

[MS-OXCEXT]: Client Extension Message Object Protocol Specification

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Revision Summary

Date	Revision History	Revision Class	Comments
04/27/2012	0.1	New	Released new document.
07/16/2012	0.2	Minor	Clarified the meaning of the technical content.

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Preliminary

1 Introduction

The Client Extension Message Object Protocol allows clients to access **mail app** data stored in a **mailbox**.

Sections 1.8, 2, and 3 of this specification are normative and can contain the terms MAY, SHOULD, MUST, MUST NOT, and SHOULD NOT as defined in RFC 2119. Sections 1.5 and 1.9 are also normative but cannot contain those terms. All other sections and examples in this specification are informative.

1.1 Glossary

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

big-endian
GUID
GUIDString
property set
remote procedure call (RPC)

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

base64 encoding
Calendar object
conversation
dictionary
E-mail object
FAI contents table
JavaScript Object Notation (JSON)
mail app
mailbox
Message object
named property
property name
property tag
Recurring Calendar object
remote operation (ROP)
ROP response
Simple Mail Transfer Protocol (SMTP)
Uniform Resource Locator (URL)
XML document
XML schema

The following terms are specific to this document:

MAY, SHOULD, MUST, SHOULD NOT, MUST NOT: These terms (in all caps) are used as described in [\[RFC2119\]](#). All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

1.2 References

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

1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information. Please check the archive site, <http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624>, as an additional source.

[MS-DTYP] Microsoft Corporation, "[Windows Data Types](#)".

[MS-OWEMXML] Microsoft Corporation, "[Office Web Extensibility Manifest Format Specification](#)".

[MS-OXCDATA] Microsoft Corporation, "[Data Structures](#)".

[MS-OXCMSG] Microsoft Corporation, "[Message and Attachment Object Protocol Specification](#)".

[MS-OXCNOTIF] Microsoft Corporation, "[Core Notifications Protocol Specification](#)".

[MS-OXCPRPT] Microsoft Corporation, "[Property and Stream Object Protocol Specification](#)".

[MS-OXCROPS] Microsoft Corporation, "[Remote Operations \(ROP\) List and Encoding Protocol Specification](#)".

[MS-OXCTABL] Microsoft Corporation, "[Table Object Protocol Specification](#)".

[MS-OXOCFG] Microsoft Corporation, "[Configuration Information Protocol Specification](#)".

[MS-OXPROPS] Microsoft Corporation, "[Exchange Server Protocols Master Property List](#)".

[MS-OXWSCORE] Microsoft Corporation, "[Core Items Web Service Protocol Specification](#)".

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

[XMLSCHEMA2/2] Biron, P.V., Ed. and Malhotra, A., Ed., "XML Schema Part 2: Datatypes Second Edition", W3C Recommendation, October 2004, <http://www.w3.org/TR/xmlschema-2>

1.2.2 Informative References

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

[MS-OWEXML] Microsoft Corporation, "[Office Web Extensibility Extensions to Office Open XML Structure Specification](#)".

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

1.3 Overview

This protocol enables email clients that use **remote procedure call (RPC)** to access user mailboxes, as described in [\[MS-OXCMSG\]](#), to read and write data that is used to support mail apps. A typical scenario for using this protocol is an email client that supports mail apps that extend email or meeting requests, as described in [\[MS-OWEXML\]](#).

This protocol defines the following:

- A method for clients to request notification of changes to the installed and enabled mail apps for the mailbox.

- A method for clients to derive a web services item identifier (as described in [\[MS-OXWScore\]](#) section 2.2.4.18) for a **Message object**.
- The location and format of mail app-specific configuration data.
- The location and format of mail app-specific custom properties on Message objects.
- The location and format of known entity data on Message objects, as described in [\[MS-OWEMXML\]](#).

1.4 Relationship to Other Protocols

This protocol uses the **remote operations (ROPs)** described in the Message and Attachment Object Protocol, described in [\[MS-OXCMSG\]](#), and the Property and Stream Object Protocol, described in [\[MS-OXCPRPT\]](#), to access data contained in Message objects and configuration data, as described in [\[MS-OXOCFG\]](#). This protocol also uses the Core Notifications Protocol described in [\[MS-OXCNOTIF\]](#) to register for notifications.

This protocol is used by clients that implement support for mail apps, as described in [\[MS-OWEXML\]](#) and the Office Web Extensibility Manifest Format, as described in [\[MS-OWEMXML\]](#).

1.5 Prerequisites/Preconditions

None.

1.6 Applicability Statement

This protocol is designed to enable email clients that use RPC to access user mailboxes on the server to implement support for mail apps, as described in [\[MS-OWEXML\]](#). This protocol provides the locations and formats of data stored in user mailboxes required to support mail apps.

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 uses the protocols specified in [\[MS-OXCMSG\]](#) and [\[MS-OXCPRPT\]](#) as its transport mechanism.

2.2 Message Syntax

2.2.1 Known Entity Properties

The following properties contain information about known entities, as specified in [\[MS-OWEMXML\]](#), contained in Message objects.

- **PidNameExtractedAddresses** (section [2.2.1.1](#))
- **PidNameExtractedContacts** (section [2.2.1.2](#))
- **PidNameExtractedEmails** (section [2.2.1.3](#))
- **PidNameExtractedMeetings** (section [2.2.1.4](#))
- **PidNameExtractedPhones** (section [2.2.1.5](#))
- **PidNameExtractedTasks** (section [2.2.1.6](#))
- **PidNameExtractedUrls** (section [2.2.1.7](#))

2.2.1.1 PidNameExtractedAddresses Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The value of the **PidNameExtractedAddresses** property ([\[MS-OXPROPS\]](#) section 2.466) on a Message object contains an **XML document** with a single **AddressSet** element.

2.2.1.2 PidNameExtractedContacts Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The value of the **PidNameExtractedContacts** property ([\[MS-OXPROPS\]](#) section 2.467) on a Message object contains an XML document with a single **ContactSet** element.

2.2.1.3 PidNameExtractedEmails Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The value of the **PidNameExtractedEmails** property ([\[MS-OXPROPS\]](#) section 2.468) on a Message object contains an XML document with a single **EmailSet** element.

2.2.1.4 PidNameExtractedMeetings Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The value of the **PidNameExtractedMeetings** property ([\[MS-OXPROPS\]](#) section 2.469) on a Message object contains an XML document with a single **MeetingSet** element.

2.2.1.5 PidNameExtractedPhones Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The value of the **PidNameExtractedPhones** property ([\[MS-OXPROPS\]](#) section 2.470) on a Message object contains an XML document with a single **PhoneSet** element.

2.2.1.6 PidNameExtractedTasks Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The value of the **PidNameExtractedTasks** property ([\[MS-OXPROPS\]](#) section 2.471) on a Message object contains an XML document with a single **TaskSet** element.

2.2.1.7 PidNameExtractedUrls Property

Type: **PtypString** ([\[MS-OXCDATA\]](#) section 2.11.1)

The value of the **PidNameExtractedUrls** ([\[MS-OXPROPS\]](#) section 2.472) property on a Message object contains an XML document with a single **UrlSet** element.

2.2.2 Known Entity XML

The properties specified in section [2.2.1.1](#) through section [2.2.1.7](#) contain XML documents that use the elements, complex types, simple types, and attributes specified in section [2.2.2.1](#) through section [2.2.2.4.6.2](#).

2.2.2.1 Elements

The set of common **XML schema** element definitions defined by this specification is summarized in the following table.

Element	Description
Address (section 2.2.2.1.1)	Specifies a postal or street address.
Addresses (section 2.2.2.1.2)	Specifies a list of postal or street addresses.
AddressSet (section 2.2.2.1.3)	Specifies a set of address known entities.
Assignees (section 2.2.2.1.4)	Specifies a set of assignees for a task.
Attendees (section 2.2.2.1.5)	Specifies a set of attendees for a meeting.
Business (section 2.2.2.1.6)	Specifies information about a business.
BusinessString (section 2.2.2.1.7)	Specifies the name of a business.
Contact (section 2.2.2.1.8)	Specifies information about a contact.
Contacts (section 2.2.2.1.9)	Specifies a list of contacts.
ContactSet (section 2.2.2.1.10)	Specifies a set of contact known entities.
ContactString (section 2.2.2.1.11)	Specifies the name of a contact.
Email (section 2.2.2.1.12)	Specifies information about an email address.

Element	Description
Emails (section 2.2.2.1.13)	Specifies a list of email addresses.
EmailSet (section 2.2.2.1.14)	Specifies a set of email address known entities.
EmailString (section 2.2.2.1.15)	Specifies an email address.
EmailUser (section 2.2.2.1.16)	Specifies information about an email user.
EndTime (section 2.2.2.1.17)	Specifies the end date and time of a meeting.
Meeting (section 2.2.2.1.18)	Specifies information about a meeting suggestion.
Meetings (section 2.2.2.1.19)	Specifies a list of meeting suggestions.
MeetingSet (section 2.2.2.1.20)	Specifies a set of meeting known entities.
MeetingString (section 2.2.2.1.21)	Specifies a string that represents a meeting suggestion.
OriginalPhoneString (section 2.2.2.1.22)	Specifies a phone number prior to normalization.
Person (section 2.2.2.1.23)	Specifies information about a person.
PersonString (section 2.2.2.1.24)	Specifies the name of a person.
Phone (section 2.2.2.1.25)	Specifies information about a phone number.
Phones (section 2.2.2.1.26)	Specifies a list of phone numbers.
PhoneSet (section 2.2.2.1.27)	Specifies a set of phone number known entities.
PhoneString (section 2.2.2.1.28)	Specifies a normalized phone number.
StartTime (section 2.2.2.1.29)	Specifies the start date and time of a meeting.
Task (section 2.2.2.1.30)	Specifies information about a task suggestion.
Tasks (section 2.2.2.1.31)	Specifies a list of task suggestions.
TaskSet (section 2.2.2.1.32)	Specifies a set of task known entities.
TaskString (section 2.2.2.1.33)	Specifies a string that represents a task suggestion.
Url (section 2.2.2.1.34)	Specifies information about a URL .
Urls (section 2.2.2.1.35)	Specifies a list of URLs.
UrlSet (section 2.2.2.1.36)	Specifies a set of URL known entities.
UrlString (section 2.2.2.1.37)	Specifies a URL.
Version (section 2.2.2.1.38)	Specifies the version of the XML schema that applies to the XML document.

2.2.2.1.1 Address Element

Type: **Address** (section [2.2.2.2.1](#))

The **Address** element contains a string that represents a postal or street address. It is an optional child element of the **Addresses** element specified in section [2.2.2.1.2](#).

```
<xs:element minOccurs="0" maxOccurs="unbounded" name="Address"
  nillable="true" type="Address" />
```

2.2.2.1.2 Addresses Element

Type: **ArrayOfAddress** (section [2.2.2.2.3](#))

The **Addresses** element contains a list of postal or street addresses. It is an optional child element of the **AddressSet** element specified in section [2.2.2.1.3](#) and the **Contact** element specified in section [2.2.2.1.8](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="Addresses" type="ArrayOfAddress" />
```

2.2.2.1.3 AddressSet Element

Type: **AddressSet** (section [2.2.2.2.2](#))

The **AddressSet** element is the root element for the XML document contained in the **PidNameExtractedAddresses** property specified in section [2.2.1.1](#). This element contains the known entities that represent addresses, as specified in [\[MS-OWEMXML\]](#).

```
<xs:element name="AddressSet" nillable="true" type="AddressSet" />
```

2.2.2.1.4 Assignees Element

Type: **ArrayOfEmailUser** (section [2.2.2.2.6](#))

The **Assignees** element contains a list of assignees for a task. It is an optional child element of the **Task** element specified in section [2.2.2.1.30](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="Assignees" type="ArrayOfEmailUser" />
```

2.2.2.1.5 Attendees Element

Type: **ArrayOfEmailUser** (section [2.2.2.2.6](#))

The **Attendees** element contains a list of attendees for a meeting. It is an optional child element of the **Meeting** element specified in section [2.2.2.1.18](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="Attendees" type="ArrayOfEmailUser" />
```

2.2.2.1.6 Business Element

Type: **Business** (section [2.2.2.2.11](#))

The **Business** element contains elements that represent the name of a business. It is an optional child element of the **Contact** element specified in section [2.2.2.1.8](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="Business" type="Business" />
```

2.2.2.1.7 BusinessString Element

Type: **xs:string** ([\[XMLSCHEMA2/2\]](#) section 3.2.1)

The **BusinessString** element contains a string that represents the name of a business. It is an optional child element of the **Business** element specified in section [2.2.2.1.6](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="BusinessString" type="xs:string" />
```

2.2.2.1.8 Contact Element

Type: **Contact** (section [2.2.2.2.12](#))

The **Contact** element contains information about a contact, such as name, phone number, or email address. It is an optional child element of the **Contacts** element specified in section [2.2.2.1.9](#).

```
<xs:element minOccurs="0" maxOccurs="unbounded" name="Contact"
  nillable="true" type="Contact" />
```

2.2.2.1.9 Contacts Element

Type: **ArrayOfContact** (section [2.2.2.2.4](#))

The **Contacts** element contains a list of contacts. It is an optional child element of the **ContactSet** element specified in section [2.2.2.1.9](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="Contacts" type="ArrayOfContact" />
```

2.2.2.1.10 ContactSet Element

Type: **ContactSet** (section [2.2.2.2.13](#))

The **ContactSet** element is the root element for the XML document contained in the **PidNameExtractedContacts** property specified in section [2.2.1.2](#). This element contains the known entities that represent contacts, as specified in [\[MS-OWEMXML\]](#).

```
<xs:element name="ContactSet" nillable="true" type="ContactSet" />
```

2.2.2.1.11 ContactString Element

Type: **xs:string** ([\[XMLSCHEMA2/2\]](#) section 3.2.1)

The **ContactString** element contains a string that represents a contact. It is an optional child element of the **Contact** element specified in section [2.2.2.1.8](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="ContactString" type="xs:string" />
```

2.2.2.1.12 Email Element

Type: **Email** (section [2.2.2.2.14](#))

The **Email** element contains elements that represent an email address. It is an optional child element of the **Emails** element specified in section [2.2.2.1.13](#).

```
<xs:element minOccurs="0" maxOccurs="unbounded" name="Email" nillable="true" type="Email" />
```

2.2.2.1.13 Emails Element

Type: **ArrayOfEmail** (section [2.2.2.2.5](#))

The **Emails** element contains a list of email addresses. It is an optional child element of the **EmailSet** element specified in section [2.2.2.1.14](#) and the **Contact** element specified in section [2.2.2.1.8](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="Emails" type="ArrayOfEmail" />
```

2.2.2.1.14 EmailSet Element

Type: **EmailSet** (section [2.2.2.2.15](#))

The **EmailSet** element is the root element for the XML document contained in the **PidNameExtractedEmails** property specified in section [2.2.1.3](#). This element contains the known entities that represent email addresses, as specified in [\[MS-OWEMXML\]](#).

```
<xs:element name="EmailSet" nillable="true" type="EmailSet" />
```

2.2.2.1.15 EmailString Element

Type: **xs:string** ([\[XMLSCHEMA2/2\]](#) section 3.2.1)

The **EmailString** element contains a string that represents an email address. It is an optional child element of the **Email** element specified in section [2.2.2.1.12](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="EmailString" type="xs:string" />
```

2.2.2.1.16 EmailUser Element

Type: **EmailUser** (section [2.2.2.2.16](#))

The **EmailUser** element contains a string that represents an email user. It is an optional child element of the **Attendees** element specified in section [2.2.2.1.5](#).

```
<xs:element minOccurs="0" maxOccurs="unbounded" name="EmailUser" nillable="true" type="EmailUser" />
```

2.2.2.1.17 EndTime Element

Type: **xs:dateTime** ([\[XMLSCHEMA2/2\]](#) section 3.2.7)

The **EndTime** element contains the date and time when the meeting ends. It is a required child element of the **Meeting** element specified in section [2.2.2.1.18](#).

```
<xs:element minOccurs="1" maxOccurs="1" name="EndTime" nillable="true" type="xs:dateTime" />
```

2.2.2.1.18 Meeting Element

Type: **Meeting** (section [2.2.2.2.17](#))

The **Meeting** element contains elements that represent a meeting suggestion. It is an optional child element of the **Meetings** element specified in section [2.2.2.1.19](#).

```
<xs:element minOccurs="0" maxOccurs="unbounded" name="Meeting" nillable="true" type="Meeting" />
```

2.2.2.1.19 Meetings Element

Type: **ArrayOfMeeting** (section [2.2.2.2.7](#))

The **Meetings** element contains a list of meeting suggestions. It is an optional child element of the **MeetingSet** element specified in section [2.2.2.1.20](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="Meetings" type="ArrayOfMeeting" />
```

2.2.2.1.20 MeetingSet Element

Type: **MeetingSet** (section [2.2.2.2.18](#))

The **MeetingSet** element is the root element for the XML document contained in the **PidNameExtractedMeetings** property specified in section [2.2.1.4](#). This element contains the known entities that represent meeting suggestions, as specified in [\[MS-OWEMXML\]](#).

```
<xs:element name="MeetingSet" nillable="true" type="MeetingSet" />
```

2.2.2.1.21 MeetingString Element

Type: **xs:string** ([\[XMLSCHEMA2/2\]](#) section 3.2.1)

The **MeetingString** element contains the string from the Message object that represents the meeting suggestion. It is an optional child element of the **Meeting** element specified in section [2.2.2.1.18](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="MeetingString" type="xs:string" />
```


2.2.2.1.22 OriginalPhoneString Element

Type: **xs:string** ([\[XMLSCHEMA2/2\]](#) section 3.2.1)

The **OriginalPhoneString** element contains the original string (before normalization) from the Message object that represents a phone number. It is an optional child element of the **Phone** element specified in section [2.2.2.1.25](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="OriginalPhoneString" type="xs:string" />
```

2.2.2.1.23 Person Element

Type: **Person** (section [2.2.2.2.19](#))

The **Person** element contains elements that represent a person's name. It is an optional child element of the **Contact** element specified in section [2.2.2.1.8](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="Person" type="Person" />
```

2.2.2.1.24 PersonString Element

Type: **xs:string** ([\[XMLSCHEMA2/2\]](#) section 3.2.1)

The **PersonString** element contains a string that represents a person's name. It is an optional child element of the **Person** element specified in section [2.2.2.1.23](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="PersonString" type="xs:string" />
```

2.2.2.1.25 Phone Element

Type: **Phone** (section [2.2.2.2.20](#))

The **Phone** element contains elements that represent a phone number. It is an optional child element of the **Phones** element specified in section [2.2.2.1.26](#).

```
<xs:element minOccurs="0" maxOccurs="unbounded" name="Phone" nillable="true" type="Phone" />
```

2.2.2.1.26 Phones Element

Type: **ArrayOfPhone** (section [2.2.2.2.8](#))

The **Phones** element contains a list of phone numbers. It is an optional child element of the **PhoneSet** element specified in section [2.2.2.1.27](#) and the **Contact** element specified in section [2.2.2.1.8](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="Phones" type="ArrayOfPhone" />
```

2.2.2.1.27 PhoneSet Element

Type: **PhoneSet** (section [2.2.2.2.21](#))

The **PhoneSet** element is the root element for the XML document contained in the **PidNameExtractedPhones** property specified in section [2.2.1.5](#). This element contains the known entities that represent phone numbers, as specified in [\[MS-OWEMXML\]](#).

```
<xs:element name="PhoneSet" nillable="true" type="PhoneSet" />
```

2.2.2.1.28 PhoneString Element

Type: **xs:string** ([\[XMLSCHEMA2/2\]](#) section 3.2.1)

The **PhoneString** element contains a string that represents a normalized phone number. The normalized phone number is based on the value of the **OriginalPhoneString** element (section [2.2.2.1.22](#)) and is the result of modifying that value into a standard, consistent format. It is an optional child element of the **Phone** element specified in section [2.2.2.1.25](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="PhoneString" type="xs:string" />
```

2.2.2.1.29 StartTime Element

Type: **xs:dateTime** ([\[XMLSCHEMA2/2\]](#) section 3.2.7)

The **StartTime** element contains the date and time when the meeting starts. It is a required child element of the **Meeting** element specified in section [2.2.2.1.18](#).

```
<xs:element minOccurs="1" maxOccurs="1" name="StartTime"
  nillable="true" type="xs:dateTime" />
```

2.2.2.1.30 Task Element

Type: **Task** (section [2.2.2.2.22](#))

The **Task** element contains elements that represent a task suggestion. It is an optional child element of the **Tasks** element specified in section [2.2.2.1.31](#).

```
<xs:element minOccurs="0" maxOccurs="unbounded" name="Task" nillable="true" type="Task" />
```

2.2.2.1.31 Tasks Element

Type: **ArrayOfTask** (section [2.2.2.2.9](#))

The **Tasks** element contains a list of task suggestions. It is an optional child element of the **TaskSet** element specified in section [2.2.2.1.32](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="Tasks" type="ArrayOfTask" />
```

2.2.2.1.32 TaskSet Element

Type: **TaskSet** (section [2.2.2.2.23](#))

The **TaskSet** element is the root element for the XML document contained in the **PidNameExtractedTasks** property specified in section [2.2.1.6](#). This element contains the known entities that represent task suggestions, as specified in [\[MS-OWEMXML\]](#).

```
<xs:element name="TaskSet" nillable="true" type="TaskSet" />
```

2.2.2.1.33 TaskString Element

Type: **xs:string** ([\[XMLSCHEMA2/2\]](#) section 3.2.1)

The **TaskString** element contains a string that describes the task suggestion. It is an optional child element of the **Task** element specified in section [2.2.2.1.30](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="TaskString" type="xs:string" />
```

2.2.2.1.34 Url Element

Type: **Url** (section [2.2.2.2.24](#))

The **Url** element contains elements that represent a URL. It is an optional child element of the **Urls** element specified in section [2.2.2.1.35](#).

```
<xs:element minOccurs="0" maxOccurs="unbounded" name="Url" nillable="true" type="Url" />
```

2.2.2.1.35 Urls Element

Type: **ArrayOfUrl** (section [2.2.2.2.10](#))

The **Urls** element contains a list of URLs. It is an optional child element of the **UriSet** element specified in section [2.2.2.1.36](#) and the **Contact** element specified in section [2.2.2.1.8](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="Urls" type="ArrayOfUrl" />
```

2.2.2.1.36 UriSet Element

Type: **UriSet** (section [2.2.2.2.25](#))

The **UriSet** element is the root element for the XML document contained in the **PidNameExtractedUrls** property specified in section [2.2.1.7](#). This element contains the known entities that represent URLs, as specified in [\[MS-OWEMXML\]](#).

```
<xs:element name="UriSet" nillable="true" type="UriSet" />
```

2.2.2.1.37 UriString Element

Type: **xs:string** ([\[XMLSCHEMA2/2\]](#) section 3.2.1)

The **UriString** element contains a string that represents a URL. It is an optional child element of the **Uri** element specified in section [2.2.2.1.34](#).

```
<xs:element minOccurs="0" maxOccurs="1" name="UrlString" type="xs:string" />
```

2.2.2.1.38 Version Element

Type: **Version** (section [2.2.2.2.26](#))

The **Version** element contains a string that describes the version of the XML schema that applies to the XML document. The value of this element MUST be "15.0.0.0". It is an optional child element of the following elements:

- **AddressSet** (section [2.2.2.1.3](#))
- **ContactSet** (section [2.2.2.1.10](#))
- **EmailSet** (section [2.2.2.1.14](#))
- **MeetingSet** (section [2.2.2.1.20](#))
- **PhoneSet** (section [2.2.2.1.27](#))
- **TaskSet** (section [2.2.2.1.32](#))
- **UriSet** (section [2.2.2.1.36](#))

```
<xs:element minOccurs="0" maxOccurs="1" name="Version" type="Version" />
```

2.2.2.2 Complex Types

The set of common XML schema complex type definitions defined by this specification is summarized in the following table.

Complex type	Description
Address (section 2.2.2.2.1)	Contains information that describes an address known entity.
AddressSet (section 2.2.2.2.2)	Contains information that describes a set of address known entities.
ArrayOfAddress (section 2.2.2.2.3)	Contains a list of addresses.
ArrayOfContact (section 2.2.2.2.4)	Contains a list of contacts.
ArrayOfEmail (section 2.2.2.2.5)	Contains a list of email addresses.
ArrayOfEmailUser (section 2.2.2.2.6)	Contains a list of email users.
ArrayOfMeeting (section 2.2.2.2.7)	Contains a list of meeting suggestions.
ArrayOfPhone (section 2.2.2.2.8)	Contains a list of phone numbers.
ArrayOfTask (section 2.2.2.2.9)	Contains a list of task suggestions.

Complex type	Description
2.2.2.2.9)	
ArrayOfUrl (section 2.2.2.2.10)	Contains a list of URLs.
Business (section 2.2.2.2.11)	Contains information that describes a business.
Contact (section 2.2.2.2.12)	Contains information that describes a contact.
ContactSet (section 2.2.2.2.13)	Contains information that describes a set of contact known entities.
Email (section 2.2.2.2.14)	Contains information that describes an email address.
EmailSet (section 2.2.2.2.15)	Contains information that describes a set of email address known entities.
EmailUser (section 2.2.2.2.16)	Contains information that describes an email user.
Meeting (section 2.2.2.2.17)	Contains information that describes a meeting suggestion.
MeetingSet (section 2.2.2.2.18)	Contains information that describes a set of meeting suggestion known entities.
Person (section 2.2.2.2.19)	Contains information that describes a person.
Phone (section 2.2.2.2.20)	Contains information that describes a phone number.
PhoneSet (section 2.2.2.2.21)	Contains information that describes a set of phone number known entities.
Task (section 2.2.2.2.22)	Contains information that describes a task suggestion.
TaskSet (section 2.2.2.2.23)	Contains information that describes a set of task suggestion known entities.
Url (section 2.2.2.2.24)	Contains information that describes a URL.
UrlSet (section 2.2.2.2.25)	Contains information that describes a set of URL known entities.
Version (section 2.2.2.2.26)	Contains information that describes the version of the XML schema that applies to the XML document.

2.2.2.2.1 Address Complex Type

The **Address** type contains information that describes a known entity that represents a postal or street address.

```

<xs:complexType name="Address">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute default="-1" name="StartIndex" type="xs:int" />
      <xs:attribute default="LatestReply" name="Position"
        type="EmailPosition" />
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

```

The value of elements of this type is the string representation of a postal or street address.

StartIndex: Indicates the location of the entity, relative to the value of the **Position** attribute. For more details, see section [2.2.2.4.4](#).

Position: Indicates the location of the entity within the Message object. For more details, see section [2.2.2.4.3](#).

2.2.2.2.2 AddressSet Complex Type

The **AddressSet** type contains information that describes a set of known entities that represent postal or street addresses.

```
<xs:complexType name="AddressSet">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Version" type="Version" />
    <xs:element minOccurs="0" maxOccurs="1" name="Addresses"
      type="ArrayOfAddress" />
  </xs:sequence>
</xs:complexType>
```

Version: Indicates the version of the XML schema that applies to the parent XML document. For more details, see section [2.2.2.1.38](#).

Addresses: Contains a list of known entities that represent postal or street addresses. For more details, see section [2.2.2.1.2](#).

2.2.2.2.3 ArrayOfAddress Complex Type

The **ArrayOfAddress** type contains zero or more **Address** elements.

```
<xs:complexType name="ArrayOfAddress">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Address"
      nillable="true" type="Address" />
  </xs:sequence>
</xs:complexType>
```

Address: Contains information about a single postal or street address. For more details, see section [2.2.2.1.1](#).

2.2.2.2.4 ArrayOfContact Complex Type

The **ArrayOfContact** type contains zero or more **Contact** elements.

```
<xs:complexType name="ArrayOfContact">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Contact"
      nillable="true" type="Contact" />
  </xs:sequence>
</xs:complexType>
```

Contact: Contains information about a single contact. For more details, see section [2.2.2.1.8](#).

2.2.2.2.5 ArrayOfEmail Complex Type

The **ArrayOfEmail** type contains zero or more **Email** elements.

```
<xs:complexType name="ArrayOfEmail">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Email"
      nillable="true" type="Email" />
  </xs:sequence>
</xs:complexType>
```

Email: Contains information about a single email address. For more details, see section [2.2.2.1.12](#).

2.2.2.2.6 ArrayOfEmailUser Complex Type

The **ArrayOfEmailUser** type contains zero or more **EmailUser** elements.

```
<xs:complexType name="ArrayOfEmailUser">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="EmailUser"
      nillable="true" type="EmailUser" />
  </xs:sequence>
</xs:complexType>
```

EmailUser: Contains information about a single email user. For more details, see section [2.2.2.1.16](#).

2.2.2.2.7 ArrayOfMeeting Complex Type

The **ArrayOfMeeting** type contains zero or more **Meeting** elements.

```
<xs:complexType name="ArrayOfMeeting">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Meeting"
      nillable="true" type="Meeting" />
  </xs:sequence>
</xs:complexType>
```

Meeting: Contains information about a single meeting. For more details, see section [2.2.2.1.18](#).

2.2.2.2.8 ArrayOfPhone Complex Type

The **ArrayOfPhone** type contains zero or more **Phone** elements.

```
<xs:complexType name="ArrayOfPhone">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Phone"
      nillable="true" type="Phone" />
  </xs:sequence>
</xs:complexType>
```

Phone: Contains information about a single phone number. For more details, see section [2.2.2.1.25](#).

2.2.2.2.9 ArrayOfTask Complex Type

The **ArrayOfTask** type contains zero or more **Task** elements.

```
<xs:complexType name="ArrayOfTask">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Task"
      nillable="true" type="Task" />
  </xs:sequence>
</xs:complexType>
```

Task: Contains information about a single task. For more details, see section [2.2.2.1.30](#).

2.2.2.2.10 ArrayOfUrl Complex Type

The **ArrayOfUrl** type contains zero or more **Url** elements.

```
<xs:complexType name="ArrayOfUrl">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Url"
      nillable="true" type="Url" />
  </xs:sequence>
</xs:complexType>
```

Url: Contains information about a single URL. For more details, see section [2.2.2.1.34](#).

2.2.2.2.11 Business Complex Type

The **Business** type contains information that describes a known entity that represents a business associated with a contact.

```
<xs:complexType name="Business">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="BusinessString"
      type="xs:string" />
  </xs:sequence>
  <xs:attribute default="-1" name="StartIndex" type="xs:int" />
  <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
</xs:complexType>
```

BusinessString: Contains the name of the business. For more details, see section [2.2.2.1.7](#).

StartIndex: Indicates the location of the entity, relative to the value of the **Position** attribute. For more details, see section [2.2.2.4.4](#).

Position: Indicates the location of the entity within the Message object. For more details, see section [2.2.2.4.3](#).

2.2.2.2.12 Contact Complex Type

The **Contact** type contains information that describes a known entity that represents a contact.

```
<xs:complexType name="Contact">
  <xs:sequence>
```



```

<xs:element minOccurs="0" maxOccurs="1" name="Person" type="Person" />
<xs:element minOccurs="0" maxOccurs="1" name="Business" type="Business" />
<xs:element minOccurs="0" maxOccurs="1" name="Phones"
  type="ArrayOfPhone" />
<xs:element minOccurs="0" maxOccurs="1" name="Urls" type="ArrayOfUrl" />
<xs:element minOccurs="0" maxOccurs="1" name="Emails"
  type="ArrayOfEmail" />
<xs:element minOccurs="0" maxOccurs="1" name="Addresses"
  type="ArrayOfAddress" />
<xs:element minOccurs="0" maxOccurs="1" name="ContactString"
  type="xs:string" />
</xs:sequence>
</xs:complexType>

```

Person: If present, this element contains the name of person represented by the contact. For more details, see section [2.2.2.1.23](#).

Business: If present, this element contains the name of a business associated with the contact. For more details, see section [2.2.2.1.6](#).

Phones: If present, this element contains the phone numbers associated with the contact. For more details, see section [2.2.2.1.26](#).

Urls: If present, this element contains the URLs associated with the contact. For more details, see section [2.2.2.1.35](#).

Emails: If present, this element contains the email addresses associated with the contact. For more details, see section [2.2.2.1.13](#).

Addresses: If present, this element contains the postal or street addresses associated with the contact. For more details, see section [2.2.2.1.2](#).

ContactString: If present, this element contains the text from the Message object that indicates a contact. For more details, see section [2.2.2.1.11](#).

2.2.2.2.13 ContactSet Complex Type

The **ContactSet** type contains information that describes a set of known entities that represent contacts.

```

<xs:complexType name="ContactSet">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Version" type="Version" />
    <xs:element minOccurs="0" maxOccurs="1" name="Contacts"
      type="ArrayOfContact" />
  </xs:sequence>
</xs:complexType>

```

Version: Indicates the version of the XML schema that applies to the parent XML document. For more details, see section [2.2.2.1.38](#).

Contacts: Contains a list of known entities that represent contacts. For more details, see section [2.2.2.1.9](#).

2.2.2.2.14 Email Complex Type

The **Email** type contains information that describes a known entity that represents an email address.

```
<xs:complexType name="Email">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="EmailString"
      type="xs:string" />
  </xs:sequence>
  <xs:attribute default="-1" name="StartIndex" type="xs:int" />
  <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
</xs:complexType>
```

EmailString: Contains an email address. For more details, see section [2.2.2.1.15](#).

StartIndex: Indicates the location of the entity, relative to the value of the **Position** attribute. For more details, see section [2.2.2.4.4](#).

Position: Indicates the location of the entity within the Message object. For more details, see section [2.2.2.4.3](#).

2.2.2.2.15 EmailSet Complex Type

The **EmailSet** type contains information that describes a set of known entities that represent email addresses.

```
<xs:complexType name="EmailSet">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Version" type="Version" />
    <xs:element minOccurs="0" maxOccurs="1" name="Emails"
      type="ArrayOfEmail" />
  </xs:sequence>
</xs:complexType>
```

Version: Indicates the version of the XML schema that applies to the parent XML document. For more details, see section [2.2.2.1.38](#).

Emails: Contains a list of known entities that represent email addresses. For more details, see section [2.2.2.1.13](#).

2.2.2.2.16 EmailUser Complex Type

The **EmailUser** type contains information that describes an email user.

```
<xs:complexType name="EmailUser">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="Id" type="xs:string" />
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

The value of an element of this type is the name of the user.

Id: Contains a unique identifier for the user, such as the user's **Simple Mail Transfer Protocol (SMTP)** address. For more details, see section [2.2.2.4.1](#).

2.2.2.2.17 Meeting Complex Type

The **Meeting** type contains information that describes a known entity that represents a meeting suggestion.

```
<xs:complexType name="Meeting">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="MeetingString"
      type="xs:string" />
    <xs:element minOccurs="0" maxOccurs="1" name="Attendees"
      type="ArrayOfEmailUser" />
    <xs:element minOccurs="1" maxOccurs="1" name="StartTime" nillable="true"
      type="xs:dateTime" />
    <xs:element minOccurs="1" maxOccurs="1" name="EndTime" nillable="true"
      type="xs:dateTime" />
  </xs:sequence>
  <xs:attribute name="Location" type="xs:string" />
  <xs:attribute name="Subject" type="xs:string" />
  <xs:attribute default="-1" name="StartIndex" type="xs:int" />
  <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
</xs:complexType>
```

MeetingString: Contains the text from the Message object that indicates a meeting suggestion. For more details, see section [2.2.2.1.21](#).

Attendees: Contains the attendees of the meeting. For more details, see section [2.2.2.1.5](#).

StartTime: Contains the date and time the meeting is scheduled to start. For more details, see section [2.2.2.1.29](#).

EndTime: Contains the date and time the meeting is scheduled to end. For more details, see section [2.2.2.1.17](#).

Location: Contains the location of the meeting. For more details, see section [2.2.2.4.2](#).

Subject: Contains the subject of the meeting. For more details, see section [2.2.2.4.5](#).

StartIndex: Indicates the location of the entity, relative to the value of the **Position** attribute. For more details, see section [2.2.2.4.4](#).

Position: Indicates the location of the entity within the Message object. For more details, see section [2.2.2.4.3](#).

2.2.2.2.18 MeetingSet Complex Type

The **MeetingSet** type contains information that describes a set of known entities that represent meeting suggestions.

```
<xs:complexType name="MeetingSet">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Version" type="Version" />
    <xs:element minOccurs="0" maxOccurs="1" name="Meetings"
      type="ArrayOfMeeting" />
  </xs:sequence>
</xs:complexType>
```

```
</xs:sequence>
</xs:complexType>
```

Version: Indicates the version of the XML schema that applies to the parent XML document. For more details, see section [2.2.2.1.38](#).

Meetings: Contains a list of known entities that represent meetings. For more details, see section [2.2.2.1.19](#).

2.2.2.2.19 Person Complex Type

The **Person** type contains information that describes a known entity that represents a person associated with a contact.

```
<xs:complexType name="Person">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="PersonString"
      type="xs:string" />
  </xs:sequence>
  <xs:attribute default="-1" name="StartIndex" type="xs:int" />
  <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
</xs:complexType>
```

PersonString: Contains the name of the person. For more details, see section [2.2.2.1.24](#).

StartIndex: Indicates the location of the entity, relative to the value of the **Position** attribute. For more details, see section [2.2.2.4.4](#).

Position: Indicates the location of the entity within the Message object. For more details, see section [2.2.2.4.3](#).

2.2.2.2.20 Phone Complex Type

The **Phone** type contains information that describes a known entity that represents a phone number.

```
<xs:complexType name="Phone">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="PhoneString"
      type="xs:string" />
    <xs:element minOccurs="0" maxOccurs="1" name="OriginalPhoneString"
      type="xs:string" />
  </xs:sequence>
  <xs:attribute default="-1" name="StartIndex" type="xs:int" />
  <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
  <xs:attribute default="Unspecified" name="Type" type="PhoneType" />
</xs:complexType>
```

PhoneString: Contains the normalized phone number associated with the known entity. For more details, see section [2.2.2.1.28](#)

OriginalPhoneString: Contains the original string from the Message object that represents the phone number associated with the known entity. For more details, see section [2.2.2.1.22](#).

StartIndex: Indicates the location of the entity, relative to the value of the **Position** attribute. For more details, see section [2.2.2.4.4](#).

Position: Indicates the location of the entity within the Message object. For more details, see section [2.2.2.4.3](#).

Type: Indicates the type of phone number. For more details, see section [2.2.2.4.6.1](#).

2.2.2.2.21 PhoneSet Complex Type

The **PhoneSet** type contains information that describes a set of known entities that represent phone numbers.

```
<xs:complexType name="PhoneSet">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Version" type="Version" />
    <xs:element minOccurs="0" maxOccurs="1" name="Phones"
      type="ArrayOfPhone" />
  </xs:sequence>
</xs:complexType>
```

Version: Indicates the version of the XML schema that applies to the parent XML document. For more details, see section [2.2.2.1.38](#).

Phones: Contains a list of known entities that represent phone numbers. For more details, see section [2.2.2.1.26](#).

2.2.2.2.22 Task Complex Type

The **Task** type contains information that describes a known entity that represents a task suggestion.

```
<xs:complexType name="Task">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="TaskString"
      type="xs:string" />
    <xs:element minOccurs="0" maxOccurs="1" name="Assignees"
      type="ArrayOfEmailUser" />
  </xs:sequence>
  <xs:attribute default="-1" name="StartIndex" type="xs:int" />
  <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
</xs:complexType>
```

TaskString: Contains a string that describes the task suggestion. For more details, see section [2.2.2.1.33](#).

Assignees: Contains a list of assignees for the task. For more details, see section [2.2.2.1.4](#).

StartIndex: Indicates the location of the entity, relative to the value of the **Position** attribute. For more details, see section [2.2.2.4.4](#).

Position: Indicates the location of the entity within the Message object. For more details, see section [2.2.2.4.3](#).

2.2.2.2.23 TaskSet Complex Type

The **TaskSet** type contains information that describes a set of known entities that represent task suggestions.

```
<xs:complexType name="TaskSet">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Version" type="Version" />
    <xs:element minOccurs="0" maxOccurs="1" name="Tasks" type="ArrayOfTask" />
  </xs:sequence>
</xs:complexType>
```

Version: Indicates the version of the XML schema that applies to the parent XML document. For more details, see section [2.2.2.1.38](#).

Tasks: Contains a list of known entities that represent tasks. For more details, see section [2.2.2.1.31](#).

2.2.2.2.24 Url Complex Type

The **Url** type contains information that describes a known entity that represents a URL.

```
<xs:complexType name="Url">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="UrlString"
      type="xs:string" />
  </xs:sequence>
  <xs:attribute default="-1" name="StartIndex" type="xs:int" />
  <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
  <xs:attribute default="Unspecified" name="Type" type="UrlType" />
</xs:complexType>
```

UrlString: Contains the URL. For more details, see section [2.2.2.1.37](#).

StartIndex: Indicates the location of the entity, relative to the value of the **Position** attribute. For more details, see section [2.2.2.4.4](#).

Position: Indicates the location of the entity within the Message object. For more details, see section [2.2.2.4.3](#).

Type: Indicates the type of URL. For more details, see section [2.2.2.4.6.2](#).

2.2.2.2.25 UriSet Complex Type

The **UriSet** type contains information that describes a set of known entities that represent URLs.

```
<xs:complexType name="UriSet">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Version" type="Version" />
    <xs:element minOccurs="0" maxOccurs="1" name="Uris" type="ArrayOfUri" />
  </xs:sequence>
</xs:complexType>
```

Version: Indicates the version of the XML schema that applies to the parent XML document. For more details, see section [2.2.2.1.38](#).

Urls: Contains a list of known entities that represent URLs. For more details, see section [2.2.2.1.35](#).

2.2.2.2.26 Version Complex Type

The **Version** type contains information about the version of the XML schema that applies to the parent XML document.

```
<xs:complexType name="Version" />
```

2.2.2.3 Simple Types

The set of common XML schema simple type definitions defined by this specification is summarized in the following table.

Simple type	Description
EmailPosition (section 2.2.2.3.1)	Specifies the portion of a Message object where a known entity is located.
PhoneType (section 2.2.2.3.2)	Specifies the type of a phone number.
UriType (section 2.2.2.3.3)	Specifies the type of a URL.

2.2.2.3.1 EmailPosition Simple Type

The **EmailPosition** type is used by the **Position** attribute, as specified in section [2.2.2.4.3](#), to indicate the portion of the Message object where a known entity is located.

```
<xs:simpleType name="EmailPosition">  
  <xs:restriction base="xs:string">  
    <xs:enumeration value="LatestReply" />  
    <xs:enumeration value="Subject" />  
    <xs:enumeration value="Signature" />  
    <xs:enumeration value="Other" />  
  </xs:restriction>  
</xs:simpleType>
```

The possible values for attributes of this type are specified in the following table.

Value	Meaning
"LatestReply"	The known entity is located in the most recent reply in a conversation .
"Subject"	The known entity is located in the subject of the message.
"Signature"	The known entity is located in the sender's signature within the most recent reply in a conversation.
"Other"	The known entity is located in the body of the message and does not meet the criteria for the other three values.

2.2.2.3.2 PhoneType Simple Type

The **PhoneType** type is used by the **Type** attribute, as specified in section [2.2.2.4.6.1](#), on the **Phone** element, as specified in section [2.2.2.1.25](#), to indicate the type of phone number associated with the known entity.

```
<xs:simpleType name="PhoneType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Unspecified" />
    <xs:enumeration value="Home" />
    <xs:enumeration value="Mobile" />
    <xs:enumeration value="Work" />
    <xs:enumeration value="Fax" />
  </xs:restriction>
</xs:simpleType>
```

The possible values for attributes of this type are specified in the following table.

Value	Meaning
"Unspecified"	The type of phone number is unavailable.
"Home"	The phone number is for a home phone.
"Mobile"	The phone number is for a mobile phone.
"Work"	The phone number is for a work phone.
"Fax"	The phone number is for a fax machine.

2.2.2.3.3 UriType Simple Type

The **UriType** type is used by the **Type** attribute, as specified in section [2.2.2.4.6.2](#), on the **Uri** element, as specified in section [2.2.2.1.34](#), to indicate the type of URL associated with the known entity.

```
<xs:simpleType name="UriType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Unspecified" />
    <xs:enumeration value="Uri" />
    <xs:enumeration value="Filename" />
  </xs:restriction>
</xs:simpleType>
```

The possible values for attributes of this type are specified in the following table.

Value	Meaning
"Unspecified"	The type of URL is unavailable.
"Uri"	The URL is for a remote resource, such as a website or a file on a network share.
"Filename"	The URL is for a local file.

2.2.2.4 Attributes

The set of common XML schema attribute definitions defined by this specification is summarized in the following table.

Attribute	Description
Id (section 2.2.2.4.1)	Specifies a unique identifier for an email user.
Location (section 2.2.2.4.2)	Specifies the location of a meeting.
Position (section 2.2.2.4.3)	Specifies the location of a known entity within a Message object.
StartIndex (section 2.2.2.4.4)	Specifies the location of a known entity, relative to the value of the Position attribute.
Subject (section 2.2.2.4.5)	Specifies the subject of a meeting.
Type (section 2.2.2.4.6)	Specifies the type of a phone number or URL.

2.2.2.4.1 Id Attribute

Type: **xs:string** ([\[XMLSCHEMA2/2\]](#) section 3.2.1)

The **Id** attribute specifies a unique identifier for an email user, such as an SMTP address. It is used on elements of the **EmailUser** type, as specified in section [2.2.2.2.16](#).

```
<xs:attribute name="Id" type="xs:string" />
```

2.2.2.4.2 Location Attribute

Type: **xs:string** ([\[XMLSCHEMA2/2\]](#) section 3.2.1)

The **Location** attribute specifies the location of a meeting. It is used on elements of the **Meeting** type, as specified in section [2.2.2.2.17](#).

```
<xs:attribute name="Location" type="xs:string" />
```

2.2.2.4.3 Position Attribute

Type: **EmailPosition** (section [2.2.2.3.1](#))

The **Position** attribute specifies the location of a known entity within a Message object. It is used by the following complex types:

- **Address**, as specified in section [2.2.2.2.1](#)
- **Business**, as specified in section [2.2.2.2.11](#)
- **Email**, as specified in section [2.2.2.2.14](#)
- **Meeting**, as specified in section [2.2.2.2.17](#)
- **Person**, as specified in section [2.2.2.2.19](#)

- **Phone**, as specified in section [2.2.2.2.20](#)
- **Task**, as specified in section [2.2.2.2.22](#)
- **Url**, as specified in section [2.2.2.2.24](#)

```
<xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
```

2.2.2.4.4 StartIndex Attribute

Type: **xs:int** ([\[XMLSCHEMA2/2\]](#) section 3.3.17)

The **StartIndex** attribute is an integer that specifies the location of a known entity, relative to the value of the **Position** attribute, as specified in section [2.2.2.4.3](#). It is used by the following complex types:

- **Address**, as specified in section [2.2.2.2.1](#)
- **Business**, as specified in section [2.2.2.2.11](#)
- **Email**, as specified in section [2.2.2.2.14](#)
- **Meeting**, as specified in section [2.2.2.2.17](#)
- **Person**, as specified in section [2.2.2.2.19](#)
- **Phone**, as specified in section [2.2.2.2.20](#)
- **Task**, as specified in section [2.2.2.2.22](#)
- **Url**, as specified in section [2.2.2.2.24](#)

The meaning of this attribute depends on the value of the **Position** attribute on the containing element.

If the **Position** attribute has a value of "Subject", the value of the **StartIndex** attribute is the number of characters from the beginning of the subject of the message.

For all other values of the **Position** attribute, the value of the **StartIndex** attribute is the number of characters from the beginning of the plain text representation of the body of the message.

A value of -1 indicates that the exact location of the known entity is unavailable.

```
<xs:attribute default="-1" name="StartIndex" type="xs:int" />
```

2.2.2.4.5 Subject Attribute

Type: **xs:string** ([\[XMLSCHEMA2/2\]](#) section 3.2.1)

The **Subject** attribute specifies the subject of a meeting. It is used by elements of the **Meeting** type, as specified in section [2.2.2.2.17](#).

```
<xs:attribute name="Subject" type="xs:string" />
```

2.2.2.4.6 Type Attribute

The type and meaning of the **Type** attribute depend on the type of the element that contains the attribute. The **Type** attribute is used on elements of the following types:

- **Phone**, as specified in section [2.2.2.2.20](#)
- **Url**, as specified in section [2.2.2.2.24](#)

For details on the **Type** attribute when used on an element of type **Phone**, see section [2.2.2.4.6.1](#). For details on the **Type** attribute when used on an element of type **Url**, see section [2.2.2.4.6.2](#).

2.2.2.4.6.1 Type Attribute (Phone)

Type: **PhoneType** (section [2.2.2.3.2](#))

The **Type** attribute specifies the type of phone number associated with a known entity. It is used on elements of the **Phone** type, as specified in section [2.2.2.2.20](#).

```
<xs:attribute default="Unspecified" name="Type" type="PhoneType" />
```

2.2.2.4.6.2 Type Attribute (Url)

Type: **UrlType** (section [2.2.2.3.3](#))

The **Type** attribute specifies the type of URL associated with a known entity. It is used on elements of the **Url** type, as specified in section [2.2.2.2.24](#).

```
<xs:attribute default="Unspecified" name="Type" type="UrlType" />
```

2.2.3 Mail App Configuration Data

Mail app-specific configuration data is stored as **dictionary** configuration data in the user's inbox, as specified in [\[MS-OXOCFG\]](#) section 2.2.5.1. The value of the **PidTagMessageClass** property ([\[MS-OXCMSG\]](#) section 2.2.1.3) on the Message object that stores the dictionary configuration data is set to "IPM.Configuration.ClientExtension.<ID>", where "<ID>" is replaced with a value derived from the value of the **Id** child element of the **OfficeWebExtension** element that represents the mail app in the mail app manifest, as specified in [\[MS-OWEMXML\]](#). The value is generated by removing any nonalphanumeric characters from the value of the **Id** element.

The client-specific configuration data is stored in **JavaScript Object Notation (JSON)** in a name-value pair in an **e** element in the **PidTagRoamingDictionary** property ([\[MS-OXOCFG\]](#) section 2.2.2.2), as specified in [\[MS-OXOCFG\]](#) section 2.2.5.1. The name of the name-value pair is "ExtensionSettings", and the value is the JSON object that represents the mail app's settings. Note that the name-value pairs within the JSON object are specific to the mail app.

2.2.4 Mail App Custom Properties

Mail app-specific custom properties on a Message object are stored as a JSON object in a string **named property** on the Message object. The property is defined as follows.

Property set: PS_PUBLIC_STRINGS {00020329-0000-0000-C000-000000000046}

Property name: cecp-<ID>

Data type: PtypString, 0x001F

The <ID> portion of the **property name** is replaced by a value derived from the value of the **Id** child element of the **OfficeWebExtension** element that represents the mail app in the mail app manifest, as specified in [\[MS-OWEMXML\]](#). The value is generated by removing any '{' or '}' characters from the value of the **Id** element.

The value of the property is a JSON object that contains name-value pairs, where the name is the name of the custom property and the value is the value of the custom property. The value is limited to a maximum of 2,500 characters.

2.2.5 Derived Web Services Identifier

The derived web services identifier is used to generate an item identifier as specified in [\[MS-OXWSCORE\]](#) section 2.2.4.18. The format of a derived web services identifier is a hexadecimal string representation of the **DerivedWSId** structure specified in section [2.2.5.1](#), encoded with **base64 encoding**.

2.2.5.1 DerivedWSId

The **DerivedWSId** structure is used to derive a web services item identifier.

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1		
CompressionType										Payload (variable)																							
...																																	

CompressionType (1 byte): This field is set to 0x00 if the **Payload** field is not compressed. It is set to 0x01 if the **Payload** field is compressed.

Payload (variable): If the value of the **CompressionType** field is 0x00, this field contains a **DerivedId** structure. If the value of the **CompressionType** field is 0x01, this field contains a **DerivedId** structure compressed with the compression algorithm specified in section [3.1.4.5](#).

2.2.5.1.1 DerivedId

The **DerivedId** structure is used to generate the **Payload** field of the **DerivedWSId** structure (section [2.2.5.1](#)).

0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1		
Reserved										MailboxGuidSize												MailboxGuid											
...																																	
ObjectType										Data (variable)																							
...																																	

Reserved (1 byte): This field MUST be 0x03.

MailboxGuidSize (2 bytes): This field is set to the number of bytes in the **MailboxGuid** field.

MailboxGuid (variable): This field contains the mailbox **GUID** in **GUIDString** format.

ObjectType (1 byte): This field is set to 0x01 if the derived web services identifier is for a single occurrence of a **Recurring Calendar object**; otherwise, set to 0x00.

Data (variable): This field contains a **RecurrenceItemData** structure (section [2.2.5.1.1.2](#)) if the derived web services identifier is for a single occurrence of a Recurring Calendar object; otherwise, it contains an **ItemData** structure (section [2.2.5.1.1.1](#)).

2.2.5.1.1.1 ItemData

The **ItemData** structure is used in the **Data** field of the **DerivedId** structure, as specified in section [2.2.5.1.1](#), when the derived web services identifier being generated is for an **E-mail object**, a **Calendar object** that is not recurring, or a Recurring Calendar object.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
EntryIdSize																EntryId (variable)															
...																															

EntryIdSize (2 bytes): This field is set to the number of bytes in the **EntryId** field.

EntryId (variable): This field is set to the value of the **Message EntryID** structure for the item, as specified in [\[MS-OXCDATA\]](#) section 2.2.4.2.

2.2.5.1.1.2 RecurrenceItemData

The **RecurrenceItemData** structure is used in the **Data** field of the **DerivedId** structure, as specified in section [2.2.5.1.1](#), when the derived web services identifier being generated is for a single occurrence of a Recurring Calendar object.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Size																DateSize								Date							
...																															
...																								EntryIdSize							
EntryId (variable)																															
...																															
Reserved																															

Size (2 bytes): This field is set to the size of all of the fields in the **RecurrenceItemData** structure.

DateSize (1 byte): This field is set to the size of the **Date** field, which is always 0x08.

Date (8 bytes): This field contains a **ULONGLONG** ([\[MS-DTYP\]](#)). The value is the number of 100-nanosecond intervals between 12:00:00 midnight, January 1, 0001, to 12:00:00 midnight on the date of the occurrence. This field is written in **big-endian** order.

EntryIdSize (1 byte): This field is set to the size of the **EntryId** field.

EntryId (variable): This field is set to the value of the **Message EntryID** structure for the item, as specified in [\[MS-OXCDATA\]](#) section 2.2.4.2.

Reserved (1 byte): This field MUST be set to 0x10.

3 Protocol Details

3.1 Client Details

The client uses this protocol to request notification of server-side changes to the list of enabled mail apps in the user's mailbox, to retrieve data from the server to use in evaluating which mail apps are applicable to the displayed message, and to retrieve data that is requested by mail apps.

3.1.1 Abstract Data Model

None.

3.1.2 Timers

None.

3.1.3 Initialization

The client SHOULD create a table view (as specified in [\[MS-OXCTABL\]](#) section 3.1.4.1) for the **FAI contents table** in the user's inbox that is restricted to items that have the value "IPM.Configuration.ExtensionMasterTable" in the **PidTagMessageClass** property ([\[MS-OXCMSG\]](#) section 2.2.1.3). The client SHOULD subscribe to a **TableModified** event notification for the table, as specified in [\[MS-OXCNOTIF\]](#) section 3.2.4.2.

3.1.4 Higher-Layer Triggered Events

The client uses this protocol to respond to the events specified in the following table.

Event	Details
The client displays a message.	Section 3.1.4.1
A mail app accesses configuration data.	Section 3.1.4.2
A mail app accesses custom properties on the current message.	Section 3.1.4.3
A mail app requests known entities on the current message.	Section 3.1.4.4
A mail app requests the web services identifier of the current message.	Section 3.1.4.5

3.1.4.1 Client Displays a Message

When a client displays an E-mail object or a Calendar object, it SHOULD check the values of the known entity properties specified in section [2.2.1.1](#) through section [2.2.1.7](#) on that object for the presence of known entities. If a property is not present on the object, the client treats that object as having no known entities of the corresponding type.

The presence or absence of known entities is used in the evaluation of rules that use the **ItemHasKnownEntity** complex type for displaying mail apps, as specified in [\[MS-OWEMXML\]](#). The relationship of the properties and the types of known entities are specified in the following table. The known entity types are specified in [\[MS-OWEMXML\]](#).

Property	Known entity type
PidNameExtractedAddresses (section 2.2.1.1)	Address
PidNameExtractedContacts (section 2.2.1.2)	Contact
PidNameExtractedEmails (section 2.2.1.3)	EmailAddress
PidNameExtractedMeetings (section 2.2.1.4)	MeetingSuggestion
PidNameExtractedPhones (section 2.2.1.5)	PhoneNumber
PidNameExtractedTasks (section 2.2.1.6)	TaskSuggestion
PidNameExtractedUrls (section 2.2.1.7)	Url

3.1.4.2 Mail App Accesses Configuration Data

When a mail app accesses its configuration data, the client performs the following steps:

1. Looks up the identifier for the mail app in the manifest, as specified in [\[MS-OWEMXML\]](#).
2. Opens the configuration data message with the value "IPM.Configuration.ClientExtension.<ID>", where "<ID>" is replaced by the identifier for the mail app, in the **PidTagMessageClass** property ([\[MS-OXCMSG\]](#) section 2.2.1.3) using the procedure specified in [\[MS-OXOCFG\]](#) section 3.1.4.1.
3. Reads the configuration data from the **PidTagRoamingDictionary** property ([\[MS-OXOCFG\]](#) section 2.2.2.2) using the procedure specified in [\[MS-OXOCFG\]](#) section 3.1.4.1.1.
4. Returns the configuration data to the mail app.

If a mail app changes any of its configuration data, the client updates the JSON object, as specified in section [2.2.3](#), with the new information and updates the dictionary on the configuration data message as specified in [\[MS-OXOCFG\]](#) section 3.1.4.2.1. The client saves the changes to the configuration data message as specified in [\[MS-OXOCFG\]](#) section 3.1.4.2.

3.1.4.3 Mail App Accesses Custom Properties

When a mail app accesses its custom properties on a Message object or Calendar object, the client performs the following steps:

1. Looks up the identifier for the mail app in the manifest, as specified in [\[MS-OWEMXML\]](#).
2. Generates a property name as specified in section [2.2.4](#).
3. Uses the procedures specified in [\[MS-OXCPRPT\]](#) section 3.1.4.1 and [\[MS-OXCPRPT\]](#) section 3.1.4.5 to retrieve the value of the named property, which contains a JSON object that contains the mail app's custom properties.
4. Returns the custom properties to the mail app.

If a mail app changes any of its custom properties, the client updates the JSON object, as specified in section [2.2.4](#), with the new information and writes it into the named property using the procedure specified in [\[MS-OXCPRPT\]](#) section 3.1.4.3.

3.1.4.4 Mail App Requests Known Entities

When a mail app requests known entities on a Message object or Calendar object, the client retrieves the XML document from the properties specified in section [2.2.1](#). The client then checks the value of the **Version** element (section [2.2.2.1.38](#)). If the value is not "15.0.0.0", the client SHOULD ignore any known entities contained within the XML document. Otherwise, the client returns the known entities contained within the XML document to the mail app. The relationship of the properties and the types of known entities is specified in the table in section [3.1.4.1](#).

3.1.4.5 Mail App Requests Web Services Identifier

When a mail app requests the web services identifier for an object the client MUST derive the identifier using the following procedure:

1. If deriving a web services identifier for an E-mail object, a Calendar object that is not recurring, or a Recurring Calendar object, the client creates an **ItemData** structure as specified in section [2.2.5.1.1.1](#). If deriving a web services identifier for a single occurrence of a Recurring Calendar object, the client creates a **RecurrenceItemData** structure as specified in section [2.2.5.1.1.2](#).
2. The client creates a **DerivedId** structure as specified in section [2.2.5.1.1](#) and puts the structure created in step 1 in the **Data** field.
3. The client compresses the **DerivedId** structure using the following algorithm. For examples, see section [4.4.1](#) and section [4.4.2](#).
 1. If a byte value is repeated, replace the repeated bytes with three bytes. The repeated byte is written into the first two bytes, and the third byte is set to the total number of times that byte is repeated in the uncompressed stream, minus 2.
 2. If a byte value is not repeated, copy it directly into the compressed stream.
4. If the length of the compressed **DerivedId** structure is greater than or equal to the length of the uncompressed **DerivedId** structure, clients MUST put the uncompressed **DerivedId** structure in the **Payload** field of a new **DerivedWSId** structure, as specified in section [2.2.5.1](#), and set the **CompressionType** field to 0x00. Otherwise, clients MUST put the compressed **DerivedId** structure in the **Payload** field of a new **DerivedWSId** structure and set the **CompressionType** field to 0x01.
5. The client encodes the **DerivedWSId** structure using base64 encoding and returns the result to the mail app.

3.1.5 Message Processing Events and Sequencing Rules

If the client receives a **RoPNotify ROP response** ([\[MS-OXCROPS\]](#) section 2.2.14.2) for the event subscription specified in section [3.1.3](#), it SHOULD obtain a new copy of the mail app manifest using the operation.

3.1.6 Timer Events

None.

3.1.7 Other Local Events

None.

3.2 Server Details

The server uses this protocol to notify clients of updates to the mail apps manifest and to add known entities to Message objects.

3.2.1 Abstract Data Model

None.

3.2.2 Timers

None.

3.2.3 Initialization

None.

3.2.4 Higher-Layer Triggered Events

The server uses this protocol to respond to the events specified in the following table.

Event	Details
The mail app manifest is updated.	Section 3.2.4.1
New Message objects arrive in a mailbox.	Section 3.2.4.2

3.2.4.1 Mail App Manifest Updated

When the mail app manifest is updated, the server SHOULD send a **RopNotify** ROP response ([\[MS-OXCROPS\]](#) section 2.2.14.2) to all clients that have subscribed to a **TableModified** event on the FAI contents table in the user's inbox using a table view that includes items with a value of "IPM.Configuration.ExtensionMasterTable" in the **PidTagMessageClass** property ([\[MS-OXCMSG\]](#) section 2.2.1.3).

3.2.4.2 New Message Object in Mailbox

When a new Message object arrives in a mailbox, the server SHOULD scan the contents of the Message object for known entities. The server SHOULD only scan E-mail objects and Calendar objects.

The server SHOULD scan Message object contents for the known entity types specified in [\[MS-OWEMXML\]](#). The algorithm for scanning Message objects is implementation-specific and does not affect the operation of this protocol.

The server SHOULD create XML documents for each found known entity type as specified in section [2.2.2](#) (including subsections). The resulting XML documents SHOULD be stored in the known entity properties, using the mapping specified in the following table.

Known entity type	Known entity property
Address	PidNameExtractedAddresses (section 2.2.1.1)
Contact	PidNameExtractedContacts (section 2.2.1.2)

Known entity type	Known entity property
EmailAddress	PidNameExtractedEmails (section 2.2.1.3)
MeetingSuggestion	PidNameExtractedMeetings (section 2.2.1.4)
PhoneNumber	PidNameExtractedPhones (section 2.2.1.5)
TaskSuggestion	PidNameExtractedTasks (section 2.2.1.6)
Url	PidNameExtractedUrls (section 2.2.1.7)

3.2.5 Message Processing Events and Sequencing Rules

None.

3.2.6 Timer Events

None.

3.2.7 Other Local Events

None.

4 Protocol Examples

The examples in section [4.1](#) through section [4.4](#) describe a scenario in which the client is hosting a single mail app.

4.1 Known Entities

4.1.1 Address Known Entity

The mail app requests the Address known entities on a message. The client checks the value of the **PidNameExtractedAddresses** property (section [2.2.1.1](#)) and finds the following XML document.

```
<?xml version="1.0" encoding="utf-16"?>
<AddressSet>
  <Version>15.0.0.0</Version>
  <Addresses>
    <Address StartIndex="1" Position="Subject">
      1234 Main St Buffalo, NY 98052
    </Address>
    <Address StartIndex="133" Position="Other">
      4567 1st St Seattle, WA 32008
    </Address>
  </Addresses>
</AddressSet>
```

4.1.2 Contact Known Entity

The mail app requests the Contact known entities on a message. The client checks the value of the **PidNameExtractedContacts** property (section [2.2.1.2](#)) and finds the following XML document.

```
<?xml version="1.0" encoding="utf-16"?>
<ContactSet>
  <Version>15.0.0.0</Version>
  <Contacts>
    <Contact>
      <Person StartIndex="63" Position="Other">
        <PersonString>Kim Akers</PersonString>
      </Person>
      <Phones>
        <Phone StartIndex="91" Position="Other">
          <PhoneString>4255550102</PhoneString>
          <OriginalPhoneString>425.555.0102</OriginalPhoneString>
        </Phone>
      </Phones>
      <Emails>
        <Email StartIndex="74" Position="Other">
          <EmailString>kim@contoso.com</EmailString>
        </Email>
      </Emails>
      <ContactString>Kim Akers
kim@contoso.com
425.555.0102
      </ContactString>
    </Contact>
  </Contacts>
```

```
</ContactSet>
```

4.1.3 EmailAddress Known Entity

The mail app requests the EmailAddress known entities on a message. The client checks the value of the **PidNameExtractedEmails** property (section [2.2.1.3](#)) and finds the following XML document.

```
<?xml version="1.0" encoding="utf-16"?>
<EmailSet>
  <Version>15.0.0.0</Version>
  <Emails>
    <Email StartIndex="1032" Position="Other">
      <EmailString>jason@contoso.com</EmailString>
    </Email>
    <Email StartIndex="1058" Position="Signature">
      <EmailString>sanjay@contoso.com</EmailString>
    </Email>
  </Emails>
</EmailSet>
```

4.1.4 MeetingSuggestion Known Entity

The mail app requests the MeetingSuggestion known entities on a message. The client checks the value of the **PidNameExtractedMeetings** property (section [2.2.1.4](#)) and finds the following XML document.

```
<?xml version="1.0" encoding="utf-16"?>
<MeetingSet>
  <Version>15.0.0.0</Version>
  <Meetings>
    <Meeting Location="My office" Subject="Project Status"
      StartIndex="56" Position="LatestReply">
      <MeetingString>
        Let's meet tomorrow at 3pm in my office to discuss the project.
      </MeetingString>
      <Attendees>
        <EmailUser Id="sanjay@contoso.com">Sanjay Shah</EmailUser>
      </Attendees>
      <StartTime>2012-03-10T23:00:00Z</StartTime>
      <EndTime>2012-03-10T23:30:00Z</EndTime>
    </Meeting>
  </Meetings>
</MeetingSet>
```

4.1.5 PhoneNumber Known Entity

The mail app requests the PhoneNumber known entities on a message. The client checks the value of the **PidNameExtractedPhones** property (section [2.2.1.5](#)) and finds the following XML document:

```
<?xml version="1.0" encoding="utf-16"?>
<PhoneSet>
  <Version>15.0.0.0</Version>
```

```

<Phones>
  <Phone StartIndex="16" Position="LatestReply">
    <PhoneString>4255550100</PhoneString>
    <OriginalPhoneString>(425) 555-0100</OriginalPhoneString>
  </Phone>
  <Phone StartIndex="942" Position="Other">
    <PhoneString>4255550101</PhoneString>
    <OriginalPhoneString>(425) 555 0101</OriginalPhoneString>
  </Phone>
</Phones>
</PhoneSet>

```

4.1.6 TaskSuggestion Known Entity

The mail app requests the TaskSuggestion known entities on a message. The client checks the value of the **PidNameExtractedTasks** property (section [2.2.1.6](#)) and finds the following XML document.

```

<?xml version="1.0" encoding="utf-16"?>
<TaskSet>
  <Version>15.0.0.0</Version>
  <Tasks>
    <Task StartIndex="42" Position="LatestReply">
      <TaskString>Please send a copy of the presentation to Bob.</TaskString>
      <Assignees>
        <EmailUser Id="jason@contoso.com">Jason Carlson</EmailUser>
      </Assignees>
    </Task>
  </Tasks>
</TaskSet>

```

4.1.7 Url Known Entity

The mail app requests the Url known entities on a message. The client checks the value of the **PidNameExtractedUrls** property (section [2.2.1.7](#)) and finds the following XML document.

```

<?xml version="1.0" encoding="utf-16"?>
<UrlSet>
  <Version>15.0.0.0</Version>
  <Urls>
    <Url StartIndex="252" Position="LatestUrl" Type="Url">
      <UrlString>http://www.contoso.com/</UrlString>
    </Url>
    <Url StartIndex="378" Position="Signature" Type="Url">
      <UrlString>https://www.contoso.com/img/companylog.jpg</UrlString>
    </Url>
  </Urls>
</UrlSet>

```

4.2 Mail App Configuration Data

The mail app requests access to its configuration data. The identifier for the mail app is "4b8686f01b4011e1bddb0800200c9a66".

The client opens the configuration data message with the value "IPM.Configuration.ClientExtension.4b8686f01b4011e1bddb0800200c9a66" in the **PidTagMessageClass** property ([\[MS-OXCMSG\]](#) section 2.2.1.3). The client checks the value of the **PidTagRoamingDictionary** property ([\[MS-OXOCFG\]](#) section 2.2.2.2) and finds the following XML document.

```
<?xml version="1.0"?>
<UserConfiguration>
  <Info version="Outlook.15"/>
  <Data>
    <e k="18-ExtensionSettings" v="18-
{&quot;application_setting_name_1&quot;:&quot;;&quot;\&quot;application_setting_1&quot;&quot;;&quot;
;application_setting_name_2&quot;:&quot;;&quot;\&quot;application_setting_2&quot;&quot;;&quot;appli
cation_setting_name_3&quot;:&quot;;&quot;\&quot;application_setting_3&quot;&quot;}&quot;/>
    <e k="18-OLPrefsVersion" v="9-1"/>
  </Data>
</UserConfiguration>
```

The value of the "ExtensionSettings" name/value pair is extracted as follows.

```
{"application_setting_name_1": "\"application_setting_1\"",
"application_setting_name_2": "\"application_setting_2\"",
"application_setting_name_3": "\"application_setting_3\""}}
```

4.3 Mail App Custom Properties

The mail app requests access to its custom properties on a message. The identifier for the mail app is "4b8686f01b4011e1bddb0800200c9a66".

The client uses the property name "cecp-4b8686f01b4011e1bddb0800200c9a66" and the PS_PUBLIC_STRINGS **property set** to generate a **property tag**. Using this property tag, the client checks the value of the property and finds the following JSON object.

```
{"custom_property_name_1": "custom_property_1",
"custom_property_name_2": "custom_property_2",
"custom_property_name_3": "custom_property_3"}
```

4.4 Derived Web Services Identifier

The following examples illustrate deriving a web services identifier for an E-mail object (section [4.4.1](#)) and for a single occurrence of a Recurring Calendar object (section [4.4.2](#)).

4.4.1 Derived Web Services Identifier for an E-Mail Object

The mail app requests the web services identifier for an E-mail object with the following value for its **Message EntryID** structure, as described in [\[MS-OXCDATA\]](#) section 2.2.4.2.

```
0000000088E6E5A0C938724DB22D21E35B7BEF6107008CE5522DEFA36348B3A449578E1E67740000002274200008
CE5522DEFA36348B3A449578E1E6774000000235400000
```

The GUID for the mailbox is 6123e271-3ea9-4de3-a56e-90172eff4539.

The client sets the fields in a **DerivedId** structure, as described in section [2.2.5.1.1](#), as shown in the following table.

DerivedId field	Value
Reserved	0x03
MailboxGuidSize	0x0024
MailboxGuid	36313233653237312D336561392D34646533 2D613536652D393031373265666634353339
ObjectType	0x00
Data	ItemData structure (section 2.2.5.1.1.1)

The fields of the **ItemData** structure in the **Data** field are set as shown in the following table.

ItemData field	Value
EntryIdSize	0x0046
EntryId	0000000088E6E5A0C938724DB22D21E35B7B EF6107008CE5522DEFA36348B3A449578E1E6 7740000002274200008CE5522DEFA36348B3A449578E1E6774000000235400000

The structure is represented by the following bytes.

```
03240036313233653237312D336561392D346465332D613536652D3930313732656666343533390046000000000088E6E5A0C938724DB22D21E35B7BEF6107008CE5522DEFA36348B3A449578E1E677400000022742000008CE5522DEFA36348B3A449578E1E6774000000235400000
```

Compressing these bytes as described in section [3.1.4.5](#) results in the following bytes.

```
03240036313233653237312D336561392D346465332D613536652D39303137326566660034353339004600000388E6E5A0C938724DB22D21E35B7BEF6107008CE5522DEFA36348B3A449578E1E67740000010227420000008CE5522DEFA36348B3A449578E1E6774000001023540000000
```

Because the length of the compressed structure is greater than the length of the uncompressed structure, the client puts the uncompressed structure in the **Payload** field of the **DerivedWSId** structure, as described in section [2.2.5.1](#), and sets the **CompressionType** field to 0x00. The client then encodes the data with base64 encoding to generate the following web services identifier.

```
AAMkADYxMjNlMjcxLTNlYTk0NGRlMy1hNTZlLTkwMTcyZWZmNDUzOQBGAAAAACI5uWgyThyTbItIeNbe+9hBwCM5VIt76NjSLOkSveOHmd0AAAAAidCAACM5VIt76NjSLOkSveOHmd0AAAAjVAAAA=
```

4.4.2 Derived Web Services Identifier for a Single Occurrence

The mail app requests the web services identifier for a single occurrence of a Recurring Calendar object with the following value for its **Message EntryID** structure, as described in [\[MS-OXCDATA\]](#) section 2.2.4.2.

Because the length of the compressed structure is less than the length of the uncompressed structure, the client puts the compressed structure in the **Payload** field of the **DerivedWSId** structure, as described in section [2.2.5.1](#), and sets the **CompressionType** field to 0x01. The client then encodes the data with base64 encoding to generate the following web services identifier.

```
AyQANjEyM2UyNzEtM2VhOS00ZGUzLWE1NmUtOTAxNzJlZmYANDUzOQEAWgIAM7PR8AyyQBGAACYIkDobxldE6AtEREA  
uwDBwAPQ/uTxevIQbSuM1H5/SAYAAADDwAAAA9D+5PF68hBtK4zUfn9IBgAAAIH8wAAABA=
```

Preliminary

5 Security

5.1 Security Considerations for Implementers

None.

5.2 Index of Security Parameters

None.

Preliminary

6 Appendix A: Full XML Schema

For ease of implementation, the following is the full XML schema for this protocol.

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema elementFormDefault="qualified" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="TaskSet" nillable="true" type="TaskSet" />
  <xs:complexType name="TaskSet">
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="Version"
        type="Version" />
      <xs:element minOccurs="0" maxOccurs="1" name="Tasks"
        type="ArrayOfTask" />
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="Version" />
  <xs:complexType name="ArrayOfTask">
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="unbounded" name="Task"
        nillable="true" type="Task" />
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="Task">
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="TaskString"
        type="xs:string" />
      <xs:element minOccurs="0" maxOccurs="1" name="Assignees"
        type="ArrayOfEmailUser" />
    </xs:sequence>
    <xs:attribute default="-1" name="StartIndex" type="xs:int" />
    <xs:attribute default="LatestReply" name="Position"
      type="EmailPosition" />
  </xs:complexType>
  <xs:complexType name="ArrayOfEmailUser">
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="unbounded" name="EmailUser"
        nillable="true" type="EmailUser" />
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="EmailUser">
    <xs:simpleContent>
      <xs:extension base="xs:string">
        <xs:attribute name="Id" type="xs:string" />
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
  <xs:simpleType name="EmailPosition">
    <xs:restriction base="xs:string">
      <xs:enumeration value="LatestReply" />
      <xs:enumeration value="Subject" />
      <xs:enumeration value="Signature" />
      <xs:enumeration value="Other" />
    </xs:restriction>
  </xs:simpleType>
  <xs:element name="AddressSet" nillable="true" type="AddressSet" />
  <xs:complexType name="AddressSet">
    <xs:sequence>
      <xs:element minOccurs="0" maxOccurs="1" name="Version" />
    </xs:sequence>
  </xs:complexType>
</xs:schema>
```

```

        type="Version" />
        <xs:element minOccurs="0" maxOccurs="1" name="Addresses"
            type="ArrayOfAddress" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="ArrayOfAddress">
    <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="unbounded" name="Address"
            nillable="true" type="Address" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="Address">
    <xs:simpleContent>
        <xs:extension base="xs:string">
            <xs:attribute default="-1" name="StartIndex" type="xs:int" />
            <xs:attribute default="LatestReply" name="Position"
                type="EmailPosition" />
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
<xs:element name="MeetingSet" nillable="true" type="MeetingSet" />
<xs:complexType name="MeetingSet">
    <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="Version"
            type="Version" />
        <xs:element minOccurs="0" maxOccurs="1" name="Meetings"
            type="ArrayOfMeeting" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="ArrayOfMeeting">
    <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="unbounded" name="Meeting"
            nillable="true" type="Meeting" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="Meeting">
    <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="MeetingString"
            type="xs:string" />
        <xs:element minOccurs="0" maxOccurs="1" name="Attendees"
            type="ArrayOfEmailUser" />
        <xs:element minOccurs="1" maxOccurs="1" name="StartTime"
            nillable="true" type="xs:dateTime" />
        <xs:element minOccurs="1" maxOccurs="1" name="EndTime" nillable="true"
            type="xs:dateTime" />
    </xs:sequence>
    <xs:attribute name="Location" type="xs:string" />
    <xs:attribute name="Subject" type="xs:string" />
    <xs:attribute default="-1" name="StartIndex" type="xs:int" />
    <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
</xs:complexType>
<xs:element name="PhoneSet" nillable="true" type="PhoneSet" />
<xs:complexType name="PhoneSet">
    <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="1" name="Version"
            type="Version" />
        <xs:element minOccurs="0" maxOccurs="1" name="Phones"
            type="ArrayOfPhone" />
    </xs:sequence>

```

```

</xs:complexType>
<xs:complexType name="ArrayOfPhone">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Phone"
      nillable="true" type="Phone" />
  </xs:sequence>
</xs:complexType>
<xs:complexType name="Phone">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="PhoneString"
      type="xs:string" />
    <xs:element minOccurs="0" maxOccurs="1" name="OriginalPhoneString"
      type="xs:string" />
  </xs:sequence>
  <xs:attribute default="-1" name="StartIndex" type="xs:int" />
  <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
  <xs:attribute default="Unspecified" name="Type" type="PhoneType" />
</xs:complexType>
<xs:simpleType name="PhoneType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Unspecified" />
    <xs:enumeration value="Home" />
    <xs:enumeration value="Mobile" />
    <xs:enumeration value="Work" />
    <xs:enumeration value="Fax" />
  </xs:restriction>
</xs:simpleType>
<xs:element name="EmailSet" nillable="true" type="EmailSet" />
<xs:complexType name="EmailSet">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Version"
      type="Version" />
    <xs:element minOccurs="0" maxOccurs="1" name="Emails"
      type="ArrayOfEmail" />
  </xs:sequence>
</xs:complexType>
<xs:complexType name="ArrayOfEmail">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Email"
      nillable="true" type="Email" />
  </xs:sequence>
</xs:complexType>
<xs:complexType name="Email">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="EmailString"
      type="xs:string" />
  </xs:sequence>
  <xs:attribute default="-1" name="StartIndex" type="xs:int" />
  <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
</xs:complexType>
<xs:element name="UrlSet" nillable="true" type="UrlSet" />
<xs:complexType name="UrlSet">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Version"
      type="Version" />
    <xs:element minOccurs="0" maxOccurs="1" name="Urls"
      type="ArrayOfUrl" />
  </xs:sequence>
</xs:complexType>

```

```

<xs:complexType name="ArrayOfUrl">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Url"
      nillable="true" type="Url" />
  </xs:sequence>
</xs:complexType>
<xs:complexType name="Url">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="UrlString"
      type="xs:string" />
  </xs:sequence>
  <xs:attribute default="-1" name="StartIndex" type="xs:int" />
  <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
  <xs:attribute default="Unspecified" name="Type" type="UrlType" />
</xs:complexType>
<xs:simpleType name="UrlType">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Unspecified" />
    <xs:enumeration value="Url" />
    <xs:enumeration value="Filename" />
  </xs:restriction>
</xs:simpleType>
<xs:element name="ContactSet" nillable="true" type="ContactSet" />
<xs:complexType name="ContactSet">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Version"
      type="Version" />
    <xs:element minOccurs="0" maxOccurs="1" name="Contacts"
      type="ArrayOfContact" />
  </xs:sequence>
</xs:complexType>
<xs:complexType name="ArrayOfContact">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="unbounded" name="Contact"
      nillable="true" type="Contact" />
  </xs:sequence>
</xs:complexType>
<xs:complexType name="Person">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="PersonString"
      type="xs:string" />
  </xs:sequence>
  <xs:attribute default="-1" name="StartIndex" type="xs:int" />
  <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
</xs:complexType>
<xs:complexType name="Business">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="BusinessString"
      type="xs:string" />
  </xs:sequence>
  <xs:attribute default="-1" name="StartIndex" type="xs:int" />
  <xs:attribute default="LatestReply" name="Position" type="EmailPosition" />
</xs:complexType>
<xs:complexType name="Contact">
  <xs:sequence>
    <xs:element minOccurs="0" maxOccurs="1" name="Person" type="Person" />
    <xs:element minOccurs="0" maxOccurs="1" name="Business"
      type="Business" />
    <xs:element minOccurs="0" maxOccurs="1" name="Phones"

```

```
        type="ArrayOfPhone" />
    <xs:element minOccurs="0" maxOccurs="1" name="Urls"
        type="ArrayOfUrl" />
    <xs:element minOccurs="0" maxOccurs="1" name="Emails"
        type="ArrayOfEmail" />
    <xs:element minOccurs="0" maxOccurs="1" name="Addresses"
        type="ArrayOfAddress" />
    <xs:element minOccurs="0" maxOccurs="1" name="ContactString"
        type="xs:string" />
</xs:sequence>
</xs:complexType>
</xs:schema>
```


7 Appendix B: Product Behavior

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

- Microsoft® Exchange Server 2013 Preview
- Microsoft® Outlook® 2013 Preview

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

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

8 Change Tracking

This section identifies changes that were made to the [MS-OXCEXT] protocol document between the April 2012 and July 2012 releases. Changes are classified as New, Major, Minor, Editorial, or No change.

The revision class **New** means that a new document is being released.

The revision class **Major** means that the technical content in the document was significantly revised. Major changes affect protocol interoperability or implementation. Examples of major changes are:

- A document revision that incorporates changes to interoperability requirements or functionality.
- An extensive rewrite, addition, or deletion of major portions of content.
- The removal of a document from the documentation set.
- Changes made for template compliance.

The revision class **Minor** means that the meaning of the technical content was clarified. Minor changes do not affect protocol interoperability or implementation. Examples of minor changes are updates to clarify ambiguity at the sentence, paragraph, or table level.

The revision class **Editorial** means that the language and formatting in the technical content was changed. Editorial changes apply to grammatical, formatting, and style issues.

The revision class **No change** means that no new technical or language changes were introduced. The technical content of the document is identical to the last released version, but minor editorial and formatting changes, as well as updates to the header and footer information, and to the revision summary, may have been made.

Major and minor changes can be described further using the following change types:

- New content added.
- Content updated.
- Content removed.
- New product behavior note added.
- Product behavior note updated.
- Product behavior note removed.
- New protocol syntax added.
- Protocol syntax updated.
- Protocol syntax removed.
- New content added due to protocol revision.
- Content updated due to protocol revision.
- Content removed due to protocol revision.
- New protocol syntax added due to protocol revision.

- Protocol syntax updated due to protocol revision.
- Protocol syntax removed due to protocol revision.
- New content added for template compliance.
- Content updated for template compliance.
- Content removed for template compliance.
- Obsolete document removed.

Editorial changes are always classified with the change type **Editorially updated**.

Some important terms used in the change type descriptions are defined as follows:

- **Protocol syntax** refers to data elements (such as packets, structures, enumerations, and methods) as well as interfaces.
- **Protocol revision** refers to changes made to a protocol that affect the bits that are sent over the wire.

The changes made to this document are listed in the following table. For more information, please contact protocol@microsoft.com.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
1.1 Glossary	Removed "Office Web Extension" from list of terms defined in MS-OXGLOS.	N	Content updated.
1.1 Glossary	Added "mail app" to list of terms defined in MS-OXGLOS.	N	Content updated.
2.2.3 Mail App Configuration Data	Renamed section to replace "extension" with "mail app".	N	Content updated.
2.2.4 Mail App Custom Properties	Renamed section to replace "extension" with "mail app".	N	Content updated.
3.1.4.2 Mail App Accesses Configuration Data	Renamed section to replace "extension" with "mail app".	N	Content updated.
3.1.4.3 Mail App Accesses Custom Properties	Renamed section to replace "extension" with "mail app".	N	Content updated.
3.1.4.4 Mail App Requests Known Entities	Renamed section to replace "extension" with "mail app".	N	Content updated.
3.1.4.5 Mail App Requests Web Services Identifier	Renamed section to replace "extension" with "mail app".	N	Content updated.
3.2.4.1 Mail App Manifest Updated	Renamed section to replace "extension" with "mail app".	N	Content updated.

Section	Tracking number (if applicable) and description	Major change (Y or N)	Change type
4.2 Mail App Configuration Data	Renamed section to replace "extension" with "mail app".	N	Content updated.
4.3 Mail App Custom Properties	Renamed section to replace "extension" with "mail app".	N	Content updated.

Preliminary

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