[MS-EUMSDP]:
Exchange Unified Messaging Session Description Protocol Extension

Intellectual Property Rights Notice for Open Specifications Documentation

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

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

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

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

- **Trademarks.** The names of companies and products contained in this documentation may be covered by trademarks or similar intellectual property rights. This notice does not grant any licenses under those rights.

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

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

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

Revision Summary

Date	Revision History	Revision Class	Comments
06/07/2010	0.1	Major	Initial Availability
06/29/2010	0.2	Editorial	Changed language and formatting in the technical content.
07/23/2010	0.2	No change	No changes to the meaning, language, or formatting of the technical content.
09/27/2010	1.0	Major	Significantly changed the technical content.
11/15/2010	1.0	No change	No changes to the meaning, language, or formatting of the technical content.
12/17/2010	1.0	No change	No changes to the meaning, language, or formatting of the technical content.
03/18/2011	1.0	No change	No changes to the meaning, language, or formatting of the technical content.
06/10/2011	1.0	No change	No changes to the meaning, language, or formatting of the technical content.
01/20/2012	1.1	Minor	Clarified the meaning of the technical content.
04/11/2012	1.1	No change	No changes to the meaning, language, or formatting of the technical content.
07/16/2012	1.1	No change	No changes to the meaning, language, or formatting of the technical content.
10/08/2012	2.0	Major	Significantly changed the technical content.

Table of Contents

1   Introduction

The Exchange Unified Messaging Session Description Protocol Extension is a proprietary extension to the Session Description Protocol (SDP) that extends the characteristics that are used to negotiate and establish audio calls between protocol servers and unified messaging servers to play or record voice messages and to manage the unified messaging mailbox by using touch-tone commands.

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]:

network address translation (NAT)

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

dual-tone multi-frequency (DTMF)
Interactive Connectivity Establishment (ICE)
Media Source ID (MSI)
Multipurpose Internet Mail Extensions (MIME)
public switched telephone network (PSTN)
Quality of Experience (QoE)
remote endpoint
SDP answer
SDP offer
Session Description Protocol (SDP)
Synchronization Source (SSRC)

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-SDPEXT] Microsoft Corporation, "Session Description Protocol (SDP) Version 2.0 Extensions".

[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

[RFC4566] Handley, M., Jacobson, V., and Perkins, C., "SDP: Session Description Protocol", RFC 4566, July 2006, http://www.ietf.org/rfc/rfc4566.txt

1.2.2 Informative References

[MS-DTMF] Microsoft Corporation, "RTP Payload for DTMF Digits, Telephony Tones, and Telephony Signals Extensions".

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

[MS-ICE] Microsoft Corporation, "Interactive Connectivity Establishment (ICE) Extensions".

[MS-ICE2] Microsoft Corporation, "Interactive Connectivity Establishment (ICE) Extensions 2.0".

[MS-OFCGLOS] Microsoft Corporation, "Microsoft Office Master Glossary".

[MS-QoE] Microsoft Corporation, "Quality of Experience Monitoring Server Protocol Specification".

[MS-RTP] Microsoft Corporation, "Real-time Transport Protocol (RTP) Extensions".

[MS-SIPRE] Microsoft Corporation, "Session Initiation Protocol (SIP) Routing Extensions".

[MS-SRTP] Microsoft Corporation, "Secure Real-time Transport Protocol (SRTP) Extensions".

[MS-TURN] Microsoft Corporation, "Traversal Using Relay NAT (TURN) Extensions".

1.3 Overview

This protocol describes the **Session Description Protocol (SDP)** extensions that are used by a protocol client (or server) to establish and exchange audio with a unified messaging server. The types of calls between the protocol client and the unified messaging server are as follows:

- **Call-in:** An incoming **public switched telephone network (PSTN)** call to a unified communications user leaves a voice message with the unified messaging server.

- **Play-On-Phone:** Upon receiving a notification from a protocol client, the unified messaging server deflects the call to the PSTN phone number to play a voice message.

The information in this document applies to all types of calls between a protocol client and the unified messaging server.

This protocol supplements [MS-SDPEXT], which describes a proprietary SDP extension that is used to establish audio sessions between unified communication clients and servers, with the following exceptions:

- Only the audio media type is supported.

- The session version on the **o** line can be incremented in subsequent offer/answer negotiations.

- If an **SDP answer** is given in an 18x-level provisional response, the SDP answer in the final response (for the same fork) is required not to contain any differences.

- Optimizing the media pathway using the **a=x-bypassid** and **a=x-bypass** attributes is not supported.

- Extensions for RTCP-based feedback messages, **Synchronization Source (SSRC)** range allocation, **Media Source ID (MSI)** assignment and media source labeling are not supported.

1.4 Relationship to Other Protocols

This protocol depends on the following protocols:

- [MS-SDPEXT] for media negotiation.

- [MS-ICE] for media to traverse **network address translation (NAT)** and firewalls.

- [MS-ICE2] and [MS-TURN] for media to traverse NAT and firewalls.

- [MS-RTP] for media transmission.

- [MS-DTMF] for **dual-tone multi-frequency (DTMF)** digits or tones to be exchanged.

- [MS-SIPRE] section 3.2.4 for **Interactive Connectivity Establishment (ICE)** Session Description Protocol (SDP) interworking and Multipart **Multipurpose Internet Mail Extensions (MIME)** support.

- [MS-SRTP] for media encryption.

- [MS-QoE] for publishing audio **Quality of Experience (QoE)** metrics.

1.5 Prerequisites/Preconditions

The prerequisites for this protocol are the same as the prerequisites described in [MS-SDPEXT] section 1.5.

1.6 Applicability Statement

None.

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 does not introduce a new transport to support audio calls, and uses the transport specified in [MS-SDPEXT] section 2.1.

2.2   Message Syntax

The messages specified in [MS-SDPEXT] are Session Description Protocol (SDP) messages. An SDP message contains the description of a media session. The session and media characteristics are described by a set of **<type>=<value>** lines, as specified in [RFC4566]. The extensions are defined as custom SDP attributes.

3 Protocol Details

3.1 Server Details

3.1.1 Abstract Data Model

The abstract data model for this protocol is the same as that specified in [MS-SDPEXT] section 3.1.1.

3.1.2 Timers

The timers for this protocol are the same as those specified in [MS-SDPEXT] section 3.1.2.

3.1.3 Initialization

The initialization for this protocol is the same as that specified in [MS-SDPEXT] section 3.1.3.

3.1.4 Higher-Layer Triggered Events

The higher-layer triggered events for this protocol are the same as those specified in [MS-SDPEXT] section 3.1.4.

3.1.5 Message Processing Events and Sequencing Rules

This protocol follows the message processing rules specified in [MS-SDPEXT] section 3.1.5, with the following exceptions:

- [MS-SDPEXT] section 3.1.5.18: Only the **m=audio** line is supported in the Session Description Protocol (SDP). All other **m** line types, such as **m=video** and **m=applicationsharing**, are rejected.

- [MS-SDPEXT] section 3.1.5.19: Regarding the **o** line of an SDP message:

  - the parameter **<sess-version>** MUST be a numeric value, but the value SHOULD be ignored on receive.

  - the protocol server SHOULD increment the session version value (**<sess-version>**) in the **o** line in any subsequent **SDP offers**.

- [MS-SDPEXT] section 3.1.5.12.3: If an SDP answer is received in a provisional 18x-level response, any SDP answer given in a final response (for the same fork) is assumed to be identical. Any differences with the SDP answer in the final response will be ignored.

- [MS-SDPEXT] section 3.1.5.25: The **a=x-bypassid**, **a=x-bypass** and **a=x-mediasettings** attributes are ignored.

- [MS-SDPEXT] section 3.1.5.30: The **a=rtcp-rsize** and **a=rtcp-fb** attributes are ignored.

- [MS-SDPEXT] section 3.1.5.31: The **a=x-ssrc-range** attribute is ignored.

- [MS-SDPEXT] section 3.1.5.32: The **a=x-source-streamid** attribute is ignored.

- [MS-SDPEXT] section 3.1.5.33: The **a=x-source** attribute is ignored.

3.1.6   Timer Events

The timer events for this protocol are the same as those specified in [MS-SDPEXT] section 3.1.6.

3.1.7   Other Local Events

The local events for this protocol are the same as those specified in [MS-SDPEXT] section 3.1.7.

4   Protocol Examples

The following example is an SDP offer sent by a **remote endpoint** to a unified messaging server.

```
v=0o=- 0 0 IN IP4 10.56.65.184s=sessionc=IN IP4 10.56.65.184b=CT:53980t=0 0m=audio 50024
RTP/AVP 114 9 112 111 0 8 116 115 97 13 118 101a=ice-ufrag:vxUDa=ice-
pwd:4QoBoSfCA7vYy9AwNBhsISk9a=candidate:1 1 UDP 2130706431 10.56.65.184 50024 typ host
a=candidate:1 2 UDP 2130705918 10.56.65.184 50025 typ host a=candidate:2 1 TCP-PASS 6556159
10.9.66.105 51450 typ relay raddr 10.56.65.184 rport 50026 a=candidate:2 2 TCP-PASS 6556158
10.9.66.105 51450 typ relay raddr 10.56.65.184 rport 50026 a=candidate:3 1 UDP 16648703
10.9.66.105  59291 typ relay raddr 10.56.65.184 rport 50020 a=candidate:3 2 UDP 16648702
10.9.66.105 3937 typ relay raddr 10.56.65.184 rport 50021 a=candidate:4 1 TCP-ACT 7076351
10.9.66.105 51450 typ relay raddr 10.56.65.184 rport 50026 a=candidate:4 2 TCP-ACT 7075838
10.9.66.105 51450 typ relay raddr 10.56.65.184 rport 50026 a=candidate:5 1 TCP-ACT 1684797439
10.56.65.184 50026 typ srflx raddr 10.56.65.184 rport 50026 a=candidate:5 2 TCP-ACT
1684796926 10.56.65.184 50026 typ srflx raddr 10.56.65.184 rport 50026 a=cryptoscale:1 client
AES_CM_128_HMAC_SHA1_80 inline:Vg7c4/T5hsxb/UDMzHqSPk2DwKXzsJk1/IPIx2tI|2^31|1:1a=crypto:2
AES_CM_128_HMAC_SHA1_80 inline:rX1Y0WgGnXDdutAA8eEH7ZYog+ydd//x+Cidwcvw|2^31|1:1a=crypto:3
AES_CM_128_HMAC_SHA1_80
inline:ZRbU8mr2f5nK9adY1tjCzbb3AbDU8pfkRIpcrecA|2^31a=maxtime:200a=rtpmap:114 x-
msrta/16000a=fmtp:114 bitrate=29000a=rtpmap:9 G722/8000a=rtpmap:112 G7221/16000a=fmtp:112
bitrate=24000a=rtpmap:111 SIREN/16000a=fmtp:111 bitrate=16000a=rtpmap:0 PCMU/8000a=rtpmap:8
PCMA/8000a=rtpmap:116 AAL2-G726-32/8000a=rtpmap:115 x-msrta/8000a=fmtp:115
bitrate=11800a=rtpmap:97 RED/8000a=rtpmap:13 CN/8000a=rtpmap:118 CN/16000a=rtpmap:101
telephone-event/8000a=fmtp:101 0-16a=x-bypassid:9CD08A01-E998-456a-AC8A-D028930E5933
```

The following example is the SDP answer sent by the unified messaging server.

```
v=0o=- 2303 0 IN IP4 157.56.65.134s=sessionc=IN IP4 157.56.65.134b=CT:1000t=0 0m=audio 1469
RTP/SAVP 114 115 112 111 116 0 8 13 118 97 101c=IN IP4 157.56.65.134a=rtcp:32805a=ice-
ufrag:Aieba=ice-pwd:qw3WPnif3nyEAFbPHhtWpWs3a=candidate:1 1 UDP 2130706431 157.56.65.134 1469
typ hosta=candidate:1 2 UDP 2130705918 157.56.65.13432805 typ hosta=candidate:2 1 tcp-pass
6555135 172.29.105.158 56439 typ relay raddr 205.248.125.34 rport 56439a=candidate:2 2 tcp-
pass 6555134 172.29.105.158 56439 typ relay raddr 205.248.125.34 rport 56439a=candidate:3 1
UDP 16647679 172.29.105.158 56659 typ relay raddr 172.29.105.158  rport 56659a=candidate:3 2
UDP 16647678 172.29.105.158 51883 typ relay raddr 172.29.105.158  rport 51883a=candidate:4 1
tcp-act 7076863 172.29.105.158.34 56439 typ relay raddr 172.29.105.158 rport
56439a=candidate:4 2 tcp-act 7076350 172.29.105.158 56439 typ relay raddr 172.29.105.158
rport 56439a=candidate:5 1 tcp-act 1684797951 192.168.104.102 38263 typ srflx raddr
157.56.65.134 rport 1783a=candidate:5 2 tcp-act 1684797438 192.168.104.102 38263 typ srflx
raddr 157.56.65.134 rport 1783a=crypto:2 AES_CM_128_HMAC_SHA1_80
inline:apG+pahPrJUcGUw3FMogAth9HWpCVzv6BxakuzNL|2^31|1:1a=label:main-audioa=rtpmap:114 x-
msrta/16000a=fmtp:114 bitrate=29000a=rtpmap:115 x-msrta/8000a=fmtp:115
bitrate=11800a=rtpmap:112 G7221/16000a=fmtp:112 bitrate=24000a=rtpmap:111
SIREN/16000a=fmtp:111 bitrate=16000a=rtpmap:116 AAL2-G726-32/8000a=rtpmap:0
PCMU/8000a=rtpmap:8 PCMA/8000a=rtpmap:13 CN/8000a=rtpmap:118 CN/16000a=rtpmap:97
RED/8000a=rtpmap:101 telephone-event/8000a=fmtp:101 0-16,36
```

5   Security

5.1   Security Considerations for Implementers

This protocol has the security considerations described in [MS-SDPEXT] section 5.1.

5.2   Index of Security Parameters

This protocol has the index of security parameters described in [MS-SDPEXT] section 5.2.

6 Appendix A: Product Behavior

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

- Microsoft® Office Communications Server 2007 R2

- Microsoft® Office Communicator 2007 R2

- Microsoft® Exchange Server 2007

- Microsoft® Exchange Server 2010

- Microsoft® Exchange Server 2013

- Microsoft® Lync® 2010

- Microsoft® Lync® Server 2010

- Microsoft® Lync® 2013

- Microsoft® Lync® Server 2013

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.

7 Change Tracking

This section identifies changes that were made to the [MS-EUMSDP] protocol document between the July 2012 and October 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
1.3 Overview	Changed the name from 'Protocol Overview (Synopsis)' to 'Overview'.	Y	Content updated for template compliance.
4 Protocol Examples	Removed the G723/8000 codec.	N	Content updated.

Release: October 8, 2012

8   Index