response) <UserInformation> (response only)
Child elements	None
Data type	**Integer**
Number allowed for **Settings** parent	1…1 (Required)
Number allowed for **Oof** parent, **Set** parent, or **UserInformation** parent	0..1

The following table lists the valid values for the **Status** element in the context of the **Settings** command response. This is the status at the top level.

Value	Meaning
1	Success.
2	Protocol error.
3	Access denied. The user's access to ActiveSync is disabled.
4	Service/storage unavailable.
5	Invalid arguments. An unsupported property is specified.
6	Conflicting arguments. There are multiple property nodes (**Oof**, **DeviceInformation**, **DevicePassword**, **UserInformation**) with the same name.

The following table lists the valid values for **Status** in a **Settings** command **DeviceInformation** response.

Value	Meaning
1	Success.
2	Protocol error. The XML code is formatted incorrectly.
3	Access denied. An unauthorized write to the user's mailbox was tried.
4	Service/storage unavailable. Unable to write settings to the user’s mailbox.
5	Invalid arguments. There is an unsupported value within the **DeviceInformation** node.
6	Conflicting arguments. There are multiple entries with same name in the **DeviceInformation** node.

The following table lists the values for **Status** in a **Settings** command **DevicePassword** response.

Value	Meaning
1	Success.
2	Protocol error. The XML code is formatted incorrectly.
3	Access denied. An unauthorized write to the user's mailbox was tried.
5	Invalid arguments. The specified password is too long.
7	Denied by policy. The administrator has disabled password recovery in this deployment.

The following table lists the values for **Status** in a **Settings** command **UserInformation** response.

Value	Meaning
1	Success.
2	Protocol error. The XML code is formatted incorrectly.

The status is specified for the **Settings** command response and for each property node (**Oof**, **DeviceInformation**, **DevicePassword**, **UserInformation**) within **Settings**.

Error code values 100 to 255 are reserved for property-specific error codes and vary from property to property. Any status value that is not 1 is a failure.

If the status is not returned for a property node, the client assumes success.

2.2.1.18.2.3 Oof

The **Oof** element specifies a named property node for retrieving and setting Out of Office (OOF) information.

Parent elements	<Settings>
Child elements	<Get> <Set> (request only) <Status> (response only)
Data type	**Container**
Number allowed	0..1

The **Settings** command will support **Get** and **Set** operations for the OOF property. The OOF property enables a user to do the following:

- Specify whether the user is currently out of office.
- Schedule an out of office message to be sent between a particular start date and end date.
- Specify the message that is to be shown to various audiences when the mobile device user is out of office.

OOF Get Request and Response

The **Get** command within the **Oof** element enables the client to retrieve OOF information from the server. The client specifies the **BodyType** to be retrieved and the server will return all OOF information and messages.

There is one **OofMessage** node per audience in an OOF **Get** response. If a sender group is not allowed and is disabled (an unknown external sender can be disabled by the administrator), an **OofMessage** node is not reported to the client in a **Get** response. If the sender group is allowed, but is disabled and has no Reply message (specified by the **ReplyMessage** element), an **OofMessage** node is still reported to the client.

If the client does not receive a group, it is presumably because the client does not have permission to enter settings for that group; in such a case, it is expected that any attempt to set those properties will result in an Access Denied status code.

OOF Set Request and Response

The **Set** command allows the client to set the OOF status, time OOF, and OOF messages for one or more of the following groups:

- Internal
- External Known Senders (such as contacts)
- External Unknown Senders

The following example shows an OOF **Get** request and response.

Request

```
<Settings>
    <Oof>
        <Get>
            <BodyType>...</BodyType>
        </Get>
    </Oof>
</Settings>
```

Response

```
<Settings xmlns="Settings:">
    <Status>1</Status>
    <Oof>
        <Status>1</Status>
        <Get>
            <OofState>2</OofState>
```

```
            <StartTime>...</StartTime>
            <EndTime>...</EndTime>
            <OofMessage>
                <AppliesToInternal/>
                <Enabled>1</Enabled>
                <ReplyMessage>...</ReplyMessage>
                <BodyType>...</BodyType>
            </OofMessage>
            <OofMessage>
                <AppliesToExternalKnown/>
                <Enabled>1</Enabled>
                <ReplyMessage>...</ReplyMessage>
                <BodyType>...</BodyType>
            </OofMessage>
            <OofMessage>
                <AppliesToExternalUnknown/>
                <Enabled>1</Enabled>
                <ReplyMessage>...</ReplyMessage>
                <BodyType>...</BodyType>
            </OofMessage>
        </Get>
    </Oof>
</Settings>
```

The following example shows an OOF **Set** request and response.

Request

```
<Settings>
    <Oof>
        <Set>
            <OofState>0</OofState>
            <OofMessage>
                <AppliesToInternal/>
                <Enabled>1</Enabled>
                <ReplyMessage>...</ReplyMessage>
```

```
                <BodyType>...</BodyType>
            </OofMessage>
            <OofMessage>
                <AppliesToExternalKnown/>
                <Enabled>0</Enabled>
            </OofMessage>
            <OofMessage>
                <AppliesToExternalUnknown/>
                <Enabled>0</Enabled>
            </OofMessage>
        </Set>
    </Oof>
</Settings>
```

Response

```
<Settings>
    <Status>1</Status>
    <Oof>
        <Status>1</Status>
    </Oof>
</Settings>
```

2.2.1.18.2.4 Get

The **Get** command enables the client to retrieve information from the server for any named property that supports **Get**.

Parent elements	<Oof> <UserInformation> (request only)
Child elements in an <Oof> request	<BodyType>
Child elements in an <Oof> response	<OofState) <StartTime> <EndTIme> <OofMessage>
Child elements in a <UserInformation> request or response	None
Data type	**Container**

Number allowed	0..1

Only the OOF and User Information named properties support **Get**.
In an **Oof** request, the client specifies the body type to be retrieved and the server will return all OOF settings and messages for that body type.

2.2.1.18.2.5 Set

The **Set** command enables the client to set information on the server for any named property that supports **Set**.

Parent elements	<Oof> (request only) <DeviceInformation> <DevicePassword>
Child elements in an <Oof> request	<OofState> <StartTime> <EndTime> <OofMessage>
Child elements in an <Oof> response	None
Child elements in a <DeviceInformation> request	<Model> <IMEI> <FriendlyName> <OS> <OSLanguage> <PhoneNumber>
Child elements in a <DeviceInformation> response	<Status>
Child elements in an <DevicePassword> request	<Password>
Child elements in an <DevicePassword> response	<Status>
Data type	**Container**
Number allowed	0..1 (Required)

The named properties that support **Set** are OOF, Device Information, and Device Password.
OOF Property
The **Set** command enables the client to set the following in the OOF property:

- OOF state
- Start time and end time, if the user wants to schedule an OOF message
- OOF message or messages for one or more of the supported audiences

Device Information Property

Set enables the client to specify values for any of the Device Information parameters. The following statements apply to the **Set** command request implementation:

- The client must specify all supported Device Information parameters in the **Set** request.
- The client or server makes no assumptions about ordering. The Device Information parameters may be specified in any order.
- To delete a given Device Information value, the client is expected to send the **Set** command with an empty element for that parameter. Exchange Active Sync will set that parameter to **NULL**.

Device Password Property
The **Set** command enables the client to set or clear the recovery password of the device.

2.2.1.18.2.6 OofState

The **OofState** element specifies the availability of the OOF property.

Parent elements	<Get> (**Oof** response only) <Set> (**Oof** request only)
Child elements	None
Data type	**Integer**
Number allowed	0…1 (optional)

The following table lists the valid values for **OofState**.

Value	Meaning
0	The OOF property is disabled.
1	The OOF property is global.
2	The OOF property is time-based.

The values of **OofState** match those of the Availabilities Service enumeration. **OofState** must be set to 2 if the **StartTime** and **EndTime** elements are present.

2.2.1.18.2.7 StartTime

The **StartTime** element is used with the **EndTime** element to specify the range of time during which the user will be out of office.

Parent elements	<Get> (**Oof** response only) <Set> (**Oof** request only)
Child elements	None
Data type	**DateTime**
Number allowed	1…1 (Required)

The **StartTime** element may be present within the **Get** element of the **Settings** response for the OOF property, or within the **Set** element of the **Settings** request for the OOF property.

If **StartTime** is present, the **EndTime** element must be present also; otherwise, the client will receive a protocol error. In addition, **OofState** must be set to 2.

2.2.1.18.2.8 EndTime

The **EndTime** element is used with the **StartTime** element to specify the range of time during which the user will be out of office.

Parent elements	<Get> (**Oof** response only) <Set> (**Oof** request only)
Child elements	None
Data type	**DateTime**
Number allowed	1…1 (Required)

The **EndTime** element may be present within the **Get** element of the **Settings** response for the OOF property, or within the **Set** element of the **Settings** request for the OOF property.

If **EndTime** is present, the **StartTime** element must be present also. Otherwise, the client will receive a protocol error. In addition, **OofState** must be set to 2.

2.2.1.18.2.9 OofMessage

The **OofMessage** element contains a set of elements that specify the OOF message for a particular audience.

Parent elements	<Get> (**Oof** response only) <Set> (**Oof** request only)
Child elements	<AppliesToInternal> <AppliesToExternalKnown> <AppliesToExternalUnknown> <Enabled> <ReplyMessage> <BodyType>
Data type	**Container**
Number allowed	0…3

The OOF property supports the following three audiences for an OOF message <8>:

- Internal—A user who is in the same organization as the sending user.
- Known external—A user who is outside the sending user's organization, but is represented in the sending user’s contacts.
- Unknown external—A user who is outside the sending user's organization and is not represented in the sending user’s contacts.

The presence of one of the following elements, which are mutually exclusive, indicates the audience to which an OOF message pertains:

- **AppliesToInternal**—The OOF message is relevant to an internal audience.
- **AppliesToExternalKnown**—The OOF message is relevant to a known external audience.
- **AppliesToExternalUnknown**—The OOF message is relevant to an unknown external audience.

There is one **OofMessage** node per audience in an OOF **Get** response. If a sender group is not allowed and is disabled (an unknown external sender can be disabled by the administrator), an **OofMessage** node is not reported to the client in a **Get** response. If a sender group is allowed, but is disabled and has no reply message (specified by the **ReplyMessage** element), an **OofMessage** node is still reported to the client.

If the client does not receive a group, it is presumably because the client does not have permission to enter settings for that group; in such a case, it is expected that any attempt to set those properties will result in an Access Denied status code.
In an OOF **Set** request, the client must not include the same *AppliesTo** element in more than one **OofMessage** element.

2.2.1.18.2.10 BodyType

The **BodyType** element is a string that specifies the format of the OOF message.

Parent elements	<Get> (request only) <OofMessage>
Child elements	None
Data type	**String**
Number allowed	1…1 (required)

The following are the permitted values for the **BodyType** element:

- Text
- HTML

If **BodyType** has the value HTML, all message strings are sent in the HTML format. If **BodyType** has the value Text, the message strings are sent in plain text. Because there is no default value, the **BodyType** node must be present.

2.2.1.18.2.11 AppliesToInternal

The **AppliesToInternal** element indicates that the OOF message applies to internal users. (An internal user is a user who is in the same organization as the sending user.)

Parent elements	<OofMessage>
Child elements	None
Data type	**Flag**
Number	0…1 (Choice)

allowed	

When the **AppliesToInternal** element is present, its peer elements (that is, the other elements within the **OofMessage** element) specify the OOF settings with regard to internal users. The following are the peer elements of the **AppliesToInternal** element:

- **Enabled**—Specifies whether an OOF message is sent to this audience while the sending user is OOF.
- **ReplyMessage**—Specifies the OOF message itself.
- **BodyType**—Specifies the format of the OOF message.

The **AppliesToInternal**, **AppliesToExternalKnown**, and **AppliesToExternalUnknown** elements, each of which indicates the audience to which an OOF message pertains, are mutually exclusive.

2.2.1.18.2.12 AppliesToExternalKnown

The **AppliesToExternalKnown** element indicates that the OOF message applies to known external users. (A known external user is a user who is outside the sending user's organization, but is represented in the sending user’s contacts.)

Parent elements	<OofMessage>
Child elements	None
Data type	**Flag**
Number allowed	0…1 (Choice)

When the **AppliesToExternalKnown** element is present, its peer elements (that is, the other elements within the **OofMessage** element) specify the OOF settings with regard to known external users.

The following are the peer elements of the **AppliesToExternalKnown** element:

- **Enabled**—Specifies whether an OOF message is sent to this audience while the sending user is OOF.
- **ReplyMessage**—Specifies the OOF reply message. Exchange 2007 requires that the reply message for unknown external and known external audiences is the same.
- **BodyType**—Specifies the format of the OOF message.

The **AppliesToInternal**, **AppliesToExternalKnown**, and **AppliesToExternalUnknown** elements, each of which indicates the audience to which an OOF message pertains, are mutually exclusive.

2.2.1.18.2.13 AppliesToExternalUnknown

The **AppliesToExternalUnknown** element indicates that the OOF message applies to unknown external users. (An unknown external user is a user who is outside the sending user's organization and is not represented in the sending user’s contacts.)

Parent elements	<OofMessage>
Child elements	None
Data type	**Flag**
Number allowed	0…1 (Optional

When the **AppliesToExternalKnown** element is present, its peer elements (that is, the other elements within the **OofMessage** element) specify the OOF settings with regard to unknown external users.
The following are the peer elements of the **AppliesToExternalKnown** element:

- **Enabled**—Specifies whether an OOF message is sent to this audience while the sending user is OOF.
- **ReplyMessage**—Specifies the OOF reply message. Exchange 2007 requires that the reply message for unknown external and known external audiences is the same.
- **BodyType**—Specifies the format of the OOF message.

The **AppliesToInternal**, **AppliesToExternalKnown**, and **AppliesToExternalUnknown** elements, each of which indicates the audience to which an OOF message pertains, are mutually exclusive.

2.2.1.18.2.14 Enabled

The **Enabled** element specifies whether an OOF message is sent to this audience while the sending user is OOF.

Parent elements	<OofMessage>
Child elements	None
Data type	**Integer**
Number allowed	0…1 (optional)

The **Enabled** element is used in the OOF **Get** response to retrieve the current value. The **Enabled** element is used in the OOF **Set** request to set the value.
The value of **Enabled** is 1 if an OOF message is sent while the sending user is OOF; otherwise, the value is 0.

2.2.1.18.2.15 ReplyMessage

The **ReplyMessage** element specifies the message to be shown to a particular audience when the user is OOF.

Parent elements	<OofMessage>

Child elements	None
Data type	**String**
Number allowed	0…1 (optional)

The **ReplyMessage** may be used in an OOF **Get** response to convey the requested OOF message, or in an OOF **Set** request to set the message that the client wants to send to a particular audience.
The OOF property supports the following three audiences for an OOF message:

- Internal—A user who is in the same organization as the sending user.
- Known external—A user who is outside the sending user's organization, but is represented in the sending user's contacts.
- Unknown external—A user who is outside the sending user's organization and is not represented in the sending user's contacts.

Exchange 2007 requires that the reply message for unknown external and known external audiences is the same. The presence of one of the following elements, which are mutually exclusive, indicates the audience to which an OOF message pertains:

- **AppliesToInternal**—The OOF message is relevant to an internal audience.
- **AppliesToExternalKnown**—The OOF message is relevant to a known external audience.
- **AppliesToExternalUnknown**—The OOF message is relevant to an unknown external audience.

2.2.1.18.2.16 DeviceInformation

The **DeviceInformation** element is the container node that is used for sending the client device's properties of the client device to the computer that is running Exchange Server.

Parent elements	<Settings>
Child elements	<Set>
Data type	**Container**
Number allowed	0..1 (Required)

It is important to have pertinent information about a user's device for monitoring and troubleshooting ActiveSync. The **DeviceInformation** element is used in the **Settings** command to send the following information about a client device to the server:

- Device model
- International Mobile Equipment Identity (IMEI)
- Device friendly name
- Device operating system
- Telephone number

- Device operating system language

This information is reflected both in the Microsoft Office Outlook® Web Access mobile device console and the output to Exchange administrative tasks (for example, reporting). The device information is represented as a flat list of settings under the <DeviceInformation> node in the **Settings** command. **DeviceInformation** has only one child element, **Set**, which contains the list of device information items in the request and the status in the response. The **DeviceInformation** property supports only the **Set** operation because this information is write-only from the device.

The following example shows a device-information request and response.

Request

```
<Settings xmlns="Settings:">
    <DeviceInformation>
        <Set>
            <Model>...</Model>
            <IMEI>...</IMEI>
            <FriendlyName>...</FriendlyName>
            <OS>...</OS>
            <OSLanguage>...</OSLanguage>
            <PhoneNumber>...</PhoneNumber>
        </Set>
    </DeviceInformation>
</Settings>
```

Response

```
<Settings xmlns="Settings:">
    <Status>1</Status>
    <DeviceInformation>
        <Set>
            <Status>...</Status>
        </Set>
    </DeviceInformation>
</Settings>
```

2.2.1.18.2.17 DevicePassword

The **DevicePassword** element is a container node that is used to send the recovery password of the client device to the Exchange server.

Parent elements	<Settings>
Child elements	<Set>
Data type	**Container**
Number allowed	0..1 (Optional)

ActiveSync supports the **Set** operation on the **DevicePassword** property to enable the device to send or store a recovery password on the Exchange server. The recovery password will be stored in the user's mailbox and can be retrieved by the administrator or the end-user if the user forgets his or her password.

The following example shows a device-password request and response.

Request

```
<Settings>
    <DevicePassword>
        <Set>
            <Password>bar</Password>
        </Set>
    </DevicePassword>
</Settings>
```

Response

```
<Settings>
    <Status>1</Status>
    <DevicePassword>
        <Set>
            <Status>...</Status>
        </Set>
    </DevicePassword>
</Settings>
```

2.2.1.18.2.18 UserInformation

The **UserInformation** element is a container node that is used to request a list of a user's e-mail addresses from the Exchange server.

Parent elements	<Settings>
Child	<Get>

elements	<Status> (**UserInformation** response only)
Data type	**Container**
Number allowed	0..1 (Optional)

The list of a user's e-mail addresses can be useful, for example, for ensuring that the user is not included when performing a Reply to All operation to an e-mail message.

In a request, the **UserInformation** element contains the **Get** command to indicate that the server is to return all available e-mail addresses for the user.

The **Settings** command supports read-only access to the list of a user's various e-mail addresses via the **Get** command. The client will be unable to write this information.

The following example shows a user-information request and response.

Request

```
<Settings>
    <UserInformation>
        <Get/>
    </UserInformation>
</Settings>
```

Response

```
<Settings>
    <Status>1</Status>
    <UserInformation>
        <Status>1</Status>
        <Get>
            <EmailAddresses>
                <SMTPAddress>nameA@microsoft.com</SMTPAddress>
                <SMTPAddress>firstB.lastB@microsoft.com</SMTPAddress>
            </EmailAddresses>
        </Get>
    </UserInformation>
</Settings>
```

2.2.1.18.2.19 EmailAddresses

The **EmailAddresses** element contains one or more e-mail addresses for the user.

Parent elements	<Get> (response only)
Child elements	<SMTPAddress> (response only)
Data type	**Container**
Number allowed	0..1 (Optional)

2.2.1.18.2.20 SMTPAddress

The **SMTPAddress** element specifies one of the user's e-mail addresses.

Parent elements	<EmailAddresses>
Child elements	None
Data type	**String**
Number allowed	1..n (Optional)

2.2.1.19 SmartForward

The **SmartForward** command is used by clients to forward messages without retrieving the full, original message from the server.

2.2.1.19.1 Request

The **SmartForward** command is issued in the HTTP **POST** command Uniform Resource Identifier (URI); the command does not specify additional information in an XML body. The *ItemId* command parameter specifies the server ID of the message item to be forwarded. The *CollectionId* command parameter specifies the server ID of the collection that contains the message to be forwarded. The *SaveInSent* command parameter specifies whether a copy of the forwarded message will be saved in the Sent Items folder.

Messages should not be saved directly to the local Sent Items folder by the client. It is not possible to reconcile the local Sent Items folder with the server's Sent Items folder by using the **Sync** command. Items in the server's Sent Items folder can be added to the client by using the **Sync** command, but it is not possible to add items that are in the local Sent Items folder, to the server.

To instruct the server to save the forwarded e-mail message in the user's Sent Items folder in the Exchange mailbox, include the *SaveInSent* parameter in the HTTP **POST** command URI and set the parameter to 'T'. To instruct the server not to save the outgoing e-mail message in the user's Sent Items folder, omit the *SaveInSent* parameter. The *SaveInSent* parameter is set to 'F' by default.

Note: Explicitly setting the *SaveInSent* parameter to 'F' currently results in an error.

The forwarded message is included as a Multipurpose Internet Mail Extensions (MIME)-formatted message in the body of the **POST** command request; the Content-Type MIME header field is set to "message/rfc822". For more information about the RFC 822 format, see [RFC822]. RFC 821-formatted messages are not supported.

The **SmartForward** command can be applied to a meeting. When **SmartForward** is applied to a recurring meeting, the command's *Occurrence* parameter specifies the ID of a particular occurrence in the recurring meeting. If **SmartForward** is applied to a recurring meeting and the *Occurrence* parameter is absent, the server should forward the entire recurring meeting. If the value of *Occurrence* is invalid, the server should respond with an error.

When **SmartForward** is applied to an appointment, the original message is included by the server as an attachment to the outgoing message. When smart-forwarding a normal message or a meeting, **SmartForward**'s behavior is the same as that of the **SmartReply** command.

The **SmartForward** command is similar to the **SendMail** command, but the outgoing message consists of the new message followed by the text of the original message. The full text of the original message is sent. Using the server copy of the original message saves network bandwidth by avoiding the need to download the original message and then upload it again with the forward.

The **SmartForward** command lists the message recipients.

By default, since the original message and the forward messages can use different character sets, this command will always send the outgoing message by using the UTF8 character set for the body of the message.

2.2.1.19.2 Response

The response from the server contains the HTTP status code.

A 500 HTTP status code is returned to the client if the client attempts to forward a message that has been either moved or deleted from the specified folder on the server.

2.2.1.20 SmartReply

The **SmartReply** command is used by clients to reply to messages without retrieving the full, original message from the server.

2.2.1.20.1 Request

The **SmartReply** command is issued in the HTTP **POST** command Uniform Resource Identifier (URI); the command does not specify any additional information in an XML body. The *ItemId* command parameter specifies the server ID of the message item that is being replied to. The *CollectionId* command parameter specifies the server ID of the collection that contains the message item to be replied to. The *SaveInSent* command parameter specifies whether a copy of the reply message will be saved in the Sent Items folder.

Messages should not be saved directly to the local Sent Items folder by the client. It is not possible to reconcile the local Sent Items folder with the server's Sent Items folder by using

the **Sync** command. Items in the server's Sent Items folder can be added to the client by using the **Sync** command, but it is not possible to add items that are in the local Sent Items folder, to the server.

To instruct the server to save the outgoing e-mail message in the user's Sent Items folder in the Exchange mailbox, include the *SaveInSent* parameter in the HTTP POST command URI and set the parameter to 'T'. To instruct the server not to save the outgoing e-mail message in the user's Sent Items folder, omit the *SaveInSent* parameter. The *SaveInSent* parameter is set to 'F' by default.

Note: Explicitly setting the *SaveInSent* parameter to 'F' currently results in an error.

The reply message is included as a Multipurpose Internet Mail Extensions (MIME)-formatted message in the body of the **POST** command request; the Content-Type MIME header field is set to "message/rfc822". For more information about the RFC 822 format, see [RFC822]. RFC 821-formatted messages are not supported.

The **SmartReply** command can be applied to a meeting. When **SmartReply** is applied to a recurring meeting, the command's *Occurrence* parameter specifies the ID of a particular occurrence in the recurring meeting. If **SmartReply** is applied to a recurring meeting and the *Occurrence* parameter is absent, the server should reply to the entire recurring meeting. If the value of *Occurrence* is invalid, the server should respond with an error.

The **SmartReply** command is similar to the **SendMail** command, but the outgoing message consists of the new message followed by the text of the original message. The full text of the original message is sent. Using the server copy of the original message saves network bandwidth by avoiding the need to download the original message and then upload it again with the reply.

The **SmartReply** command lists the message recipients, so it is used to implement both Reply and Reply-to-All functionality. It is the responsibility of the client to implement Reply and Reply-to-All functionality.

By default, since the original message and the reply messages can use different character sets, this command will always send the outgoing message by using the UTF8 character set for the body of the message.

2.2.1.20.2 Response

The response from the server contains the HTTP status code.

A 500 HTTP status code is returned to the client if the client attempts to reply to a message that has been either moved or deleted from the folder on the server.

2.2.1.21 Sync

The **Sync** command synchronizes changes in a collection between the client and the server.

For more information about the AirSyncBase elements that are included in this schema, see [MS-AIRS].

Synchronization is a two-step process. For each collection, the client must issue an initial **Sync** request by sending a synchronization key of 0. This request establishes a synchronization relationship with the server and initializes the synchronization state there. The server responds with an initial value of the synchronization key, which the client may then use to get the initial set of objects from the server. (From this point forward, client requests should always include the synchronization key that was received in the last response from the server.) The client then sends a **Sync** command request to the server with the response synchronization key and includes any changes that were made on the client.

Note: If the client device has not yet synchronized a folder, there should be no client-side changes. The device should synchronize the entire folder, and then have changes, additions, and deletions applied.

The response from the server indicates whether the client's changes were accepted, and includes any changes that were made on the server. The server response also contains a synchronization key that is to be used for the next synchronization session for the folder. The Outbox folder cannot be synchronized and the Sent Items folder is a one-way synchronization from the server to the client.

The **Sync** command schema also supports the following features:

- Options for synchronization of data that is an HTML body
- Enhanced synchronization of Multipurpose Internet Mail Extensions (MIME) data

For more information, see the **MIMESupport** element, and the **Body** element or the **BodyPreference** element in [MS-AIRS].

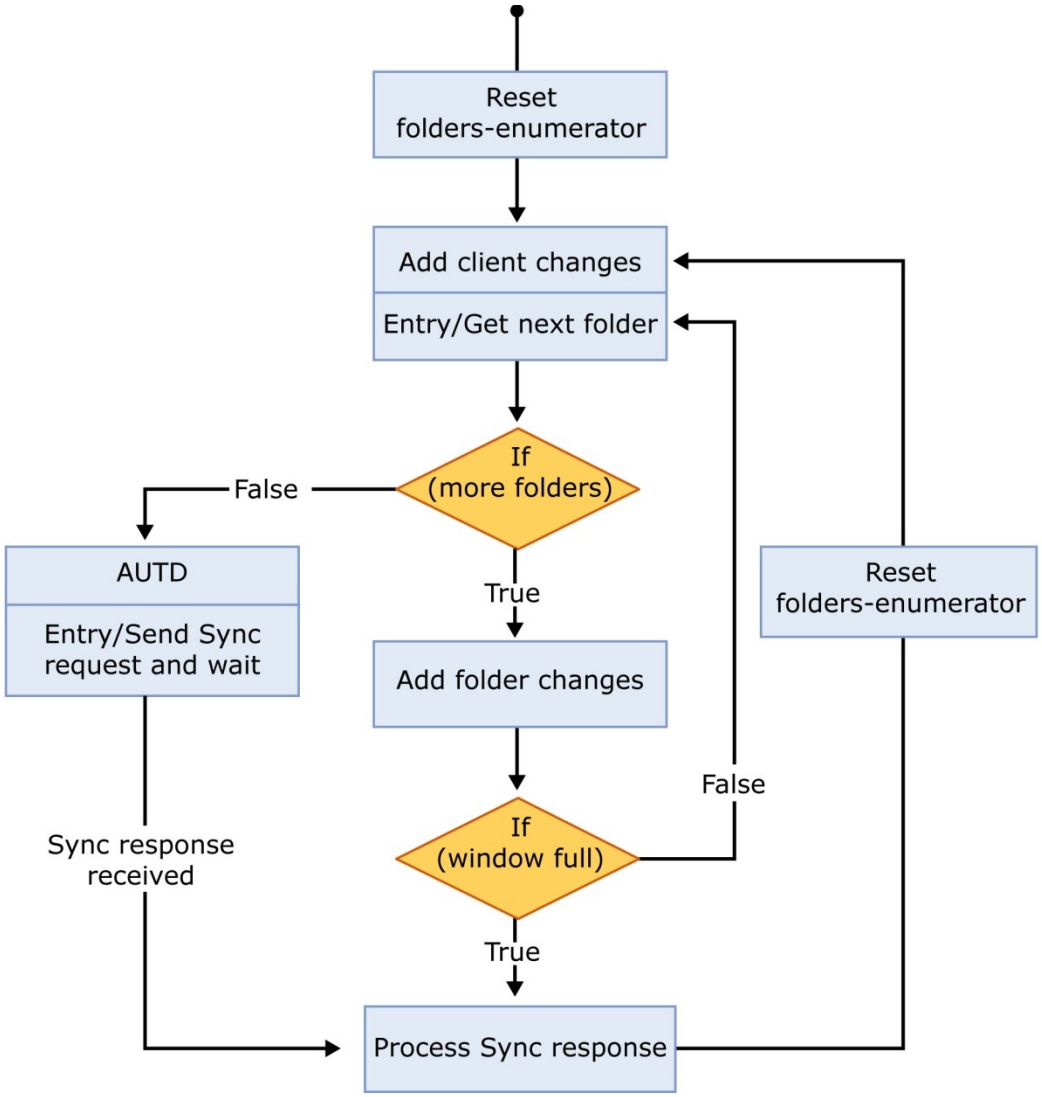
The ActiveSync protocol has been optimized for the case in which there are no changes to any of the collections that are specified in the **Sync** request. In such a case, the client may receive an empty response from the server. After the client receives an empty response, the client can issue an empty **Sync** request. The server then re-executes the previous request, which it cached. The following is an example of an empty request:

```
POST /Microsoft-Server-ActiveSync?Cmd=Sync&User=administrator
&DeviceId=v25Devicedffasdf&DeviceType=PocketPC
MS-ASProtocolVersion: 12.1
```

Other changes that optimize the protocol include the following:

- The addition of three new elements: **Partial**, **Wait**, and **Limit**.
- Changes to the **Collections**, **Options**, **WindowSize**, and **SyncKey** elements.
- The addition of new status codes.
- Empty response and request semantics

The following diagram shows request and response processing by the client.



2.2.1.21.1 Request

2.2.1.21.1.1 Sync

The **Sync** element is the top-level element in the XML document. It identifies the body of the HTTP Post as containing a **Sync** command.

Parent elements	None
Child elements	<Limit> (response only) <Partial> (request only) <Wait> <WindowSize> (request only)
Data type	**Container**
Number allowed	0…1 (Optional)

The **Sync** element can also include one or more explicit namespace attributes.

The **Limit** element and **Collections** element are mutually exclusive in a **Sync** response. That is, a **Sync** response can include either a **Limit** element or a **Collections** element, but not both. If the server response to a sync request with no body, the client may issue the next sync request with no body as well to save bandwidth. The server will cache the last request if it issues an empty response, and if the next request is empty the server will use the cached request instead. If there exists any body, then it must contain a <Sync> element.

The following is an example of the **Sync** element in a **Sync** command request or response.
Request/Response

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns=”AirSync:” xmlns:A="CONTACTS:">
    <Collections>
    …
    </Collections>
</Sync>
```

2.2.1.21.1.2 Wait

The **Wait** element specifies, in a request, the number of minutes that the server should delay a response and, in a response, the number of minutes that the server can wait for any changes before responding.

Parent elements	<Sync>
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

Valid values for **Wait** are 1 through 59. When the client requests a wait-interval that is outside the acceptable range the server will send a response that includes a **Status** value of 14 and a **Limit** element.

When **Wait** is used in a **Sync** request, the element indicates to the server that a response should be delayed either until the wait-interval, which is indicated by the contents of the **Wait** element, elapses or until any of the collections that are included in the request have changed. It is at the discretion of the client to send the **Wait** element; the server is only guaranteed to respond immediately when **Wait** is not present. The client typically may want a server response immediately in the following cases:

- The client adds new items by using the **Add** element. In this case, an immediate response is needed because the client will need the server-provided item ID to track changes to those new items.

- The client sends up a large change by using the **Change** element. In this case, a delayed response will increase the possibility that the client must resend the change because of a lost connection.

Note: Although the server is only guaranteed to respond immediately when **Wait** is not present, the server should always respond immediately to a **Sync** request that includes an **Add** or a **Change**, unless the addition or change involves only flags.

A hard delete of tasks or calendar items will cause a waited **Sync** to finish. The benefit of this is a better user experience. For example, a user will not get reminders for deleted meetings. A hard delete is infrequent and rarely results in an extra roundtrip. A flagging change or a move out of (and not into) a folder which is being synced should not cause the request to finish early.

2.2.1.21.1.3 Partial

The **Partial** element indicates to the server that the client sent a partial list of collections, in which case the server should obtain the rest of the collections from its cache.

Parent elements	<Sync> (Request)
Child elements	None
Data type	**Empty**
Number allowed	0..1 (Optional)

The client must not send a **Partial** element without any other elements in the **Sync** request. A **Sync** request is valid with just a **Partial** element and either a **Wait** element, a **WindowSize** element, a Collections element, or any combination of the three. A **Sync** request requires, at least, either a **Partial** element or a **Collections** element.

When a request includes a **Partial** element but does not specify some collections, the settings and synchronization key for each of those unspecified collections specified in the previous **Sync** request remain the same as specified in the previous request. Such a request is equivalent to a request that specifies each of these collections with the same settings and synchronization key as in the previous request. This allows the client to modify some aspect of the previous request (one of the collections, the wait time, the global window size, etc) without sending up every unchanged collection.

The following example shows a **Sync** request that includes the **Partial** element.

```
<Sync xmlns="AirSync:">
    <Collections>
        <Collection>
            <SyncKey>1723058747</SyncKey>
            <CollectionId>10</CollectionId>
        </Collection>
    </Collections>
    <Wait>8</Wait>
```

```
    <Partial/>
</Sync>
```

2.2.1.21.1.4 WindowSize

The **WindowSize** element is sent from the client to the server to specify a maximum number of changed items in a collection or a request that should be included in the synchronization response.

Parent elements	<Collection> (Request) <Sync>
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

The server sends the requested number of changes, and if there are more, the server includes a **MoreAvailable** element in the response. The maximum value for the **WindowSize** element is 512.

The **WindowSize** element appears only in requests that are sent to the server from the client. If **WindowSize** is omitted, the server behaves as if a **WindowSize** element with a value of 100 were submitted.

A good value for **WindowSize** is 100. Small values increase the load on the server, increase bandwidth, and decrease battery life because of the additional requests that are required to obtain all changes. Larger values cause larger responses, which are more susceptible to communication errors. A lower **WindowSize** value can be useful if the client can display the initial set of objects while additional ones are still being retrieved from the server.

If the window size is changed during a synchronization transaction, this can result in a **MoreAvailable** element being returned in the response but no items are returned. If this occurs, the client should synchronize again to continue getting items from the server.

The **WindowSize** element has been repurposed to also impose a global limit on the number of changes that are returned by the server. **WindowSize** can still be specified at the **Collection** level and the server is expected to honor both settings.

When **WindowSize** is not sent by the client, the server assumes a default **WindowSize** of 100. This value is used by most clients and this default will save those clients some bytes. The default is also in effect at the **Collection** level. As in earlier versions, the maximum value for **WindowSize** is 512.

The collections are to be processed by the server in the order received, as follows:

- If the server has filled the **WindowSize** on a particular collection that has more changes, it will return the **MoreAvailable** element for that collection and continue to process the other collections until the global **WindowSize** has been filled.

- When the server has filled the global **WindowSize** and collections that have changes did not fit in the response, the server may return a **MoreAvailable** element.
- If a collection is not present in a **Sync** response, the client may assume that no changes are currently available for that collection.

The actual number of changes that are included in a **Sync** response for any particular collection depends on the **WindowSize** of the collection, the overall number of changes that are already included in the response, and the global **WindowSize**. The server will stop processing after the global **WindowSize** has been filled and simply not process the remaining collections. Any server-side changes that are pending in the unprocessed collections will be picked up in the next synchronization.

The following synchronization request specifies that up to 100 changes be sent from the server back to the client. If there are more than 100 changes on the server, the **MoreAvailable** element is included in the response.

Request

```
<Collection>
      <Class>Email</Class>
      <SyncKey>1</SyncKey>
      <CollectionId>1</CollectionId>
      <DeletesAsMoves/>
      <GetChanges/>
      <WindowSize>100</WindowSize>
</Collection>
```

2.2.1.21.1.5 Add

The **Add** command can be used to create a new object in a collection on the client or on the server.

When a new item is being sent from the client to the server, the **ClientId** element specifies a temporary ID for the item, which is unique on the client. The **ApplicationData** element specifies the item data. The server then responds with an **Add** element in a **Responses** element, which specifies the client ID and the server ID that was assigned to the new item. When the client sends a **Sync** command to the server and a new item has been added to the server collection since the last synchronization, the server responds with an **Add** element in a **Commands** element. This **Add** element specifies the server ID and data of the item to be added to the collection on the client.

When you add a calendar item, the **Timezone** property must be specified first and the **StartTime** and **EndTime** properties must be present in the **ApplicationData** element.

Parent elements	<Commands> <Responses> (Response only)
Child elements	<ServerID/> (Response only, see remarks) <ClientId/> <ApplicationData> <Status/> (Response only)
Data type	**Container**
Number allowed	0..n (Optional)

One or more **Add** elements can appear as a child of the **Commands** and **Responses** elements for a particular collection.

The **Add** element cannot be used to add any e-mail items from the client to the server. If the server ID in an **Add** element from the server matches the server ID for an item on the client, the client should treat the addition as a change to the client item.

The server may not send an individual response for every command that is sent by the client. The client will only receive responses for successful additions and fetches, and failed changes and deletions. When the client does not receive a response, the client should assume that the command succeeded unless informed otherwise.

This example shows a **Sync** command request that is sent to the server to add a contact. The response from the server shows that the synchronization was successful and that the new item from the client, identified by the **ClientId** element, was added to the collection on the server. The server also assigns a permanent ID for the newly added item in the **ServerId** element. After the client receives a successful response, the client is then expected to use this server ID for any future **Change** or **Delete** commands for this item.

Request

```
<Commands>
    <Add>
                            <ClientId>123</ClientId>
        <ApplicationData>
            <A:Email1Address>schai@fourthcoffee.com</A:Email1Address>
            <A:FirstName>Sean</A:FirstName>
            <A:MiddleName>W</A:MiddleName>
            <A:LastName>Chai</A:LastName>
            <A:Title>Sr Marketing Manager</A:Title>
        </ApplicationData>
    </Add>
</Commands>
```

Response

```
<Responses>
    <Add>
        <ClientId>123</ClientId>
        <ServerId>4:1</ServerId>
        <Status>1</Status>
    </Add>
</Responses>
```

The response from the server to a **Sync** command shows that a contact item, identified by the **ServerId** element, should be added to the client collection.

Response

```
<Commands>
    <Add>
        <ServerId> 2:6</ServerId>
        <ApplicationData>
            <A:Email1Address>ahill@fourthcoffee.com</A:Email1Address>
            <A:FirstName>Annette</A:FirstName>
            <A:MiddleName>C</A:MiddleName>
            <A:LastName>Hill</A:LastName>
            <A:Title>Lead Tester</A:Title>
        </ApplicationData>
    </Add>
</Commands>
```

2.2.1.21.1.6 ApplicationData

The **ElementName** element encloses data for a particular object, such as a contact, e-mail message, calendar appointment, or task item. The **ApplicationData** element can be used to add or change items on the client device or server. The format of this data is determined by the schema for the object.

Parent elements	<Add> <Change>
Child elements	Data elements from the content classes. For more information about the content classes and their elements, see Property Sets.
Data type	**Container**
Number allowed	1 (Required)

The following **ApplicationData** element is used to add a contact item, identified by the **ServerId** element, to a folder on the client device.

Response

```
<Add>
          <ServerId> 2:6</ServerId>
          <ApplicationData>
<A:Body></A:Body>
             <A:Email1Address>"jdobney@fourthcoffee.com"
&lt;jdobney@fourthcoffee.com&gt;</A:Email1Address>
                <A:FileAs>Dobney, JoLynn Julie</A:FileAs>
                <A:FirstName>JoLynn</A:FirstName>
                <A:HomePhoneNumber>425 555 1234</A:HomePhoneNumber>
                <A:MiddleName>Julie</A:MiddleName>
                <A:MobilePhoneNumber>425 555 1111</A:MobilePhoneNumber>
                <A:CompanyName>Fourth Coffee</A:CompanyName>
                <A:LastName>Dobney</A:LastName>
                <A:BusinessPhoneNumber>425 555
5555</A:BusinessPhoneNumber>
                <A:JobTitle>Usability Engineer</A:JobTitle>
          </ApplicationData>
</Add>
```

2.2.1.21.1.7 Change

The **Change** element modifies properties of an existing object on the client device or the server. The object to change is identified by its **ServerId** element.

Parent elements	<Commands> <Responses> (Response only)
Child elements	<ServerID/> <ApplicationData> <Status/> (Response only)
Data type	**Container**
Number allowed	0..n (Optional)

One or more **Change** elements can appear as a child of the **Commands** element for a particular collection.

Certain in-schema properties remain untouched in the following three cases:

- If there is only a **Flag** or **Read** change (that is, if only a **Flag** or **Read** node is present), all other properties will remain unchanged and nothing else has to be sent.
- If an **Exceptions** node is not specified, the properties for that **Exceptions** node will remain unchanged. If an **Exception** node within the **Exceptions** node is not present, that particular exception will remain unchanged.
- If **Body**, **Data**, **Picture**, or **RTF** nodes are not present, the corresponding properties will remain unchanged.

In all other cases, if an in-schema property is not specified in a change request, the property is actively deleted from the item on the server. A client should be aware of this when it is sending **Sync** requests; otherwise, data may be unintentionally removed.

The following example shows a **Sync** command request from the client. The request modifies a contact, which is identified by the server ID, on the server. The response from the server shows that the change that is specified by the **Sync** request of the client succeeded and supplies the synchronization key and collection ID of the changed item.

Request

```
<Commands>
    <Change>
        <ServerId>3:1</ServerId>
        <ApplicationData>
            <A:Email1Address>jsmith@fourthcoffee.com</A:Email1Address>
            <A:FirstName>Jeff</A:FirstName>
        </ApplicationData>
    </Change>
</Commands>
```

Response

```
<Collections>
    <Collection>
      <Class>Contacts</Class>
      <SyncKey>4</SyncKey>
      <CollectionId>1</CollectionId>
      <Status>1</Status>
    </Collection>
</Collections>
```

2.2.1.21.1.8 Class

The **Class** element is no longer supported. For E-Mail, Calendar, Tasks, or Contacts collections, the server will determine the collection type from the interpersonal folder (IPF) class of the folder. The client can determine the collection type from the **FolderCreate**, **FolderSync**, or **GetHierarchy** command response. An E-mail collection type is assumed for generic folders.

If the client sends a **Class** element, the server responds with a status code 4 (protocol error).

Example:

```
<Class>Calendar</Class>
```

2.2.1.21.1.9 ClientId

The **ClientId** is a unique identifier that is generated by the client to temporarily identify a new object that is being created by using the **Add** command. The client includes the **ClientId** element in the **Add** command request that it sends to the server. The server response contains an **Add** element that contains the original client ID and a new server ID that was assigned for the object, which replaces the client ID as the permanent object identifier.

Parent elements	<Add>
Child elements	None
Data type	**String** (Typically an integer)
Number allowed	Request: 1 (Required)

The **ClientId** element is a unique identifier that consists of up to 40 digits and letters. The client generates this ID. The value must only be unique for the device during the duration of the **Sync** request that adds the object to the server. The client should store the client IDs until the synchronization session is completed successfully, which makes recovery easier if the synchronization process fails.

An easy way to implement the client ID is to use a counter that is incremented for each new object that is created on the client.

The following example shows a client **Sync** command request that adds a new item, which is identified by the temporary client ID, to the server. The response from the server shows that the new client item has been successfully added to the server and assigned a permanent server ID.

Request

```
<Commands>
<Add>
                    <ClientId>145</ClientId>
        <ApplicationData>…</ApplicationData>
    </Add>
```

```
</Commands>
```

Response

```
<Responses>
    <Add>
        <ClientId>145</ClientId>
        <ServerId>3:12</ServerId>
        <Status>1</Status>
    </Add>
</Responses>
```

2.2.1.21.1.10 Collection

The **Collection** element wraps commands and options that apply to a particular collection.

Parent elements	<Collections>
Child elements	<SyncKey/> <NotifyGUID/> (Request only, Ignored/Deprecated) <Supported> (Request only) <CollectionId/> <DeletesAsMoves/> (Request only) <GetChanges/> (Request only) <WindowSize/> (Request only) <Options> (Request only) <Status/> (Response only) <MoreAvailable/> (Response only) <Commands> <Responses> (Response only)
Data type	**Container**
Number allowed	1..512 (required)

The **Collection** element contains identification information (**Class**, **CollectionID**), synchronization state (**SyncKey**), commands (**GetChanges**, **Commands**), and options (**WindowSize**, **Options**, **DeleteAsMoves**, **MoreAvailable**). Only one collection can be specified in a **Sync** command.

Note: There is a strict ordering of the XML elements within a **Collection** node in a **Sync** request. The order is as follows:

1. <Class>
2. <SyncKey>
3. <NotifyGUID> (no longer used; ignored on the server-side)
4. <CollectionId>

5. <Supported>
6. <DeletesAsMoves>
7. <GetChanges>
8. <WindowSize>
9. <Options>
10. <Commands>

The **Collection** element appears in both **Sync** requests and responses. The form is similar, although some child elements are valid in only one context.

A single **Collections** element may contain multiple **Collection** elements. Therefore, each collection does not require its own **Sync** command. That is, a **Sync** request can specify multiple collections to be synchronized.

The following example shows a request that is sent to the server to synchronize an e-mail folder. The request asks that deleted items be moved to the Deleted Items folder. The request also asks for changes on the server to be specified in the response. The server response contains the new synchronization key and the items to be added, deleted, and changed on the client.

Request

```
<Collections>
<Collection>
        <Class>Email</Class>
        <SyncKey>6</SyncKey>
        <CollectionId>1</CollectionId>
        <DeletesAsMoves/>
        <GetChanges/>
        <Options> … </Options>
</Collection>
</Collections>
```

Response

```
<Collections>
<Collection>
        <Class>Email</Class>
        <SyncKey>7</SyncKey>
        <CollectionId>1</CollectionId>
        <Status>1</Status>
```

```
        <Commands>
            <Add>…</Add>
            <Delete>…</Delete>
            <Change>…</Change>
            <Fetch>…</Fetch>
        </Commands>
</Collection>
</Collections>
```

2.2.1.21.1.11 NotifyGUID

The **NotifyGUID** element is used to verify that the notification is intended for that particular client.<9>

Parent elements	<Collection> (Request only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

2.2.1.21.1.12 SyncKey

The **SyncKey** element contains a value that is used by the server to mark the synchronization state of a collection.

Parent elements	<Collection>
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (required)

A synchronization key of value 0 initializes the synchronization state on the server and causes a full synchronization of the collection. The server sends a response that includes a new synchronization key value. The client stores this synchronization key value until the client requires the key value for the next synchronization request for that collection. When the client uses this synchronization key value to do the next synchronization of the collection, the client sends this synchronization key value to the server in a **Sync** request. If the synchronization is successful, the server responds by sending all objects in the collection. The response includes a new synchronization key value that the client uses on the next synchronization of the collection.

The client should store the synchronization key value as a string of up to 64 characters. It should make no assumptions about the format of the synchronization key.

Note: The client always sends a synchronization key value of 0 in an initial **Sync** request and the server sends a new synchronization key value in its response to the client. The

client should never ignore the synchronization key value that is included in the initial response from the server.

The following example shows the initial synchronization of the Calendar folder with a synchronization key of 0.

Request

```
<Collection>
    <Class>Calendar</Class>
    <SyncKey>0</SyncKey>
    <DeletesAsMoves/>
    <GetChanges/>
</Collection>
```

The following example shows the synchronization of the Calendar with a synchronization key that was obtained from a previous synchronization.

Request

```
<Collection>
    <Class>Calendar</Class>
    <SyncKey>9</SyncKey>
    <DeletesAsMoves/>
    <GetChanges/>
</Collection>
```

2.2.1.21.1.13 Supported

The **Supported** element is used to specify which contact and calendar properties are supported.

Parent elements	<Collection>
Child elements	Any **Contact** or **Calendar** property. [Only container elements (**Children**, **Categories**) are valid. Their child elements (**Child**, **Category**) are not valid.]
Data type	**Container**
Number allowed	0..1 (Optional)

The **Supported** element lists all properties that the client can manage. Properties that are not named are not changed when the client sends an update to the server.

The supported properties list is sent on the initial synchronization only; the server remembers the list for subsequent synchronizations.

Note: The initial **Sync** request must include a **CollectionId** node, which must always precede the **Supported** node. See the **Collection** element for the order of elements within the **Collection** node. This order is strictly enforced.

```
<Collection>
<Supported>
        <c:FirstName/>
        <c:MiddleName/>
        <c:LastName/>
        <c:HomePhoneNumber/>
        <c:MobilePhoneNumber/>
        <c:BusinessPhoneNumber/>
        <c:Email1Address/>
    </Supported>
</Collection>
```

2.2.1.21.1.14 GetChanges

The **GetChanges** element requests the server to include in its response any pending changes to the collection that is specified by the **ServerId** element. If there have been changes since the last synchronization, the server response includes a **Commands** element that contains additions, deletions, and changes.

Parent elements	<Collection> (Request only)
Child elements	None
Data type	**Boolean**
Number allowed	0..1 (Optional)

The **GetChanges** element appears only in requests to the server from the client.
The server will not notify the client about changes in the calendar **Reminder**, **DtStamp**, **Email**, and **Name** properties in a **Sync** command response. If the client requests to receive the changes, the server will not return the calendar item if only these properties were changed. If any other property on the calendar item was changed, it will be returned in the response.
If a calendar event is changed on both the server and the client, and the client has chosen the option to keep the server object in a conflict (**Conflict**=1), a conflict is only reported by the server if the **GetChanges** element is included in the body as false. If the **GetChanges** element is included in the request body as false, no conflict is reported, the changes on the client are applied to the server, and a response code of 1 is returned. If the **GetChanges** element is not included or is included with a value of true, the server correctly reports a status 7, and then returns the server version of the calendar event in the **Commands** section of the response.
If the client does not want the server changes to be returned, the request must include the **GetChanges** element with a value of 0 (**FALSE**). A value of 1 (**TRUE**), which is the default, indicates that the client wants the server changes to be returned. The default is assumed when the **GetChanges** element is either empty or not present.

For requests with a **SyncKey** value of 0, the **GetChanges** element is a protocol error.

The following example shows the client requesting any changes since the last synchronization from the server.

Request

```
<Collection>
      <Class>Email</Class>
      <SyncKey>5</SyncKey>
      <CollectionId>1</CollectionId>
      <DeletesAsMoves/>
      <GetChanges/>
</Collection>
```

Response

```
<Collection>
      <Class>Email</Class>
      <SyncKey>6</SyncKey>
      <CollectionId>1</CollectionId>
      <Status>1</Status>
      <Commands>
            <Delete>
                  <ServerId>1:1</ServerId>
            </Delete>
            <Delete>
                  <ServerId>1:2</ServerId>
            </Delete>
      </Commands>
    </Collection>
```

2.2.1.21.1.15 CollectionId

The **CollectionId** element specifies the server ID of the folder to be synchronized.

Parent elements	<Collection>
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

The server ID of the folder is obtained from the **ServerId** element of a previous **FolderSync** or **FolderCreate** command.

2.2.1.21.1.16 Collections

The **Collections** element serves as a container for the **Collection** element.

Parent elements	<Sync>
Child elements	<Collection>
Data type	**Container**
Number allowed	0..1 (Optional)

The **Collections** element appears both in synchronization requests and responses. The structure is identical.

The **Collections** element is optional. If **Collections** is present, it may contain multiple **Collection** elements.

Request/Response

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns="AirSync:">
<Collections>
    <Collection>
        …
    </Collection>
</Collections>
```

2.2.1.21.1.17 Commands

The **Commands** element is a container for commands that apply to a collection. Available commands are **Add**, **Delete**, **Change**, and **Fetch**. Client commands are sent in the POST request; server commands are sent in the POST response.

This element is optional. If it is present, it must include at least one command. It is a child of the **Collection** element.

Parent elements	<Collection>
Child elements	<Add> <Delete> <Change> <Fetch>
Data type	**Container**
Number allowed	0..1 (Optional)

The **Commands** element can appear in both **Sync** requests and responses.

Request/Response

```
<Collection>
<Commands>
        <Add>
            …
        </Add>
        <Delete>
            …
        </Delete >
        <Change>
            …
        </Change >
        <Fetch>
            …
        </Fetch>
    </Commands>
</Collection>
```

2.2.1.21.1.18 SoftDelete

The **SoftDelete** element deletes an object on the client due to being out of filter on the server. The object is identified by its **ServerId** element.

Parent elements	<Commands>
Child elements	<ServerId/>
Data type	**Container**
Number allowed	0..n (Optional)

2.2.1.21.1.19 Fetch

The **Fetch** element is used to request the application data of an item that was truncated in a synchronization response from the server. The complete item is then returned to the client in a server response.

Note: The **ItemOperations** command is the preferred way to fetch items.

Parent elements	<Commands> (Request only) <Responses> (Response only)
Child elements	<ServerID/>

	<Status/> (Response only) <ApplicationData> (Response only)
Data type	**Container**
Number allowed	0..N (Optional)

The **Fetch** element cannot be used to get truncated calendar, contact, or task items from the server.

The following example shows a request that is sent to the server to fetch an item from the server by its server ID.

Request

```
<Commands>
    <Fetch >
        <ServerId>1:14</ServerId>
    </Fetch >
</Commands>
```

A response from the server contains the server ID, status, and application data of the requested item.

Response

```
<Responses>
    <Fetch>
        <ServerId>1:14</ServerId>
        <Status>1</Status>
        <ApplicationData>…</ApplicationData>
    </Fetch>
</Responses >
```

2.2.1.21.1.20 DeletesAsMoves

The **DeletesAsMoves** element indicates that any deleted items should be moved to the Deleted Items folder.

Parent elements	<Collection> (Request only)
Child elements	None
Data type	**Boolean**
Number allowed	0..1 (Optional)

The **DeletesAsMoves** element appears only in requests to the server from the client. If the **DeleteAsMoves** element is set to false, the deletion is permanent.

If the client wants to permanently delete items, the request must include the **DeletesAsMoves** element with a value of 0 (**FALSE**). A value of 1 (**TRUE**), which is the default, indicates that any deleted items should be moved to the Deleted Items folder. The default is assumed when the **DeletesAsMoves** element is either empty or not present.

The following example shows a request that is sent to the server to update the Contacts folder. The request specifies that any deleted items be moved to the Deleted Items folder.

Request

```
<Collection>
     <Class>Contacts</Class>
     <SyncKey>4</SyncKey>
     <DeletesAsMoves/>
     <GetChanges/>
</Collection>
```

2.2.1.21.1.21 Options

The **Options** element is a container that encloses elements that control certain aspects of how the synchronization is performed.

Parent elements	<Collection> (Request only)
Child elements	<FilterType/> <Truncation/> <Conflict/> <MIMETruncation/> <MIMESupport/> <airsyncbase:BodyPreference>
Data type	**Container**
Number allowed	0..1 (Optional)

This element is optional, but if it is present, it must include at least one child element. The **Options** element appears only in requests to the server from the client.

Additional synchronization options enable the client to specify truncation and content settings. These settings are encapsulated within a **BodyPreference** node within the **Options** element as follows:

```
    <airsyncbase:BodyPreference>
        <airsyncbase:Type>1</Type>
        <airsyncbase:TruncationSize>512</TruncationSize>
        <airsyncbase:AllOrNone/>
    </airsyncbase:BodyPreference>
```

Because synchronization options are specified on a collection, the client may specify a unique **BodyPreference** for each collection that it is being synchronized. For more information about the **BodyPreference** element, see [MS-AIRS].
The server preserves the options across requests. Therefore, the options must only be sent once per collection unless the client sends a **SyncKey** value of 0. Whenever the client specifies new options by including an **Options** node in the request, the server replaces the original options with the new options.

The following **Options** element specifies that items in the collection that are older than three days should not be returned to the client, that items will be truncated to 512 characters if they are larger, and that, if there are any item conflicts, the server should replace the client items.

Request

```
<Collection>
    <Options>
        <FilterType>2</FilterType>
        <Truncation>1</Truncation>
        <Conflict>1</Conflict>
    </Options>
</Collection>
```

2.2.1.21.1.22 Conflict

The **Conflict** element specifies how to resolve the conflict that occurs when an object has been changed on both the client and the server. The value specifies which object—the client object or the server object—to keep if there is a conflict.

Parent elements	<Options>
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

The following table lists valid values for the element.

Value	Meaning
0	Client object replaces server object.
1	Server object replaces client object.

If the **Conflict** element is not present, the server object will replace the client object when a conflict occurs.
A value of 0 means to keep the client object; a value of 1 means to keep the server object. If the value is 1 and there is a conflict, a **Status** value of 7 is returned to inform the client that the object that the client sent to the server was discarded.

Note: The **Conflict** element applies to the entire collection; therefore, it is not possible to use the element on an object-by-object basis in a single **Sync** command.

The **Conflict** element is a child of the **Options** element, and therefore the **Conflict** element appears only in requests to the server from the client.
If a **Delete** command conflicts with an **Add** or **Change** command, the **Delete** takes precedence.
Example:

```
<Options>
    <Conflict>1</Conflict>
</Options>
```

2.2.1.21.1.23 FilterType

The **FilterType** element specifies an optional time window for the objects that are sent from the server to the client. It applies to e-mail and calendar collections. If **FilterType** is specified, the server sends only objects that are dated within the specified time window.

Parent elements	<Options> (Request only)
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

The following table lists valid values for the element.

Value	Meaning	E-mail?	Calendar?	Tasks?
0	No filter-synchronize all items	Yes	Yes	Yes
1	1 day back	Yes	No	No
2	3 days back	Yes	No	No
3	1 week back	Yes	No	No
4	2 weeks back	Yes	Yes	No
5	1 month back	Yes	Yes	No
6	3 months back	No	Yes	No
7	6 months back	No	Yes	No
8	Filter by incomplete tasks	No	No	Yes

When the **FilterType** element is specified, the server manages objects on the client to maintain the time window. New objects are added when they are within the time window. The server sends **SoftDelete** commands for objects on the client when they become older than the window.

Calendar items that are in the future or that have recurrence but no end date are sent to the client regardless of the **FilterType** element value.

The **FilterType** element is a child of the **Options** element. Therefore, it appears only in requests to the server from the client.

If the **FilterType** element is omitted, all objects are sent from the server without regard for their age.

Filters cannot be sent on Contact folders.

The following **Options** element in a synchronization request on an Inbox specifies that only e-mail messages that date back three days are returned to the client in the server synchronization response.

```
<Options>
    <FilterType>2</FilterType>
</Options>
```

2.2.1.21.1.24 Truncation

The **Truncation** element is no longer supported. Use **TruncationSize** under **BodyPreference** instead.

2.2.1.21.1.25 MIMETruncation

The **MIMETruncation** element is included in the **Options** element of a client **Sync** command request to specify to the server whether the MIME data of the e-mail item should be truncated when it is sent from the server to the client.

Parent elements	<Options> (Request only)
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

The following table lists valid values for the element.

Value	Meaning
0	Truncate all body text.
1	Truncate text over 4,096 characters.
2	Truncate text over 5,120 characters.
3	Truncate text over 7,168 characters.
4	Truncate text over 10,240 characters.
5	Truncate text over 20,480 characters.
6	Truncate text over 51,200 characters.
7	Truncate text over 102,400 characters.
8	Do not truncate; send complete MIME data.

If the size of the MIME data exceeds the value that is specified by the client in the **MIMETruncation** element, the string that is returned in the **MIMEData** element will be truncated up to the MIMETruncation value. The value of the **MIMESize** element will then contain the original size, in characters, of the MIME data. Note that for the FETCH case, the

complete MIME data of the message will be returned to the client regardless of any **MIMETruncation** option.

2.2.1.21.1.26 MIMESupport

The **MIMESupport** element is included in the **Options** element of a client **Sync** command request to enable MIME support for e-mail items that are sent from the server to the client.

Parent elements	<Options> (Request only)
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

The following table shows valid values for the element.

Value	Meaning
0	Never send MIME data.
1	Send MIME data for S/MIME messages only. Send regular body for all other messages.
2	Send MIME data for all messages. This flag could be used by clients to build a more rich and complete Inbox solution.

The version of ActiveSync protocol that is being used determines the applicable **Sync** command schema for S/MIME synchronization.

The **Sync** request must include the following in the **Options** element:

- The **MIMESupport** element to tell the server to return MIME for S/MIME-only/All/None messages.
- The **BodyPreference** element with its child element, **Type**, which contains a value of 4 to inform the server that the device can read the MIME binary large object (BLOB).

The response from the server must include the **Body** element, which is a child of the **ApplicationData** element. The **Body** element is a complex element and must contain the following child nodes in an S/MIME synchronization response:

- The **Type** element with a value of 4 to inform the device that the data is a MIME BLOB.
- The **EstimatedDataSize** element to specify the rough total size of the data.
- The **Truncated** element to indicate whether the MIME BLOB is truncated.
- The **Data** element that contains the full MIME BLOB.

For more information about the **Body** element or the **BodyPreference** element, see [MS-AIRS].

For more information about the **Body**, **BodyTruncated**, and **BodySize** elements, see [MS-ASEMAIL].

This example uses the **MIMETruncated**, **MIMETruncation**, and **MIMEData** elements.

Request

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns="AirSync:">
  <Collections>
    <Collection>
      <Class>Email</Class>
      <SyncKey>2</SyncKey>
      <CollectionId>1</CollectionId>
      <DeletesAsMoves/>
      <GetChanges/>
      <Options>
        <MIMETruncation>1</MIMETruncation>
        <MIMESupport>1</MIMESupport>
      </Options>
    </Collection>
  </Collections>
</Sync>
```

Response

```
<Add>
   <ServerId>1:3</ServerId>
   <ApplicationData>
      <A:To>"James Smith" &lt;jsmith@contoso.com&gt;</A:To>
      <A:From>"Jyothi Pai" &lt;jpai@contoso.com&gt;</A:From>
      <A:Subject>RE: Presentation</A:Subject>
      <A:DateReceived>2004-11-12T00:45:06.000Z</A:DateReceived>
      <A:DisplayTo>James Smith</A:DisplayTo>
      <A:Importance>1</A:Importance>
      <A:Read>0</A:Read>
      <A:MIMETruncated>0</A:MIMETruncated>
      <A:MIMEData>"Received: from server1.contoso.com
      ([192.168.0.20]) by server2.contoso.com with Microsoft
      SMTPSVC(5.0.2195.6624); ... </A:MIMEData>
```

```
      <A:Importance>1</A:Importance>
      <A:Read>0</A:Read>
      <A:MessageClass>IPM.Note.SMIME.MultipartSigned</A:MessageClass>
   </ApplicationData>
</Add>
```

Request

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns="AirSync:" xmlns:A="AirSyncBase:">
  <Collections>
    <Collection>
      <Class>Email</Class>
      <SyncKey>2</SyncKey>
      <CollectionId>17</CollectionId>
      <DeletesAsMoves/>
      <GetChanges/>
      <Options>
        <A:BodyPreference>
          <A:Type>4</A:Type>
          <A:TruncationSize>512</A:TruncationSize>
        </A:BodyPreference>
        <MIMESupport>1</MIMESupport>
      </Options>
    </Collection>
  </Collections>
</Sync>
```

Response

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns="AirSync:" xmlns:A="POOMMAIL:" xmlns:B="AirSyncBase:">
  <Collections>
    <Collection>
      <Class>Email</Class>
      <SyncKey>3</SyncKey>
      <CollectionId>17</CollectionId>
```

```
<Status>1</Status>
<Commands>
  <Change>
    <ServerId>17:11</ServerId>
    <ApplicationData>
      <A:To>"Mike Phipps" &lt;mike@contoso.com&gt;</A:To>
      <A:From>"Arlene Huff" &lt;arlene@contoso.com&gt;</A:From>
      <A:Subject>opaque s + e </A:Subject>
      <A:DateReceived>2007-02-01T06:42:46.015Z</A:DateReceived>
      <A:DisplayTo>Mike Phipps</A:DisplayTo>
      <A:ThreadTopic>opaque s + e</A:ThreadTopic>
      <A:Importance>1</A:Importance>
      <A:Read>1</A:Read>
      <B:Attachments>
        <B:Attachment>
          <B:DisplayName>smime.p7m</B:DisplayName>
          <B:FileReference>17%3a11%3a0</B:FileReference>
          <B:Method>1</B:Method>
          <B:EstimatedDataSize>9340</B:EstimatedDataSize>
        </B:Attachment>
      </B:Attachments>
      <B:Body>
        <B:Type>4</B:Type>
        <B:EstimatedDataSize>13814</B:EstimatedDataSize>
        <B:Truncated>1</B:Truncated>
        <B:Data>Received: from contoso.com ([157.55.97.121])
        By contoso.com ([157.55.97.121]) with mapi;
        Wed, 31 Jan 2007 22:42:45 -0800
        From: Arlene Huff &lt;arlene@contoso.com&gt;
        To: Mike &lt;mike@contoso.com&gt;
        Content-Class: urn:content-classes:message
        Date: Wed, 31 Jan 2007 22:42:41 -0800
        Subject: opaque s + e
        Thread-Topic: opaque s + e
```

```
                Thread-Index: AcdFzCv5tyCXieBuTd2I5APpEvS+iQ==
                Message-ID:
                &lt;3AA64EB47EA90</B:Data>
              </B:Body>
              <A:MessageClass>IPM.Note.SMIME</A:MessageClass>
              <A:InternetCPID>20127</A:InternetCPID>
              <A:Flag/>
              <A:ContentClass>urn:content-
classes:message</A:ContentClass>
              <B:NativeBodyType>1</B:NativeBodyType>
            </ApplicationData>
          </Change>
        </Commands>
      </Collection>
    </Collections>
</Sync>
```

2.2.1.21.2 Response

2.2.1.21.2.1 Add

The **Add** command can be used to create a new object in a collection on the client or on the server.

When a new item is being sent from the client to the server, the **ClientId** element specifies a temporary ID for the item, which is unique on the client. The **ApplicationData** element specifies the item data. The server then responds with an **Add** element in a **Responses** element, which specifies the client ID and the server ID that was assigned to the new item. When the client sends a **Sync** command to the server and a new item has been added to the server collection since the last synchronization, the server responds with an **Add** element in a **Commands** element. This **Add** element specifies the server ID and data of the item to be added to the collection on the client.

Parent elements	<Commands> <Responses> (Response only)
Child elements	<ServerID/> (Response only, see remarks) <ClientId/> <ApplicationData> <Status/> (Response only)
Data type	**Container**
Number allowed	0..n (Optional)

One or more **Add** elements can appear as a child of the **Commands** and **Responses** elements for a particular collection.

If the server ID in an **Add** element from the server matches the server ID for an item on the client, the client should treat the addition as a change to the client item.

The server may not send an individual response for every command that is sent by the client. The client will only receive responses for successful additions and fetches, and failed changes and deletions. When the client does not receive a response, the client should assume that the command succeeded unless informed otherwise.

This example shows a **Sync** command request that is sent to the server to add a contact. The response from the server shows that the synchronization was successful and that the new item from the client, identified by the **ClientId** element, was added to the collection on the server. The server also assigns a permanent ID for the newly added item in the **ServerId** element. After the client receives a successful response, the client is then expected to use this server ID for any future **Change** or **Delete** commands for this item.

Request

```
<Commands>
    <Add>
                              <ClientId>123</ClientId>
        <ApplicationData>
            <A:Email1Address>schai@fourthcoffee.com</A:Email1Address>
            <A:FirstName>Sean</A:FirstName>
            <A:MiddleName>W</A:MiddleName>
            <A:LastName>Chai</A:LastName>
            <A:Title>Sr Marketing Manager</A:Title>
        </ApplicationData>
    </Add>
</Commands>
```

Response

```
<Responses>
    <Add>
        <ClientId>123</ClientId>
        <ServerId>4:1</ServerId>
        <Status>1</Status>
    </Add>
```

```
</Responses>
```

The response from the server to a **Sync** command shows that a contact item, identified by the **ServerId** element, should be added to the client collection.

Response

```
<Commands>
    <Add>
        <ServerId> 2:6</ServerId>
        <ApplicationData>
            <A:Email1Address>ahill@fourthcoffee.com</A:Email1Address>
            <A:FirstName>Annette</A:FirstName>
            <A:MiddleName>C</A:MiddleName>
            <A:LastName>Hill</A:LastName>
            <A:Title>Lead Tester</A:Title>
        </ApplicationData>
    </Add>
</Commands>
```

2.2.1.21.2.2 ApplicationData

The **ElementName** element encloses data for a particular object, such as a contact, e-mail message, calendar appointment, or task item. The **ApplicationData** element can be used to add or change items on the client device or server. The format of this data is determined by the schema for the object.

Parent elements	<Add> <Change>
Child elements	Data elements from the content classes. For more information about the content classes and their elements, see Property Sets.
Data type	**Container**
Number allowed	1 (Required)

The following **ApplicationData** element is used to add a contact item, identified by the **ServerId** element, to a folder on the client device.

Response

```
<Add>
          <ServerId> 2:6</ServerId>
          <ApplicationData>
<A:Body></A:Body>
```

```
            <A:Email1Address>"jdobney@fourthcoffee.com"
&lt;jdobney@fourthcoffee.com&gt;</A:Email1Address>
                <A:FileAs>Dobney, JoLynn Julie</A:FileAs>
                <A:FirstName>JoLynn</A:FirstName>
                <A:HomePhoneNumber>425 555 1234</A:HomePhoneNumber>
                <A:MiddleName>Julie</A:MiddleName>
                <A:MobilePhoneNumber>425 555 1111</A:MobilePhoneNumber>
                <A:CompanyName>Fourth Coffee</A:CompanyName>
                <A:LastName>Dobney</A:LastName>
                <A:BusinessPhoneNumber>425 555
5555</A:BusinessPhoneNumber>
                <A:JobTitle>Usability Engineer</A:JobTitle>
          </ApplicationData>
</Add>
```

2.2.1.21.2.3 Change

The **Change** element modifies properties of an existing object on the client device or the server. The object to change is identified by its **ServerId** element.

Parent elements	<Commands> <Responses> (Response only)
Child elements	<ServerID/> <ApplicationData> <Status/> (Response only)
Data type	**Container**
Number allowed	0..n (Optional)

One or more **Change** elements can appear as a child of the **Commands** element for a particular collection.

Certain in-schema properties remain untouched in the following three cases:

- If there is only a **Flag** or **Read** change (that is, if only a **Flag** or **Read** node is present), all other properties will remain unchanged and nothing else has to be sent.
- If an **Exceptions** node is not specified, the properties for that **Exceptions** node will remain unchanged. If an **Exception** node within the **Exceptions** node is not present, that particular exception will remain unchanged.
- If **Body**, **Data**, **Picture**, or **RTF** nodes are not present, the corresponding properties will remain unchanged.

In all other cases, if an in-schema property is not specified in a change request, the property is actively deleted from the item on the server. A client should be aware of this when it is sending **Sync** requests; otherwise, data may be unintentionally removed.

The following example shows a **Sync** command request from the client. The request modifies a contact, which is identified by the server ID, on the server. The response from the server shows that the change that is specified by the **Sync** request of the client succeeded and supplies the synchronization key and collection ID of the changed item.

Request

```
<Commands>
    <Change>
        <ServerId>3:1</ServerId>
        <ApplicationData>
            <A:Email1Address>jsmith@fourthcoffee.com</A:Email1Address>
            <A:FirstName>Jeff</A:FirstName>
        </ApplicationData>
    </Change>
</Commands>
```

Response

```
<Collections>
    <Collection>
      <Class>Contacts</Class>
      <SyncKey>4</SyncKey>
      <CollectionId>1</CollectionId>
      <Status>1</Status>
    </Collection>
</Collections>
```

2.2.1.21.2.4 Class

The **Class** element is no longer supported. For E-Mail, Calendar, Tasks, or Contacts collections, the server will determine the collection type from the interpersonal folder (IPF) class of the folder. The client can determine the collection type from the **FolderCreate** command, **FolderSync** command, or **GetHierarchy** command response. An E-mail collection type is assumed for generic folders.

2.2.1.21.2.5 ClientId

The **ClientId** is a unique identifier that is generated by the client to temporarily identify a new object that is being created by using the **Add** command. The client includes the **ClientId** element in the **Add** command request that it sends to the server. The server response contains

an **Add** element that contains the original client ID and a new server ID that was assigned for the object, which replaces the client ID as the permanent object identifier.

Parent elements	<Add>
Child elements	None
Data type	**String** (Typically an integer)
Number allowed	Request: 1 (Required) Response: 1

The **ClientId** element is a unique identifier that consists of up to 40 digits and letters. The client generates this ID. The value must only be unique for the device during the duration of the **Sync** request that adds the object to the server. The client should store the client IDs until the synchronization session is completed successfully, which makes recovery easier if the synchronization process fails.

An easy way to implement the client ID is to use a counter that is incremented for each new object that is created on the client.

The following example shows a client **Sync** command request that adds a new item, which is identified by the temporary client ID, to the server. The response from the server shows that the new client item has been successfully added to the server and assigned a permanent server ID.

Request

```
<Commands>
<Add>
                    <ClientId>145</ClientId>
        <ApplicationData>…</ApplicationData>
    </Add>
</Commands>
```

Response

```
<Responses>
    <Add>
        <ClientId>145</ClientId>
        <ServerId>3:12</ServerId>
        <Status>1</Status>
    </Add>
</Responses>
```

2.2.1.21.2.6 Collection

The **Collection** element wraps commands and options that apply to a particular collection.

Parent elements	<Collections>
Child elements	<SyncKey/> <NotifyGUID/> (Request only) <Supported> (Request only) <CollectionId/> <DeletesAsMoves/> (Request only) <GetChanges/> (Request only) <WindowSize/> (Request only) <Options> (Request only) <Status/> (Response only) <MoreAvailable/> (Response only) <Commands> <Responses> (Response only)
Data type	**Container**
Number allowed	1..512 (required)

The **Collection** element contains identification information (**Class**, **CollectionID**), synchronization state (**SyncKey**), commands (**GetChanges**, **Commands**), and options (**WindowSize**, **Options**, **DeleteAsMoves**, **MoreAvailable**). Only one collection can be specified in a **Sync** command.

Note: There is a strict ordering of the XML elements within a **Collection** node in a **Sync** request. The order is as follows:

- <Class>
- <SyncKey>
- <NotifyGUID> (no longer used; ignored on the server-side)
- <CollectionId>
- <Supported>
- <DeletesAsMoves>
- <GetChanges>
- <WindowSize>
- <Options>
- <Commands>

The **Collection** element appears in both **Sync** requests and responses. The form is similar, although some child elements are valid in only one context.

A single **Collections** element may contain multiple **Collection** elements. Therefore, each collection does not require its own **Sync** command. That is, a **Sync** request can specify multiple collections to be synchronized.

The following example shows a request that is sent to the server to synchronize an e-mail folder. The request asks that deleted items be moved to the Deleted Items folder. The request

also asks for changes on the server to be specified in the response. The server response contains the new synchronization key and the items to be added, deleted, and changed on the client.

Request

```
<Collections>
<Collection>
        <Class>Email</Class>
        <SyncKey>6</SyncKey>
        <CollectionId>1</CollectionId>
        <DeletesAsMoves/>
        <GetChanges/>
        <Options> … </Options>
</Collection>
</Collections>
```

Response

```
<Collections>
<Collection>
        <Class>Email</Class>
        <SyncKey>7</SyncKey>
        <CollectionId>1</CollectionId>
        <Status>1</Status>
        <Commands>
            <Add>…</Add>
            <Delete>…</Delete>
            <Change>…</Change>
            <Fetch>…</Fetch>
        </Commands>
</Collection>
</Collections>
```

2.2.1.21.2.7 CollectionId

The **CollectionId** element specifies the server ID of the folder to be synchronized.

Parent elements	<Collection>
Child elements	None

Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

The server ID of the folder is obtained from the **ServerId** element of a previous **FolderSync** or **FolderCreate** command.

2.2.1.21.2.8 Collections

The **Collections** element serves as a container for the **Collection** element.

Parent elements	<Sync>
Child elements	<Collection>
Data type	**Container**
Number allowed	0..1 (Optional)

The **Collections** element appears both in synchronization requests and responses. The structure is identical.

The **Collections** element is optional. If **Collections** is present, it may contain multiple **Collection** elements, but must contain at least one.

Request/Response

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns="AirSync:">
<Collections>
    <Collection>
        …
    </Collection>
</Collections>
```

2.2.1.21.2.9 Commands

The **Commands** element is a container for commands that apply to a collection. Available commands are **Add**, **Delete**, **Change**, and **Fetch**. Client commands are sent in the POST request; server commands are sent in the POST response.

This element is optional. If it is present, it must include at least one command. It is a child of the **Collection** element.

Parent elements	<Collection>
Child elements	<Add> <Delete> <Change> <Fetch>
Data type	**Container**

Number allowed	0..1 (Optional)

The **Commands** element can appear in both **Sync** requests and responses.

Request/Response

```
<Collection>
<Commands>
        <Add>
            …
        </Add>
        <Delete>
            …
        </Delete >
        <Change>
            …
        </Change >
        <Fetch>
            …
        </Fetch>
    </Commands>
</Collection>
```

2.2.1.21.2.10 SoftDelete

The **SoftDelete** element deletes an object. The object is identified by its **ServerId** element.

Parent elements	<Commands>
Child elements	<ServerId/>
Data type	**Container**
Number allowed	0..n (Optional)

2.2.1.21.2.11 Fetch

The **Fetch** element is used to request the application data of an item that was truncated in a synchronization response from the server. The complete item is then returned to the client in a server response.

Note: The **ItemOperations** command is the preferred way to fetch items.

Parent elements	<Commands> (Request only) <Responses> (Response only)
Child elements	<ServerID/> <Status/> (Response only)

	<ApplicationData> (Response only)
Data type	**Container**
Number allowed	0..N (Optional)

The **Fetch** element cannot be used to get truncated calendar, contact, or task items from the server.

The following example shows a request that is sent to the server to fetch an item from the server by its server ID.

Request

```
<Commands>
    <Fetch >
        <ServerId>1:14</ServerId>
    </Fetch >
</Commands>
```

A response from the server contains the server ID, status, and application data of the requested item.

Response

```
<Responses>
    <Fetch>
        <ServerId>1:14</ServerId>
        <Status>1</Status>
        <ApplicationData>…</ApplicationData>
    </Fetch>
</Responses>
```

2.2.1.21.2.12 Limit

The **Limit** element specifies either the maximum number of collections that can be synchronized or the maximum/minimum value that is allowed for the wait-interval.

Parent elements	<Sync> (response only)
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

The **Limit** element is returned in a response with a status code of 14 or 15. The value of the **Status** element indicates whether the limit applies to the wait-interval or the number of collections, as follows:

- A status code 14 indicates that **Limit** specifies the minimum or maximum wait-interval that is acceptable. When the value of the **Wait** element is outside the acceptable range, the server will respond with the closest acceptable value. The server will send a response that includes a status code 14 and a **Limit** element.
- A status code 15 indicates that **Limit** specifies the maximum number of collections that can be synchronized.

2.2.1.21.2.13 MessageClass

The **MessageClass** element is returned by the server in the **Add** element of a **Sync** command response and specifies the message type.

Parent elements	<Add> (Response only)
Child elements	None
Data type	**String**
Number allowed	0..1 (Optional)

The following table lists some values for the element.

Value	Meaning
IPM.Note.SMIME	The message is encrypted and may also be signed.
IPM.Note.SMIME.MultipartSigned	The message is clear signed.
IPM.Note.Receipt.SMIME	The message is a secure read receipt.

The following table lists some values for the element.

Value	Meaning
REPORT.IPM.Note.SMIME.DR	Delivery report for a Secure/MIME (S/MIME) message.
REPORT.IPM.Note.SMIME.IPNRN	Read report for an S/MIME message.
REPORT.IPM.Note.SMIME.IPNNRN	Non-read report for an S/MIME message.
REPORT.IPM.Note.SMIME.MultipartSigned.NDR	Non-delivery report for a signed S/MIME message.
REPORT.IPM.Note.SMIME.MultipartSigned.DR	Delivery report for a signed S/MIME message.
REPORT.IPM.Note.SMIME.MultipartSigned.IPNRN	Read report for a signed S/MIME message.
REPORT.IPM.Note.SMIME.MultipartSigned.IPNNRN	Non-read report for a signed S/MIME message.

2.2.1.21.2.14 MIMEData

The **MIMEData** element is returned by the server in the **ApplicationData** element of a **Sync** command response and contains the raw MIME data of an e-mail item.

Parent elements	<ApplicationData> (response only)
Child elements	None

Data type	**String**
Number allowed	1 (Required)

This element will be returned by the server only if the client enabled MIME support.

2.2.1.21.2.15 MIMESize

The **MIMESize** element specifies the complete size, in characters, of the MIME message that is contained in the **MIMEData** element.

Parent elements	<ApplicationData> (response only)
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

The **MIMESize** element is returned by the server in the **ApplicationData** element of a **Sync** command response. This element will be returned by the server only if the client enabled MIME support.

2.2.1.21.2.16 MIMETruncated

The **MIMETruncated** element indicates whether the **MIMEData** element contains a truncated string.

Parent elements	<ApplicationData> (response only)
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

The **MIMETruncated** element is returned by the server in the **ApplicationData** element of a **Sync** command response. This element will be returned by the server only if the client enabled MIME support.

A value of zero indicates that the data has not been truncated; a nonzero value indicates otherwise.

2.2.1.21.2.17 MoreAvailable

The **MoreAvailable** element is included in a synchronization response from the server to the client if there are more changes than the number that are requested in the **WindowSize** element.

Parent elements	<Collection> (Response only)
Child elements	None
Data type	**Empty**
Number allowed	0..1 (Optional)

The **MoreAvailable** element appears only in responses that are sent from the server to the client. It appears only if the client request contained a **WindowSize** element and there are still changes to be returned to the client.

The **MoreAvailable** element has no body. It is omitted if no additional changes are available. The maximum value for the **WindowSize** element is 512.

If the **WindowSize** element is omitted, the server behaves as if a **WindowSize** element with a value of 100 was submitted. The **MoreAvailable** element is returned by the server if there are more than 512 changes, regardless of whether the **WindowSize** element is included in the request.

Example:

```
<Collection>
      <Class>Email</Class>
      <SyncKey>2</SyncKey>
      <CollectionId>1</CollectionId>
      <Status>1</Status>
      <Commands>
            …
      </Commands>
      <MoreAvailable/>
</Collection>
```

2.2.1.21.2.18 Responses

The **Responses** element contains responses to commands that are processed by the server. Each response is wrapped in an element with the same name as the command, such as **Add** and **Delete**. The response contains a status code and other information, depending on the command.

Parent elements	<Collection> (Responses)
Child elements	<Add>, <Fetch> (If the command succeeded.) <Change>, <Delete> (If the command failed.)
Data type	**Container**
Number allowed	0..1 (Optional)

The **Responses** element appears only in responses that are sent from the server to the client. It is present only if the server has processed commands from the client. It is omitted otherwise (for example, if the client requested server changes but had no changes to send to the server). If present, it includes at least one child element.

The following **Responses** element is part of a server response to a synchronization request. It shows items in the server collection that have been added, deleted, changed, or fetched.

Response

```
<Collection>
```

```
    <Responses>
        <Add>
            …
        </Add>
        <Change>
            …
        </Change >
    </Responses>
</Collection>
```

2.2.1.21.2.19 ServerId

The **ServerId** is a unique identifier that is assigned by the server to each object that can be synchronized. The client must store the server ID for each object and be able to locate an object given a server ID. In a synchronization request, commands such as **Change** and **Delete** identify objects by using their server IDs.

Parent elements	<Add> (Response only) <Delete> <Change> <Fetch> (Response only)
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (Required)

The client should store the server ID as a string of up to 64 characters. It should make no assumptions about the format of the ID.

The following **Add** element is part of a response from the server. It shows an item being added to the client.

```
<Add>
    <ServerId> 1:9</ServerId>
    <ApplicationData>…</ApplicationData>
</Add>
```

2.2.1.21.2.20 Status

The **Status** element indicates the success or failure of a command. If the command failed, the **Status** element contains a code that indicates the type of failure. The values are summarized in the following table.

Parent elements	<Sync> (Response only) <Collection> (Response only) <Add> (Response only)

	<Delete> (Response only) <Change> (Response only) <Fetch> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	1 (Required)

The following table lists valid values for the element.

Value	Meaning
1	Success.
2	Protocol version mismatch.
3	Invalid synchronization key.
4	Protocol error.
5	Server error.
6	Error in client/server conversion.
7	Conflict matching the client and server object.
8	Object not found.
9	User account may be out of disk space.
10	An error occurred while setting the notification GUID.
11	The device has not been provisioned for notifications yet.
12	The folder hierarchy has changed.
13	The client sent an empty or partial **Sync** request, but the server is unable to process it. Please resend the request with the full XML
14	The **Sync** request was processed successfully but the wait-interval that is specified by the client is outside the range set by the server administrator. If the wait-interval is too great, the response contains a **Limit** element that specifies the maximum allowed value. If the wait-interval is too low, the response contains a **Limit** element that specifies the minimum allowed value.
15	The **Sync** request was processed successfully, but specified more folders to monitor for changes than is allowed by the limit configured by the server administrator. The response includes the **Limit** element, which specifies the maximum number of folders that can be synchronized.
16	Please retry the same request.

The **Status** element is sent only in responses from the server to the client.
If a status code is not returned for a command, the client should assume success.

The following example shows that an item, identified by the **ServerId** element, was successfully deleted on the server.

Response

```
<Responses>
    <Delete>
         <ServerId>5:3</ServerId>
        <Status>1</Status>
     </Delete>
</Responses >
```

2.2.1.21.2.21 Sync

The **Sync** element is the top-level element in the XML document. It identifies the body of the HTTP Post as containing a **Sync** command.

Parent elements	None
Child elements	<Limit> (response only) <Partial> (request only) <Wait> <WindowSize> (request only)
Data type	**Container**
Number allowed	0…1 (Optional)

The **Sync** element can also include one or more explicit namespace attributes.

The **Limit** element and **Collections** element are mutually exclusive in a **Sync** response. That is, a **Sync** response can include either a **Limit** element or a **Collections** element, but not both.
If an XML body exists, then the <Sync> element is required.
The following is an example of the **Sync** element in a **Sync** command request or response.

Request/Response

```
<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns=”AirSync:” xmlns:A="CONTACTS:">
    <Collections>
    …
    </Collections>
</Sync>
```

2.2.1.21.2.22 SyncKey

The **SyncKey** element contains a value that is used by the server to mark the synchronization state of a collection.

Parent elements	<Collection>
Child elements	None
Data type	**String** (Up to 64 characters)
Number allowed	1 (required)

A synchronization key of value 0 initializes the synchronization state on the server and causes a full synchronization of the collection. The server sends a response that includes a new synchronization key value. The client stores this synchronization key value until the client requires the key value for the next synchronization request for that collection. When the client uses this synchronization key value to do the next synchronization of the collection, the client sends this synchronization key value to the server in a **Sync** request. If the synchronization is successful, the server responds by sending all objects in the collection. The response includes a new synchronization key value that the client uses on the next synchronization of the collection.

The client should store the synchronization key value as a string of up to 64 characters. It should make no assumptions about the format of the synchronization key.

Note: The client always sends a synchronization key value of 0 in an initial **Sync** request and the server sends a new synchronization key value in its response to the client. The client should never ignore the synchronization key value that is included in the initial response from the server.

The following example shows the initial synchronization of the Calendar folder with a synchronization key of 0.

Request

```
<Collection>
    <Class>Calendar</Class>
    <SyncKey>0</SyncKey>
    <DeletesAsMoves/>
    <GetChanges/>
</Collection>
```

The following example shows the synchronization of the Calendar with a synchronization key that was obtained from a previous synchronization.

Request

```
<Collection>
    <Class>Calendar</Class>
```

```
    <SyncKey>9</SyncKey>
    <DeletesAsMoves/>
    <GetChanges/>
</Collection>
```

2.2.1.21.2.23 Wait

The **Wait** element specifies, in a request, the number of minutes that the server should delay a response and, in a response, the number of minutes that the server can wait for any changes before responding.

Parent elements	<Sync>
Child elements	None
Data type	**Integer**
Number allowed	0..1 (Optional)

Valid values for **Wait** are 1 through 59. When the client requests a wait-interval that is outside the acceptable range, the server will respond with the wait-interval that is the closest acceptable value. The server will send a response that includes a **Status** value of 14 and a **Limit** element.

When **Wait** is used in a **Sync** request, the element indicates to the server that a response should be delayed either until the wait-interval, which is indicated by the contents of the **Wait** element, elapses or until any of the collections that are included in the request have changed. It is at the discretion of the client to send the **Wait** element; the server is only guaranteed to respond immediately when **Wait** is not present. The client typically may want a server response immediately in the following cases:

- The client adds new items by using the **Add** element. In this case, an immediate response is needed because the client will need the server-provided item ID to track changes to those new items.
- The client sends up a large change by using the **Change** element. In this case, a delayed response will increase the possibility that the client must resend the change because of a lost connection.

Note: Although the server is only guaranteed to respond immediately when **Wait** is not present, the server should always respond immediately to a **Sync** request that includes an **Add** or a **Change**, unless the addition or change involves only flags.

A hard delete of tasks or calendar items will cause a waited **Sync** to finish. The benefit of this is a better user experience. For example, a user will not get reminders for deleted meetings. A hard delete is infrequent and rarely results in an extra roundtrip. Readflag changes and moves out of (and not into) a folder which is being synchronized will cause the server to batch up the notification.

2.2.1.22 ValidateCert

The **ValidateCert** command is used by the client to validate a certificate that has been received via a Secure/Multipurpose Internet Mail Extensions (S/MIME) mail.

To validate a certificate, the server will verify that the certificate has not expired and has not been revoked. The server will walk up the certificate chain, verifying that each intermediate CA certificate has not expired and has not been revoked and that the root certificate is a trusted certificate authority. Certificate validation is particularly important for verifying signatures (for example, on S/MIME signed mail).

2.2.1.22.1 Request

2.2.1.22.1.1 ValidateCert

The **ValidateCert** element is the top-level element in the XML document. It identifies the body of the HTTP Post as containing a **ValidateCert** command.

Parent elements	None
Child elements	<Certificates>, <CertificateChain>, <CheckCRL> (request only) <Status> (response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.22.1.2 Certificate

The **Certificate** element contains the Base64-encoded x509 certificate binary large object (BLOB).

Parent elements	<Certificates>, <CertificateChain>
Child elements	<Status> (Response only)
Data type	**String** (Base64-encoded)
Number allowed	1…N

2.2.1.22.1.3 CertificateChain

The **CertificateChain** element contains the list of certificates to be validated.

Parent elements	<ValidateCert> (Request only)
Child elements	<Certificate>
Data type	**Container**
Number allowed	1 (Required)

2.2.1.22.1.4 Certificates

The **Certificates** element contains the list of certificates to be validated.

Parent elements	<ValidateCert> (Request only)
Child elements	<Certificate>
Data type	**Container**
Number allowed	1 (Required)

2.2.1.22.1.5 CheckCRL

The **CheckCRL** element specifies whether the server should ignore an unverifiable revocation status.

Parent elements	<ValidateCert>
Child elements	None
Data type	**Integer**
Number allowed	0…1 (Optional)

The revocation status of a certificate cannot be verified when the certificate revocation lists (CRLs) cannot be retrieved.

When **CheckCRL** is set to 1 (**TRUE**), the server will not ignore an unverifiable revocation status. The default value is 0.

2.2.1.22.2 Response

2.2.1.22.2.1 ValidateCert

The **ValidateCert** element is the top-level element in the XML document. It identifies the body of the HTTP Post as containing a **ValidateCert** command.

Parent elements	None
Child elements	<Certificates>, <CertificateChain>, <CheckCRL> (request only) <Status> (response only)
Data type	**Container**
Number allowed	1 (Required)

2.2.1.22.2.2 Certificate

The **Certificate** element contains the Base64-encoded x509 certificate binary large object (BLOB).

Parent elements	<Certificates>, <CertificateChain>
Child elements	<Status> (Response only)
Data type	**String** (Base64-encoded)
Number allowed	1…N

2.2.1.22.2.3 Status

The **Status** element indicates whether one or more certificates were successfully validated.

Parent elements	<ValidateCert>, <Certificate> (Response only)
Child elements	None
Data type	**Integer**
Number allowed	1…N (Required)

The following table shows valid values for the element.

Value	Meaning
1	Successful validation.
2	Protocol error.
3	The signature in the digital ID can't be validated.
4	The digital ID was issued by an untrusted source.
5	The certificate chain that contains the digital ID was not created properly.
6	The digital ID is not valid for signing e-mail messages.
7	The digital ID used to sign the message has expired or is not yet valid.
8	The time periods during which the digital IDs in the certificate chain are not consistent.
9	A certificate is being used for a purpose other than what it was specified for.
10	Information associated with the digital ID is missing or incorrect.
11	A certificate that can only be used as an end-entity is being used as a certification authority (CA), or a CA that can only be used as an end-entity is being used as a certificate.
12	The digital ID doesn't match the recipient's e-mail address.
13	The digital ID used to sign this message has been revoked. This can indicate that the issuer of the digital ID no longer trusts the sender, the digital ID was reported stolen, or the digital ID was compromised.
14	The validity of the digital ID can't be determined because the server that provides this information can't be contacted.
15	A digital ID in the chain has been revoked by the authority that issued it.
16	The digital ID can't be validated because its revocation status can't be determined.
17	An unknown server error has occurred.

2.2.2 Status Codes

This section specifies the codes that the server returns in the **Status** element of each command response. To process the returned code, see section 3.1.5.1, **Handling Status Errors**.

Each status code has a **Scope** assigned to it. The following table lists the **Scope** values.

Scope Value	Description
Global	The status pertains to the overall client request.
Item	The status pertains to a particular item within the overall client request.
Policy	The status pertains to a particular policy within the **Provision** command.

2.2.2.1 FolderCreate Status Codes

The following table lists the status codes for the **FolderCreate** command.

Code	Meaning	Cause	Scope	Resolution
1	Success.			
2	A folder that has this name already exists.	The parent folder already contains a folder that has this name.	Item	Prompt user to supply a unique name.
5	The specified parent folder was not found.	The parent folder does not exist on the server. It may have been deleted or renamed.	Item	Issue a **FolderSync** command for the new hierarchy and prompt the user for a new parent folder.
6	An error occurred on the server.	Server misconfiguration, temporary system issue, or bad item. This is frequently a transient condition.	Global	Retry the **FolderSync** command. If continued attempts to synchronization fail, consider returning to synchronization key zero (0).
7	Access denied.	The user does not have permission to access the mailbox.	Global	Refer user to mail administrator.
8	The request timed out.	The server took too long to respond to the request.	Global	Retry.

9	Synchronization key mismatch or invalid synchronization key.	The client sent a malformed or mismatched synchronization key, or the synchronization state is corrupted on the server.	Global	Delete folders added since last synchronization and return to synchronization key to zero (0).
10	Malformed request.	The client sent a **FolderCreate** command that contains a semantic error.	Global	Fix bug in client code. Double-check the request for accuracy.
12	Code Unknown.	Unusual back-end issue.	Global	No solution.

2.2.2.2 FolderDelete Status Codes

The following table lists the status codes for the **FolderDelete** command.

Code	Meaning	Cause	Scope	Resolution
1	Success.			
3	The specified folder is a special folder; for example, Inbox, Outbox, Contacts, and so on.	The client specified a special folder in a **FolderDelete** command request. Special folders cannot be deleted.	Item	None.
4	The specified folder does not exist.	The client specified a nonexistent folder in a **FolderDelete** command request.	Item	Issue a **FolderSync** command for the new hierarchy.
6	An error occurred on the server.	Server misconfiguration, temporary system issue, or bad item. This is frequently a transient condition.	Global	Retry the **FolderDelete** command. If continued attempts to synchronization fail, consider returning to synchronization key zero (0).
7	Access denied.	The user does not	Global	Refer user to

		have permission to access the mailbox.		mail administrator.
8	The request timed out.	The server took too long to respond to the request.	Global	Retry.
9	Synchronization key mismatch or invalid synchronization key.	The client sent a malformed or mismatched synchronization key, or the synchronization state is corrupted on the server.	Global	Issue a **FolderSync** command request with a synchronization key of zero (0).
10	Malformed request.	The client sent a **FolderCreate** command request that contains a semantic or syntactic error.	Global	Fix bug in client code. Double-check the request for accuracy.
11	Code Unknown.	Unusual back-end issue.	Global	No solution.

2.2.2.3 FolderSync Status Codes

The following table lists the status codes for the **FolderSync** command.

Code	Meaning	Cause	Scope	Resolution
1	Success			
6	An error occurred on the server.	Server misconfiguration, temporary system issue, or bad item. This is frequently a transient condition.	Global	Retry the **FolderSync** command. If continued attempts to synchronization fail, consider returning to synchronization key zero (0).
7	Access denied.	The user does not have permission to access the mailbox.	Global	Refer user to mail administrator.
8	The request	The server took	Global	Retry.

	timed out.	too long to respond to the request.		
9	Synchronization key mismatch or invalid synchronization key.	The client sent a malformed or mismatched synchronization key, or the synchronization state is corrupted on the server.	Global	Delete items added since last synchronization and return to synchronization key zero (0).
10	Malformed request.	The client sent a **FolderSync** command request that contains a semantic or syntactic error.	Global	Fix bug in client code. Double-check the request for accuracy.
11	An unknown error occurred.	Server misconfiguration, temporary system issue, or bad item. This is frequently a transient condition.	Global	Retry the **FolderSync** command request. If continued attempts to synchronization fail, consider returning to synchronization key zero (0).
12	Code Unknown.	Unusual back-end issue.	Global	No solution.

2.2.2.4 FolderUpdate Status Codes

The following table lists the status codes for the **FolderUpdate** command.

Code	Meaning	Cause	Scope	Resolution
1	Success.			
3	The specified folder is a special folder; for example, Inbox, Outbox, Contacts, and so on.	Client specified a special folder in a **FolderUpdate** command request. Special folders cannot be deleted.	Item	None.
4	The specified	Client specified a	Item	Issue a

	folder does not exist.	nonexistent folder in a **FolderUpdate** command request.		**FolderSync** command for the new hierarchy.
6	An error occurred on the server.	Server misconfiguration, temporary system issue, or bad item. This is frequently a transient condition.	Global	Retry the **FolderUpdate** command request. If continued attempts to synchronization fail, consider returning to synchronization key 0.
7	Access denied.	The user does not have permission to access the mailbox.	Global	Refer user to mail administrator.
8	The request timed out.	The server took too long to respond to the request.	Global	Retry.
9	Synchronization key mismatch or invalid synchronization key.	The client sent a malformed or mismatched synchronization key, or the synchronization state is corrupted on the server.	Global	Issue a **FolderSync** command request with a synchronization key of 0.
10	Malformed request.	The client sent a **FolderCreate** command request that contains a semantic error.	Global	Fix bug in client code. Double-check the request for accuracy.
11	Code Unknown.	Unusual back-end issue.	Global	No solution.

2.2.2.5 GetItemEstimate Status Codes

The following table lists the status codes for the **GetItemEstimate** command.

Code	Meaning	Cause	Scope	Resolution
1	Success.			

2	A collection was invalid or one of the specified collection IDs was invalid.	One or more of the specified folders does not exist or an incorrect folder was requested.	Item	Issue a **FolderSync** to get the new hierarchy. Then retry with a valid collection or collection ID.
3	The synchronization state has not been primed.	The client has issued a **GetItemEstimate** command without first issuing a **Sync** command request with synchronization key zero (0).	Item	Issue a **Sync** command with synchronization key of zero (0) before issuing **GetItemEstimate** again.
4	Invalid synchronization key	Malformed or mismatched synchronization key. —or— The synchronization state is corrupted on the server.	Global	Delete any items added since the last successful synchronization and return to synchronization key zero (0). The **ItemID** value is the new item ID sent back by **Sync** during synchronization zero (0). These **ItemID** values will be different than the current item IDs. Client code should check for duplicate items.

2.2.2.6 MeetingResponse Status Codes

The following table lists the status codes for the **MeetingResponse** command.

Code	Meaning	Cause	Scope	Resolution
1	Success.			
2	Invalid meeting request.	The client has sent a malformed or invalid item.	Item	Stop sending the item. This is not a transient condition.
3	An error occurred on the server	Server misconfiguration, temporary system	Global	Retry the **MeetingResponse**. If continued

	mailbox.	issue, or bad item. This is frequently a transient condition.		attempts fail, synchronize the folder again, and then attempt the MeetingResponse command again. If it still continues to fail, make no changes.
4	An error occurred on the server.	Server misconfiguration, temporary system issue, or bad item. This is frequently a transient condition.	Global	Retry the **MeetingResponse**. If continued attempts fail, synchronize the folder again, and then attempt the MeetingResponse command again. If it still continues to fail, make no changes.

2.2.2.7 MoveItems Status Codes

The following table lists the status codes for the **MoveItems** command.

Code	Meaning	Cause	Scope	Resolution
1	Invalid **collectionId** for source.	The source folder **collectionId** is not recognized by the server. The source folder may have been deleted.	Item	Issue a **FolderSync** command to get the new hierarchy. Then, use a valid **collectionID**.
2	Invalid **collectionId** for destination.	The destination folder **collectionId** is not recognized by the server. The source folder may have been deleted.	Item	Issue a **FolderSync** to get the new hierarchy. Then, use a valid **collectionID**.
3	Success.			
4	Source and destination	The client supplied a	Item	Only send requests where

	collectionIds are the same.	destination folder that is the same as the source.		the **collectionIds** for the source and destination differ.
5	An error occurred on the server.	Server misconfiguration, temporary system issue, or bad item. This is frequently a transient condition.	Global	Retry the **MoveItems**. If continued attempts fail, give up on the item.
6	An item with that name already exists in the destination.	Client tried to move an item into a folder that contains another item with the same name.	Item	Inform the user of the collision and prompt the user to rename the item before trying to move it.
7	Source or destination item was locked.	Transient server condition.	Item	Retry.

2.2.2.8 Notify Status Codes (Deprecated)

The **Notify** command is no longer supported in the ActiveSync protocol. Instead, use the **Ping** command to monitor folders for new items, and the **Settings** command to set device information.

2.2.2.9 Ping Status Codes

The following table lists the status codes for the **Ping** command.

Code	Meaning	Cause	Scope	Resolution
1	The heartbeat interval expired before any changes occurred in the folders being monitored.		Global	Reissue the **Ping** command request.
2	Changes occurred in at least one of the monitored folders. The response		Global	Issue a **Sync** request for each folder that was specified in the **Ping** command

	specifies the changed folders.			response.
3	The **Ping** command request omitted required parameters.	The **Ping** command request omitted one or both of the folder list or interval.	Global	Reissue the **Ping** command request with the entire XML body.
4	Syntax error in **Ping** command request.	Frequently caused by poorly formatted WAP binary XML (WBXML).	Global	Fix bug in client code.
5	The specified heartbeat interval is outside the allowed range. For intervals that were too short, the response contains the shortest allowed interval. For intervals that were too long, the response contains the longest allowed interval.	The client sent a **Ping** command request with a heartbeat interval that was either too long or too short.	Global	Reissue the **Ping** command by using a heartbeat interval inside the allowed range. Setting the interval to the value returned in the **Ping** response will most closely accommodate the original value specified.
6	The **Ping** command request specified more than the allowed number of folders to monitor. The response indicates the allowed number in the **MaxFolders**	The client sent a **Ping** command request that specified more folders than the server is configured to monitor.	Global	Direct the user to select fewer folders to monitor. Resend the **Ping** command request with the new, shorter list.

	element.			
7	Folder Hierarchy Sync Required	The Folder Hierarchy is out of date; a FolderHierarchySync is required	Global	Issue a **FolderSync** command to get the new hierarchy and prompt the user, if it is necessary, for new folders to monitor. Reissue the **Ping** command.
8	An error occurred on the server.	Server misconfiguration, temporary system issue, or bad item. This is frequently a transient condition.	Global	Retry.

2.2.2.10 Provision Status Codes

The following table lists the status codes for the **Provision** command.

Code	Meaning	Cause	Scope	Resolution
1	Success.	The requested policy data is included in the response.	Policy	Apply the policy.
2	Protocol error.	Syntax error in the **Provision** command request.	Global	Fix bug in client code.
2	Policy not defined.	There is no policy of the requested type that is defined on the server.	Policy	Stop sending policy information. No policy is implemented.
3	The policy type is unknown.	The client sent a policy that the server does not recognize.	Policy	Issue a request by using MS-EAS-Provisioning-WBXML.
3	An error occurred on the	Server misconfiguration,	Global	Retry.

	server.	temporary system issue, or bad item. This is frequently a transient condition.		
4	The policy data is corrupted.	The policy data on the server is corrupted.	Policy	Direct the user to contact the server administrator.
5	Policy key mismatch.	The client is trying to acknowledge an out-of-date or invalid policy.	Policy	Issue a new Provision request to obtain a valid policy key.

2.2.2.11 ResolveRecipients Status Codes

The following table lists the status codes for the **ResolveRecipients** command.

Code	Meaning	Cause	Scope	Resolution
1	Success.			
2	The recipient provided was ambiguous. The response lists all possible matches. No certificate nodes were returned.	The recipient string supplied by the client matched more than one, but not more than **MaxAmbiguousRecipients**, recipients.	Item	Prompt the user to select the intended recipient from the list returned.
3	The recipient provided was ambiguous. The response lists some possible matches. No certificate	The recipient string supplied by the client matched more than **MaxAmbiguousRecipients** recipients.	Item	Prompt the user to select the intended recipient from the list returned or to get more recipients.

	nodes were returned.			
4	No matching entries were found for the recipient. No certificates were returned.	The recipient does not exist or the supplied recipient string was incorrect.	Item	Inform the user of the error and direct the user to check the spelling.
5	Protocol error.	Syntactic or semantic error in the **ResolveRecipients** request.	Global	Fix bug in client code.
6	An error occurred on the server.	Server misconfiguration, temporary system issue, or bad item. This is frequently a transient condition.	Global	Retry.
7	No Certificate found	No certificate was found but one was requested	Item	Prompt the user.
8	Global Limit hit	The global limit of certificates for the request was hit	Item	Retry with fewer recipients if possible, otherwise prompt the user.
9	Certificate Enumeration Failure	There was an error enumerating the certificates.	Item	Prompt the user.

2.2.2.12 Search Status Codes

The following table lists the status codes for the **Search** command.

Code	Meaning	Cause	Scope	Resolution
1	Success.			
2	The request was invalid.	One or more of the search parameters was invalid.	Item	Inform the user which parameter was invalid. Describe the valid options and prompt the user to select a valid value.

3	An error occurred on the server.	Server misconfiguration, temporary system issue, or bad item. This is frequently a transient condition.	Global	Retry.
4	Bad Link	A bad link was supplied	Global	Prompt user to reformat link.
5	Access Denied	Access was denied to the resource	Global	Prompt the user.
6	Not Found	Resource was not found	Global	Prompt the user.
7	Connection Failed	Failed to connect to the resource	Global	Prompt the user. Sometimes these are transient, so retry. If it continues to fail, point user to administrator.
8	Too Complex	The query was too complex.	Global	Reduce the complexity of the query. Prompt user if necessary.
9	Index Not Loaded	The server index is not loaded	Global	Point user to the administrator.
10	Timed Out	The search timed out	Global	The search timed out. Retry with or without rebuilding results. If it continues, contact the Administrator.
11	Folder Sync Required	The folder hierarchy is out of date.	Global	Issue a FolderSync and try again.
12	End of retrievable range warning	The requested range has gone past the end of the range of retrievable results.	Local	Prompt the user that there are no more results that can

				be fetched, and the user should consider restricting their search query.
13	Access Blocked	Access is blocked to the specified resource	Global	Prompt the user.
14	Credentials Requires	To complete this request, basic credentials are required.	Global	If over a trusted connection, supply the basic credentials from the user (prompt if necessary). Otherwise fail as if the Access Denied status code was provided.

2.2.2.13 Sync Status Codes

The following table lists the status codes for the **Sync** command.

Code	Meaning	Cause	Scope	Resolution
1	Success.			
2	Protocol version mismatch.	The client's version string specified version was different than previous **Sync** requests.	Global	Specify the correct version in the version string.
3	Invalid synchronization key.	Malformed or mismatched synchronization key. —or— Synchronization state corrupted on server.	Global	Delete any items that were added since the last successful synchronization and return to synchronization key 0. The **ItemID** value is the new item ID sent back by **Sync** during synchronization zero

				(0). These **ItemID** values will be different than the current item IDs. Client code should check for duplicate items.
4	Protocol error.	There was a semantic error in the recovery synchronization.	Item or Global	This is caused by a bug in the client. Fix the client. In recovery synchronization, resend all changes from previous synchronization. Wait until all changes are acknowledged before committing the new synchronization key. Return to synchronization key zero (0).
5	Server error.	Server misconfiguration, temporary system issue, or bad item. This is frequently a transient condition.	Global	Retry the synchronization. If continued attempts to synchronization fail, consider returning to synchronization key 0.
6	Error in client/server conversion.	The client has sent a malformed or invalid item.	Item	Stop sending the item. This is not a transient condition.
7	Conflict matching the client and server object.	The client has changed an item for which the conflict policy indicates that the server's changes take precedence.	Item	If it is necessary, inform the user that the change they made to the item has been overwritten by a server change.
8	Object not found.	The client issued a **Fetch** or **Change** command that has an **ItemID** value	Item	Issue a synchronization request and prompt the user if necessary.

		that is no longer valid on the server (for example, the item was deleted).		
9	The **Sync** command cannot be completed.	User account may be out of disk space.	Item	Free space in the user's mailbox and try the **Sync** command again.
10	The **NotifyGUID** element caused an error.	An error occurred while setting the **NotifyGUID** element.	Item	The **NotifyGUID** element is ignored by Microsoft Exchange Server 2007. This error can be ignored.
11	The **Sync** command cannot be completed.	The device has not been provisioned for notifications yet.	Item	Use the **Provision** command to request policy settings from the server then retry the **Sync** command.
12	The Folder Hierarchy has changed.	Mailbox folders are not synchronized.	Item	Perform a **FolderSync** command and then retry the **Sync** command.
13	The **Sync** command request is not complete.	An empty or partial **Sync** command request is received and the cached set of notify-able collections is missing.	Item	Resend a full **Sync** command request.
14	Invalid **Wait** value.	The **Wait** element value is too large or too small.	Item	Update the **Wait** element value according to the **Limit** element and then resend the **Sync** command request.
15	Invalid **Sync** command request.	Too many collections are included in the **Sync** request.	Item	Notify the user and synchronize fewer folders within one request.
16	Retry	Something on the server caused a	Global	Resend the request.

		retriable error.		

2.2.2.14 ValidateCert Status Codes

The following table lists the status codes for the **ValidateCert** command.

Code	Meaning	Cause	Scope	Resolution
1	Success.			
2	Protocol error.	Supplied protocol parameters are out of range or invalid.	Global	Fix client code.
3	The signature in the digital ID cannot be validated.	The signature in the certificate is invalid.	Item	Verify that the certificate has a valid signature.
4	The digital ID was issued by an untrusted source.	The certificate source is not trusted by the server.	Item	Contact the administrator to add the certificate to the trusted sources list if it is needed.
5	The certificate chain that contains the digital ID was not created correctly.	Invalid, incorrectly formatted certificate.	Item	Verify that the certificate chain is formatted correctly.
6	The digital ID is not valid for signing e-mail messages.	The supplied certificate is not meant to be used for signing e-mail.	Item	Prompt the user.
7	The digital ID used to sign the message has expired or is not yet valid.	The certificate has expired.	Item	Obtain a new certificate.
8	The time periods during which the digital IDs in the certificate chain are valid are not consistent.	The certificate chain may not contain the newest certificates.	Item	Get the most recent certificate chain for the certificate.

9	A digital ID in the certificate chain is used incorrectly.	The supplied certificate is not valid for what it is being used for.	Item	Obtain a new certificate.
10	Information associated with the digital ID is missing or incorrect.	The certificate format is incorrect.	Item	Obtain a new certificate.
11	A digital ID in the certificate chain is used incorrectly.	A certificate in the chain is being used for a purpose other than what it was intended for.	Item	Obtain the correct certificate chain.
12	The digital ID does not match the recipient's e-mail address.	Incorrect certificate was supplied, could be malicious.	Item	Obtain the correct certificate for the user.
13	The digital ID used to sign this message has been revoked. This can indicate that the issuer of the digital ID no longer trusts the sender, the digital ID was reported stolen, or the digital ID was compromised.	The certificate has been revoked by the certification authority that issued it.	Item	Obtain a new certificate.
14	The validity of the digital ID cannot be determined because the server that provides this information cannot be contacted.	The certificate revocation server is offline.	Item	Retry request after some time.
15	A digital ID in	A certificate in the	Item	Obtain a new

	the chain has been revoked by the authority that issued it.	chain has been revoked.		certificate.
16	The digital ID cannot be validated because its revocation status cannot be determined.	The signature in the certificate is invalid.	Item	Verify that the certificate has a valid signature.
17	An unknown server error has occurred.	The certificate source is not trusted by the server.	Item	Contact the administrator to add the certificate to the trusted sources list if it is necessary.

2.2.3 XML Schemas for Commands

This section provides the schemas for each ActiveSync protocol command. For more information about XML schemas, see [W3C-XML].

2.2.3.1 EmptyFolderContents Command

The schema for the **EmptyFolderContents** command is included in the **ItemOperations** schema. For more information about this schema, see the **ItemOperations** command.

2.2.3.2 Fetch Command

The schema for the **Fetch** command is included in the **ItemOperations** schema. For more information about this schema, see the **ItemOperations** command.

2.2.3.3 FolderCreate Command

2.2.3.3.1 FolderCreate Command Request

The computer that is running Exchange 2007 that is using the ActiveSync protocol enforces the following eXtensible Schema Definition (XSD) when processing protocol requests. Requests that do not adhere to the schema result in the return of a status 4 to the client. The following XSD is not applied by the server when sending responses to the client.

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="FolderHierarchy:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
```

```
targetNamespace="FolderHierarchy:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
    <xs:element name="FolderCreate">
        <xs:complexType>
            <xs:sequence>
                <xs:element name="SyncKey">
                    <xs:simpleType>
                        <xs:restriction base="xs:string">
                            <xs:maxLength value="64"/>
                        </xs:restriction>
                    </xs:simpleType>
                </xs:element>
                <xs:element name="ParentId">
                    <xs:simpleType>
                        <xs:restriction base="xs:string">
                            <xs:maxLength value="64"/>
                        </xs:restriction>
                    </xs:simpleType>
                </xs:element>
                <xs:element name="DisplayName">
                    <xs:simpleType>
                        <xs:restriction base="xs:string">
                            <xs:maxLength value="256"/>
                            <xs:minLength value="1"/>
                        </xs:restriction>
                    </xs:simpleType>
                </xs:element>
                <xs:element name="Type" type="xs:unsignedByte" />
            </xs:sequence>
        </xs:complexType>
    </xs:element>
</xs:schema>
```

2.2.3.3.2 FolderCreate Command Response

```
<?xml version="1.0" ?>
```

```
<xs:schema xmlns:tns="FolderHierarchy:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="FolderHierarchy:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
    <xs:element name="FolderCreate">
        <xs:complexType>
            <xs:sequence>
                <xs:element name="Status" type="xs:unsignedByte" />
                <xs:element minOccurs="0" name="SyncKey"
type="xs:string" />
                <xs:element minOccurs="0" name="ServerId"
type="xs:string" />
            </xs:sequence>
        </xs:complexType>
    </xs:element>
</xs:schema>
```

2.2.3.4 FolderDelete Command

2.2.3.4.1 FolderDelete Command Request

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="FolderHierarchy:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="FolderHierarchy:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
    <xs:element name="FolderDelete">
        <xs:complexType>
            <xs:sequence>
                <xs:element name="SyncKey" type="xs:string" />
                <xs:element name="ServerId" type="xs:string" />
            </xs:sequence>
        </xs:complexType>
    </xs:element>
</xs:schema>
```

2.2.3.4.2 FolderDelete Command Response

```
<?xml version="1.0" ?>
```

```
<xs:schema xmlns:tns="FolderHierarchy:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="FolderHierarchy:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
    <xs:element name="FolderDelete">
        <xs:complexType>
            <xs:sequence>
                <xs:element name="Status" type="xs:unsignedByte" />
                <xs:element minOccurs="0" name="SyncKey"
type="xs:string" />
            </xs:sequence>
        </xs:complexType>
    </xs:element>
</xs:schema>
```

2.2.3.5 FolderSync Command

2.2.3.5.1 FolderSync Command Request

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="FolderHierarchy:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="FolderHierarchy:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
    <xs:element name="FolderSync">
        <xs:complexType>
            <xs:sequence>
                <xs:element name="SyncKey" type="xs:string" />
            </xs:sequence>
        </xs:complexType>
    </xs:element>
</xs:schema>
```

2.2.3.5.2 FolderSync Command Response

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="FolderHierarchy:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
```

```
targetNamespace="FolderHierarchy:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
     <xs:element name="FolderSync">
          <xs:complexType>
               <xs:sequence>
                    <xs:element name="Status" type="xs:unsignedByte" />
                    <xs:element minOccurs="0" name="SyncKey"
type="xs:string" />
                    <xs:element minOccurs="0" name="Changes">
                         <xs:complexType>
                              <xs:sequence>
                                   <xs:element name="Count"
type="xs:unsignedByte" />
                                   <xs:element minOccurs="0"
name="Update">
                                        <xs:complexType>
                                             <xs:sequence>
                                                  <xs:element
name="ServerId" type="xs:string" />
                                                  <xs:element
name="ParentId" type="xs:string" />
                                                  <xs:element
name="DisplayName" type="xs:string" />
                                                  <xs:element
name="Type" type="xs:unsignedByte" />
                                             </xs:sequence>
                                        </xs:complexType>
                                   </xs:element>
                                   <xs:element minOccurs="0"
name="Delete">
                                        <xs:complexType>
                                             <xs:sequence>
                                                  <xs:element
name="ServerId" type="xs:string" />
                                             </xs:sequence>
                                        </xs:complexType>
```

```
                                    </xs:element>
                                    <xs:element minOccurs="0"
maxOccurs="unbounded" name="Add">
                                        <xs:complexType>
                                            <xs:sequence>
                                                <xs:element
name="ServerId" type="xs:string" />
                                                <xs:element
name="ParentId" type="xs:string" />
                                                <xs:element
name="DisplayName" type="xs:string" />
                                                <xs:element
name="Type" type="xs:unsignedByte" />
                                            </xs:sequence>
                                        </xs:complexType>
                                    </xs:element>
                                </xs:sequence>
                            </xs:complexType>
                        </xs:element>
                    </xs:sequence>
                </xs:complexType>
            </xs:element>
</xs:schema>
```

2.2.3.6 FolderUpdate Command

2.2.3.6.1 FolderUpdate Command Request

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="FolderHierarchy:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="FolderHierarchy:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
    <xs:element name="FolderUpdate">
        <xs:complexType>
            <xs:sequence>
                <xs:element name="SyncKey" type="xs:string" />
```

```
                <xs:element name="ServerId" type="xs:string" />
                <xs:element name="ParentId" type="xs:string" />
                <xs:element name="DisplayName" type="xs:string" />
            </xs:sequence>
        </xs:complexType>
    </xs:element>
</xs:schema>
```

2.2.3.6.2 FolderUpdate Command Response

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="FolderHierarchy:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="FolderHierarchy:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
    <xs:element name="FolderUpdate">
        <xs:complexType>
            <xs:sequence>
                <xs:element name="Status" type="xs:unsignedByte" />
                <xs:element minOccurs="0" name="SyncKey"
type="xs:string" />
            </xs:sequence>
        </xs:complexType>
    </xs:element>
</xs:schema>
```

2.2.3.7 GetHierarchy Command

2.2.3.7.1 GetHierarchy Command Request

```
POST /Microsoft-Server-
ActiveSync?Cmd=GetHierarchy&User=username&DeviceId=deviceidentification
&DeviceType=TreyT5600
Accept-Language: en-us
User-Agent: Trey-T5600/1.2
```

2.2.3.7.2 GetHierarchy Command Response

```
<?xml version="1.0" ?>
```

```
<xs:schema xmlns:tns="FolderHierarchy:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
     targetNamespace="FolderHierarchy:"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:q1="AirSync:">
     <xs:import namespace="AirSync:" />
     <xs:element name="Folders">
          <xs:complexType>
               <xs:sequence>
                    <xs:element maxOccurs="unbounded" name="Folder">
                         <xs:complexType>
                              <xs:sequence>
                                   <xs:element name="DisplayName"
type="xs:string"></xs:element>
                                   <xs:element name="ServerId"
type="xs:string" />
                                   <xs:element name="Type"
type="xs:unsignedByte" />
                                   <xs:element name="ParentId"
type="xs:string" />
                              </xs:sequence>
                         </xs:complexType>
                    </xs:element>
               </xs:sequence>
          </xs:complexType>
     </xs:element>
</xs:schema>
```

2.2.3.8 GetItemEstimate Command

2.2.3.8.1 GetItemEstimate Command Request

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="GetItemEstimate:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="GetItemEstimate:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
     <xs:import namespace="AirSync:" />
```

```
     <xs:element name="GetItemEstimate">
          <xs:complexType>
               <xs:sequence>
                    <xs:element name="Collections">
                         <xs:complexType>
                              <xs:sequence>
                                   <xs:element name="Collection">
                                        <xs:complexType>
                                             <xs:sequence>

                                                  <xs:element
name="CollectionId" type="xs:string" />
                                                  <xs:element
xmlns:q1="AirSync:" ref="q1:FilterType" />
                                                  <xs:element
xmlns:q2="AirSync:" ref="q2:SyncKey" />
                                             </xs:sequence>
                                        </xs:complexType>
                                   </xs:element>
                              </xs:sequence>
                         </xs:complexType>
                    </xs:element>
               </xs:sequence>
          </xs:complexType>
     </xs:element>
</xs:schema>
```

2.2.3.8.2 GetItemEstimate Command Response

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="GetItemEstimate:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="GetItemEstimate:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
     <xs:element name="GetItemEstimate">
          <xs:complexType>
```

```
                <xs:sequence>
                     <xs:element name="Response">
                          <xs:complexType>
                               <xs:sequence>
                                    <xs:element name="Status"
type="xs:unsignedByte" />
                                    <xs:element minOccurs="0"
name="Collection">
                                         <xs:complexType>
                                              <xs:sequence>


                                                   <xs:element
name="CollectionId" type="xs:string" />
                                                   <xs:element
name="Estimate" type="xs:unsignedByte" />
                                              </xs:sequence>
                                         </xs:complexType>
                                    </xs:element>
                               </xs:sequence>
                          </xs:complexType>
                     </xs:element>
</xs:schema>
```

2.2.3.9 ItemOperations Command

2.2.3.9.1 ItemOperations Command Request, Including Fetch and EmptyFolderContents

The computer that is running Exchange Server that is using the ActiveSync protocol enforces the following eXtensible Schema Definition (XSD) when it processes protocol requests. Requests that do not follow the schema result in the return of a status 4 to the client. The following XSD is not applied by the server when it sends responses to the client.

```
<?xml version="1.0"?>
<xs:schema id="ItemOperations" targetNamespace="ItemOperations:"
xmlns:search="Search:" xmlns:calendar="Calendar:"
```

```
xmlns:contacts2="Contacts2:" xmlns:contacts="Contacts:"
xmlns:email="Email:" xmlns:mstns="ItemOperations:"
xmlns:airsyncbase="AirSyncBase:"
xmlns:documentLibrary="DocumentLibrary:" xmlns:airsync="AirSync:"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
attributeFormDefault="qualified" elementFormDefault="qualified">
  <xs:import namespace="DocumentLibrary:"/>
  <xs:import namespace="AirSync:"/>
  <xs:import namespace="AirSyncBase:"/>
  <xs:import namespace="Email:"/>
  <xs:element name="ItemOperations">
    <xs:complexType>
      <xs:choice maxOccurs="unbounded">
        <xs:element name="EmptyFolderContents">
          <xs:complexType>
            <xs:all>
              <xs:element ref="airsync:CollectionId" minOccurs="1"
maxOccurs="1"/>
              <xs:element name="Options" minOccurs="0" maxOccurs="1">
                <xs:complexType>
                  <xs:all>
                    <xs:element name="DeleteSubFolders"/>
                  </xs:all>
                </xs:complexType>
              </xs:element>
            </xs:all>
          </xs:complexType>
        </xs:element>
        <xs:element name="Fetch">
          <xs:complexType>
            <xs:all>
              <xs:element name="Store">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:minLength value="1"/>
```

```
                    <xs:maxLength value="256"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element ref="airsync:ServerId" minOccurs="0"
maxOccurs="1"/>
              <xs:element ref="airsync:CollectionId" minOccurs="0"
maxOccurs="1"/>
              <xs:element ref="documentLibrary:LinkId" minOccurs="0"
maxOccurs="1"/>
              <xs:element ref="search:LongId" minOccurs="0"
maxOccurs="1"/>
              <xs:element ref="airsyncbase:FileReference" minOccurs="0"
maxOccurs="1"/>
              <xs:element name="Options" minOccurs="0" maxOccurs="1">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element minOccurs="0" maxOccurs="1"
name="Schema">
                      <xs:complexType>
                        <xs:choice maxOccurs="unbounded">
                          <xs:group ref="email:TopLevelSchemaProps"/>
                          <xs:group
ref="airsyncbase:TopLevelSchemaProps"/>
                          <xs:group
ref="calendar:TopLevelSchemaProps"/>
                          <xs:group
ref="contacts:TopLevelSchemaProps"/>
                          <xs:group
ref="contacts2:TopLevelSchemaProps"/>
                        </xs:choice>
                      </xs:complexType>
                    </xs:element>
                    <xs:element name="Range" minOccurs="0"
maxOccurs="1">
                      <xs:simpleType>
```

```
                        <xs:restriction base="xs:string">
                          <xs:pattern value="[0-9]{1,9}-[0-9]{1,9}"/>
                        </xs:restriction>
                      </xs:simpleType>
                    </xs:element>
<xs:element name="UserName" minOccurs="0" maxOccurs="1">
      <xs:simpleType>
      <xs:restriction base="xs:string">
      <xs:maxLength value="100" />
      </xs:restriction>
      </xs:simpleType>
      </xs:element>
                                                                  <xs:element
name="Password" minOccurs="0" maxOccurs="1">
      <xs:simpleType>
      <xs:restriction base="xs:string">
      <xs:maxLength value="100" />
      </xs:restriction>
      </xs:simpleType>

      </xs:element>
                    <xs:element ref="airsync:MIMESupport" minOccurs="0"
maxOccurs="1" />
                    <xs:element ref="airsyncbase:BodyPreference"
minOccurs="0" maxOccurs="256" >
                      <xs:complexType>
                        <xs:sequence>
                          <xs:element ref="airsyncbase:Type"
minOccurs="0" maxOccurs="1" />
                          <xs:element ref="airsyncbase:TruncationSize"
minOccurs="0" maxOccurs="1" />
                          <xs:element ref="airsyncbase:AllOrNone"
minOccurs="0" maxOccurs="1" />
```

```
                        </xs:sequence>
                      </xs:complexType>
                    </xs:element>
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
            </xs:all>
          </xs:complexType>
        </xs:element>
      </xs:choice>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

2.2.3.9.2 ItemOperations Command Response, Including Fetch and EmptyFolderContents

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="ItemOperations:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="ItemOperations:" xmlns:DocumentLibrary
="DocumentLibrary:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:import namespace="DocumentLibrary:" />
  <xs:element name="ItemOperations">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="Status" type="xs:integer " minOccurs="1"
maxOccurs="1" />
        <xs:element name="Response" minOccurs="0" maxOccurs="1">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="EmptyFolderContents" minOccurs="0"
maxOccurs="1">
                <xs:complexType>
                  <xs:sequence>
```

```
                    <xs:element name="Status" type="xs:integer"
minOccurs="1" maxOccurs="1" />
                    <xs:element ref="AirSync:CollectionId"
minOccurs="0" maxOccurs="1" />
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
               <xs:element name="Fetch" minOccurs="0"
maxOccurs="unbounded">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="Status" type="xs:integer"
minOccurs="1" maxOccurs="1"/>
                    <xs:element ref="app1:LinkId" minOccurs="0"
maxOccurs="1"/>
                    <xs:element name="Properties" minOccurs="0"
maxOccurs="1">
                      <xs:complexType>
                        <xs:sequence>
                          <xs:element name="Range" type="xs:string"
minOccurs="0" maxOccurs="1"/>
                          <xs:element name="Total" type="xs:integer"
minOccurs="0" maxOccurs="1" />
                          <xs:element name="Data" type="xs:string"
minOccurs="0" maxOccurs="1" />
                          <xs:element name="Version" type="xs:datetime"
minOccurs="0" maxOccurs="1"/>
                        </xs:sequence>
                      </xs:complexType>
                    </xs:element>
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
```

```
      </xs:sequence>
    </xs:complexType>
  </xs:element>
 </xs:schema>
```

2.2.3.10 MeetingResponse Command

2.2.3.10.1 MeetingResponse Command Request

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="MeetingResponse:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
     targetNamespace="MeetingResponse:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
     <xs:element name="MeetingResponse">
          <xs:complexType>
               <xs:sequence>
                    <xs:element maxOccurs="unbounded" name="Request">
                         <xs:complexType>
                              <xs:all>

<xs:element name="UserResponse">
                                                  <xs:simpleType>
                                                       <xs:restriction
base="xs:unsignedByte">
      <xs:enumeration value="3"/>
      <xs:enumeration value="1"/>
      <xs:enumeration value="2"/>
                                                       </xs:restriction>
                                                  </xs:simpleType>
                                             </xs:element>

<xs:element minOccurs="0" name="CollectionId">
                                                  <xs:simpleType>
                                                       <xs:restriction
base="xs:string">
      <xs:maxLength value="64"/>
                                                       </xs:restriction>
                                                  </xs:simpleType>
                                             </xs:element>
<xs:element minOccurs="0" name="RequestId">
```

```
                                                    <xs:simpleType>
                                                          <xs:restriction
base="xs:string">
      <xs:maxLength value="64"/>
                                                          </xs:restriction>
                                                    </xs:simpleType>
                                               </xs:element><xs:element
ref="search:LongId" minOccurs="0" maxOccurs="1"/>
                              </xs:all>
                         </xs:complexType>
                    </xs:element>
               </xs:sequence>
          </xs:complexType>
     </xs:element>
</xs:schema>
```

2.2.3.10.2 MeetingResponse Command Response

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="MeetingResponse:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
     targetNamespace="MeetingResponse:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
     <xs:element name="MeetingResponse">
          <xs:complexType>
               <xs:sequence>
                    <xs:element maxOccurs="unbounded" name="Result">
                         <xs:complexType>
                              <xs:sequence>
                                   <xs:element name="RequestId"
type="xs:string" />
                                   <xs:element name="Status"
type="xs:unsignedByte" />
                                   <xs:element name="CalendarId"
type="xs:string" minOccurs="0" />
                              </xs:sequence>
                         </xs:complexType>
                    </xs:element>
```

```
            </xs:sequence>
        </xs:complexType>
    </xs:element>
</xs:schema>
```

2.2.3.11 MoveItems Command

2.2.3.11.1 MoveItems Command Request

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="Move:" attributeFormDefault="unqualified"
elementFormDefault="qualified" targetNamespace="Move:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
    <xs:element name="MoveItems">
        <xs:complexType>
            <xs:sequence>
                <xs:element maxOccurs="unbounded" name="Move">
                    <xs:complexType>
                        <xs:sequence>
                            <xs:element name="SrcMsgId"
type="xs:string" />
                            <xs:element name="SrcFldId"
type="xs:string" />
                            <xs:element name="DstFldId"
type="xs:string" />
                        </xs:sequence>
                    </xs:complexType>
                </xs:element>
            </xs:sequence>
        </xs:complexType>
    </xs:element>
</xs:schema>
```

2.2.3.11.2 MoveItems Command Response

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="Move:" attributeFormDefault="unqualified"
elementFormDefault="qualified" targetNamespace="Move:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
```

```
     <xs:element name="MoveItems">
          <xs:complexType>
               <xs:sequence>
                    <xs:element maxOccurs="unbounded" name="Response">
                         <xs:complexType>
                              <xs:sequence>
                                   <xs:element name="SrcMsgId"
type="xs:string" />
                                   <xs:element name="Status"
type="xs:unsignedByte" />
                                   <xs:element minOccurs="0"
name="DstMsgId" type="xs:string" />
                              </xs:sequence>
                         </xs:complexType>
                    </xs:element>
               </xs:sequence>
          </xs:complexType>
     </xs:element>
</xs:schema>
```

2.2.3.12 Notify Command

Important The **Notify** command is no longer supported in the Microsoft® ActiveSync® protocol. Instead, use the **Ping** command to monitor folders for new items, and the **Settings** command to set device information.

2.2.3.13 Ping Command

2.2.3.13.1 Ping Command Request

Note: A **Ping** command can be sent with no body, in which case the cached version is used. This XSD is applied only to requests with a body.

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="Ping:" attributeFormDefault="unqualified"
elementFormDefault="qualified"
targetNamespace="Ping:" xmlns:xs="http://www.w3.org/2001/XMLSchema">
     <xs:element name="Ping">
          <xs:complexType>
               <xs:sequence>
```

```
                    <xs:element minOccurs="0" maxOccurs="1"
name="HeartbeatInterval" type="xs:unsignedShort" />
                    <xs:element minOccurs="0" maxOccurs="1"
name="Folders">
                         <xs:complexType>
                              <xs:sequence>
                                   <xs:element minOccurs="1"
maxOccurs="unbounded"  name="Folder">
                                        <xs:complexType>
                                             <xs:sequence>
                                                  <xs:element name="Id"
type="xs:string" minOccurs="1" maxOccurs="1"/>
                                                  <xs:element
name="Class" type="xs:string" minOccurs="1" maxOccurs="1" />
                                             </xs:sequence>
                                        </xs:complexType>
                                   </xs:element>
                              </xs:sequence>
                         </xs:complexType>
                    </xs:element>
               </xs:sequence>
          </xs:complexType>
     </xs:element>
</xs:schema>
```

2.2.3.13.2 Ping Command Response

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="Ping:" attributeFormDefault="unqualified"
elementFormDefault="qualified"
targetNamespace="Ping:" xmlns:xs="http://www.w3.org/2001/XMLSchema">
     <xs:element name="Ping">
          <xs:complexType>
               <xs:choice>
                    <xs:element minOccurs="1" name="Status"
type="xs:unsignedByte" />
```

```
                    <xs:element minOccurs=”0” maxOccurs="1”
name="Folders">
                         <xs:complexType>
                              <xs:sequence>
                                 <xs:element minOccurs=”1”
maxOccurs="unbounded” name="Folder" type=" xs:string "/>
                              </xs:sequence>
                         </xs:complexType>
                    </xs:element>
                    <xs:element minOccurs=”0” name="MaxFolders"
type="xs:integer" />
                    <xs:element minOccurs=”0” name="HeartbeatInterval"
type="xs:integer" />
               </xs:choice>
          </xs:complexType>
     </xs:element>
</xs:schema>
```

2.2.3.14 Provision Command

2.2.3.14.1 Provision Command Request

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema
  xmlns:tns="Provision:"
  attributeFormDefault="unqualified"
  elementFormDefault="qualified"
  targetNamespace="Provision:"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <xs:element name="Provision">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="Policies" minOccurs="0" maxOccurs="1">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="Policy" minOccurs="1" maxOccurs="1">
```

```
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="PolicyType" type="xs:string"
minOccurs="1" maxOccurs="1" />
                    <xs:element name="PolicyKey" type="xs:string"
minOccurs="0" maxOccurs="1" />
                    <xs:element name="Status" type="xs:string"
minOccurs="0" maxOccurs="1" />
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="RemoteWipe" minOccurs="0" maxOccurs="1">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="Status" type="xs:string" minOccurs="1"
maxOccurs="1" />
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

2.2.3.14.2 Provision Command Response

```
<?xml version="1.0" encoding="utf-16"?>
<xs:schema xmlns:tns="Provision:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="Provision:" xmlns="Provision:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="Provision">
    <xs:complexType>
```

```
      <xs:sequence>
        <xs:element name="Status" type="xs:integer" minOccurs="0"
maxOccurs="1"/>
        <xs:element name="Policies" minOccurs="0" maxOccurs="1">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="Policy" minOccurs="1"
maxOccurs="unbounded">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="PolicyType" type="xs:string"
minOccurs="0" maxOccurs="1"/>
                    <xs:element name="Status" type="xs:integer"
minOccurs="0" maxOccurs="1"/>
                    <xs:element name="PolicyKey" type="xs:string"
minOccurs="0" maxOccurs="1"/>
                    <xs:element name="Data" minOccurs="0" maxOccurs="1
">
                      <xs:complexType>
                        <xs:sequence>
                          <xs:element name="eas-provisioningdoc"
minOccurs="0" maxOccurs="1">
                            <xs:complexType>
                              <xs:sequence>
                                <xs:element
name="DevicePasswordEnabled" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
                                <xs:element
name="AlphanumericDevicePasswordRequired" type="xs:boolean"
minOccurs="0" maxOccurs="1"/>
                                <xs:element
name="PasswordRecoveryEnabled" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
                                <xs:element
name="DeviceEncryptionEnabled" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
```

```
                                <xs:element name="AttachmentsEnabled"
type="xs:boolean" minOccurs="0" maxOccurs="1"/>
                                <xs:element
name="MinDevicePasswordLength" type="xs:integer" minOccurs="0"
maxOccurs="1"/>
                                <xs:element
name="MaxInactivityTimeDeviceLock" type="xs:integer" minOccurs="0"
maxOccurs="1"/>
                                <xs:element
name="MaxDevicePasswordFailedAttempts" type="xs:integer" minOccurs="0"
maxOccurs="1" />
                                <xs:element name="MaxAttachmentSize"
type="xs:integer" minOccurs="0" maxOccurs="1"/>
                                <xs:element
name="AllowSimpleDevicePassword" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
                                <xs:element
name="DevicePasswordExpiration" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
                                <xs:element
name="DevicePasswordHistory" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="AllowStorageCard" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="AllowCamera" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="RequireDeviceEncryption" type="xs:boolean"
minOccurs="0" maxOccurs="1"/>
<xs:element name="AllowUnsignedApplications" type="xs:boolean"
minOccurs="0" maxOccurs="1"/>
<xs:element name="AllowUnsignedInstallationPackages" type="xs:boolean"
minOccurs="0" maxOccurs="1"/>
<xs:element name="MinDevicePasswordComplexCharacters" type="xs:integer"
minOccurs="0" maxOccurs="1"/>
<xs:element name="AllowWiFi" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="AllowTextMessaging" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
```

```
<xs:element name="AllowPOPIMAPEmail" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="AllowBluetooth" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="AllowIrDA" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="RequireManualSyncWhenRoaming" type="xs:boolean"
minOccurs="0" maxOccurs="1"/>
<xs:element name="AllowDesktopSync" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="MaxCalendarAgeFilter" type="xs:integer" minOccurs="0"
maxOccurs="1"/>
<xs:element name="AllowHTMLEmail" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="MaxEmailAgeFilter" type="xs:integer" minOccurs="0"
maxOccurs="1"/>
<xs:element name="MaxEmailBodyTruncationSize" type="xs:integer"
minOccurs="0" maxOccurs="1"/>
<xs:element name="MaxEmailHTMLBodyTruncationSize" type="xs:integer"
minOccurs="0" maxOccurs="1"/>
<xs:element name="RequireSignedSMIMEMessages" type="xs:boolean"
minOccurs="0" maxOccurs="1"/>
<xs:element name="RequireEncryptedSMIMEMessages" type="xs:boolean"
minOccurs="0" maxOccurs="1"/>
<xs:element name="RequireSignedSMIMEAlgorithm" type="xs:integer"
minOccurs="0" maxOccurs="1"/>
<xs:element name="RequireEncryptionSMIMEAlgorithm" type="xs:integer"
minOccurs="0" maxOccurs="1"/>
<xs:element name="AllowSMIMEEncryptionAlgorithmNegotiation"
type="xs:boolean" minOccurs="0" maxOccurs="1"/>
<xs:element name="AllowSMIMESoftCerts" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="AllowBrowser" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="AllowConsumerEmail" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
```

```
<xs:element name="AllowRemoteDesktop" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="AllowInternetSharing" type="xs:boolean" minOccurs="0"
maxOccurs="1"/>
<xs:element name="UnapprovedInROMApplicationList" minOccurs="0"
maxOccurs="1">
<xs:sequence>
<xs:element name=”ApplicationName” type=”xs:string” minOccurs=”0”
maxOccurs=”unbounded” />
</xs:sequence>
</xs:element>
<xs:element name="ApprovedApplicationList" minOccurs="0" maxOccurs="1">
<xs:sequence>
<xs:element name=”Hash” type=”xs:string” minOccurs=”0”
maxOccurs=”unbounded” />
</xs:sequence>
</xs:element>                                    </xs:sequence>
                              </xs:complexType>
                            </xs:element>
                          </xs:sequence>
                        </xs:complexType>
                      </xs:element>
                    </xs:sequence>
                  </xs:complexType>
                </xs:element>
              </xs:sequence>
            </xs:complexType>
          </xs:element>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
</xs:schema>
```

2.2.3.15 ResolveRecipients Command

2.2.3.15.1 ResolveRecipients Command Request

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="ResolveRecipients:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="ResolveRecipients:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:element name="ResolveRecipients">
      <xs:complexType>
      <xs:sequence>
         <xs:element minOccurs="1" maxOccurs="1000" name="To"
type="xs:string" />
         <xs:element name="Options" minOccurs="0" maxOccurs="1">
            <xs:complexType>
            <xs:sequence>
               <xs:element minOccurs="0" maxOccurs="1"
name="CertificateRetrieval" type="xs:integer" />
               <xs:element minOccurs="0" maxOccurs="1"
name="MaxCertificates" type="xs:integer">
               <xs:element minOccurs="0" maxOccurs="1"
name="MaxAmbiguousRecipients" type="xs:integer">
            </xs:sequence>
            </xs:complexType>
         </xs:element>
      </xs:sequence>
      <xs:complexType>
</xs:element>
</xs:schema>
```

2.2.3.15.2 ResolveRecipients Command Response

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="ResolveRecipients:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="ResolveRecipients:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:element name="ResolveRecipients">
   <xs:complexType>
      <xs:choice>
```

```
         <xs:element minOccurs=”1” name="Status" type="xs:unsignedByte"
/>
         <xs:element minOccurs=”0” maxOccurs="unbounded”
name="Response">
            <xs:complexType>
            <xs:sequence>
               <xs:element minOccurs=”1” maxOccurs="1” name="To"
type="xs:string"/>
               <xs:element minOccurs=”1” maxOccurs="1” name="Status"
type="xs:string"/>
               <xs:element minOccurs=”1” maxOccurs="1”
name="RecipientCount" type="xs:integer"/>
               <xs:element minOccurs=”1” maxOccurs="unbounded”
name="Recipient" type="xs:string">
                  <xs:complexType>
                  <xs:sequence>
                     <xs:element minOccurs=”1” maxOccurs="1”
name="Type" type="xs:unsignedbyte"/>
                     <xs:element minOccurs=”1” maxOccurs="1”
name="DisplayName" type="xs:string"/>
                     <xs:element minOccurs=”1” maxOccurs="1”
name="EmailAddress" type="xs:string"/>
                     <xs:element minOccurs=”0” maxOccurs="unbounded”
name="Certificates">
                        <xs:complexType>
                        <xs:sequence>
                           <xs:element minOccurs=”1” maxOccurs="1”
name="Status" type="xs:unsignedbyte"/>
                           <xs:element minOccurs=”1” maxOccurs="1”
name="CertificateCount" type="xs:integer"/>
                           <xs:element minOccurs=”1” maxOccurs="1”
name="RecipientCount" type="xs:integer"/>
                           <xs:element minOccurs=”0” maxOccurs="1”
name="MiniCertificate" type="xs:string"/>
                        </xs:complexType>
                        </xs:sequence>
```

```
                    </xs:element>
                  </xs:complexType>
                  </xs:sequence>
                </xs:element>
              </xs:sequence>
              </xs:complexType>
            </xs:element>
        </xs:choice>
    </xs:complexType>
</xs:element>
</xs:schema>
```

2.2.3.16 Search Command

2.2.3.16.1 Search Request

```
<?xml version="1.0"?>
<xs:schema id="Search" targetNamespace="Search:"
xmlns:calendar="Calendar:" xmlns:contacts2="Contacts2:"
xmlns:contacts="Contacts:" xmlns:email="Email:" xmlns:mstns="Search:"
xmlns="Search:" xmlns:airSync="AirSync:"
xmlns:airsyncbase="AirSyncBase:"
xmlns:documentLibrary="DocumentLibrary:"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
attributeFormDefault="qualified" elementFormDefault="qualified">
  <xs:import namespace="DocumentLibrary:"/>
  <xs:import namespace="AirSync:"/>
  <xs:import namespace="AirSyncBase:"/>
  <xs:import namespace="Email:"/>
  <xs:element name="LongId">
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:minLength value="1"/>
        <xs:maxLength value="256"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:element>
```

```
  <xs:complexType name="EmptyTag" />
  <xs:complexType name="queryType" mixed="true">
    <xs:sequence>
      <xs:choice maxOccurs="unbounded">
        <xs:element name="And" type="queryType"/>
        <xs:element name="Or" type="queryType"/>
        <xs:element name="FreeText" type="xs:string" />
        <xs:element ref="airSync:Class" />
        <xs:element ref="airSync:CollectionId" />
        <xs:element name="EqualTo" minOccurs="0">
          <xs:complexType>
            <xs:sequence>
              <xs:element ref="documentLibrary:LinkId" minOccurs="1"
maxOccurs="1"/>
              <xs:element minOccurs="1" name="Value">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:maxLength value="1024"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="GreaterThan">
          <xs:complexType>
            <xs:sequence>
              <xs:element ref="email:DateReceived" minOccurs="1"
maxOccurs="1"/>
              <xs:element minOccurs="1" name="Value">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:maxLength value="1024"/>
                  </xs:restriction>
```

```
                </xs:simpleType>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="LessThan">
          <xs:complexType>
            <xs:sequence>
              <xs:element ref="email:DateReceived" minOccurs="1"
maxOccurs="1"/>
              <xs:element minOccurs="1" name="Value">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:maxLength value="1024"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:choice>
    </xs:sequence>
  </xs:complexType>
  <xs:element name="Search">
    <xs:complexType>
      <xs:choice maxOccurs="unbounded">
        <xs:element name="Store">
          <xs:complexType>
            <xs:all>
              <xs:element name="Name">
                <xs:simpleType>
                  <xs:restriction base="xs:string">
                    <xs:minLength value="1"/>
                    <xs:maxLength value="256"/>
```

```
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element name="Query" minOccurs="0" type="queryType"
/>
              <xs:element name="Options" minOccurs="0" maxOccurs="1">
                <!-- Must differentiate between document library and
Mailbox options...!-->
                <xs:complexType>
                  <xs:choice maxOccurs="unbounded">
                   <xs:element ref="airSync:MIMESupport" minOccurs="0"
maxOccurs="1" />
<xs:element ref="airsyncbase:BodyPreference" minOccurs="0"
maxOccurs="unbounded" >
                    <xs:complexType>
                      <xs:sequence>
                        <xs:element ref="airsyncbase:Type" />
                        <xs:element ref="airsyncbase:TruncationSize"
/>

                        <xs:element ref="airsyncbase:AllOrNone" />
                      </xs:sequence>
                    </xs:complexType>
                  </xs:element>

                  <xs:element name="Schema">
                    <xs:complexType>
                      <xs:choice maxOccurs="unbounded">
                        <xs:element ref="airSync:Class" />
                      </xs:choice>
                    </xs:complexType>
                  </xs:element>
                  <xs:element name="Range">
                    <xs:simpleType>
                      <xs:restriction base="xs:string">
                        <xs:pattern value="[0-9]{1,3}-[0-9]{1,3}"/>
```

```
                        </xs:restriction>
                      </xs:simpleType>
                    </xs:element>
<xs:element name="UserName">
      <xs:simpleType>
      <xs:restriction base="xs:string">
      <xs:maxLength value="100" />
      </xs:restriction>
      </xs:simpleType>
      </xs:element>
                                                                  <xs:element
name="Password">
      <xs:simpleType>
      <xs:restriction base="xs:string">
      <xs:maxLength value="100" />
      </xs:restriction>
      </xs:simpleType>

      </xs:element>
                    <xs:element name="DeepTraversal" type="EmptyTag" />
                    <xs:element name="RebuildResults" type="EmptyTag" />
                  </xs:choice>
                </xs:complexType>
              </xs:element>
            </xs:all>
          </xs:complexType>
        </xs:element>
      </xs:choice>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

2.2.3.17 Settings Command

2.2.3.17.1 Settings Command Request

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema
  xmlns:tns="Settings:"
  attributeFormDefault="unqualified"
  elementFormDefault="qualified"
  targetNamespace="Settings:"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <xs:simpleType name="EmptyStringType">
    <xs:restriction base="xs:string">
      <xs:maxLength value="0"/>
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="NonEmptyStringType">
    <xs:restriction base="xs:string">
      <xs:minLength value="1"/>
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="DeviceInformationStringType">
    <xs:restriction base="xs:string">
      <xs:maxLength value="1024"/>
    </xs:restriction>
  </xs:simpleType>

  <xs:element name="Settings">
    <xs:complexType>
      <xs:all>
        <xs:element name="Oof" minOccurs="0" maxOccurs="1">
          <xs:complexType>
```

```
            <xs:choice>
              <xs:element name="Get">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="BodyType"
type="tns:NonEmptyStringType" minOccurs="1" maxOccurs="1" />
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
              <xs:element name="Set">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="OofState"
type="tns:NonEmptyStringType" minOccurs="0" maxOccurs="1" />
                    <xs:element name="StartTime"
type="tns:NonEmptyStringType" minOccurs="0" maxOccurs="1" />
                    <xs:element name="EndTime"
type="tns:NonEmptyStringType" minOccurs="0" maxOccurs="1" />
                    <xs:element name="OofMessage" minOccurs="0"
maxOccurs="3">
                      <xs:complexType>
                        <xs:all>
                          <xs:element name="AppliesToInternal"
type="tns:EmptyStringType" minOccurs="0" maxOccurs="1" />
                          <xs:element name="AppliesToExternalKnown"
type="tns:EmptyStringType" minOccurs="0" maxOccurs="1" />
                          <xs:element name="AppliesToExternalUnknown"
type="tns:EmptyStringType" minOccurs="0" maxOccurs="1" />
                          <xs:element name="Enabled"
type="tns:NonEmptyStringType" minOccurs="0" maxOccurs="1" />
                          <xs:element name="ReplyMessage"
type="xs:string" minOccurs="0" maxOccurs="1" />
                          <xs:element name="BodyType"
type="tns:NonEmptyStringType" minOccurs="0" maxOccurs="1" />
                        </xs:all>
                      </xs:complexType>
```

```
                    </xs:element>
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
            </xs:choice>
          </xs:complexType>
        </xs:element>
        <xs:element name="DevicePassword" minOccurs="0" maxOccurs="1">
          <xs:complexType>
            <xs:choice>
              <xs:element name="Set">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="Password" type="xs:string"
minOccurs="1" maxOccurs="1" />
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
            </xs:choice>
          </xs:complexType>
        </xs:element>
        <xs:element name="DeviceInformation" minOccurs="0"
maxOccurs="1">
          <xs:complexType>
            <xs:choice>
              <xs:element name="Set">
                <xs:complexType>
                  <xs:all>
                    <xs:element name="Model"
type="tns:DeviceInformationStringType" maxOccurs="1" minOccurs="0" />
                    <xs:element name="IMEI"
type="tns:DeviceInformationStringType" maxOccurs="1" minOccurs="0" />
                    <xs:element name="FriendlyName"
type="tns:DeviceInformationStringType" maxOccurs="1" minOccurs="0" />
```

```
                    <xs:element name="OS"
type="tns:DeviceInformationStringType" maxOccurs="1" minOccurs="0" />
                    <xs:element name="OSLanguage"
type="tns:DeviceInformationStringType" maxOccurs="1" minOccurs="0" />
                    <xs:element name="PhoneNumber"
type="tns:DeviceInformationStringType" maxOccurs="1" minOccurs="0" />
                                                                <xs:element
name="UserAgent" type="tns:DeviceInformationStringType" maxOccurs="1"
minOccurs="0" />
                  </xs:all>
                </xs:complexType>
              </xs:element>
            </xs:choice>
          </xs:complexType>
        </xs:element>
        <xs:element name="UserInformation" minOccurs="0" maxOccurs="1">
          <xs:complexType>
            <xs:choice>
              <xs:element minOccurs="1" maxOccurs="1" name="Get"
type="tns:EmptyStringType"/>
            </xs:choice>
          </xs:complexType>
        </xs:element>
      </xs:all>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

2.2.3.18 Sync Command

2.2.3.18.1 Sync Command Request

The following XML is optional in the body.

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="AirSync:" attributeFormDefault="unqualified"
elementFormDefault="qualified" targetNamespace="AirSync:"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:contacts="Contacts:"
```

```
xmlns:contacts2="Contacts2:" xmlns:calendar="Calendar:"
xmlns:email="Email:" xmlns:airsyncbase="AirSyncBase:"
xmlns:tasks="Tasks:">
      <xs:import namespace="Contacts2:"/>
      <xs:import namespace="Contacts:"/>
      <xs:import namespace="Email:"/>
      <xs:import namespace="Calendar:"/>
      <xs:import namespace="AirSyncBase:"/>
      <xs:import namespace="Tasks:"/>
      <xs:element name="MIMESupport">
            <xs:simpleType>
                  <xs:restriction base="xs:unsignedByte">
                        <xs:minInclusive value="0" />
                        <xs:maxInclusive value="2" />
                  </xs:restriction>
            </xs:simpleType>
      </xs:element>
      <xs:element name="CollectionId">
            <xs:simpleType>
                  <xs:restriction base="xs:string">
                        <xs:maxLength value="64"/>
                  </xs:restriction>
            </xs:simpleType>
      </xs:element>
      <xs:element name="ServerId">
            <xs:simpleType>
                  <xs:restriction base="xs:string">
                        <xs:maxLength value="64"/>
                  </xs:restriction>
            </xs:simpleType>
      </xs:element>
      <xs:element name="FilterType">
            <xs:simpleType>
                  <xs:restriction base="xs:unsignedByte">
                        <xs:minInclusive value="0"/>
                        <xs:maxInclusive value="8"/>
                  </xs:restriction>
            </xs:simpleType>
      </xs:element>
      <xs:element name="SyncKey">
            <xs:simpleType>
                  <xs:restriction base="xs:string">
                        <xs:maxLength value="64"/>
                  </xs:restriction>
            </xs:simpleType>
      </xs:element>
      <xs:element name="Class" type="xs:string"/>
      <xs:element name="Sync">
            <xs:complexType>
                  <xs:sequence minOccurs="1" maxOccurs="1">
        <xs:element name="Collections" minOccurs="0" maxOccurs="1">
          <xs:complexType>
            <xs:sequence>
```

```
              <xs:element minOccurs="0" maxOccurs="unbounded"
name="Collection">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="SyncKey">
                      <xs:simpleType>
                        <xs:restriction base="xs:string">
                          <xs:maxLength value="64"/>
                        </xs:restriction>
                      </xs:simpleType>
                    </xs:element>
                    <xs:element minOccurs="0" name="NotifyGUID"
type="xs:string"/>
                    <xs:element minOccurs="1" name="CollectionId">
                      <xs:simpleType>
                        <xs:restriction base="xs:string">
                          <xs:maxLength value="64"/>
                        </xs:restriction>
                      </xs:simpleType>
                    </xs:element>
                    <xs:element minOccurs="0" name="Supported">
                      <xs:complexType mixed="true">
                        <xs:sequence minOccurs="0">
                          <xs:choice maxOccurs="unbounded">
                            <xs:group ref="contacts:GhostingProps"/>
                            <xs:group ref="contacts2:GhostingProps"/>
                            <xs:group ref="calendar:GhostingProps"/>
                          </xs:choice>
                        </xs:sequence>
                      </xs:complexType>
                    </xs:element>
                    <xs:element minOccurs="0" name="DeletesAsMoves"/>
                    <xs:element minOccurs="0" name="GetChanges"/>
                    <xs:element minOccurs="0" name="WindowSize">
                      <xs:simpleType>
                        <xs:restriction base="xs:integer">
                          <xs:minInclusive value="0"/>
                        </xs:restriction>
                      </xs:simpleType>
                    </xs:element>
                    <xs:element minOccurs="0" name="Options">
                      <xs:complexType>
                        <xs:choice maxOccurs="unbounded">
                          <xs:element name="FilterType" minOccurs="0">
                            <xs:simpleType>
                              <xs:restriction base="xs:unsignedByte">
                                <xs:minInclusive value="0"/>
                                <xs:maxInclusive value="8"/>
                              </xs:restriction>
                            </xs:simpleType>
                          </xs:element>
                          <xs:element ref="airsyncbase:BodyPreference"
minOccurs="0" maxOccurs="unbounded" />
```

```
                        <xs:element minOccurs="0" name="Conflict"
type="xs:unsignedByte"/>
                        <xs:element minOccurs="0" maxOccurs="1"
name="MIMESupport">
                          <xs:simpleType>
                            <xs:restriction base="xs:unsignedByte">
                              <xs:minInclusive value="0" />
                              <xs:maxInclusive value="2" />
                            </xs:restriction>
                          </xs:simpleType>
                        </xs:element>
                        <xs:element minOccurs="0" maxOccurs="1"
name="MIMETruncation">
                          <xs:simpleType>
                            <xs:restriction base="xs:unsignedByte">
                              <xs:minInclusive value="0" />
                              <xs:maxInclusive value="8" />
                            </xs:restriction>
                          </xs:simpleType>
                        </xs:element>
                      </xs:choice>
                    </xs:complexType>
                  </xs:element>
                  <xs:element minOccurs="0" name="Commands">
                    <xs:complexType>
                      <xs:choice maxOccurs="unbounded">
                        <xs:element minOccurs="0"
maxOccurs="unbounded" name="Change">
                          <xs:complexType>
                            <xs:sequence>
                              <xs:element name="ServerId">
                                <xs:simpleType>
                                  <xs:restriction base="xs:string">
                                    <xs:maxLength value="64"/>
                                  </xs:restriction>
                                </xs:simpleType>
                              </xs:element>
                              <xs:element name="ApplicationData">
                                <xs:complexType>
                                  <xs:sequence>
                                    <xs:choice maxOccurs="unbounded">
                                      <xs:element ref="email:Flag"/>
                                      <xs:element ref="email:Read"/>
                                      <xs:element
ref="calendar:OrganizerName"/>
                                      <xs:element
ref="calendar:OrganizerEmail"/>
                                      <xs:element
ref="calendar:Exceptions"/>
                                      <xs:element
ref="calendar:Attendees"/>
                                      <xs:element
ref="calendar:TimeZone"/>
```

```
                                        <xs:element
ref="calendar:AllDayEvent"/>
                                        <xs:element
ref="airsyncbase:NativeBodyType"/>
                                        <xs:element
ref="airsyncbase:Body"/>
                                        <xs:element
ref="calendar:BusyStatus"/>
                                        <xs:element
ref="calendar:Categories"/>
                                        <xs:element
ref="calendar:DtStamp"/>
                                        <xs:element
ref="calendar:EndTime"/>
                                        <xs:element
ref="calendar:Location"/>
                                        <xs:element
ref="calendar:MeetingStatus"/>
                                        <xs:element
ref="calendar:Reminder"/>
                                        <xs:element
ref="calendar:Sensitivity"/>
                                        <xs:element
ref="calendar:Subject"/>
                                        <xs:element
ref="calendar:StartTime"/>
                                        <xs:element
ref="calendar:UID"/>
                                        <xs:element
ref="calendar:Recurrence"/>
                                        <xs:element
ref="contacts:Anniversary"/>
                                        <xs:element
ref="contacts:AssistantName"/>
                                        <xs:element
ref="contacts:AssistantPhoneNumber"/>
                                        <xs:element
ref="contacts:AssistnamePhoneNumber"/>
                                        <xs:element
ref="contacts:Birthday"/>
                                        <xs:element
ref="contacts:Business2PhoneNumber"/>
                                        <xs:element
ref="contacts:BusinessAddressCity"/>
                                        <xs:element
ref="contacts:BusinessAddressCountry"/>
                                        <xs:element
ref="contacts:BusinessAddressPostalCode"/>
                                        <xs:element
ref="contacts:BusinessAddressState"/>
                                        <xs:element
ref="contacts:BusinessAddressStreet"/>
                                        <xs:element
ref="contacts:BusinessFaxNumber"/>
```

```
                                        <xs:element
ref="contacts:BusinessPhoneNumber"/>
                                        <xs:element
ref="contacts:CarPhoneNumber"/>
                                        <xs:element
ref="contacts:Categories"/>
                                        <xs:element
ref="contacts:Children"/>
                                        <xs:element
ref="contacts:CompanyName"/>
                                        <xs:element
ref="contacts:Department"/>
                                        <xs:element
ref="contacts:Email1Address"/>
                                        <xs:element
ref="contacts:Email2Address"/>
                                        <xs:element
ref="contacts:Email3Address"/>
                                        <xs:element
ref="contacts:FileAs"/>
                                        <xs:element
ref="contacts:FirstName"/>
                                        <xs:element
ref="contacts:MiddleName"/>
                                        <xs:element
ref="contacts:Home2PhoneNumber"/>
                                        <xs:element
ref="contacts:HomeAddressCity"/>
                                        <xs:element
ref="contacts:HomeAddressCountry"/>
                                        <xs:element
ref="contacts:HomeAddressPostalCode"/>
                                        <xs:element
ref="contacts:HomeAddressState"/>
                                        <xs:element
ref="contacts:HomeAddressStreet"/>
                                        <xs:element
ref="contacts:HomeFaxNumber"/>
                                        <xs:element
ref="contacts:HomePhoneNumber"/>
                                        <xs:element
ref="contacts:JobTitle"/>
                                        <xs:element
ref="contacts:LastName"/>
                                        <xs:element
ref="contacts:MobilePhoneNumber"/>
                                        <xs:element
ref="contacts:OfficeLocation"/>
                                        <xs:element
ref="contacts:OtherAddressCity"/>
                                        <xs:element
ref="contacts:OtherAddressCountry"/>
                                        <xs:element
ref="contacts:OtherAddressPostalCode"/>
```

```
                                        <xs:element
ref="contacts:OtherAddressState"/>
                                        <xs:element
ref="contacts:OtherAddressStreet"/>
                                        <xs:element
ref="contacts:PagerNumber"/>
                                        <xs:element
ref="contacts:RadioPhoneNumber"/>
                                        <xs:element
ref="contacts:Spouse"/>
                                        <xs:element
ref="contacts:Suffix"/>
                                        <xs:element
ref="contacts:Title"/>
                                        <xs:element
ref="contacts:WebPage"/>
                                        <xs:element
ref="contacts:YomiCompanyName"/>
                                        <xs:element
ref="contacts:YomiFirstName"/>
                                        <xs:element
ref="contacts:Picture"/>
                                        <xs:element
ref="contacts2:CustomerId"/>
                                        <xs:element
ref="contacts2:GovernmentId"/>
                                        <xs:element
ref="contacts2:IMAddress"/>
                                        <xs:element
ref="contacts2:IMAddress2"/>
                                        <xs:element
ref="contacts2:IMAddress3"/>
                                        <xs:element
ref="contacts2:ManagerName"/>
                                        <xs:element
ref="contacts2:CompanyMainPhone"/>
                                        <xs:element
ref="contacts2:AccountName"/>
                                        <xs:element
ref="contacts2:NickName"/>
                                        <xs:element
ref="contacts2:MMS"/>
                                        <xs:element
ref="contacts:YomiLastName"/>
                                        <xs:element
ref="tasks:Complete"/>
                                        <xs:element
ref="tasks:Subject"/>
                                        <xs:element
ref="tasks:Categories"/>
                                        <xs:element
ref="tasks:DateCompleted"/>
                                        <xs:element
ref="tasks:DueDate"/>
```

```
                                        <xs:element
ref="tasks:UtcDueDate"/>
                                        <xs:element
ref="tasks:Importance"/>
                                        <xs:element
ref="tasks:Recurrence"/>
                                        <xs:element
ref="tasks:ReminderSet"/>
                                        <xs:element
ref="tasks:ReminderTime"/>
                                        <xs:element
ref="tasks:Sensitivity"/>
                                        <xs:element
ref="tasks:StartDate"/>
                                        <xs:element
ref="tasks:UtcStartDate"/>
                                      </xs:choice>
                                    </xs:sequence>
                                  </xs:complexType>
                                </xs:element>
                              </xs:sequence>
                            </xs:complexType>
                          </xs:element>
                          <xs:element minOccurs="0"
maxOccurs="unbounded" name="Delete">
                            <xs:complexType>
                              <xs:sequence>
                                <xs:element name="ServerId">
                                  <xs:simpleType>
                                    <xs:restriction base="xs:string">
                                      <xs:maxLength value="64"/>
                                    </xs:restriction>
                                  </xs:simpleType>
                                </xs:element>
                              </xs:sequence>
                            </xs:complexType>
                          </xs:element>
                          <xs:element minOccurs="0"
maxOccurs="unbounded" name="Add">
                            <xs:complexType>
                              <xs:sequence>
                                <xs:element name="ClientId">
                                  <xs:simpleType>
                                    <xs:restriction base="xs:string">
                                      <xs:maxLength value="64"/>
                                    </xs:restriction>
                                  </xs:simpleType>
                                </xs:element>
                                <xs:element name="ApplicationData">
                                  <xs:complexType>
                                    <xs:sequence>
                                      <xs:choice maxOccurs="unbounded">
                                        <xs:element
ref="calendar:OrganizerName"/>
```

```
                                        <xs:element
ref="calendar:OrganizerEmail"/>
                                        <xs:element
ref="calendar:Exceptions"/>
                                        <xs:element
ref="calendar:Attendees"/>
                                        <xs:element
ref="calendar:TimeZone"/>
                                        <xs:element
ref="calendar:AllDayEvent"/>
                                        <xs:element
ref="airsyncbase:NativeBodyType"/>
                                        <xs:element
ref="airsyncbase:Body"/>
                                        <xs:element
ref="calendar:BusyStatus"/>
                                        <xs:element
ref="calendar:Categories"/>
                                        <xs:element
ref="calendar:DtStamp"/>
                                        <xs:element
ref="calendar:EndTime"/>
                                        <xs:element
ref="calendar:Location"/>
                                        <xs:element
ref="calendar:MeetingStatus"/>
                                        <xs:element
ref="calendar:Reminder"/>
                                        <xs:element
ref="calendar:Sensitivity"/>
                                        <xs:element
ref="calendar:Subject"/>
                                        <xs:element
ref="calendar:StartTime"/>
                                        <xs:element
ref="calendar:UID"/>
                                        <xs:element
ref="calendar:Recurrence"/>
                                        <xs:element
ref="contacts:Anniversary"/>
                                        <xs:element
ref="contacts:AssistantName"/>
                                        <xs:element
ref="contacts:AssistantPhoneNumber"/>
                                        <xs:element
ref="contacts:AssistnamePhoneNumber"/>
                                        <xs:element
ref="contacts:Birthday"/>
                                        <xs:element
ref="contacts:Business2PhoneNumber"/>
                                        <xs:element
ref="contacts:BusinessAddressCity"/>
                                        <xs:element
ref="contacts:BusinessAddressCountry"/>
```

```
                                        <xs:element
ref="contacts:BusinessAddressPostalCode"/>
                                        <xs:element
ref="contacts:BusinessAddressState"/>
                                        <xs:element
ref="contacts:BusinessAddressStreet"/>
                                        <xs:element
ref="contacts:BusinessFaxNumber"/>
                                        <xs:element
ref="contacts:BusinessPhoneNumber"/>
                                        <xs:element
ref="contacts:CarPhoneNumber"/>
                                        <xs:element
ref="contacts:Categories"/>
                                        <xs:element
ref="contacts:Children"/>
                                        <xs:element
ref="contacts:CompanyName"/>
                                        <xs:element
ref="contacts:Department"/>
                                        <xs:element
ref="contacts:Email1Address"/>
                                        <xs:element
ref="contacts:Email2Address"/>
                                        <xs:element
ref="contacts:Email3Address"/>
                                        <xs:element
ref="contacts:FileAs"/>
                                        <xs:element
ref="contacts:FirstName"/>
                                        <xs:element
ref="contacts:MiddleName"/>
                                        <xs:element
ref="contacts:Home2PhoneNumber"/>
                                        <xs:element
ref="contacts:HomeAddressCity"/>
                                        <xs:element
ref="contacts:HomeAddressCountry"/>
                                        <xs:element
ref="contacts:HomeAddressPostalCode"/>
                                        <xs:element
ref="contacts:HomeAddressState"/>
                                        <xs:element
ref="contacts:HomeAddressStreet"/>
                                        <xs:element
ref="contacts:HomeFaxNumber"/>
                                        <xs:element
ref="contacts:HomePhoneNumber"/>
                                        <xs:element
ref="contacts:JobTitle"/>
                                        <xs:element
ref="contacts:LastName"/>
                                        <xs:element
ref="contacts:MobilePhoneNumber"/>
```

```
                                        <xs:element
ref="contacts:OfficeLocation"/>
                                        <xs:element
ref="contacts:OtherAddressCity"/>
                                        <xs:element
ref="contacts:OtherAddressCountry"/>
                                        <xs:element
ref="contacts:OtherAddressPostalCode"/>
                                        <xs:element
ref="contacts:OtherAddressState"/>
                                        <xs:element
ref="contacts:OtherAddressStreet"/>
                                        <xs:element
ref="contacts:PagerNumber"/>
                                        <xs:element
ref="contacts:RadioPhoneNumber"/>
                                        <xs:element
ref="contacts:Spouse"/>
                                        <xs:element
ref="contacts:Suffix"/>
                                        <xs:element
ref="contacts:Title"/>
                                        <xs:element
ref="contacts:WebPage"/>
                                        <xs:element
ref="contacts:YomiCompanyName"/>
                                        <xs:element
ref="contacts:YomiFirstName"/>
                                        <xs:element
ref="contacts:YomiLastName"/>
                                        <xs:element
ref="contacts:Picture"/>
                                        <xs:element
ref="contacts2:CustomerId"/>
                                        <xs:element
ref="contacts2:GovernmentId"/>
                                        <xs:element
ref="contacts2:IMAddress"/>
                                        <xs:element
ref="contacts2:IMAddress2"/>
                                        <xs:element
ref="contacts2:IMAddress3"/>
                                        <xs:element
ref="contacts2:ManagerName"/>
                                        <xs:element
ref="contacts2:CompanyMainPhone"/>
                                        <xs:element
ref="contacts2:AccountName"/>
                                        <xs:element
ref="contacts2:NickName"/>
                                        <xs:element
ref="contacts2:MMS"/>
                                        <xs:element
ref="tasks:Complete"/>
```

```
                                        <xs:element
ref="tasks:Subject"/>
                                        <xs:element
ref="tasks:Categories"/>
                                        <xs:element
ref="tasks:DateCompleted"/>
                                        <xs:element
ref="tasks:DueDate"/>
                                        <xs:element
ref="tasks:UtcDueDate"/>
                                        <xs:element
ref="tasks:Importance"/>
                                        <xs:element
ref="tasks:Recurrence"/>
                                        <xs:element
ref="tasks:ReminderSet"/>
                                        <xs:element
ref="tasks:ReminderTime"/>
                                        <xs:element
ref="tasks:Sensitivity"/>
                                        <xs:element
ref="tasks:StartDate"/>
                                        <xs:element
ref="tasks:UtcStartDate"/>
                                    </xs:choice>
                                  </xs:sequence>
                                </xs:complexType>
                              </xs:element>
                            </xs:sequence>
                          </xs:complexType>
                        </xs:element>
                        <xs:element minOccurs="0"
maxOccurs="unbounded" name="Fetch">
                          <xs:complexType>
                            <xs:sequence>
                              <xs:element name="ServerId">
                                <xs:simpleType>
                                  <xs:restriction base="xs:string">
                                    <xs:maxLength value="64"/>
                                  </xs:restriction>
                                </xs:simpleType>
                              </xs:element>
                            </xs:sequence>
                          </xs:complexType>
                        </xs:element>
                      </xs:choice>
                    </xs:complexType>
                  </xs:element>
                </xs:sequence>
              </xs:complexType>
            </xs:element>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
```

```
        <xs:element name="Wait" minOccurs="0" maxOccurs="1">
          <xs:simpleType>
            <xs:restriction base="xs:integer">
              <xs:minInclusive value="1"/>
              <xs:maxInclusive value="59"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="WindowSize" minOccurs="0" maxOccurs="1">
          <xs:simpleType>
            <xs:restriction base="xs:integer">
              <xs:minInclusive value="0"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="Partial" minOccurs="0" maxOccurs="1" />
      </xs:sequence>
            </xs:complexType>
      </xs:element>
</xs:schema>
```

2.2.3.18.2 Sync Command Response

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="AirSync:" attributeFormDefault="unqualified"
elementFormDefault="qualified" targetNamespace="AirSync:"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:contacts="CONTACTS:"
xmlns:contacts2="CONTACTS2:" xmlns:calendar="CAL:" xmlns:email="EMAIL:"
xmlns:airsyncbase="AirSyncBase:" xmlns:tasks=”TASKS:”>
  <xs:import namespace="CONTACTS:" />
  <xs:import namespace="CONTACTS2:" />
  <xs:import namespace="EMAIL:" />
  <xs:import namespace="CAL:" />
  <xs:import namespace="AirSyncBase:"/>
  <xs:import namespace:=”TASKS:”/>
  <xs:element name="Sync" minOccurs=”0”>
    <xs:complexType>
    <xs:sequence>
      <xs:element minOccurs="1" name="Status" type="xs:unsignedByte" />
      <xs:element minOccurs="0" name="Collections">
        <xs:complexType>
        <xs:sequence>
          <xs:element name="Collection" minOccurs=”0”
maxOccurs=”unbounded”>
```

```
            <xs:complexType>
            <xs:sequence>
              <xs:choice maxOccurs="unbounded">

<xs:element name="SyncKey" type="xs:string" />
                <xs:element name="CollectionId" type="xs:string" />
                <xs:element name="Status" type="xs:unsignedByte" />
                <xs:element name="Commands">
                  <xs:complexType>
                  <xs:sequence>
                    <xs:element minOccurs="0" maxOccurs="unbounded"
name="Delete">
                      <xs:complexType>
                      <xs:sequence>
                        <xs:element name="ServerId" type="xs:string" />
                      </xs:sequence>
                      </xs:complexType>
                    </xs:element>
                    <xs:element minOccurs="0" name="Change">
                      <xs:complexType>
                      <xs:sequence>
                        <xs:element name="ServerId" type="xs:string" />
                        <xs:element name="ApplicationData">
                          <xs:complexType>
                          <xs:sequence>
                            <xs:choice maxOccurs="unbounded">
                              <xs:element ref="calendar:Timezone" />
                              <xs:element ref="calendar:DtStamp" />
                              <xs:element ref="calendar:StartTime" />
                              <xs:element ref="calendar:Subject" />
                           <xs:element ref="calendar:UID" />
                              <xs:element ref="calendar:OrganizerName"
/>
                              <xs:element ref="calendar:OrganizerEmail"
/>
```

```
                                <xs:element ref="calendar:Location" />
                                <xs:element ref="calendar:EndTime" />
                                <xs:element ref="calendar:Recurrence" />
                                <xs:element ref="calendar:Body" />
                                <xs:element ref="calendar:Categories" />
                                <xs:element ref="calendar:Sensitivity" />
                                <xs:element ref="calendar:BusyStatus" />
                                <xs:element ref="calendar:AllDayEvent" />
                                <xs:element ref="calendar:Reminder" />
                                <xs:element ref="calendar:Exceptions" />
                                <xs:element ref="calendar:MeetingStatus"
/>
                                <xs:element ref="calendar:Rtf" />
                                <xs:element ref="calendar:Attendees" />
                                <xs:element ref="contacts:Rtf" />
                                <xs:element ref="contacts:Anniversary" />
                                <xs:element ref="contacts:AssistantName"
/>
                                <xs:element
ref="contacts:AssistnamePhoneNumber" />
                                <xs:element ref="contacts:Birthday" />
                                <xs:element ref="contacts:Body" />
                                <xs:element ref="contacts:BodySize" />
                                <xs:element ref="contacts:BodyTruncated"
/>
                                <xs:element
ref="contacts:Business2PhoneNumber" />
                                <xs:element ref="contacts:BusinessCity"
/>
                                <xs:element
ref="contacts:BusinessCountry" />
                                <xs:element
ref="contacts:BusinessPostalCode" />
                                <xs:element ref="contacts:BusinessState"
/>
```

```
                                <xs:element ref="contacts:BusinessStreet"
/>
                                <xs:element
ref="contacts:BusinessFaxNumber" />
                                <xs:element
ref="contacts:BusinessPhoneNumber" />
                                <xs:element ref="contacts:CarPhoneNumber"
/>
                                <xs:element ref="contacts:Categories" />
                                <xs:element ref="contacts:Children" />
                                <xs:element ref="contacts:CompanyName" />
                                <xs:element ref="contacts:Department" />
                                <xs:element ref="contacts:Email1Address"
/>
                                <xs:element ref="contacts:Email2Address"
/>
                                <xs:element ref="contacts:Email3Address"
/>
                                <xs:element ref="contacts:FileAs" />
                                <xs:element ref="contacts:FirstName" />
                                <xs:element ref="contacts:MiddleName" />
                                <xs:element
ref="contacts:Home2PhoneNumber" />
                                <xs:element ref="contacts:HomeCity" />
                                <xs:element ref="contacts:HomeCountry" />
                                <xs:element ref="contacts:HomePostalCode"
/>
                                <xs:element ref="contacts:HomeState" />
                                <xs:element ref="contacts:HomeStreet" />
                                <xs:element ref="contacts:HomeFaxNumber"
/>
                                <xs:element
ref="contacts:HomePhoneNumber" />
                                <xs:element ref="contacts:JobTitle" />
                                <xs:element ref="contacts:LastName" />
```

```
                            <xs:element
ref="contacts:MobilePhoneNumber" />
                            <xs:element ref="contacts:OfficeLocation"
/>
                            <xs:element ref="contacts:OtherCity" />
                            <xs:element ref="contacts:OtherCountry"
/>
                            <xs:element
ref="contacts:OtherPostalCode" />
                            <xs:element ref="contacts:OtherState" />
                            <xs:element ref="contacts:OtherStreet" />
                            <xs:element ref="contacts:PagerNumber" />
                            <xs:element ref="contacts:picture" />
                            <xs:element
ref="contacts:RadioPhoneNumber" />
                            <xs:element ref="contacts:Spouse" />
                            <xs:element ref="contacts:Suffix" />
                            <xs:element ref="contacts:Title" />
                            <xs:element ref="contacts:WebPage" />
                            <xs:element
ref="contacts:YomiCompanyName" />
                            <xs:element ref="contacts:YomiFirstName"
/>
                            <xs:element ref="contacts:YomiLastName"
/>
                            <xs:element ref="contacts2:CustomerId" />
                            <xs:element ref="contacts2:GovernmentId"
/>
                            <xs:element ref="contacts2:IMAddress" />
                            <xs:element ref="contacts2:IMAddress2" />
                            <xs:element ref="contacts2:IMAddress3" />
                            <xs:element ref="contacts2:ManagerName"
/>
                            <xs:element
ref="contacts2:CompanyMainPhone" />
```

```
                                <xs:element ref="contacts2:AccountName"
/>
                                <xs:element ref="contacts2:NickName" />
                                <xs:element ref="contacts2:MMS" />
                                <xs:element ref=”tasks:Body” />
                                <xs:element ref=”tasks:BodySize” />
                                <xs:element ref=”tasks:BodyTruncated” />
                                <xs:element ref=”tasks:Subject” />
                                <xs:element ref=”tasks:Categories” />
                                <xs:element ref=”tasks:Importance” />
                                <xs:element ref=”tasks:UtcStartDate” />
                                <xs:element ref=”tasks:StartDate” />
                                <xs:element ref=”tasks:UtcDueDate” />
                                <xs:element ref=”tasks:DueDate” />
                                <xs:element ref=”tasks:Recurrence” />
                                <xs:element ref=”tasks:Complete” />
                                <xs:element ref=”tasks:DateCompleted” />
                                <xs:element ref=”tasks:Sensitivity” />
                                <xs:element ref=”tasks:ReminderTime” />
                                <xs:element ref=”tasks:ReminderSet” />
                                <xs:element ref=”tasks:Rtf” />
                              </xs:choice>
                            </xs:sequence>
                            </xs:complexType>
                          </xs:element>
                        </xs:sequence>
                        </xs:complexType>
                      </xs:element>
                      <xs:element minOccurs="0" maxOccurs="unbounded"
name="Add">
                        <xs:complexType>
                        <xs:sequence>
                          <xs:element name="ServerId" type="xs:string" />
                          <xs:element name="ApplicationData">
```

```
                        <xs:complexType>
                        <xs:sequence>
                          <xs:choice maxOccurs="unbounded">
                            <xs:element ref="email:To" />
                            <xs:element ref="email:From" />
                            <xs:element ref="email:Reply-To" />
                            <xs:element ref="email:Subject" />
                            <xs:element ref="email:DateReceived"/>
                            <xs:element ref="email:DisplayTo" />
                            <xs:element ref="email:ThreadTopic" />
                            <xs:element ref="email:Importance" />
                            <xs:element ref="email:Read" />
                            <xs:element ref="email:Attachments" >
                             <xs:complexType>
                                 <xs:sequence>
                                     <xs:element
ref="airsyncbase:Attachment">
                                         <xs:complexType>
                                             <xs:all>
<xs:element ref="airsyncbase:DisplayName" />
                                                 <xs:element
ref="airsyncbase:FileReference" />
                                                 <xs:element
ref="airsyncbase:Method" />
                                                 <xs:element
ref="airsyncbase:EstimatedDataSize" />
                                                 <xs:element
ref="airsyncbase:ContentId" />
                                                 <xs:element
ref="airsyncbase:ContentLocation" />
                                                 <xs:element
ref="airsyncbase:IsInline" />
                                             </xs:all>
                                         </xs:complexType>
                                     </xs:element>
```

```
                                    </xs:sequence>
                                 </xs:complexType>
                               </xs:element>
                               <xs:element ref="email:BodyTruncated"/>
                               <xs:element ref="airsyncbase:Body" >
                                 <xs:complexType>
                                   <xs:sequence>
                                     <xs:element ref="airsyncbase:Type"
/>
                                     <xs:element
ref="airsyncbase:EstimatedDataSize" />
                                     <xs:element
ref="airsyncbase:Truncated" />
                                     <xs:element ref="airsyncbase:Data"
/>
                                   </xs:sequence>
                                 </xs:complexType>
                             </xs:element>
                               <xs:element ref="email:MessageClass"/>
                               <xs:element ref="email:AttRemoved" />
                               <xs:element ref="email:MeetingRequest" />
                               <xs:element ref="email:MIMETruncated" />
                               <xs:element ref="email:MIMEData" />
                               <xs:element ref="email:MIMESize" />
                               <xs:element ref="email:MessageClass" />
                               <xs:element ref="email:InternetCPID" />
                               <xs:element ref="email:Flag" />
                                 <xs:complexType>
                                   <xs:sequence>
                                     <xs:element ref="tasks:Subject"./>
                                     <xs:element ref="email:Status" />
                                     <xs:element ref="email:FlagType" />
                                     <xs:element ref="tasks:ReminderSet"
/>
```

```
                                    <xs:element
ref="tasks:ReminderTime" />
                                </xs:sequence>
                             </xs:complexType>
                            </xs:element>
                            <xs:element ref="email:ContentClass" />
                            <xs:element
ref="airsyncbase:NativeBodyType" />
                            <xs:element ref="calendar:Timezone" />
                            <xs:element ref="calendar:DtStamp" />
                            <xs:element ref="calendar:StartTime"/>
                            <xs:element ref="calendar:Subject" />
                            <xs:element ref="calendar:UID" />
                            <xs:element ref="calendar:OrganizerName"
/>
                            <xs:element ref="calendar:OrganizerEmail"
/>
                            <xs:element ref="calendar:Location" />
                            <xs:element ref="calendar:EndTime" />
                            <xs:element ref="calendar:Recurrence"/>
                            <xs:element ref="calendar:Body" />
                            <xs:element ref="calendar:Categories" />
                            <xs:element ref="calendar:Sensitivity" />
                            <xs:element ref="calendar:BusyStatus" />
                            <xs:element ref="calendar:AllDayEvent" />
                            <xs:element ref="calendar:Reminder" />
                            <xs:element ref="calendar:Exceptions"/>
                            <xs:element ref="calendar:MeetingStatus"
/>
                            <xs:element ref="calendar:Rtf" />
                            <xs:element ref="calendar:Attendees" />
                            <xs:element ref="contacts:Rtf" />
                            <xs:element ref="contacts:Anniversary"/>
                            <xs:element ref="contacts:AssistantName"
/>
```

```
                            <xs:element
ref="contacts:AssistnamePhoneNumber" />
                            <xs:element ref="contacts:Birthday" />
                            <xs:element ref="contacts:Body" />
                            <xs:element ref="contacts:BodySize" />
                            <xs:element ref="contacts:BodyTruncated"
/>
                            <xs:element
ref="contacts:Business2PhoneNumber" />
                            <xs:element ref="contacts:BusinessCity"
/>
                            <xs:element
ref="contacts:BusinessCountry" />
                            <xs:element
ref="contacts:BusinessPostalCode" />
                            <xs:element ref="contacts:BusinessState"
/>
                            <xs:element ref="contacts:BusinessStreet"
/>
                            <xs:element
ref="contacts:BusinessFaxNumber" />
                            <xs:element
ref="contacts:BusinessPhoneNumber" />
                            <xs:element ref="contacts:CarPhoneNumber"
/>
                            <xs:element ref="contacts:Categories"/>
                            <xs:element ref="contacts:Children" />
                            <xs:element ref="contacts:CompanyName"/>
                            <xs:element ref="contacts:Department" />
                            <xs:element ref="contacts:Email1Address"
/>
                            <xs:element ref="contacts:Email2Address"
/>
                            <xs:element ref="contacts:Email3Address"
/>
                            <xs:element ref="contacts:FileAs" />
```

```
                                <xs:element ref="contacts:FirstName" />
                                <xs:element ref="contacts:MiddleName" />
                                <xs:element
ref="contacts:Home2PhoneNumber" />
                                <xs:element ref="contacts:HomeCity" />
                                <xs:element ref="contacts:HomeCountry" />
                                <xs:element ref="contacts:HomePostalCode"
/>
                                <xs:element ref="contacts:HomeState" />
                                <xs:element ref="contacts:HomeStreet"/>
                                <xs:element ref="contacts:HomeFaxNumber"
/>
                                <xs:element
ref="contacts:HomePhoneNumber" />
                                <xs:element ref="contacts:JobTitle" />
                                <xs:element ref="contacts:LastName" />
                                <xs:element
ref="contacts:MobilePhoneNumber" />
                                <xs:element ref="contacts:OfficeLocation"
/>
                                <xs:element ref="contacts:OtherCity"/>
                                <xs:element ref="contacts:OtherCountry"
/>
                                <xs:element
ref="contacts:OtherPostalCode" />
                                <xs:element ref="contacts:OtherState"/>
                                <xs:element ref="contacts:OtherStreet" />
                                <xs:element ref="contacts:PagerNumber"/>
                                <xs:element ref="contacts:picture" />
                                <xs:element
ref="contacts:RadioPhoneNumber" />
                                <xs:element ref="contacts:Spouse" />
                                <xs:element ref="contacts:Suffix" />
                                <xs:element ref="contacts:Title" />
                                <xs:element ref="contacts:WebPage" />
```

```
                                <xs:element
ref="contacts:YomiCompanyName" />
                                <xs:element ref="contacts:YomiFirstName"
/>
                                <xs:element ref="contacts:YomiLastName"
/>
                                <xs:element ref="contacts2:CustomerId" />
                                <xs:element ref="contacts2:GovernmentId"
/>
                                <xs:element ref="contacts2:IMAddress" />
                                <xs:element ref="contacts2:IMAddress2" />
                                <xs:element ref="contacts2:IMAddress3" />
                                <xs:element ref="contacts2:ManagerName"
/>
                                <xs:element
ref="contacts2:CompanyMainPhone" />
                                <xs:element ref="contacts2:AccountName"
/>
                                <xs:element ref="contacts2:NickName" />
                                <xs:element ref="contacts2:MMS" />
                                <xs:element ref=”tasks:Body” />
                                 <xs:element ref=”tasks:BodySize” />
                                 <xs:element ref=”tasks:BodyTruncated” />
                                 <xs:element ref=”tasks:Subject” />
                                 <xs:element ref=”tasks:Categories” />
                                 <xs:element ref=”tasks:Importance” />
                                 <xs:element ref=”tasks:UtcStartDate” />
                                 <xs:element ref=”tasks:StartDate” />
                                 <xs:element ref=”tasks:UtcDueDate” />
                                 <xs:element ref=”tasks:DueDate” />
                                 <xs:element ref=”tasks:Recurrence” />
                                 <xs:element ref=”tasks:Complete” />
                                 <xs:element ref=”tasks:DateCompleted” />
                                 <xs:element ref=”tasks:Sensitivity” />
                                 <xs:element ref=”tasks:ReminderTime” />
```

```
                                <xs:element ref=”tasks:ReminderSet” />
                                <xs:element ref=”tasks:Rtf” />
                              </xs:choice>
                            </xs:sequence>
                            </xs:complexType>
                          </xs:element>
                        </xs:sequence>
                        </xs:complexType>
                      </xs:element>
                    </xs:sequence>
                    </xs:complexType>
                  </xs:element>
                  <xs:element name="Responses">
                    <xs:complexType>
                    <xs:sequence>
                      <xs:element minOccurs="0" name="Change">
                        <xs:complexType>
                        <xs:sequence>
                          <xs:element name="ServerId" type="xs:string"
/>
                          <xs:element name="Status"
type="xs:unsignedByte" />
                        </xs:sequence>
                        </xs:complexType>
                      </xs:element>
                      <xs:element minOccurs="0" maxOccurs="unbounded"
name="Add">
                        <xs:complexType>
                        <xs:sequence>
                          <xs:element name="ClientId"
type="xs:unsignedByte" />
                          <xs:element name="ServerId" type="xs:string"
/>
                          <xs:element name="Status"
type="xs:unsignedByte" />
```

```
                        </xs:sequence>
                        </xs:complexType>
                      </xs:element>
                      <xs:element name="Fetch">
                        <xs:complexType>
                        <xs:sequence>
                          <xs:element name="ServerId"
type="xs:string"></xs:element>
                          <xs:element name="Status"
type="xs:unsignedByte"></xs:element>
                          <xs:element name="ApplicationData">
                            <xs:complexType>
                            <xs:sequence>
                              <xs:choice maxOccurs="unbounded">
                              <xs:element ref="email:To" />
                              <xs:element ref="email:From" />
                              <xs:element ref="email:Reply-To" />
                              <xs:element ref="email:Subject" />
                              <xs:element ref="email:DateReceived" />
                              <xs:element ref="email:DisplayTo" />
                              <xs:element ref="email:ThreadTopic" />
                              <xs:element ref="email:Importance" />
                              <xs:element ref="email:Read" />
                              <xs:element ref="email:Attachments" >
                                <xs:complexType>
                                    <xs:sequence>
                                        <xs:element
ref="airsyncbase:Attachment">
                                            <xs:complexType>
                                                <xs:all>
<xs:element ref="airsyncbase:DisplayName" />
                                                    <xs:element
ref="airsyncbase:FileReference" />
                                                    <xs:element
ref="airsyncbase:Method" />
```

```
                                                    <xs:element
ref="airsyncbase:EstimatedDataSize" />
                                                    <xs:element
ref="airsyncbase:ContentId" />
                                                    <xs:element
ref="airsyncbase:ContentLocation" />
                                                    <xs:element
ref="airsyncbase:IsInline" />
                                                </xs:all>
                                            </xs:complexType>
                                        </xs:element>
                                    </xs:sequence>
                                </xs:complexType>
                            </xs:element>
                            <xs:element ref="email:BodyTruncated" />
                            <xs:element ref="airsyncbase:Body" >
                              <xs:complexType>
                                <xs:sequence>
                                  <xs:element ref="airsyncbase:Type"
/>
                                  <xs:element
ref="airsyncbase:EstimatedDataSize" />
                                  <xs:element
ref="airsyncbase:Truncated" />
                                  <xs:element ref="airsyncbase:Data"
/>
                                </xs:sequence>
                              </xs:complexType>
                          </xs:element>
                            <xs:element ref="email:MessageClass" />
                            <xs:element ref="email:AttRemoved" />
                            <xs:element ref="email:MeetingRequest" />
                            <xs:element ref="email:InternetCPID" />
                            <xs:element ref="email:Flag" />
                              <xs:complexType>
```

```
                                    <xs:sequence>
                                      <xs:element ref="tasks:Subject"./>
                                      <xs:element ref="email:Status" />
                                      <xs:element ref="email:FlagType" />
                                      <xs:element ref="tasks:ReminderSet"
/>
                                       <xs:element
ref="tasks:ReminderTime" />
                                    </xs:sequence>
                                  </xs:complexType>
                                 </xs:element>
                                 <xs:element ref="email:ContentClass" />
                                 <xs:element
ref="airsyncbase:NativeBodyType" />
                               </xs:choice>
                            </xs:sequence>
                            </xs:complexType>
                          </xs:element>
                        </xs:sequence>
                        </xs:complexType>
                      </xs:element>
                    </xs:sequence>
                    </xs:complexType>
                  </xs:element>
                  <xs:element name="MoreAvailable"></xs:element>
                </xs:choice>
              </xs:sequence>
              </xs:complexType>
            </xs:element>
          </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
      </xs:complexType>
<xs:element name=”Limit” type=”xs:integer” />
```

```
  </xs:element>
</xs:schema>
```

2.2.3.19 Sync Command for Calendar Folder

2.2.3.19.1 Sync Command Request for Calendar Items

```
<?xml version="1.0" ?>
<xs:schema xmlns:calendar="Calendar:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
xmlns:airsyncbase="AirSyncBase:"    targetNamespace="Calendar:"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns="Calendar:">
  <xs:import namespace="AirSyncBase:"/>
  <xs:element name="TimeZone" type="xs:string" />
  <xs:element name="AllDayEvent" type="xs:unsignedByte" />
  <xs:element name="BusyStatus">
    <xs:simpleType>
      <xs:restriction base="xs:unsignedByte">
        <xs:minInclusive value="0"/>
        <xs:maxInclusive value="5"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:element>
  <xs:element name="OrganizerName" type="xs:string" />
  <xs:element name="OrganizerEmail" type="xs:string" />
  <xs:element name="DtStamp" type="xs:string" />
  <xs:element name="EndTime" type="xs:string" />
  <xs:element name="Location" type="xs:string" />
  <xs:element name="Reminder" type="xs:unsignedInt" />
  <xs:element name="Sensitivity">
    <xs:simpleType>
      <xs:restriction base="xs:unsignedByte">
        <xs:minInclusive value="0"/>
        <xs:maxInclusive value="3"/>
      </xs:restriction>
    </xs:simpleType>
```

```
</xs:element>
<xs:element name="Subject" type="xs:string" />
<xs:element name="StartTime" type="xs:string" />
<xs:element name="UID">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:maxLength value="300"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="MeetingStatus">
  <xs:simpleType>
    <xs:restriction base="xs:unsignedByte">
      <xs:enumeration value="1"/>
      <xs:enumeration value="0"/>
      <xs:enumeration value="3"/>
      <xs:enumeration value="5"/>
      <xs:enumeration value="7"/>
      <xs:enumeration value="9"/>
      <xs:enumeration value="11"/>
      <xs:enumeration value="13"/>
      <xs:enumeration value="15"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:element name="Attendees">
  <xs:complexType>
    <xs:sequence minOccurs="0">
      <xs:element name="Attendee" maxOccurs="unbounded">
        <xs:complexType>
          <xs:all>
            <xs:element name="Email" type="xs:string" />
            <xs:element name="Name" type="xs:string" />
            <xs:element name="AttendeeStatus" minOccurs="0">
```

```
              <xs:simpleType>
                <xs:restriction base="xs:unsignedByte">
                  <xs:enumeration value="0"/>
                  <xs:enumeration value="2"/>
                  <xs:enumeration value="3"/>
                  <xs:enumeration value="4"/>
                  <xs:enumeration value="5"/>
                </xs:restriction>
              </xs:simpleType>
            </xs:element>
            <xs:element name="AttendeeType" minOccurs="0">
              <xs:simpleType>
                <xs:restriction base="xs:unsignedByte">
                  <xs:enumeration value="1"/>
                  <xs:enumeration value="2"/>
                  <xs:enumeration value="3"/>
                </xs:restriction>
              </xs:simpleType>
            </xs:element>
          </xs:all>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="Categories">
  <xs:complexType>
    <xs:sequence minOccurs="0">
      <xs:element maxOccurs="300" name="Category" type="xs:string" />
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="Recurrence">
  <xs:complexType>
```

```
      <xs:all minOccurs="0">
        <xs:element minOccurs="1" name="Type">
          <xs:simpleType>
            <xs:restriction base="xs:unsignedByte">
              <xs:minInclusive value="0"/>
              <xs:maxInclusive value="6"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element minOccurs="0" name="Occurrences"
type="xs:unsignedShort" />
        <xs:element minOccurs="0" name="Interval">
          <xs:simpleType>
            <xs:restriction base="xs:unsignedShort">
              <xs:minInclusive value="0"/>
              <xs:maxInclusive value="999"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element minOccurs="0" name="WeekOfMonth">
          <xs:simpleType>
            <xs:restriction base="xs:unsignedByte">
              <xs:minInclusive value="1"/>
              <xs:maxInclusive value="5"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element minOccurs="0" name="DayOfWeek">
          <xs:simpleType>
            <xs:restriction base="xs:unsignedShort">
              <xs:minInclusive value="0"/>
              <xs:maxInclusive value="127"/>
            </xs:restriction>
          </xs:simpleType>
```

```
        </xs:element>
        <xs:element minOccurs="0" name="MonthOfYear">
          <xs:simpleType>
            <xs:restriction base="xs:unsignedByte">
              <xs:minInclusive value="1"/>
              <xs:maxInclusive value="12"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element minOccurs="0" name="Until" type="xs:string" />
        <xs:element minOccurs="0" name="DayOfMonth">
          <xs:simpleType>
            <xs:restriction base="xs:unsignedByte">
              <xs:minInclusive value="1"/>
              <xs:maxInclusive value="127"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
      </xs:all>
    </xs:complexType>
  </xs:element>
  <xs:element name="Exceptions">
    <xs:complexType>
      <xs:sequence minOccurs="0">
        <xs:element name="Exception" maxOccurs="1000">
          <xs:complexType>
            <xs:all>
              <xs:element minOccurs="0" name="Deleted"
type="xs:unsignedByte" />
              <xs:element name="ExceptionStartTime" type="xs:string" />
              <xs:element minOccurs="0" name="Subject" type="xs:string"
/>
              <xs:element minOccurs="0" name="StartTime"
type="xs:string" />
```

```
              <xs:element minOccurs="0" name="EndTime" type="xs:string"
/>
              <xs:element minOccurs="0" ref="airsyncbase:Body" />
              <xs:element minOccurs="0" name="Location"
type="xs:string" />
              <xs:element minOccurs="0" name="Categories">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element maxOccurs="300" name="Category"
type="xs:string" />
                  </xs:sequence>
                </xs:complexType>
              </xs:element>
              <xs:element minOccurs="0" name="Sensitivity">
                <xs:simpleType>
                  <xs:restriction base="xs:unsignedByte">
                    <xs:minInclusive value="0"/>
                    <xs:maxInclusive value="3"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element minOccurs="0" name="BusyStatus">
                <xs:simpleType>
                  <xs:restriction base="xs:unsignedByte">
                    <xs:minInclusive value="0"/>
                    <xs:maxInclusive value="5"/>
                  </xs:restriction>
                </xs:simpleType>
              </xs:element>
              <xs:element minOccurs="0" name="AllDayEvent"
type="xs:unsignedByte" />
              <xs:element minOccurs="0" name="Reminder"
type="xs:unsignedInt" />
              <xs:element minOccurs="0" name="DtStamp" type="xs:string"
/>
```

```
            <xs:element minOccurs="0" name="MeetingStatus">
              <xs:simpleType>
                <xs:restriction base="xs:unsignedByte">
                  <xs:enumeration value="1"/>
                  <xs:enumeration value="0"/>
                  <xs:enumeration value="3"/>
                  <xs:enumeration value="5"/>
                  <xs:enumeration value="7"/>
                  <xs:enumeration value="9"/>
                  <xs:enumeration value="11"/>
                  <xs:enumeration value="13"/>
                  <xs:enumeration value="15"/>
                </xs:restriction>
              </xs:simpleType>
            </xs:element>
          </xs:all>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:complexType name="EmptyTag"/>
<xs:group name="GhostingProps">
  <xs:sequence>
    <xs:choice maxOccurs="unbounded">
      <xs:element name="TimeZone" type="calendar:EmptyTag" />
      <xs:element name="AllDayEvent" type="calendar:EmptyTag" />
      <xs:element name="BusyStatus" type="calendar:EmptyTag" />
      <xs:element name="OrganizerName" type="calendar:EmptyTag" />
      <xs:element name="OrganizerEmail" type="calendar:EmptyTag" />
      <xs:element name="DtStamp" type="calendar:EmptyTag" />
      <xs:element name="EndTime" type="calendar:EmptyTag" />
      <xs:element name="Location" type="calendar:EmptyTag" />
      <xs:element name="Reminder" type="calendar:EmptyTag" />
```

```
      <xs:element name="Sensitivity" type="calendar:EmptyTag" />
      <xs:element name="Subject" type="calendar:EmptyTag" />
      <xs:element name="StartTime" type="calendar:EmptyTag" />
      <xs:element name="UID" type="calendar:EmptyTag" />
      <xs:element name="MeetingStatus" type="calendar:EmptyTag" />
      <xs:element name="Attendees" type="calendar:EmptyTag" />
      <xs:element name="Categories" type="calendar:EmptyTag" />
      <xs:element name="Recurrence" type="calendar:EmptyTag" />
      <xs:element name="Exceptions" type="calendar:EmptyTag" />
    </xs:choice>
  </xs:sequence>
</xs:group>
<xs:group name="TopLevelSchemaProps">
  <xs:sequence>
    <xs:choice maxOccurs="unbounded">
      <xs:element name="TimeZone" type="calendar:EmptyTag" />
      <xs:element name="StartTime" type="calendar:EmptyTag" />
      <xs:element name="EndTime" type="calendar:EmptyTag" />
      <xs:element name="Subject" type="calendar:EmptyTag" />
      <xs:element name="Location" type="calendar:EmptyTag" />
      <xs:element name="Reminder" type="calendar:EmptyTag" />
      <xs:element name="AllDayEvent" type="calendar:EmptyTag" />
      <xs:element name="BusyStatus" type="calendar:EmptyTag" />
      <xs:element name="Recurrence" type="calendar:EmptyTag" />
      <xs:element name="Sensitivity" type="calendar:EmptyTag" />
      <xs:element name="DtStamp" type="calendar:EmptyTag" />
      <xs:element name="Attendees" type="calendar:EmptyTag" />
      <xs:element name="Categories" type="calendar:EmptyTag" />
      <xs:element name="MeetingStatus" type="calendar:EmptyTag" />
      <xs:element name="OrganizerName" type="calendar:EmptyTag" />
      <xs:element name="OrganizerEmail" type="calendar:EmptyTag" />
      <xs:element name="UID" type="calendar:EmptyTag" />
      <xs:element name="Exceptions" type="calendar:EmptyTag" />
    </xs:choice>
```

```
    </xs:sequence>
  </xs:group>
</xs:schema>
```

2.2.3.19.2 Sync Command Response for Calendar Items

For the complete **Sync** command response, see section 2.2.3.18.2.

2.2.3.20 Sync Command for Contacts Folder

2.2.3.20.1 Sync Command Request for Contacts

```
<?xml version="1.0" ?>
<xs:schema xmlns:contacts="Contacts:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="Contacts:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="Anniversary" type="xs:dateTime" />
  <xs:element name="AssistantName" type="xs:string" />
  <xs:element name="AssistantPhoneNumber" type="xs:string" />
  <xs:element name="AssistnamePhoneNumber" type="xs:string" />
  <xs:element name="Birthday" type="xs:dateTime" />
  <xs:element name="Business2PhoneNumber" type="xs:string" />
  <xs:element name="BusinessAddressCity" type="xs:string" />
  <xs:element name="BusinessPhoneNumber" type="xs:string" />
  <xs:element name="WebPage" type="xs:string" />
  <xs:element name="BusinessAddressCountry" type="xs:string" />
  <xs:element name="Department" type="xs:string" />
  <xs:element name="Email1Address" type="xs:string" />
  <xs:element name="Email2Address" type="xs:string" />
  <xs:element name="Email3Address" type="xs:string" />
  <xs:element name="BusinessFaxNumber" type="xs:string" />
  <xs:element name="FileAs" type="xs:string" />
  <xs:element name="FirstName" type="xs:string" />
  <xs:element name="MiddleName" type="xs:string" />
  <xs:element name="HomeAddressCity" type="xs:string" />
  <xs:element name="HomeAddressCountry" type="xs:string" />
  <xs:element name="HomeFaxNumber" type="xs:string" />
```

```
<xs:element name="HomePhoneNumber" type="xs:string" />
<xs:element name="Home2PhoneNumber" type="xs:string" />
<xs:element name="HomeAddressPostalCode" type="xs:string" />
<xs:element name="HomeAddressState" type="xs:string" />
<xs:element name="HomeAddressStreet" type="xs:string" />
<xs:element name="MobilePhoneNumber" type="xs:string" />
<xs:element name="Suffix" type="xs:string" />
<xs:element name="CompanyName" type="xs:string" />
<xs:element name="OtherAddressCity" type="xs:string" />
<xs:element name="OtherAddressCountry" type="xs:string" />
<xs:element name="CarPhoneNumber" type="xs:string" />
<xs:element name="OtherAddressPostalCode" type="xs:string" />
<xs:element name="OtherAddressState" type="xs:string" />
<xs:element name="OtherAddressStreet" type="xs:string" />
<xs:element name="PagerNumber" type="xs:string" />
<xs:element name="Title" type="xs:string" />
<xs:element name="BusinessAddressPostalCode" type="xs:string" />
<xs:element name="LastName" type="xs:string" />
<xs:element name="Spouse" type="xs:string" />
<xs:element name="BusinessAddressState" type="xs:string" />
<xs:element name="BusinessAddressStreet" type="xs:string" />
<xs:element name="JobTitle" type="xs:string" />
<xs:element name="YomiFirstName" type="xs:string" />
<xs:element name="YomiLastName" type="xs:string" />
<xs:element name="YomiCompanyName" type="xs:string" />
<xs:element name="OfficeLocation" type="xs:string" />
<xs:element name="RadioPhoneNumber" type="xs:string" />
<xs:element name="Picture" type="xs:string" />
<xs:element name="Categories">
  <xs:complexType>
    <xs:sequence minOccurs="0">
      <xs:element maxOccurs="300" name="Category" type="xs:string" />
    </xs:sequence>
  </xs:complexType>
```

```
  </xs:element>
  <xs:element name="Children">
    <xs:complexType>
      <xs:sequence minOccurs="0">
        <xs:element maxOccurs="300" name="Child" type="xs:string" />
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:complexType name="EmptyTag"/>
  <xs:group name="GhostingProps">
    <xs:sequence>
      <xs:choice maxOccurs="unbounded">
        <xs:element name="Anniversary" type="contacts:EmptyTag"/>
        <xs:element name="Birthday" type="contacts:EmptyTag"/>
        <xs:element name="WebPage" type="contacts:EmptyTag"/>
        <xs:element name="Children" type="contacts:EmptyTag"/>
        <xs:element name="BusinessAddressCountry"
type="contacts:EmptyTag"/>
        <xs:element name="Department" type="contacts:EmptyTag"/>
        <xs:element name="Email1Address" type="contacts:EmptyTag"/>
        <xs:element name="Email2Address" type="contacts:EmptyTag"/>
        <xs:element name="Email3Address" type="contacts:EmptyTag"/>
        <xs:element name="BusinessFaxNumber" type="contacts:EmptyTag"/>
        <xs:element name="FileAs" type="contacts:EmptyTag"/>
        <xs:element name="FirstName" type="contacts:EmptyTag"/>
        <xs:element name="HomeAddressCity" type="contacts:EmptyTag"/>
        <xs:element name="HomeAddressCountry"
type="contacts:EmptyTag"/>
        <xs:element name="HomeFaxNumber" type="contacts:EmptyTag"/>
        <xs:element name="HomePhoneNumber" type="contacts:EmptyTag"/>
        <xs:element name="Home2PhoneNumber" type="contacts:EmptyTag"/>
        <xs:element name="HomeAddressPostalCode"
type="contacts:EmptyTag"/>
        <xs:element name="HomeAddressState" type="contacts:EmptyTag"/>
        <xs:element name="HomeAddressStreet" type="contacts:EmptyTag"/>
```

```
        <xs:element name="BusinessAddressCity"
type="contacts:EmptyTag"/>
        <xs:element name="MiddleName" type="contacts:EmptyTag"/>
        <xs:element name="MobilePhoneNumber" type="contacts:EmptyTag"/>
        <xs:element name="Suffix" type="contacts:EmptyTag"/>
        <xs:element name="CompanyName" type="contacts:EmptyTag"/>
        <xs:element name="OtherAddressCity" type="contacts:EmptyTag"/>
        <xs:element name="OtherAddressCountry"
type="contacts:EmptyTag"/>
        <xs:element name="CarPhoneNumber" type="contacts:EmptyTag"/>
        <xs:element name="OtherAddressPostalCode"
type="contacts:EmptyTag"/>
        <xs:element name="OtherAddressState" type="contacts:EmptyTag"/>
        <xs:element name="OtherAddressStreet"
type="contacts:EmptyTag"/>
        <xs:element name="PagerNumber" type="contacts:EmptyTag"/>
        <xs:element name="Title" type="contacts:EmptyTag"/>
        <xs:element name="BusinessAddressPostalCode"
type="contacts:EmptyTag"/>
        <xs:element name="AssistantName" type="contacts:EmptyTag"/>
        <xs:element name="AssistantPhoneNumber"
type="contacts:EmptyTag"/>
        <xs:element name="AssistnamePhoneNumber"
type="contacts:EmptyTag"/>
        <xs:element name="LastName" type="contacts:EmptyTag"/>
        <xs:element name="Spouse" type="contacts:EmptyTag"/>
        <xs:element name="BusinessAddressState"
type="contacts:EmptyTag"/>
        <xs:element name="BusinessAddressStreet"
type="contacts:EmptyTag"/>
        <xs:element name="BusinessPhoneNumber"
type="contacts:EmptyTag"/>
        <xs:element name="Business2PhoneNumber"
type="contacts:EmptyTag"/>
        <xs:element name="JobTitle" type="contacts:EmptyTag"/>
        <xs:element name="YomiFirstName" type="contacts:EmptyTag"/>
```

```
        <xs:element name="YomiLastName" type="contacts:EmptyTag"/>
        <xs:element name="YomiCompanyName" type="contacts:EmptyTag"/>
        <xs:element name="OfficeLocation" type="contacts:EmptyTag"/>
        <xs:element name="RadioPhoneNumber" type="contacts:EmptyTag"/>
        <xs:element name="Picture" type="contacts:EmptyTag"/>
        <xs:element name="Categories" type="contacts:EmptyTag"/>
      </xs:choice>
    </xs:sequence>
  </xs:group>
  <xs:group name="TopLevelSchemaProps">
    <xs:sequence>
      <xs:choice maxOccurs="unbounded">
        <xs:element name="Anniversary" type="contacts:EmptyTag"/>
        <xs:element name="Birthday" type="contacts:EmptyTag"/>
        <xs:element name="Webpage" type="contacts:EmptyTag"/>
        <xs:element name="Children" type="contacts:EmptyTag"/>
        <xs:element name="BusinessAddressCountry"
type="contacts:EmptyTag"/>
        <xs:element name="Department" type="contacts:EmptyTag"/>
        <xs:element name="Email1Address" type="contacts:EmptyTag"/>
        <xs:element name="Email2Address" type="contacts:EmptyTag"/>
        <xs:element name="Email3Address" type="contacts:EmptyTag"/>
        <xs:element name="BusinessFaxNumber" type="contacts:EmptyTag"/>
        <xs:element name="FileAs" type="contacts:EmptyTag"/>
        <xs:element name="FirstName" type="contacts:EmptyTag"/>
        <xs:element name="HomeAddressCity" type="contacts:EmptyTag"/>
        <xs:element name="HomeAddressCountry"
type="contacts:EmptyTag"/>
        <xs:element name="HomeFaxNumber" type="contacts:EmptyTag"/>
        <xs:element name="HomeTelephoneNumber"
type="contacts:EmptyTag"/>
        <xs:element name="Home2TelephoneNumber"
type="contacts:EmptyTag"/>
        <xs:element name="HomeAddressPostalCode"
type="contacts:EmptyTag"/>
```

```
        <xs:element name="HomeAddressState" type="contacts:EmptyTag"/>
        <xs:element name="HomeAddressStreet" type="contacts:EmptyTag"/>
        <xs:element name="BusinessAddressCity"
type="contacts:EmptyTag"/>
        <xs:element name="MiddleName" type="contacts:EmptyTag"/>
        <xs:element name="MobileTelephoneNumber"
type="contacts:EmptyTag"/>
        <xs:element name="Suffix" type="contacts:EmptyTag"/>
        <xs:element name="CompanyName" type="contacts:EmptyTag"/>
        <xs:element name="OtherAddressCity" type="contacts:EmptyTag"/>
        <xs:element name="OtherAddressCountry"
type="contacts:EmptyTag"/>
        <xs:element name="CarTelephoneNumber"
type="contacts:EmptyTag"/>
        <xs:element name="OtherAddressPostalCode"
type="contacts:EmptyTag"/>
        <xs:element name="OtherAddressState" type="contacts:EmptyTag"/>
        <xs:element name="OtherAddressStreet"
type="contacts:EmptyTag"/>
        <xs:element name="PagerNumber" type="contacts:EmptyTag"/>
        <xs:element name="Title" type="contacts:EmptyTag"/>
        <xs:element name="BusinessAddressPostalCode"
type="contacts:EmptyTag"/>
        <xs:element name="AssistantName" type="contacts:EmptyTag"/>
        <xs:element name="AssistantTelephoneNumber"
type="contacts:EmptyTag"/>
        <xs:element name="LastName" type="contacts:EmptyTag"/>
        <xs:element name="Spouse" type="contacts:EmptyTag"/>
        <xs:element name="BusinessAddressState"
type="contacts:EmptyTag"/>
        <xs:element name="BusinessAddressStreet"
type="contacts:EmptyTag"/>
        <xs:element name="BusinessTelephoneNumber"
type="contacts:EmptyTag"/>
        <xs:element name="Business2TelephoneNumber"
type="contacts:EmptyTag"/>
```

```
        <xs:element name="JobTitle" type="contacts:EmptyTag"/>
        <xs:element name="YomiFirstName" type="contacts:EmptyTag"/>
        <xs:element name="YomiLastName" type="contacts:EmptyTag"/>
        <xs:element name="YomiCompanyName" type="contacts:EmptyTag"/>
        <xs:element name="OfficeLocation" type="contacts:EmptyTag"/>
        <xs:element name="RadioTelephoneNumber"
type="contacts:EmptyTag"/>
        <xs:element name="Categories" type="contacts:EmptyTag"/>
        <xs:element name="Picture" type="contacts:EmptyTag"/>
      </xs:choice>
    </xs:sequence>
  </xs:group>
</xs:schema>
```

2.2.3.20.2 Sync Command Response for Contacts

For the complete **Sync** command response, see **2.2.3.18.2 Sync Command Response**.

2.2.3.21 Sync Command for Contacts2 Folder

2.2.3.21.1 Sync Command Request for Contacts2

```
<?xml version="1.0" ?>
<xs:schema xmlns:contacts2="Contacts2:"
attributeFormDefault="unqualified" elementFormDefault="qualified"
targetNamespace="Contacts2:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="CustomerId" type="xs:string" />
  <xs:element name="GovernmentId" type="xs:string" />
  <xs:element name="IMAddress" type="xs:string" />
  <xs:element name="IMAddress2" type="xs:string" />
  <xs:element name="IMAddress3" type="xs:string" />
  <xs:element name="ManagerName" type="xs:string" />
  <xs:element name="CompanyMainPhone" type="xs:string" />
  <xs:element name="AccountName" type="xs:string" />
  <xs:element name="NickName" type="xs:string" />
  <xs:element name="MMS" type="xs:string" />
  <xs:complexType name="EmptyTag"/>
```

```
  <xs:group name="GhostingProps">
    <xs:sequence>
      <xs:choice maxOccurs="unbounded">
        <xs:element name="CustomerId" type="contacts2:EmptyTag"/>
        <xs:element name="GovernmentId" type="contacts2:EmptyTag"/>
        <xs:element name="IMAddress" type="contacts2:EmptyTag"/>
        <xs:element name="IMAddress2" type="contacts2:EmptyTag"/>
        <xs:element name="IMAddress3" type="contacts2:EmptyTag"/>
        <xs:element name="ManagerName" type="contacts2:EmptyTag"/>
        <xs:element name="CompanyMainPhone" type="contacts2:EmptyTag"/>
        <xs:element name="AccountName" type="contacts2:EmptyTag"/>
        <xs:element name="NickName" type="contacts2:EmptyTag"/>
        <xs:element name="MMS" type="contacts2:EmptyTag"/>
      </xs:choice>
    </xs:sequence>
  </xs:group>
  <xs:group name="TopLevelSchemaProps">
    <xs:sequence>
      <xs:choice maxOccurs="unbounded">
        <xs:element name="CustomerId" type="contacts2:EmptyTag"/>
        <xs:element name="GovernmentId" type="contacts2:EmptyTag"/>
        <xs:element name="IMAddress" type="contacts2:EmptyTag"/>
        <xs:element name="IMAddress2" type="contacts2:EmptyTag"/>
        <xs:element name="IMAddress3" type="contacts2:EmptyTag"/>
        <xs:element name="ManagerName" type="contacts2:EmptyTag"/>
        <xs:element name="CompanyMainPhone" type="contacts2:EmptyTag"/>
        <xs:element name="AccountName" type="contacts2:EmptyTag"/>
        <xs:element name="NickName" type="contacts2:EmptyTag"/>
        <xs:element name="MMS" type="contacts2:EmptyTag"/>
      </xs:choice>
    </xs:sequence>
  </xs:group>
</xs:schema>
```

2.2.3.21.2Sync Command Response for Contacts2

For the complete **Sync** command response, see **2.2.3.18.2 Sync Command Response**.

2.2.3.22 Sync Command for E-Mail Folder

2.2.3.22.1 Sync Command Request for E-Mail

```
<?xml version="1.0" ?>
<xs:schema xmlns:email="Email:" attributeFormDefault="unqualified"
elementFormDefault="qualified"
targetNamespace="Email:" xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:tasks="Tasks:">
  <xs:import namespace="Tasks:"/>
  <xs:element name="Read" type="xs:unsignedByte" />
  <xs:element name="DateReceived" type="email:EmptyTag"/>
  <xs:element name="Flag">
    <xs:complexType>
      <xs:choice minOccurs="0" maxOccurs="unbounded">
          <xs:element name="Status" maxOccurs="1"
type="xs:unsignedByte" />
          <xs:element name="FlagType" maxOccurs="1" type="xs:string" />
                      <xs:element name="CompleteTime" maxOccurs="1"
type="xs:string" />
          <xs:element ref="tasks:StartDate" maxOccurs="1"/>
          <xs:element ref="tasks:UtcStartDate" maxOccurs="1"/>
          <xs:element ref="tasks:DueDate" maxOccurs="1"/>
          <xs:element ref="tasks:UtcDueDate" maxOccurs="1"/>
                      <xs:element ref="tasks:DateCompleted"
maxOccurs="1"/>
                      <xs:element ref="tasks:ReminderSet"
maxOccurs="1"/>
                      <xs:element ref="tasks:ReminderTime"
maxOccurs="1"/>
          <xs:element ref="tasks:Subject" maxOccurs="1"/>
          <xs:element ref="tasks:OrdinalDate" maxOccurs="1"/>
          <xs:element ref="tasks:SubOrdinalDate" maxOccurs="1"/>
      </xs:choice>
    </xs:complexType>
```

```
  </xs:element>
  <xs:complexType name="EmptyTag"/>
  <xs:group name="TopLevelSchemaProps">
    <xs:sequence>
      <xs:choice maxOccurs="unbounded">
        <xs:element name="To" type="email:EmptyTag"/>
        <xs:element name="CC" type="email:EmptyTag"/>
        <xs:element name="From" type="email:EmptyTag"/>
        <xs:element name="ReplyTo" type="email:EmptyTag"/>
        <xs:element name="DateReceived" type="email:EmptyTag"/>
        <xs:element name="Subject" type="email:EmptyTag"/>
        <xs:element name="DisplayTo" type="email:EmptyTag"/>
        <xs:element name="Importance" type="email:EmptyTag"/>
        <xs:element name="Read" type="email:EmptyTag"/>
        <xs:element name="MessageClass" type="email:EmptyTag"/>
        <xs:element name="MeetingRequest" type="email:EmptyTag"/>
        <xs:element name="ThreadTopic" type="email:EmptyTag"/>
        <xs:element name="InternetCPID" type="email:EmptyTag"/>
      </xs:choice>
    </xs:sequence>
  </xs:group>
</xs:schema>
```

2.2.3.22.2 Sync Command Response for E-Mail

For the complete **Sync** command response, see **2.2.3.18.2 Sync Command Response**.

2.2.3.23 Sync Command for Tasks Folder

2.2.3.23.1 Sync Command Request for Tasks

```
<?xml version="1.0" ?>
<xs:schema xmlns:email="Email:" attributeFormDefault="unqualified"
elementFormDefault="qualified"
targetNamespace="Email:" xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:tasks="Tasks:">
  <xs:import namespace="Tasks:"/>
  <xs:element name="Read" type="xs:unsignedByte" />
```

```
  <xs:element name="DateReceived" type="email:EmptyTag"/>
  <xs:element name="Flag">
    <xs:complexType>
      <xs:choice minOccurs="0" maxOccurs="unbounded">
          <xs:element name="Status" maxOccurs="1"
type="xs:unsignedByte" />
          <xs:element name="FlagType" maxOccurs="1" type="xs:string" />
                      <xs:element name="CompleteTime" maxOccurs="1"
type="xs:string" />
          <xs:element ref="tasks:StartDate" maxOccurs="1"/>
          <xs:element ref="tasks:UtcStartDate" maxOccurs="1"/>
          <xs:element ref="tasks:DueDate" maxOccurs="1"/>
          <xs:element ref="tasks:UtcDueDate" maxOccurs="1"/>
                      <xs:element ref="tasks:DateCompleted"
maxOccurs="1"/>
                      <xs:element ref="tasks:ReminderSet"
maxOccurs="1"/>
                      <xs:element ref="tasks:ReminderTime"
maxOccurs="1"/>
          <xs:element ref="tasks:Subject" maxOccurs="1"/>
          <xs:element ref="tasks:OrdinalDate" maxOccurs="1"/>
          <xs:element ref="tasks:SubOrdinalDate" maxOccurs="1"/>
      </xs:choice>
    </xs:complexType>
  </xs:element>
  <xs:complexType name="EmptyTag"/>
  <xs:group name="TopLevelSchemaProps">
    <xs:sequence>
      <xs:choice maxOccurs="unbounded">
        <xs:element name="To" type="email:EmptyTag"/>
        <xs:element name="CC" type="email:EmptyTag"/>
        <xs:element name="From" type="email:EmptyTag"/>
        <xs:element name="ReplyTo" type="email:EmptyTag"/>
        <xs:element name="DateReceived" type="email:EmptyTag"/>
        <xs:element name="Subject" type="email:EmptyTag"/>
```

```
        <xs:element name="DisplayTo" type="email:EmptyTag"/>
        <xs:element name="Importance" type="email:EmptyTag"/>
        <xs:element name="Read" type="email:EmptyTag"/>
        <xs:element name="MessageClass" type="email:EmptyTag"/>
        <xs:element name="MeetingRequest" type="email:EmptyTag"/>
        <xs:element name="ThreadTopic" type="email:EmptyTag"/>
        <xs:element name="InternetCPID" type="email:EmptyTag"/>
      </xs:choice>
    </xs:sequence>
  </xs:group>
</xs:schema>
```

2.2.3.23.2 Sync Command Response for Tasks

For the complete **Sync** command response, see **2.2.3.18.2 Sync Command Response**.

2.2.3.24 ValidateCert Command

2.2.3.24.1 ValidateCert Command Request

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="ValidateCert:" attributeFormDefault="unqualified"
elementFormDefault="qualified"
targetNamespace="ValidateCert:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:element name="ValidateCert">
            <xs:complexType>
                  <xs:all minOccurs="0" maxOccurs="1">
                        <xs:element name="CertificateChain"
minOccurs="0" maxOccurs="1">
                              <xs:complexType>
                                    <xs:choice maxOccurs="unbounded">
                                          <xs:element
name="Certificate" minOccurs="1" maxOccurs="unbounded">
                                                <xs:simpleType>
                                                      <xs:restriction
base="xs:base64Binary">
      <xs:minLength value="4"/>
                                                      </xs:restriction>
                                                </xs:simpleType>
                                          </xs:element>
                                    </xs:choice>
                              </xs:complexType>
                        </xs:element>
```

```
                        <xs:element name="Certificates" minOccurs="1"
maxOccurs="1">
                              <xs:complexType>
                                    <xs:choice maxOccurs="unbounded">
                                          <xs:element
name="Certificate" minOccurs="1" maxOccurs="unbounded">
                                                <xs:simpleType>
                                                      <xs:restriction
base="xs:base64Binary">

      <xs:minLength value="4"/>
                                                      </xs:restriction>
                                                </xs:simpleType>
                                          </xs:element>
                                    </xs:choice>
                              </xs:complexType>
                        </xs:element>
                        <xs:element name="CheckCrl" minOccurs="0"
maxOccurs="1">
                              <xs:simpleType>
                                    <xs:restriction base="xs:integer">
                                          <xs:minInclusive value="0"/>
                                          <xs:maxInclusive value="1"/>
                                    </xs:restriction>
                              </xs:simpleType>
                        </xs:element>
                  </xs:all>
            </xs:complexType>
```

2.2.3.24.2 </xs:element>ValidateCert Command Response

```
<?xml version="1.0" ?>
<xs:schema xmlns:tns="ValidateCert:" attributeFormDefault="unqualified"
elementFormDefault="qualified"
targetNamespace="ValidateCert:"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:element name="ValidateCert">
   <xs:complexType>
      <xs:sequence>
         <xs:element minOccurs=”1” maxOccurs="1" name="Status"
type="xs:unsignedByte" />
<xs:element minOccurs=”0” maxOccurs=”unbounded” name=”Certificate”>
   <xs:element minOccurs=”1” maxOccurs="1" name="Status"
type="xs:unsignedByte" />
</xs:element>
      </xs:sequence>
```

```
   </xs:complexType>
</xs:element>
```

2.2.3.25 AirSyncBase XSD

The following namespace is for tags that other requests can use.

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema attributeFormDefault="unqualified"
xmlns:airsyncbase="AirSyncBase:" elementFormDefault="qualified"
targetNamespace="AirSyncBase:"
xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns="AirSyncBase:">
<xs:element name="FileReference" type="xs:string" />
<xs:element name="BodyPreference">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="Type" type="xs:unsignedByte" />
      <xs:element name="TruncationSize"
minOccurs="0"type="xs:unsignedInt"/>
      <xs:element name="AllOrNone" minOccurs="0" type="xs:boolean"/>
    </xs:sequence>
  </xs:complexType>
  </xs:element>
  <xs:element name="Body">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="Type" type="xs:unsignedByte" />
<xs:element name="EstimatedDataSize" type="xs:unsignedInt"
minOccurs="0"/>
        <xs:element name="Truncated" minOccurs="0" type="xs:boolean"/>
        <xs:element name="Data" type="xs:string" />
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="Attachments">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="Attachment">
```

```
          <xs:complexType>
            <xs:all>
<xs:element name="DisplayName" type="xs:string" minOccurs="0"/>
              <xs:element name="FileReference" type="xs:string" />
              <xs:element name="Method" type="xs:unsignedByte" />
              <xs:element name="EstimatedDataSize"
type="xs:unsignedInt" />
              <xs:element name="ContentId" type="xs:string"
minOccurs="0"/>
              <xs:element name="ContentLocation" type="xs:string"
minOccurs="0"/>
              <xs:element name="IsInline" minOccurs="0"
type="xs:boolean"/>
            </xs:all>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:complexType name="EmptyTag"/>
  <xs:element name="NativeBodyType" type="xs:unsignedByte" />
  <xs:group name="TopLevelSchemaProps">
    <xs:sequence>
      <xs:choice maxOccurs="unbounded">
        <xs:element name="Body" type="airsyncbase:EmptyTag"/>
        <xs:element name="Attachments" type="airsyncbase:EmptyTag"/>
      </xs:choice>
    </xs:sequence>
  </xs:group>
</xs:schema>
```

3 Protocol Details

3.1 Client Details

3.1.1 Abstract Data Model

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

The abstract data model used by the server and the client are the same.

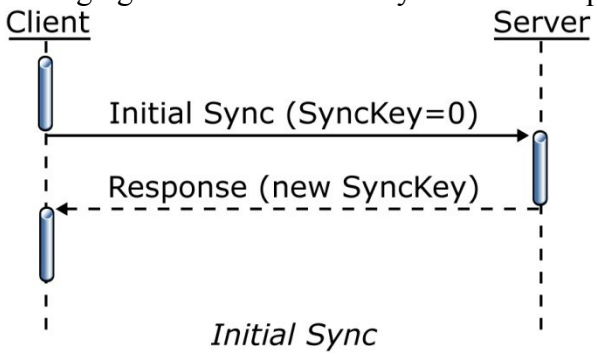
3.1.2 Timers

None.

3.1.3 Initialization

3.1.3.1 Initial Synchronization

Before a collection can be synchronized, an initial synchronization key must be obtained from the server. The client obtains this synchronization key by sending the server an initial synchronization request where the synchronization key is set to zero (0). The server responds with a new synchronization key value, which is generated by the server for each transaction. The client must store the synchronization key and reissue it in the next synchronization request. Therefore, the initial synchronization of a collection consists of one request to obtain the synchronization key and a second request to complete the full synchronization. The following figure shows the initial synchronization process.



At any point, the client can do a full resynchronization by repeating the initial synchronization steps. This may be necessary if the client data becomes corrupted or if communication or other errors cause the server to be unable to service synchronization requests. The device can also give the user the option to complete a full resynchronization.

To do a full resynchronization, the client should delete its copy of all objects in a particular collection and then perform synchronization with a synchronization key value of zero (0) to obtain fresh copies of the objects from the server. The following table lists the command sequence for the initial synchronization.

Order	Client	Server
1	The client sends a **Sync** command with **SyncKey** = zero (0) and the **CollectionId** of the collection to be synchronized.	The server responds with new **SyncKey** value.
2	Client sends a **Sync** command with a new **SyncKey** value and the **GetChanges** element.	Server responds with the **Sync** command **Add** element that contains all items in the collection.

The client should use the **WindowSize** element to request that the server break the **Add** element into sets of multiple items. The recommended window size is 100. The maximum size allowed in the **WindowSize** element is 512. If the server has to send the items in more than one chunk, the server returns the **MoreAvailable** element and the client sends additional **Sync** commands. The server continues to send **MoreAvailable** elements until no more **MoreAvailable** elements are returned from the server. For more information about the **WindowSize** element, see **Sync** command later in this document.

3.1.4 Higher-Layer Triggered Events

3.1.4.1 Synchronizing Inbox, Calendar, Contacts, and Tasks Folders

This section describes how to use the **Sync** command to perform an initial synchronization to get a synchronization key for an Inbox, Calendar, or Contacts folder and a perform a full synchronization on that folder to get the items from the server.

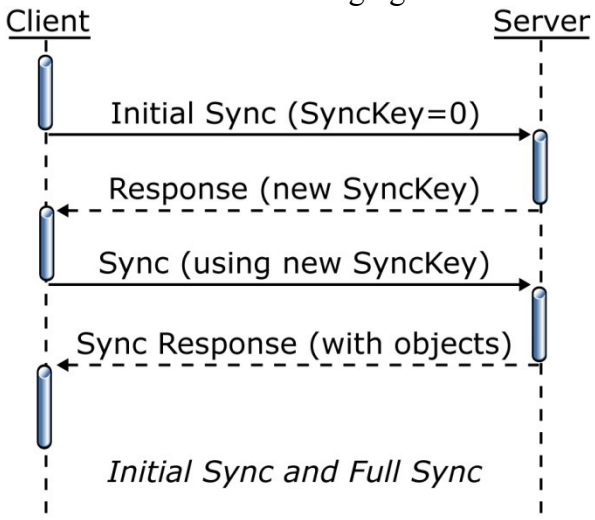
The Inbox, Calendar, Contacts, and Tasks folders should be synchronized by using the server ID of the collection, which requires that the client first perform a **FolderSync** command to discover the folder hierarchy. Please see 3.1.4.2 below.

Before a collection can be synchronized, an initial synchronization key must be obtained from the server. The client obtains the key by sending the server an initial synchronization request with a synchronization key of zero (0) and specifying the appropriate CollectionId(s). The server responds with a new synchronization key, which is generated by the server for each transaction. The client must store the synchronization key and reissue the key in the next synchronization request. Therefore, the initial synchronization of a collection consists of one request to obtain the synchronization key and a second request to do the full synchronization.

The client then performs a full synchronization of a folder by sending a second **Sync** command to the server, specifying the **GetChanges** element and the synchronization key that is returned by the initial synchronization.

The server responds by adding all the items in the collection to the client and returning a new synchronization key, which can be used in successive synchronizations. The client should delete its copy of all objects in the collection that are being synchronized before the client performs a full synchronization. The client can use the **GetItemEstimate** command to obtain an estimate of the number of items that must be synchronized before completely synchronizing a collection, which is useful when the client user interface (UI) displays a progress bar while getting items from the server. In some cases, the client may have to submit a **WindowSize** element that specifies the number of items to be synchronized at a time.

If more items remain to be synchronized, the **MoreAvailable** element is returned in the **Sync** command response. The client then continues to call the **Sync** command until no more items are available. For more information about the **WindowSize** element, see **Sync** command later in this document. The following figure shows the folder synchronization process.



After a full synchronization has been performed on a collection, successive synchronizations are used to obtain additions, deletions, or changes to the initial collection state. The client can use the **Sync** command request to add, delete, or change items on the server, and the server can use the **Sync** command response to add, delete, or change items on the client.
The following table lists the command sequence for folder synchronization.

The asterisk (*) in the Order column means that a step can be repeated multiple times. [*n*] means that a step is optional.

Order	Client Action	Server Action
1	The client sends the **Sync** command for the **Email**, **Calendar**, **Contacts**, and/or **Tasks** collection	The server response contains the synchronization key for the collection, to be used in successive synchronizations.

	with a synchronization key of zero (0). This establishes a partnership with the server, initializing server data for the device.	
2*	The client sends the **Sync** command with a synchronization key of zero (0) for other collections to be synchronized.	The server responds with new synchronization keys for each collection.
[3]	The client sends the **GetItemEstimate** command for all collections to be synchronized. This step can be skipped if it is not required by the client UI.	The server response indicates how many items will be added for each collection.
4*	The client sends the **Sync** command with the **GetChanges** element for a collection. The command should include the **WindowSize** element, the recommended value for which is 100. This step is repeated for each collection to be synchronized or all collections can be combined into one request.	The server response contains **Add** elements for items in the collection. If the response contains the **MoreAvailable** element, this step is repeated.

Note The client should use the **WindowSize** element to break the server **Add** elements into sets of multiple items. The recommended window size is 100. For more information about the **WindowSize** element, see **Sync** command later in this document.

3.1.4.2 Synchronizing a Folder Hierarchy

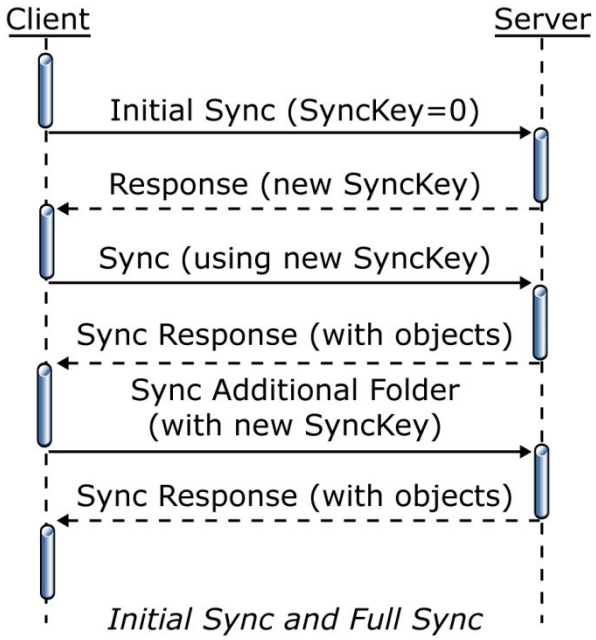
This section describes how to use the **FolderSync** command to discover the folder hierarchy of the user's mailbox, perform an initial synchronization to get a synchronization key for a collection, and perform a full synchronization to get the items in that collection from the server.

The **FolderSync** command is used to synchronize the folder hierarchy of a user's mailbox folder tree. An initial folder synchronization request with a synchronization key of zero (0) is sent to the server, which responds with an initial synchronization key and all the folders in the

user's mailbox. The folders are identified by server ID, which can then be used in a **Sync** command to synchronize the items of those folders.

Additional folder synchronizations can be performed, by using the synchronization key from the initial folder **Sync** command response, to get folder additions, deletions, or updates from the server. At any point, the client can repeat the initial folder **Sync** command. Existing collection IDs do not change when the client resynchronizes.

Before a folder hierarchy can be synchronized, an initial synchronization key must be obtained from the server. The client does this by sending the server an initial synchronization request with a synchronization key of zero (0). The response will contain the server's folder hierarchy. When the folder hierarchy of the user's mailbox has been discovered and an initial synchronization has been performed on a folder to obtain a synchronization key, the contents of that folder can then be synchronized. To synchronize the content, send the **Sync** command to the server, specifying the **GetChanges** element and the synchronization key for the collection. The server responds by adding all the items in the collection to the client and returning a new synchronization key, which can be used in successive synchronizations. In some cases, the client should use the **GetItemEstimate** command to obtain an estimate of the number of items that must be synchronized before completely synchronizing a collection, which is useful when the client UI displays a progress bar while it retrieves items from the server. In some cases, the client may have to submit a **WindowSize** element that specifies the number of items to be synchronized at a time. If more items remain to be synchronized, the **MoreAvailable** element is returned in the **Sync** command response. The client then continues to call the **Sync** command until no more items are available. The following figure shows the process for synchronizing multiple folders.



After a full synchronization has been performed on a collection, successive synchronizations are used to obtain additions, deletions, or changes to the initial collection state. The client can use a **Sync** command request to add, delete, or change items on the server, and the server can use the **Sync** command response to add, delete, or change items on the client.
The following table lists the command sequence for folder hierarchy synchronization.

The asterisk (*) in the Order column means that a step can be repeated multiple times. [*n*] means that a step is optional.

Order	Client Action	Server Action
1	The client sends the **FolderSync** command with the **SyncKey** element set to zero (0) to get the folder hierarchy and the server IDs of all the folders.	The server response contains the folder hierarchy. Client stores names and server IDs of all folders that can be synchronized.
2	The client sends the **Sync** command for one collection, with the **SyncKey** element set to zero (0) and the server ID of the collection to be synchronized. This establishes a partnership with the server, initializing server data for the device.	The server response contains the synchronization key for the collection, to be used in successive synchronizations.
3*	The client sends a **Sync** command with the **SyncKey** element set to zero (0) for other collections to be synchronized.	The server responds with new **SyncKey** values for each collection.
[4]	The client sends the **GetItemEstimate** command for all collections to be synchronized. This step can be skipped if it is not required by the client UI.	The server response indicates how many items will be added for each collection.
5*	The client sends the **Sync** command for a collection, specifying the **GetChanges** element and the server ID of the collection to be synchronized. The command should include the **WindowSize** element, the recommended value for which is 100. Repeat this step for each collection to be synchronized.	The server response contains **Add** commands for items in the collection. If the response contains the **MoreAvailable** element, this step is repeated.

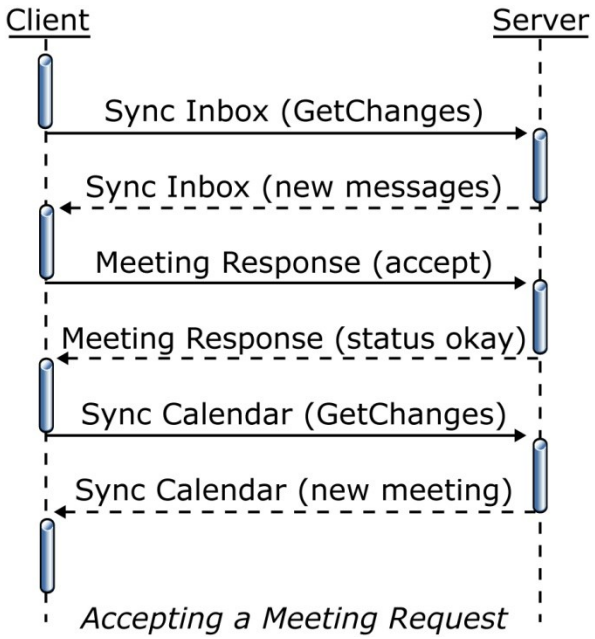
3.1.4.3 Receiving and Accepting Meeting Requests

This section describes how to retrieve items from the Inbox folder by using the **Sync** command, to respond to a meeting request item by using the **MeetingResponse** command, and to synchronize the Calendar folder by using the **Sync** command so that the new calendar object is added to the client's calendar.

A meeting request is returned by the server in response to a synchronization of the Inbox folder. A meeting request is an e-mail message that has an embedded calendar item. The message contains a **MessageClass** element that has a value of IPM.Schedule.Meeting.Request, and its **ApplicationData** element contains a **MeetingRequest** element. When the client displays the meeting request message, the client should offer the options of accepting, declining, or tentatively accepting the meeting. If one of these actions is selected, the client sends a **MeetingResponse** command to the server.
If the response to the meeting is accepted or is tentatively accepted, the server will add or update the corresponding calendar item and return its server ID in the **CalendarId** element of the response. If the response to the meeting is declined, the response will not contain a **CalendarId** element because the server will delete the corresponding calendar item. If the client had created a tentative meeting calendar item, the client should update that item with the returned server ID (if accepted or tentative). The client should also change the busy status on the client calendar item from tentative to busy if the meeting request was accepted. Note that, if the client synchronizes the Calendar folder after responding to a meeting request, the calendar item in question will be in conflict if the client also sends the changed item change for it back to the server. This conflict will be resolved according to the conflict resolution rules that are specified by the client in the **Sync** command request.

If the meeting request was accepted, the Calendar folder must be synchronized for the client to obtain the new calendar item. The new calendar item for the accepted meeting will be added here and should be added to the client's calendar.

The following figure shows how meeting requests are received and accepted.



The following table lists the command sequence for receiving and accepting meeting requests.

Order	Client Action	Server Action
1	The client sends the **Sync** command for the Inbox collection with the value of the **SyncKey** element set to zero (0).	The server response contains the **SyncKey** for the collection, to be used in successive synchronizations.
2	The client sends a **Sync** command, specifying the **GetChanges** element and the **SyncKey** for the Inbox folder. The command should include the **WindowSize** element, the recommended value for which is 100.	The server response contains **Add** elements for items in the Inbox collection, including a meeting request item. If the response contains the **MoreAvailable** element, this step is repeated.
3	The user chooses to accept, decline, or tentatively accept a meeting request that is displayed in the client UI.	
4	The client sends a **MeetingResponse** command to the server, which specifies that the meeting was accepted, declined, or tentatively	The server sends a response that contains the **MeetingResponse** command request status.

	accepted, and provides the server IDs of the meeting request message and its parent folder.	
5	If the meeting was accepted, the client sends a **Sync** command for the Calendar collection, specifying the **GetChanges** element.	The server responds with any changes to the Calendar folder caused by the last synchronization and the new calendar item for the accepted meeting.

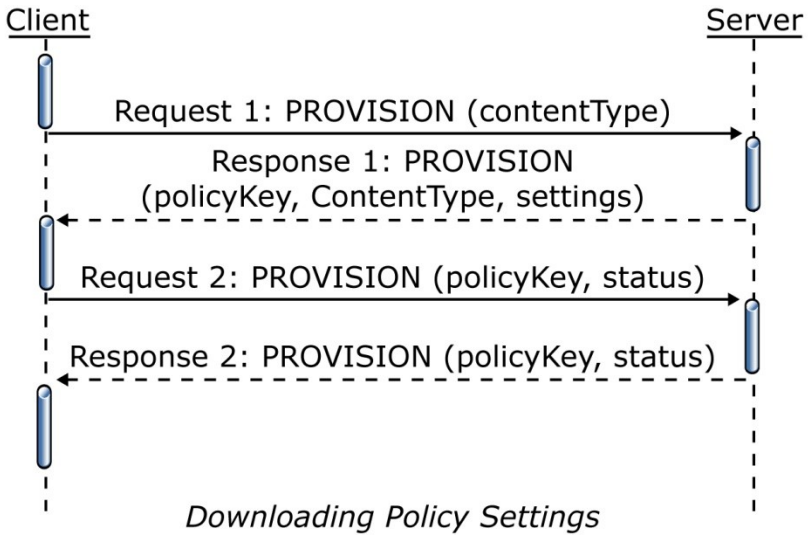
3.1.4.4 Downloading Policy Settings

This section describes how the client device can download policy settings from the server by using the **Provision** command.

The client device is required to send a **Provision** command as the first command the client issues to the server. This initial request for policy settings contains the **PolicyType** element, which specifies the format in which the policy settings will be provided. The server then responds with the **PolicyType**, **PolicyKey**, and **Data** elements. The policy key is used by the server to mark the state of policy settings on the client device. The policy settings, in the format specified in the **PolicyType** element, are contained in the **Data** element.

The client device then applies the policy settings that were received from the server and sends an acknowledgement back to the server in another **Provision** command request. The acknowledgement from the client device contains **PolicyType**, **PolicyKey**, and **Status** elements. The **Status** element indicates whether the policy settings were successfully applied by the client. The response from the server contains **PolicyType**, **PolicyKey**, and **Status** elements. The **Status** element indicates whether the server successfully recorded the client's acknowledgement.

The following figure shows the process for downloading policy settings.



The following table lists the command sequence for downloading policy settings.

Order	Client Action	Server Action
1	The client sends a **Provision** command request with the type of policy settings to be downloaded.	The server response contains the policy type, policy key, policy settings, and status code.
2	The client acknowledges that it received and applied the policy settings by sending another **Provision** command request with the policy type, policy key, and status code.	The server response contains the policy type, policy key, and status code to indicate that the server recorded the client's acknowledgement.

3.1.5 Message Processing Events and Sequencing Rules

3.1.5.1 Handling Status Errors

Client software MUST handle errors that occur during synchronization sessions. Errors fall into two categories: HTTP errors and synchronization errors. HTTP errors are standard error codes, such as 401 Logon failed, and they are returned from the server in response to an HTTP POST. Synchronization errors result from a problem during the synchronization process. Synchronization errors are indicated by codes that are returned in the **Status** element of a command response. For details about the status codes, see section 2.2.3.

The client MUST implement the error handling and its user interface (UI). Some errors are handled by a recovery procedure. Other errors require that an error message is displayed, along with a prompt for the user to respond.

In addition to synchronization errors that the server sends, incomplete communication between server and client can result in the failure of a synchronization session. The server has an error recovery feature that enables a client to respond to errors by repeating the most recent synchronization session. The client MUST handle synchronization failures by retrying the synchronization, either immediately or later. The server tracks synchronization requests to be able to respond appropriately in both of the following cases:

- The client failed in communicating a full request to the server for synchronization.
    - In this case, the client sends a request but the server does not receive the request. The server does not act on the request, and no server-side changes occur. Therefore, no response is sent to the client. The client MUST resend a synchronization request if there is no server response.
- The server failed in communicating a response to the client for updates.
    - In this case, the server response is not received by the client. The data on the server changed. The client MUST resend the request. The server recognizes the duplicate request. Because the server changes have already occurred, the server resends the response to the client to keep the server and client synchronized.

3.1.6 Timer Events

None.

3.1.7 Other Local Events

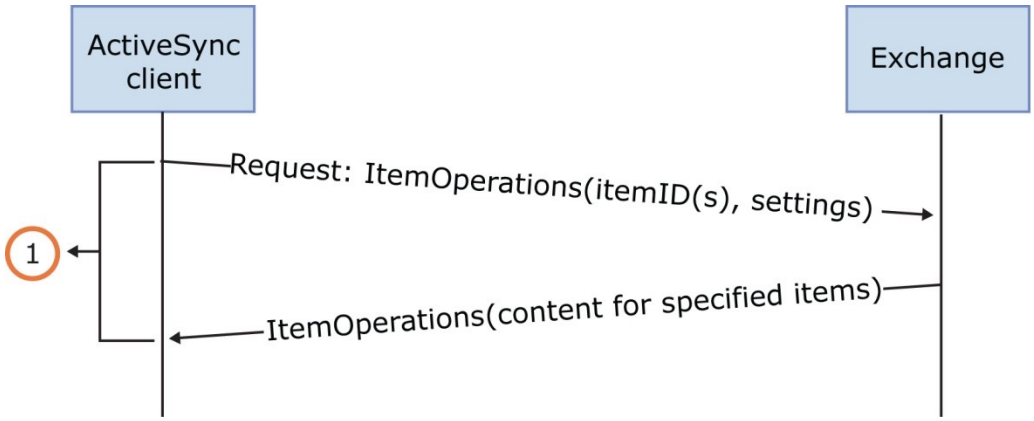
None.

4 Protocol Examples

4.1 Fetching E-Mail and Attachments

The **ItemOperations** command enables the client to retrieve Personal Information Manager (PIM) items and attachments (in addition to document library items and search results) outside the **Sync** command context.

These examples focus on retrieval of items and attachments, following a simple request and response model. The following figure shows the request and response model used in fetching e-mail and attachments.



4.1.1 Fetching an E-Mail Item

The following example shows the client retrieving an e-mail message by using the **ItemOperations** command.

Request

```
POST /Microsoft-Server-
ActiveSync?Cmd=ItemOperations&User=deviceuser&DeviceId=device1&
DeviceType=PocketPC HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 12.1
User-Agent: Microsoft-SmartPhone/2.5
Host: somehost

<?xml version="1.0" encoding="utf-8"?>
<ItemOperations xmlns:airsync="AirSync:"
xmlns:airsyncbase="AirSyncBase:" xmlns="ItemOperations:">
  <Fetch>
    <Store>Mailbox</Store>
    <airsync:CollectionId>7</airsync:CollectionId>
    <airsync:ServerId>7:1</airsync:ServerId>
    <Options>
      <airsyncbase:BodyPreference>
        <airsyncbase:Type>1</airsyncbase:Type>
        <airsyncbase:TruncationSize>5120</airsyncbase:TruncationSize>
        <airsyncbase:AllOrNone>0</airsyncbase:AllOrNone>
```

```
      </airsyncbase:BodyPreference>
    </Options>
  </Fetch>
</ItemOperations>
```

Response

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 409
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
MS-Server-ActiveSync: 8.1
Date: Tue, 08 May 2007 17:29:52 GMT

<?xml version="1.0" encoding="utf-8"?><ItemOperations
xmlns:airsync="AirSync:" xmlns:email="POOMMAIL:"
xmlns="ItemOperations:">
  <Status>1</Status>
  <Response>
    <Fetch>
      <Status>1</Status>
      <airsync:CollectionId>7</airsync:CollectionId>
      <airsync:ServerId>7:1</airsync:ServerId>
      <airsync:Class>Email</airsync:Class>
      <Properties>
        <email:To>"deviceuser" &lt;someone1@example.com&gt;</email:To>
        <email:Cc>"deviceuser3" &lt;someone3@example.com&gt;</email:Cc>
        <email:From>"deviceuser2" &lt;someone2@example.com&gt;
        </email:From>
        <email:Subject>Subject</email:Subject>
        <email:DateReceived>2007-05-08T17:29:07.890Z
        </email:DateReceived>
        <email:DisplayTo>DeviceUserDisplayName</email:DisplayTo>
        <email:ThreadTopic>Subject</email:ThreadTopic>
```

```
        <email:Importance>1</email:Importance>
        <email:Read>0</email:Read>
        <airsyncbase:Body>
          <airsyncbase:Type>1</airsyncbase:Type>
          <airsyncbase:EstimatedDataSize>20
          </airsyncbase:EstimatedDataSize>
          <airsyncbase:Data>Body as plain text</airsyncbase:Data>
        </airsyncbase:Body>
        <email:MessageClass>IPM.Note</email:MessageClass>
        <email:InternetCPID>28591</email:InternetCPID>
        <email:Flag />
        <email:ContentClass>urn:content-classes:message
        </email:ContentClass>
        <airsyncbase:NativeBodyType>1</airsyncbase:NativeBodyType>
      </Properties>
    </Fetch>
  </Response>
</ItemOperations>
```

4.1.2 Fetching an E-Mail Item with a LongId

The following example shows the client retrieving an e-mail message by using **LongId**. First, use the **Search** command to get the **LongId** of the message, and then use the **Fetch** command with the **LongId** to retrieve the message.

Search Request

```
POST /Microsoft-Server-
ActiveSync?Cmd=Search&User=deviceuser&DeviceId=device1&DeviceType=Smart
Phone HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 12.1
User-Agent: Microsoft-SmartPhone/2.5
Host: somehost

<?xml version="1.0" encoding="utf-8"?>
<Search xmlns="Search:" xmlns:airsync="AirSync:"
xmlns:email="POOMMAIL:">
```

```
  <Store>
    <Name>Mailbox</Name>
    <Query>
      <And>
        <airsync:Class>Email</airsync:Class>
        <airsync:CollectionId>7</airsync:CollectionId>
        <FreeText>Sales Totals</FreeText>
      </And>
    </Query>
    <Options>
      <RebuildResults />
      <Range>0-4</Range>
    </Options>
  </Store>
</Search>
```

Search Response

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 423
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
MS-Server-ActiveSync: 8.1
Date: Tue, 08 May 2007 17:42:07 GMT

<?xml version="1.0" encoding="utf-8"?><Search xmlns:airsync="AirSync:"
xmlns:email="POOMMAIL:" xmlns:airsyncbase="AirSyncBase:"
xmlns="Search:">
  <Status>1</Status>
  <Response>
    <Store>
      <Status>1</Status>
      <Result>
        <airsync:Class>Email</airsync:Class>
```

```
        <LongId>RgAAAACYWCHnyBZ%2fTq8bujFmR1EPBwBzyWfENpcEQ7zU
        NyaWwM4BAAAA8FxEAABzyWfENpcEQ7zUNyaWwM4BAAAA8HACAAAJ</LongId>
        <airsync:CollectionId>7</airsync:CollectionId>
        <Properties>
          <email:To>"deviceuser" &lt;someone1@example.com&gt;
          </email:To>
          <email:From>"deviceuser2" &lt;someone2@example.com&gt;
          </email:From>
          <email:Subject>Sales Totals for April</email:Subject>
          <email:DateReceived>2007-05-08T17:29:07.890Z
          </email:DateReceived>
          <email:DisplayTo>DeviceUserDisplayName</email:DisplayTo>
          <email:Read>1</email:Read>
          <airsyncbase:Body>
            <airsyncbase:Type>1</airsyncbase:Type>
            <airsyncbase:EstimatedDataSize>6
            </airsyncbase:EstimatedDataSize>
            <airsyncbase:Truncated>1</airsyncbase:Truncated>
          </airsyncbase:Body>
          <email:MessageClass>IPM.Note</email:MessageClass>
          <email:InternetCPID>28591</email:InternetCPID>
          <email:Flag />
          <email:ContentClass>urn:content-classes:message
          </email:ContentClass>
          <airsyncbase:NativeBodyType>1</airsyncbase:NativeBodyType>
        </Properties>
      </Result>
      <Range>0-0</Range>
      <Total>1</Total>
    </Store>
  </Response>
</Search>
```

Fetch Request

```
POST /Microsoft-Server-
ActiveSync?Cmd=ItemOperations&User=deviceuser&DeviceId=device1&
DeviceType=PocketPC HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 12.1
User-Agent: Microsoft-SmartPhone/2.5
Host: somehost

<?xml version="1.0" encoding="utf-8"?>
<ItemOperations xmlns:airsync="AirSync:"
xmlns:airsyncbase="AirSyncBase:" xmlns="ItemOperations:">
  <Fetch>
    <Store>Mailbox</Store>
    <airsync:LongId>RgAAAACYWCHnyBZ%2fTq8bujFmR1EPBwBzyWfENpc
    EQ7zUNyaWwM4BAAAA8FxEAABzyWfENpcEQ7zUNyaWwM4BAAAA8HA
    CAAAJ</airsync:CollectionId>
    <Options>
      <airsyncbase:BodyPreference>
        <airsyncbase:Type>1</airsyncbase:Type>
      </airsyncbase:BodyPreference>
    </Options>
  </Fetch>
</ItemOperations>
```

Fetch Response

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 409
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
MS-Server-ActiveSync: 8.1
Date: Tue, 08 May 2007 17:29:52 GMT

<?xml version="1.0" encoding="utf-8"?><ItemOperations
```

```
xmlns:airsync="AirSync:" xmlns:email="POOMMAIL:"
xmlns="ItemOperations:">
  <Status>1</Status>
  <Response>
    <Fetch>
      <Status>1</Status>
      <airsync:CollectionId>7</airsync:CollectionId>
      <airsync:ServerId>7:1</airsync:ServerId>
      <airsync:Class>Email</airsync:Class>
      <Properties>
        <email:To>"deviceuser" &lt;someone1@example.com&gt;</email:To>
        <email:From>"deviceuser2" &lt;someone2@example.com&gt;
        </email:From>
        <email:Subject>Sales Totals for April</email:Subject>
        <email:DateReceived>2007-05-08T17:29:07.890Z
        </email:DateReceived>
        <email:DisplayTo>DeviceUserDisplayName</email:DisplayTo>
        <email:ThreadTopic>Subject</email:ThreadTopic>
        <email:Importance>1</email:Importance>
        <email:Read>1</email:Read>
        <airsyncbase:Body>
          <airsyncbase:Type>1</airsyncbase:Type>
          <airsyncbase:EstimatedDataSize>20
          </airsyncbase:EstimatedDataSize>
          <airsyncbase:Data>Income generated by the sales department
          in April can be attributed to the following…
          </airsyncbase:Data>
        </airsyncbase:Body>
        <email:MessageClass>IPM.Note</email:MessageClass>
        <email:InternetCPID>28591</email:InternetCPID>
        <email:Flag />
        <email:ContentClass>urn:content-classes:message
        </email:ContentClass>
        <airsyncbase:NativeBodyType>1</airsyncbase:NativeBodyType>
```

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

4.1.3 Fetching an Attachment

In the following example, the **Sync** command is used to synchronize a new message with an attachment to the client. Then, the **ItemOperations** command is used to retrieve the attachment.

In the XML scenario code, HTML strings are escaped by using < and &gt. However, as these values are passed over the wire, they are passed in their original HTML format, as < and >.

Sync Command Request

```
POST /Microsoft-Server-
ActiveSync?Cmd=Sync&User=deviceuser&DeviceId=device1&DeviceType=
PocketPC HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 12.1
User-Agent: Microsoft-SmartPhone/2.5
Host:somehost
Content-Length: 106

<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns:airsyncbase="AirSyncBase:" xmlns="AirSync:">
  <Collections>
    <Collection>
      <Class>Email</Class>
      <SyncKey>1</SyncKey>
      <CollectionId>7</CollectionId>
      <DeletesAsMoves />
      <GetChanges />
    </Collection>
  </Collections>
</Sync>
```

Sync Command Response

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 347
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
MS-Server-ActiveSync: 8.1
Date: Tue, 08 May 2007 17:57:32 GMT

<?xml version="1.0" encoding="utf-8"?>
<Sync xmlns:email="POOMMAIL:"
xmlns:airsyncbase="AirSyncBase:" xmlns="AirSync:">
  <Collections>
    <Collection>
      <Class>Email</Class>
      <SyncKey>2</SyncKey>
      <CollectionId>7</CollectionId>
      <Status>1</Status>
      <Commands>
        <Add>
          <ServerId>7:1</ServerId>
          <ApplicationData>
            <email:To>"deviceuser" &lt;someone@example.com&gt;
            </email:To>
            <email:From>"deviceuser2" &lt;someone2@example.com&gt;
            </email:From>
            <email:Subject>Email with Attachment</email:Subject>
            <email:DateReceived>2007-05-08T17:57:22.890Z
            </email:DateReceived>
            <email:DisplayTo>deviceuser</email:DisplayTo>
            <email:ThreadTopic>Email with Attachment
            </email:ThreadTopic>
            <email:Importance>1</email:Importance>
            <email:Read>0</email:Read>
```

```
            <airsyncbase:Attachments>
              <airsyncbase:Attachment>
                <airsyncbase:DisplayName>ActiveSyncClient_
                AcceptingMeetingRequest.JPG</airsyncbase:DisplayName>
                <airsyncbase:FileReference>7%3a1%3a0
                </airsyncbase:FileReference>
                <airsyncbase:Method>1</airsyncbase:Method>
                <airsyncbase:EstimatedDataSize>18790
                </airsyncbase:EstimatedDataSize>
              </airsyncbase:Attachment>
            </airsyncbase:Attachments>
            <airsyncbase:Body>
              <airsyncbase:Type>2</airsyncbase:Type>
              <airsyncbase:EstimatedDataSize>58
              </airsyncbase:EstimatedDataSize>
              <airsyncbase:Truncated>1</airsyncbase:Truncated>
              <airsyncbase:Data>&lt;html&gt;&lt;hea</airsyncbase:Data>
            </airsyncbase:Body>
            <email:MessageClass>IPM.Note</email:MessageClass>
            <email:InternetCPID>28591</email:InternetCPID>
            <email:Flag />
            <email:ContentClass>urn:content-classes:message
            </email:ContentClass>
            <airsyncbase:NativeBodyType>1</airsyncbase:NativeBodyType>
          </ApplicationData>
        </Add>
      </Commands>
    </Collection>
  </Collections>
</Sync>
```

ItemOperation Command Request

```
POST /Microsoft-Server-
ActiveSync?Cmd=ItemOperations&User=deviceuser&DeviceId=device1&
```

```
DeviceType=PocketPC HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 12.1
User-Agent: Microsoft-SmartPhone/2.5
Host: somehost

<?xml version="1.0" encoding="utf-8"?>
<ItemOperations xmlns:airsyncbase="AirSyncBase:"
xmlns="ItemOperations:">
  <Fetch>
    <Store>Mailbox</Store>
       <airsyncbase:FileReference>7%3a1%3a0</airsyncbase:FileReference>
  </Fetch>
</ItemOperations>
```

ItemOperation Command Response

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 1151
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
MS-Server-ActiveSync: 8.1
Date: Tue, 08 May 2007 17:28:33 GMT

<?xml version="1.0" encoding="utf-8"?>
<ItemOperations xmlns:airsyncbase="AirSyncBase:"
xmlns="ItemOperations:">
  <Status>1</Status>
  <Response>
    <Fetch>
      <Status>1</Status>
      <airsyncbase:FileReference>7%3a1%3a0</airsyncbase:FileReference>
      <Properties>
        <airsyncbase:ContentType>text/plain
```

```
        </airsyncbase:ContentType>
        <Data>U291cmNlIERlcG90IFN5c3RlbSBSZXF1aXJlbWVudHMNClRv
        IHJ1biBTb3VyY2UgRGVwb3QsIHlvdXIgY29tcHV0ZXIgbXVzdCBtZ
        WV0IGNlcnRhaW4gaGFyZHdhcmUgYW5kIHNvZnR3YXJlIHJlcXVpc
        mVtZW50cy4gVG8gcnVuIHRoZSBTb3VyY2UgRGVwb3QgY2xpZW50L
        CBjaGVjayB0aGUgZm9sbG93aW5nIGxpc3Qgb2YgbWluaW11bSBw
        bGF0Zm9ybS1zcGVjaWZpYyByZXF1aXJlbWVudHMgZm9yIFNvdXJj
        ZSBEZXBvdC4gDQoNClNvZnR3YXJlIFJlcXVpcmVtZW50cw0KV2luZG9
        3cyBYUCBhbmQgV2luZG93cyAyMDAwIJYgSW50ZWwgb3IgQVhQ
        NjQNCk5UNCAtIEludGVsIA0KV2luZG93cyA5eCCWIEludGVsDQ
        pIYXJkd2FyZSBSZXF1aXJlbWVudHMNCkludGVsIENsaWVudA0K
        DQp4ODYgcHJvY2Vzc29yDQpQZW50aXVtIG9yIGJldHRlciANCkV
        ub3VnaCBoYXJkIGRpc2sgc3BhY2UgdG8gaG9sZCB0aGUgZmlsZX
        MNCkFYUDY0IENsaWVudA0KDQpBbHBoYSBDbGllbnQgc3lzdGVtI
        HJ1bm5pbmcgYW4gQVhQNjQgZW11bGF0b3IuIA0KSG93IHRvDQoN
        Ckluc3RhbGwgU291cmNlIERlcG90DQoNCg0KLS0tLS0tLS0tLS0t
        LS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0
        tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0tLS0NCg0KU2VuZCB
        1cyBmZWVkYmFjayBhbmQgc3VnZ2VzdGlvbnMgb24gdGhpcyBIZW
        xwIHRvcGljIG9yIHRoaXMgcHJvZHVjdC4NCg0KQ29udGFjdCBzdX
        Bwb3J0IGZvciBhc3Npc3RhbmNlLg0KDQoNCmMuIDIwMDQuIE1pY3
        Jvc29mdCBDb25maWRlbnRpYWwgDQpMYXN0IHVwZGF0ZWQgMy8xO
        S8yMDA0IA==</Data>
      </Properties>
    </Fetch>
  </Response>
</ItemOperations>
```

4.2 Retrieving and Changing OOF Settings

This section provides sample messages related to retrieving and changing Out of Office (OOF) settings.

4.2.1 Retrieving OOF Settings

The client requests the user's OOF settings by using the **Get** command and specifying the type in which the client wants to have the OOF message formatted.

```
POST /Microsoft-Server-
```

```
ActiveSync?Cmd=Settings&User=deviceuser&DeviceId=device1&DeviceType=
PocketPC HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 12.1
User-Agent: Microsoft/SmartPhone/2.5
Host: somehost

<?xml version="1.0" encoding="utf-8"?>
<Settings xmlns="Settings:">
  <Oof>
    <Get>
      <BodyType>HTML</BodyType>
    </Get>
  </Oof>
</Settings>
```

The client requested the messages to be returned in HTML, so all OOF messages are formatted as such.

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 203
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
MS-Server-ActiveSync: 8.1
Date: Tue, 08 May 2007 17:46:07 GMT

<?xml version="1.0" encoding="utf-8"?>
<Settings xmlns="Settings:">
<Status>1</Status>
  <Oof>
    <Status>1</Status>
    <Get>
      <OofState>2</OofState>
      <StartTime>2007-05-08T10:45:51.250Z</StartTime>
```

```
      <EndTime>2007-05-11T10:45:51.250Z</EndTime>
      <OofMessage>
        <AppliesToInternal />
        <Enabled>1</Enabled>
        <ReplyMessage>Internal OOF Message</ReplyMessage>
       <BodyType>HTML</BodyType>
      </OofMessage>
      <OofMessage>
        <AppliesToExternalKnown />
        <Enabled>1</Enabled>
        <ReplyMessage>External OOF Message</ReplyMessage>
         <BodyType>HTML</BodyType>
       </OofMessage>
       <OofMessage>
       <AppliesToExternalUnknown /><Enabled>0</Enabled>
       <ReplyMessage>External OOF Message</ReplyMessage>
       <BodyType>HTML</BodyType>
     </OofMessage>
    </Get>
  </Oof>
</Settings>
```

4.2.2 Turning On the OOF Message

The client wants to turn on the OOF message. The client has to update the OOF status by using the **Set** command.

```
POST /Microsoft-Server-
ActiveSync?Cmd=Settings&User=deviceuser&DeviceId=device1&DeviceType=Poc
ketPC HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 12.1
User-Agent: Microsoft-SmartPhone/2.5
Host: somehost

<?xml version="1.0" encoding="utf-8"?>
<Settings xmlns="Settings:">
```

```
<Oof>
  <Set>
    <OofState>2</OofState>
    <OofMessage>
      <AppliesToInternal/>
      <Enabled>1</Enabled>
      <ReplyMessage> &lt;html&gt;&lt;head&gt;&lt;meta
      http-equiv="Content-Type" content="text/html;
      charset=utf-8"&gt;&lt;style&gt;@font-face
      {font-family:Verdana}p.MsoNormal, li.MsoNormal,
      div.MsoNormal {margin:0in; margin-bottom:.0001pt;
      font-size:10.0pt; font-family:Verdana} a:link,
      span.MsoHyperlink {color:blue; text-
      decoration:underline}a:visited,
      span.MsoHyperlinkFollowed {color:purple;
      text-decoration:underline} span.EmailStyle17
      {font-family:Arial; color:windowtext} @page Section1
      {margin:1.0in 1.25in 1.0in 1.25in} div.Section1 {}
      &lt;/style&gt; &lt;/head&gt; &lt;body lang="EN-US"
      link="blue" vlink="purple"&gt; &lt;div class="Section1"&gt;
      &lt;p class="MsoNormal"&gt;&lt;font size="2"
      face="Arial"&gt;&lt;span style="font-size:10.0pt;
      font-family:Arial"&gt;I'll be out of the office
      today.&lt;/span&gt;&lt;/font&gt;&lt;/p&gt; &lt;/div&gt;
      &lt;/body&gt;&lt;/html&gt;</ReplyMessage>
      <BodyType>HTML</BodyType>
    </OofMessage>
    <OofMessage>
      <AppliesToExternalKnown/>
      <Enabled>0</Enabled>
    </OofMessage>
    <OofMessage>
      <AppliesToExternalUnknown/>
      <Enabled>0</Enabled>
```

```
      </OofMessage>
    </Set>
  </Oof>
</Settings>
```

The server responds with status, to indicate that OOF was successfully enabled.

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 20
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
MS-Server-ActiveSync: 8.1
Date: Tue, 08 May 2007 17:45:09 GMT

<?xml version="1.0" encoding="utf-8"?>
<Settings xmlns="Settings:">
  <Status>1</Status>
  <Oof>
    <Status>1</Status>
  </Oof>
</Settings>
```

4.2.3 Turning Off the OOF Message

The client wants to turn off the OOF message. The client has to update the OOF status by using the **Set** command.

```
POST /Microsoft-Server-
ActiveSync?Cmd=Settings&User=deviceuser&DeviceId=device1&DeviceType=Poc
ketPC HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 12.1
User-Agent: Microsoft-SmartPhone/2.5
Host: somehost

<?xml version="1.0" encoding="utf-8"?>
<Settings xmlns="Settings:">
  <Oof>
```

```
    <Set>
      <OofState>0</OofState>
    </Set>
  </Oof>
</Settings>
```

The server responds with status, to indicate that OOF was successfully disabled.

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 20
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
MS-Server-ActiveSync: 8.1
Date: Tue, 08 May 2007 17:45:09 GMT

<?xml version="1.0" encoding="utf-8"?>
<Settings xmlns="Settings:">
  <Status>1</Status>
  <Oof>
    <Status>1</Status>
  </Oof>
</Settings>
```

4.3 Accessing Documents on File Shares and URIs

Use the following process to retrieve an item from a Windows® SharePoint® Services or Universal Naming Convention (UNC) site:

1. Issue a **Search** command, specifying the link to the folder. The server will return folder/item metadata, specifying the ID, file name, size, and so on for the item. For instructions on completing this task, see **Issuing a Search for Item Metadata**.
2. Issue the **ItemOperations** command, specifying the ID from the item metadata. For instructions on completing this task, see **Fetching an Item Based on Metadata**.

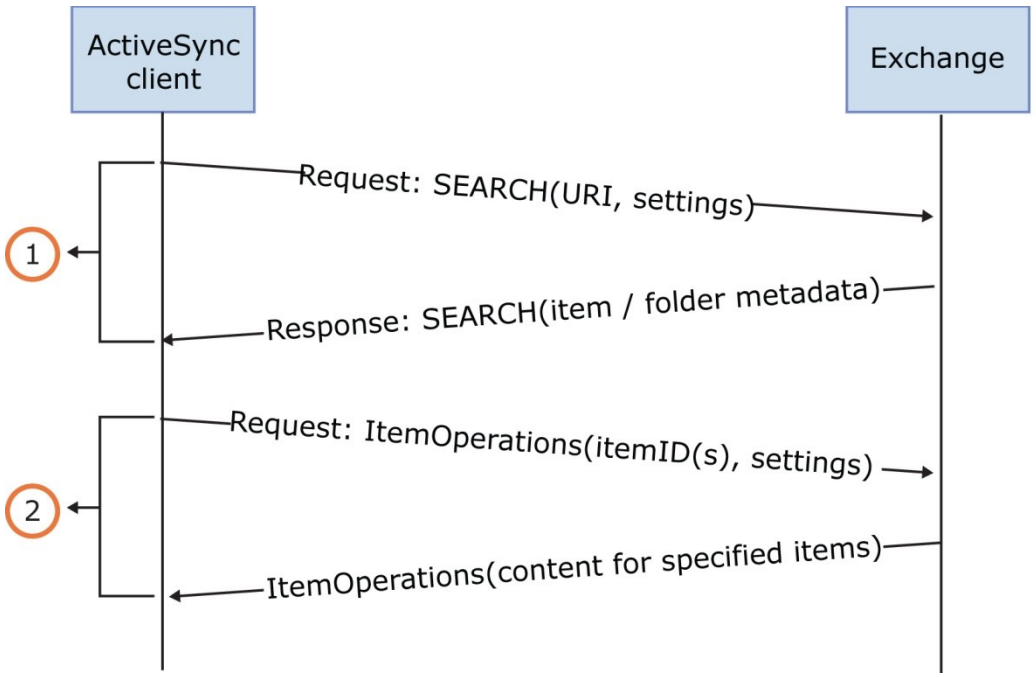
In issuing request 2, the following are considerations for the client pertaining to the size of the file to be retrieved:

- Does the client want to have the item content returned inline in the WAP binary XML (WBXML), or as separate body parts in the HTTP response? Using

WBXML might be easier to implement, but might consume more memory on the device, depending on how the response parser on the device is implemented.

- What is the maximum number of bytes of item content that the client wants to have returned in one response? (Successive requests can be used to obtain the remaining content.)

The following figure shows the request and response pattern that is used to find and retrieve an item located on a Windows SharePoint Services or UNC site.



4.3.1 Issuing a Search for Item Metadata

As illustrated in the figure, the client first issues a search request to the server to retrieve metadata about the item (if the URI points to an item) or the items (if the URI points to a folder). The client then does the following:

- Indicates that the client is searching a document library store by using the **Name** element.
- Specifies the URI as the <Value> in an <EqualTo> query.
- Specifies the range of results that the client wants to have returned in the response.

In this case, the client is attempting to retrieve metadata for the files in a UNC share.

```
POST /Microsoft-Server-
ActiveSync?Cmd=Search&User=deviceuser&DeviceId=device1&DeviceType=
SmartPhone HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 12.1
```

```
User-Agent: Microsoft-SmartPhone/2.5
Host: somehost

<?xml version="1.0" encoding="utf-8"?>
<Search xmlns:documentlibrary="DocumentLibrary:"
xmlns="Search:">
  <Store>
    <Name>DocumentLibrary</Name>
    <Query>
      <EqualTo>
        <documentlibrary:LinkId/>
        <Value>\\somehost\directory</Value>
      </EqualTo>
    </Query>
    <Options>
      <Range>0-999</Range>
    </Options>
  </Store>
</Search>
```

The response from the server contains the metadata for the folder and items. The very first node in the response is always the top-level node, followed by its children (if there are children).

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 529
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
MS-Server-ActiveSync: 8.1
Date: Tue, 08 May 2007 17:28:25 GMT
<?xml version="1.0" encoding="utf-8"?>
<Search xmlns:documentlibrary="DocumentLibrary:" xmlns="Search:">
  <Status>1</Status>
  <Response>
```

```
<Store>
  <Status>1</Status>
  <Result>
    <Properties>
      <documentlibrary:LinkId>\\somehost\directory
      </documentlibrary:LinkId>
      <documentlibrary:DisplayName>directory
      </documentlibrary:DisplayName>
      <documentlibrary:IsFolder>1
      </documentlibrary:IsFolder>
      <documentlibrary:CreationDate>2007-05-08T17:28:15.375Z
      </documentlibrary:CreationDate>
      <documentlibrary:LastModifiedDate>2007-05-08T17:28:15.406Z
      </documentlibrary:LastModifiedDate>
      <documentlibrary:IsHidden>0</documentlibrary:IsHidden>
    </Properties>
  </Result>
  <Result>
    <Properties>
      <documentlibrary:LinkId>\\somehost\directory\resource
      </documentlibrary:LinkId>
      <documentlibrary:DisplayName>resource
      </documentlibrary:DisplayName>
      <documentlibrary:IsFolder>1</documentlibrary:IsFolder>
      <documentlibrary:CreationDate>2004-03-02T12:34:56.123Z
      </documentlibrary:CreationDate>
      <documentlibrary:LastModifiedDate>2005-04-03T12:34:56.345Z
      </documentlibrary:LastModifiedDate>
      <documentlibrary:IsHidden>0</documentlibrary:IsHidden>
    </Properties>
  </Result>
  <Result>
    <Properties>
      <documentlibrary:LinkId>\\somehost\directory\TestFile.txt
```

```
            </documentlibrary:LinkId>
            <documentlibrary:DisplayName>TestFile.txt
            </documentlibrary:DisplayName>
            <documentlibrary:IsFolder>0</documentlibrary:IsFolder>
            <documentlibrary:CreationDate>2004-03-02T12:34:56.123Z
            </documentlibrary:CreationDate>
            <documentlibrary:LastModifiedDate>2005-04-03T12:34:56.345Z
            </documentlibrary:LastModifiedDate>
            <documentlibrary:IsHidden>0</documentlibrary:IsHidden>
            <documentlibrary:ContentLength>88
            </documentlibrary:ContentLength>
            <documentlibrary:ContentType>text/plain
            </documentlibrary:ContentType>
          </Properties>
        </Result>
        <Range>0-2</Range>
        <Total>3</Total>
      </Store>
    </Response>
</Search>
```

4.3.2 Fetching an Item Based on Metadata

When document library is used to provide item or folder metadata, the client can retrieve a file within a document library by using the **ItemOperations** command and specifying the **LinkId** of the item. In this case, the client also specifies that the client only requires bytes from 10 through 19 of the item returned in this request.

```
POST /Microsoft-Server-
ActiveSync?Cmd=ItemOperations&User=deviceuser&DeviceId=device1&
DeviceType=SmartPhone HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 12.1
User-Agent: Microsoft-SmartPhone/2.5
Host: somehost

<?xml version="1.0" encoding="utf-8"?>
```

```
<ItemOperations xmlns:documentlibrary="DocumentLibrary:"
xmlns="ItemOperations:">
  <Fetch>
    <Store>DocumentLibrary</Store>
    <documentlibrary:LinkId>\\somehost\directory\
    ActiveSyncDocumentFetch.txt</documentlibrary:LinkId>
    <Options>
      <Range>10-19</Range>
    </Options>
  </Fetch>
</ItemOperations>
```

The response from the server contains the requested item. The binary content of the file is Base64-encoded and is included in the **Data** element.

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 167
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
MS-Server-ActiveSync: 8.1
Date: Tue, 08 May 2007 17:28:53 GMT

<?xml version="1.0" encoding="utf-8"?>
<ItemOperations xmlns:documentlibrary="DocumentLibrary:"
xmlns="ItemOperations:">
  <Status>1</Status>
  <Response>
    <Fetch>
      <Status>1</Status>
      <documentlibrary:LinkId>\\somehost\directory\
      ActiveSyncDocumentFetch.txt</documentlibrary:LinkId>
      <Properties>
        <Range>10-19</Range>
        <Total>26</Total>
```

```
        <Data>S0xNTk9QUVJTVA==</Data>
        <Version>2005-04-03T12:34:56.345Z</Version>
      </Properties>
    </Fetch>
  </Response>
</ItemOperations>
```

4.4 Searching for an Item in the Exchange Mailbox

This section provides sample messages used to perform keyword searches and forward search results for items in the mailbox.

4.4.1 Keyword Search

In the following example, the client is searching the Inbox in the mailbox by using the keyword Presentation. The client has asked for the first 5 results and specified that it wants text bodies returned for the results. Note that the content of the **FreeText** element is not case-sensitive.

XML Request

```
POST /Microsoft-Server-
ActiveSync?Cmd=Search&User=deviceuser&DeviceId=device1&DeviceType=Smart
Phone HTTP/1.1
Content-Type: application/vnd.ms-sync.wbxml
MS-ASProtocolVersion: 12.1
User-Agent: Microsoft-SmartPhone/2.5
Host: somehost

<?xml version="1.0" encoding="utf-8"?>
<Search xmlns="Search:" xmlns:airsync="AirSync:"
xmlns:email="POOMMAIL:">
<Store>
  <Name>Mailbox</Name>
    <Query>
      <And>
        <airsync:Class>Email</airsync:Class>
        <airsync:CollectionId>7</airsync:CollectionId>
        <FreeText>Presentation</FreeText>
      </And>
```

```
    </Query>
    <Options>
      <RebuildResults />
      <Range>0-4</Range>
    </Options>
  </Store>
</Search>
```

XML Response

```
HTTP/1.1 200 OK
Cache-Control: private
Content-Length: 423
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
MS-Server-ActiveSync: 8.1
Date: Tue, 08 May 2007 17:42:07 GMT

<?xml version="1.0" encoding="utf-8"?><Search xmlns:airsync="AirSync:"
xmlns:email="POOMMAIL:" xmlns:airsyncbase="AirSyncBase:"
xmlns="Search:">
<Status>1</Status>
  <Response>
    <Store>
      <Status>1</Status>
      <Result>
        <airsync:Class>Email</airsync:Class>
        <LongId>RgAAAACYWCHnyBZ%2fTq8bujFmR1EPBwBzyWfENpcEQ7
        zUNyaWwM4BAAAA8FxEAABzyWfENpcEQ7zUNyaWwM4BAAAA8HACAAAJ</LongId>
        <airsync:CollectionId>7</airsync:CollectionId>
        <Properties>
          <email:To>"deviceuser" &lt;someone1@example.com&gt;
          </email:To>
          <email:From>"deviceuser2"&lt;someone1@example.com&gt;
          </email:From>
```

```
          <email:Subject>Presentation</email:Subject>
          <email:DateReceived>2007-05-08T17:41:58.000Z
          </email:DateReceived>
          <email:DisplayTo>DeviceUserDisplayName</email:DisplayTo>
          <email:Read>1</email:Read>
          <airsyncbase:Body>
            <airsyncbase:Type>1</airsyncbase:Type>
            <airsyncbase:EstimatedDataSize>6
            </airsyncbase:EstimatedDataSize>
            <airsyncbase:Truncated>1</airsyncbase:Truncated>
          </airsyncbase:Body>
          <email:MessageClass>IPM.Note</email:MessageClass>
          <email:InternetCPID>28591</email:InternetCPID>
          <email:Flag />
          <email:ContentClass>urn:content-classes:message
          </email:ContentClass>
          <airsyncbase:NativeBodyType>1</airsyncbase:NativeBodyType>
        </Properties>
      </Result>
      <Range>0-0</Range>
      <Total>1</Total>
    </Store>
  </Response>
</Search>
```

4.4.2 Forward a Search Result

The client can then take the **LongId** for any given search result and forward the item.

```
POST Microsoft-Server-
ActiveSync?User=rich&DeviceId=6F24CAD599A5BF1A690246B8C68F
AE8D&DeviceType=PocketPC&Cmd=SmartForward&LongId=RgAAAADdpC58
tdlTTY7tQhya20GHBwAiBQ4MPELpSI0QbZGxqTWyAAAA8%2bycAABNRh2Abh
XqSqcG01BXnsqBAAAB2ytlAAAI&SaveInSent=T
Accept-Language: en-us
MS-ASProtocolVersion: 12.1
```

```
Content-Type: message/rfc822
X-MS-PolicyKey: 3942919513

-=-=-=- Start of Body -=-=-=-
MIME-Version: 1.0
content-class:
From:
Subject: FW: rx
Date: Thu, 27 Apr 2006 13:11:01 -0800
Importance: normal
X-Priority: 3
To: <rich@adventure-works.com>
Content-Transfer-Encoding: quoted-printable
Content-Type: text/plain; charset="utf-8"

-----Original Message-----
From: Shola Aluko <shola@adventure-works.com>
Sent: Tuesday, April 25, 2006 10:43 AM
To: Rich Haddock <rich@adventure-works.com>
Subject: rx

HTTP/1.1 200 OK
Connection: Keep-Alive
Content-Length: 0
Date: Thu, 27 Apr 2006 20:11:11 GMT
Server: Microsoft-IIS/6.0
X-Powered-By: ASP.NET
X-AspNet-Version: 2.0.50727
MS-Server-ActiveSync: 8.0
Cache-Control: private
```

4.5 Downloading the Current Server Security Policy

This section provides a walkthrough of the messages that are used to download the current server security policy.

4.5.1 Phase 1: Enforcement

In the following example, the client attempts the **FolderSync** command, which is denied by the server by using the HTTP 449 code because the server has determined that the device does not have the current policy (as denoted by the X-MS-PolicyKey header).

Request

```
POST Microsoft-Server-
ActiveSync?User=deviceuser&DeviceId=6F24CAD599A5BF1A690246B8C68FAE8D
&DeviceType=PocketPC&Cmd=FolderSync
Accept-Language: en-us
MS-ASProtocolVersion: 12.1
Content-Type: application/vnd.ms-sync.wbxml
X-MS-PolicyKey: 0

<?xml version="1.0" encoding="utf-8"?>
<FolderSync xmlns="FolderHierarchy:">
  <SyncKey>0</SyncKey>
</FolderSync>
```

Response

```
HTTP/1.1 449 Retry after sending a PROVISION command
Connection: Keep-Alive
Content-Length: 0
Date: Mon, 01 May 2006 20:15:10 GMT
Server: Microsoft-IIS/6.0
X-Powered-By: ASP.NET
X-AspNet-Version: 2.0.50727
MS-Server-ActiveSync: 8.0
Cache-Control: private
```

4.5.2 Phase 2: Client Downloads Policy from Server

In this phase, the client downloads the policy from the server and receives a temporary **PolicyKey**. The client will later use the **PolicyKey** to acknowledge the policy and in doing so obtain a key that will enable the client to successfully execute protocol commands against the server.

Request

```
POST Microsoft-Server-
ActiveSync?User=deviceuser&DeviceId=6F24CAD599A5BF1A690246B8C68FAE8D&De
viceType=PocketPC&Cmd=Provision
Accept-Language: en-us
MS-ASProtocolVersion: 12.1
Content-Type: application/vnd.ms-sync.wbxml
X-MS-PolicyKey: 0

<?xml version="1.0" encoding="utf-8"?>
<Provision xmlns="Provision:">
  <Policies>
    <Policy>
      <PolicyType> MS-EAS-Provisioning-WBXML</PolicyType>
    </Policy>
  </Policies>
</Provision>
```

Response

```
HTTP/1.1 200 OK
Connection: Keep-Alive
Content-Length: 1069
Date: Mon, 01 May 2006 20:15:15 GMT
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
X-Powered-By: ASP.NET
X-AspNet-Version: 2.0.50727
MS-Server-ActiveSync: 8.0
Cache-Control: private


<?xml version="1.0" encoding="utf-8"?>
<Provision xmlns="Provision:">
  <Status>1</Status>
  <Policies>
    <Policy>
```

```
      <PolicyType>MS-EAS-Provisioning-WBXML</PolicyType>
      <Status>1</Status>
      <PolicyKey>1307199584</PolicyKey>
      <Data>
        <eas-provisioningdoc>
          <DevicePasswordEnabled>1</DevicePasswordEnabled>
          <AlphanumericDevicePasswordRequired>1
          </AlphanumericDevicePasswordRequired>
          <PasswordRecoveryEnabled>1</PasswordRecoveryEnabled>
          <DeviceEncryptionEnabled>1</DeviceEncryptionEnabled>
          <AttachmentsEnabled>1</AttachmentsEnabled>
          <MinDevicePasswordLength/>
          <MaxInactivityTimeDeviceLock>333
          </MaxInactivityTimeDeviceLock>
          <MaxDevicePasswordFailedAttempts>8
          </MaxDevicePasswordFailedAttempts>
          <MaxAttachmentSize/>
          <AllowSimpleDevicePassword>0</AllowSimpleDevicePassword>
          <DevicePasswordExpiration/>
          <DevicePasswordHistory>0</DevicePasswordHistory>
<AllowStorageCard>1</AllowStorageCard>
          <AllowCamera>1</AllowCamera>
          <RequireDeviceEncryption>1</RequireDeviceEncryption>
          <AllowUnsignedApplications>1</AllowUnsignedApplications>

<AllowUnsignedInstallationPackages>1</AllowUnsignedInstallationPackages
>

<MinDevicePasswordComplexCharacters>3</MinDevicePasswordComplexCharacte
rs>
          <AllowWiFi>1</AllowWiFi>
          <AllowTextMessaging>1</AllowTextMessaging>
          <AllowPOPIMAPEmail>1</AllowPOPIMAPEmail>
          <AllowBluetooth>2</AllowBluetooth>
          <AllowIrDA>1</AllowIrDA>
```

```
<RequireManualSyncWhenRoaming>0</RequireManualSyncWhenRoaming>
          <AllowDesktopSync>1</AllowDesktopSync>
          <MaxCalendarAgeFilter>0</MaxCalendarAgeFilter>
          <AllowHTMLEmail>1</AllowHTMLEmail>
          <MaxEmailAgeFilter>0</MaxEmailAgeFilter>
          <MaxEmailBodyTruncationSize>-1</MaxEmailBodyTruncationSize>
          <MaxEmailHTMLBodyTruncationSize>-
1</MaxEmailHTMLBodyTruncationSize>
          <RequireSignedSMIMEMessages>0</RequireSignedSMIMEMessages>

<RequireEncryptedSMIMEMessages>0</RequireEncryptedSMIMEMessages>
          <RequireSignedSMIMEAlgorithm>0</RequireSignedSMIMEAlgorithm>

<RequireEncryptionSMIMEAlgorithm>0</RequireEncryptionSMIMEAlgorithm>

<AllowSMIMEEncryptionAlgorithmNegotiation>2</AllowSMIMEEncryptionAlgori
thmNegotiation>
          <AllowSMIMESoftCerts>1</AllowSMIMESoftCerts>
          <AllowBrowser>1</AllowBrowser>
          <AllowConsumerEmail>1</AllowConsumerEmail>
          <AllowRemoteDesktop>1</AllowRemoteDesktop>
          <AllowInternetSharing>1</AllowInternetSharing>
          <UnapprovedInROMApplicationList/>
          <ApprovedApplicationList/>
        </eas-provisioningdoc>
      </Data>
    </Policy>
  </Policies>
</Provision>
```

4.5.3 Phase 3: Client Acknowledges Receipt and Application of Policy Settings

The client acknowledges the policy download and policy application by using the temporary **PolicyKey** obtained in phase 2. In this case, the client has indicated compliance and provided the correct **PolicyKey**. Therefore, the server responds with the "final" **PolicyKey** which the client must use in the X-MS-PolicyKey header of successive command requests to satisfy policy enforcement.

Request

```
POST Microsoft-Server-
ActiveSync?User=deviceuser&DeviceId=6F24CAD599A5BF1A690246B8C68FAE8D&De
viceType=PocketPC&Cmd=Provision
Accept-Language: en-us
MS-ASProtocolVersion: 12.1
Content-Type: application/vnd.ms-sync.wbxml
X-MS-PolicyKey: 1307199584

<?xml version="1.0" encoding="utf-8"?>
<Provision xmlns="Provision:">
  <Policies>
    <Policy>
      <PolicyType>MS-EAS-Provisioning-WBXML</PolicyType>
      <PolicyKey>1307199584</PolicyKey>
      <Status>1</Status>
    </Policy>
  </Policies>
</Provision>
```

Response

```
HTTP/1.1 200 OK
Connection: Keep-Alive
Content-Length: 63
Date: Mon, 01 May 2006 20:15:17 GMT
Content-Type: application/vnd.ms-sync.wbxml
Server: Microsoft-IIS/6.0
X-Powered-By: ASP.NET
X-AspNet-Version: 2.0.50727
MS-Server-ActiveSync: 8.0
Cache-Control: private


<?xml version="1.0" encoding="utf-8"?>
<Provision xmlns="Provision:">
```

```
  <Status>1</Status>
  <Policies>
    <Policy>
      <PolicyType>MS-EAS-Provisioning-WBXML </PolicyType>
      <Status>1</Status>
      <PolicyKey>3942919513</PolicyKey>
    </Policy>
  </Policies>
</Provision>
```

4.5.4 Phase 4: Client Performs FolderSync by Using the Final PolicyKey

The client uses the "final" policy key obtained in phase 3 in the header of the **FolderSync** command request.

Request

```
POST Microsoft-Server-
ActiveSync?User=deviceuser&DeviceId=6F24CAD599A5BF1A690246B8C68FAE8D&De
viceType=PocketPC&Cmd=Provision
Accept-Language: en-us
MS-ASProtocolVersion: 12.1
Content-Type: application/vnd.ms-sync.wbxml
X-MS-PolicyKey: 3942919513

<?xml version="1.0" encoding="utf-8"?>
<FolderSync xmlns="FolderHierarchy:">
  <SyncKey>0</SyncKey>
</FolderSync>
```

5 Security

5.1 Security Considerations for Implementers

The device MUST honor all policies sent down by the server, or send up the appropriate status codes indicating the non-success.

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:

- Office 2003 with Service Pack 3 applied
- Exchange 2003 with Service Pack 2 applied
- Office 2007 with Service Pack 1 applied
- Exchange 2007 with Service Pack 1 applied

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 1: For more information about the Exchange protocols, see [MS-OXPROTO].

<2> Section 2.2.1.16: The **Search** command provides support for the following:

- The ability to search the Exchange mailbox
- The ability to browse the Microsoft Windows SharePoint Services technology Document Libraries or Universal Naming Convention (UNC) Shares

Mailbox and Windows SharePoint Services and UNC are represented as new stores within the **Search** command, and each has associated options, query, and schema.

<3> Section 2.2.1.16: The information is configured by using the Set-ActiveSyncVirtualDirectory Windows PowerShell cmdlet in the Exchange Management Shell.

<4> Section 2.2.1.16.1.11: For an Exchange 2007 Mailbox search, the following classes are supported:

- Email
- Calendar
- Contacts
- Tasks

<5> Section 2.2.1.18: In Microsoft Exchange Server 2007, the **Settings** command is used to perform the following operations:

- Get or set the out of office (OOF) settings for the user.

- Send device information to the computer that is running Exchange Server for display in the user and IT interfaces.
- Implement the device password—that is, the personal identification number (PIN)—recovery.
- Retrieve a list of a user's e-mail addresses.

<6> Section 2.2.1.18.1.8: Note: Exchange 2007 requires that the reply message for unknown external and known external audiences be the same.

<7> Section 2.2.1.18.1.14: Note: Exchange 2007 requires that the reply message for unknown external and known external audiences be the same.

<8> Section 2.2.1.18.2.9: Note: Exchange 2007 requires that the reply message for unknown external and known external audiences be the same.