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Miscellaneous Capabilities Negotiation in the Session Description Protocol (SDP)
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Abstract

SDP has been extended with a capability negotiation mechanism framework that allows the endpoints to negotiate transport protocols and attributes. This framework has been extended with a Media capabilities negotiation mechanism that allows endpoints to negotiate additional media-related capabilities. This negotiation is embedded into the widely-used SDP offer/answer procedures.
This memo extends the SDP capability negotiation framework to allow endpoints to negotiate a number of miscellaneous SDP capabilities. In particular, this memo provides a mechanism to negotiate media titles ("i=" line for each media), connection data ("c=" line), and media bandwidth ("b=" line).

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1. Introduction   TOC

The Session Description Protocol (SDP) (Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol," July 2006.) [RFC4566] is intended for describing multimedia sessions for the purposes of session announcement, session invitation, and other forms of multimedia session initiation. SDP has been extended with a capability negotiation mechanism framework (Andreasen, F., "SDP Capability Negotiation,"

March 2010.) [I-D.ietf-mmusic-sdp-capability-negotiation] that allows the endpoints to negotiate capabilities, such as support for Realtime Transport Protocol (RTP) (Schulzrinne, H., Casner, S., Frederick, R., and V. Jacobson, "RTP: A Transport Protocol for Real-Time Applications," July 2003.) [RFC3550] and Secure Realtime Transport Protocol (SRTP) (Baugher, M., McGrew, D., Naslund, M., Carrara, E., and K. Norrman, "The Secure Real-time Transport Protocol (SRTP)," March 2004.) [RFC3711]. The SDP media capabilities (Gilman, R., Even, R., and F. Andreasen, "SDP media capabilities Negotiation," February 2010.) [I-D.ietf-mmusic-sdp-media-capabilities] provides negotiation capabilities to media lines as well.

This negotiation is embedded into the widely used SDP offer/answer procedures (Rosenberg, J. and H. Schulzrinne, "An Offer/Answer Model with Session Description Protocol (SDP)," June 2002.) [RFC3264]. This memo provides the means to negotiate further capabilities than those specified in the SDP capability negotiation mechanism framework (Andreasen, F., "SDP Capability Negotiation," March 2010.) [I-D.ietf-mmusic-sdp-capability-negotiation] and the SDP media capabilities (Gilman, R., Even, R., and F. Andreasen, "SDP media capabilities Negotiation," February 2010.) [I-D.ietf-mmusic-sdp-media-capabilities]. In particular, this memo provides a mechanism to negotiate media titles ("i="), connection data ("c="), and media bandwidth ("b="). It would have been possible to define a mechanism to negotiate media encryption keys ("k="). However, the usage of the media encryption keys ("k=") is highly discouraged in favour of other existing more sophisticated mechanisms. Therefore, we are not providing a mechanism to provide capabilities for media encryption keys ("k=") at this stage.

Since the three added capabilities are highly unconnected, it is not expected that implementations will support all three at the same time. Instead, it is expected that applications will choose their needed capability for their specific purpose. Due to this, we are writing the normative part pertaining to each capability in a self-contained section. In particular, Section 3.1.1 (Bandwidth Capability) describes the bandwidth capability extension, Section 3.1.2 (Connection Data Capability) describes the connection data capability extension, and Section 3.1.3 (Information Capability) describes the information capability extension. Separate option tags are defined for each capability.

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2. Conventions Used in This Document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14, RFC 2119 (Bradner, S., "Key words for use in RFCs to Indicate Requirement

Levels," March 1997.) [RFC2119] and indicate requirement levels for compliant implementations.

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3. Protocol Description

3.1. Extensions to SDP

The SDP Capability Negotiation Framework (Andreasen, F., "SDP Capability Negotiation," March 2010.) [I-D.ietf-mmusic-sdp-capability-negotiation] and the SDP media capabilities (Gilman, R., Even, R., and F. Andreasen, "SDP media capabilities Negotiation," February 2010.) [I-D.ietf-mmusic-sdp-media-capabilities] specify attributes for negotiating SDP capabilities. These documents specify new attributes (e.g., 'acap', 'tcap', 'mcap') for achieving their purpose. In this document we define a number of new additional capability attributes for SDP lines of the the general form:

```
type=value
```

for types "i", "c", and "b". The corresponding capability attributes are defined as "icap", "ccap", and "bcap", respectively.
From the sub-rules of "a=" line in SDP (Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol," July 2006.) [RFC4566], SDP attributes are of the form:

```
attribute          = (att-field ":" att-value) / att-field
att-field          = token
att-value          = byte-string
```

Capability attributes use only the 'att-field:att-value' form.
The new attributes may be referenced in potential configurations ("a=pcfg") or in latent configurations ("a=lcfg"), as productions conforming to the extension-config-list as defined in [I-D.ietf-mmusic-sdp-capability-negotiation] (Andreasen, F., "SDP Capability Negotiation," March 2010.).

```
extension-config-list = ["+"] ext-cap-name "="
                               ext-cap-list
ext-cap-name          = 1*(ALPHA / DIGIT)
ext-cap-list          = 1*VCHAR  ; defined in [RFC4234]
```

The optional "+" is used to indicate that the entire configuration, not just the parameter, must be ignored if the parameter is not supported. The attributes may be referenced in actual configurations as productions conforming to the sel-extension-config defined in [I-D.ietf-mmusic-sdp-capability-negotiation] (Andreasen, F., "SDP Capability Negotiation," March 2010.).

> *sel-extension-config = ext-cap-name* "=" 1*VCHAR*

The specific parameters are defined in the individual description of each capability, below.
It is not the intention of this work to negotiate these new capabilities at the session level, rather only at the media level. Therefore, capabilities referenced by any configuration attribute MUST appear at the media level when a configuration is "converted" to a corresponding media block. For this reason, the "icap" attribute is called the "media information capability". Specific values for each new attribute are described below.

3.1.1. Bandwidth Capability

According to RFC 4566 (Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol," July 2006.) [RFC4566] the bandwidth field denotes the proposed bandwidth to be used by the session or media. For what it concerns this memo, we focus on the bandwidth at the media level. This bandwidth field is specified in RFC 4566 (Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol," July 2006.) [RFC4566] according to the following syntax:

    b=<bwtype>:<bandwidth>

where <bwtype> is an alphanumeric modifier giving the meaning of the <bandwidth> figure.
In this document, we define a new capability attribute: the bandwidth capability attribute "bcap". This attribute lists bandwidth as capabilities according to the following definition:

    "a=bcap:" bw-cap-num 1*WSP bwtype ":" bandwidth CRLF

where <bw-cap-num> is a unique ordinal identifier of the bandwidth capability, and the other elements are as defined for the "b=" field in [RFC4566] (Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol," July 2006.).
This format satisfies the general attribute production rules in [RFC4566] (Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol," July 2006.) according to the following Augmented

Backus-Naur Form (ABNF) (Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF," January 2008.) [RFC5234] syntax:

```
att-field        = "bcap"
att-value        = bw-cap-num 1*WSP bwtype ":" bandwidth
bw-cap-num       = 1*DIGIT   ; integer between 1 and 2^31-1, inclusive
```

Negotiation of bandwidth per media stream can be useful when negotiating media encoding capabilities with different bandwidths.

3.1.1.1. Configuration Parameters

The SDP Capability Negotiation Framework (Andreasen, F., "SDP Capability Negotiation," March 2010.) [I-D.ietf-mmusic-sdp-capability-negotiation] provides for the existence of the "pcfg" and "acfg" attributes, which can carry one or more potential configurations to be negotiated. The concept is extended by the the Media Capabilities Negotiation (Gilman, R., Even, R., and F. Andreasen, "SDP media capabilities Negotiation," February 2010.) [I-D.ietf-mmusic-sdp-media-capabilities] with an "lcfg" attribute that conveys latent configurations. Extensions to the "pcfg" and "lcfg" attributes are defined through <extension-config-list>, and extensions to the "acfg" attribute are defined through the <sel-extension-config> as defined in [I-D.ietf-mmusic-sdp-capability-negotiation] (Andreasen, F., "SDP Capability Negotiation," March 2010.).
In this document we extend the <extension-config-list> field to be able to convey lists of bandwidth capabilities in latent or potential configurations, according to the following Augmented Backus-Naur Form (ABNF) (Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF," January 2008.) [RFC5234] syntax:

```
extension-config-list  = bandwidth-config-list

bandwidth-config-list  = ["+"] "b=" bw-cap-list *(BAR b-cap-list)
bw-cap-list            = bw-cap-num *("," b-cap-num)
bw-cap-num             = 1*DIGIT   ; 1 to 2^32-1 inclusive
```

Figure 1: Syntax of the bandwidth parameter in lcfg and pcfg attributes

---

Each bandwidth capability configuration is a comma-separated list of bandwidth capability attribute numbers where 'b-cap-num' refers to the bw-cap-num bandwidth capability numbers defined explicitly earlier in

this document, and hence must be between 1 and 2^31-1 (both included). Alternative bandwidth configurations are separated by a vertical bar ("|").
The bandwidth parameter to the actual configuration attribute ("a=acfg") is formulated as a sel-extension-config with

```
ext-cap-name = "b"
```

hence

```
    sel-extension-config = sel-bandwidth-config
    sel-bandwidth-config = "b=" bw-cap-list  ; bw-cap-list as above.
```

Figure 2: Syntax of the bandwidth parameter in acfg attributes

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3.1.1.2. Option tag

The SDP Capability Negotiation Framework (Andreasen, F., "SDP Capability Negotiation," March 2010.) [I-D.ietf-mmusic-sdp-capability-negotiation] solution allows for capability negotiation extensions to be defined. Associated with each such extension is an option tag that identifies the extension in question. Hereby, we define a new option tag of "bcap-v0" that identifies support for the bandwidth capability. This option tag SHOULD be added to other existing option tags present in the "csup" and "creq" attributes in SDP, according to the procedures defined in the SDP Capability Negotiation Framework (Andreasen, F., "SDP Capability Negotiation," March 2010.) [I-D.ietf-mmusic-sdp-capability-negotiation].

3.1.2. Connection Data Capability

According to SDP (Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol," July 2006.) [RFC4566], the connection data field in SDP contains the connection data, and it has the following syntax:

```
c=<nettype> <addrtype> <connection-address>
```

where <nettype> indicates the network type, <addrtype> indicates the
address type, and the <connection-address> is the connection address,
which is dependent on the address type.
At the moment, the only network type defined is "IN", which indicates
Internet network type. The address types "IP4" and "IP6" indicate the
type of IP addresses.
SDP (Handley, M., Jacobson, V., and C. Perkins, "SDP: Session
Description Protocol," July 2006.) [RFC4566] permits specification of
connection data at the session or at the media level. In order to
permit negotiation of connection data at the media level, we define the
connection data capability attribute ("a=ccap") in the form:

    "a=ccap:" conn-cap-num 1*WSP nettype SP addrtype SP connection-
    address CRLF

where <conn-cap-num> is a unique ordinal identifier of the connection
data capability, and the other elements are as defined in [RFC4566]
(Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description
Protocol," July 2006.).
This format corresponds to the [RFC4566] (Handley, M., Jacobson, V.,
and C. Perkins, "SDP: Session Description Protocol," July 2006.)
attribute production rules according to the following Augmented Backus-
Naur Form (ABNF) (Crocker, D. and P. Overell, "Augmented BNF for Syntax
Specifications: ABNF," January 2008.) [RFC5234] syntax:

    att-field   = "ccap"
    att-value   = conn-cap-num 1*WSP nettype SP addrtype
                        SP connection-address
    conn-cap-num   = 1*DIGIT   ; integer between 1 and 2^31-1, inclusive

The connection information capability can be used to negotiate the use
of IPv4 or IPv6 addresses without resort to Interactive Connectivity
Establishment(ICE) (Rosenberg, J., "Interactive Connectivity
Establishment (ICE): A Protocol for Network Address Translator (NAT)
Traversal for Offer/Answer Protocols," October 2007.)
[I-D.ietf-mmusic-ice]. Note, however, that ICE provides for real-time
reachability testing of multiple addresses, whereas use of the
connection capability forces an early choice of connection address.

3.1.2.1. Configuration Parameters

The SDP Capability Negotiation Framework (Andreasen, F., "SDP
Capability Negotiation," March 2010.)
[I-D.ietf-mmusic-sdp-capability-negotiation] provides for the existence
of the "pcfg" and "acfg" attributes, which can carry one or more
potential configurations to be negotiated. The concept is extended by
the the Media Capabilities Negotiation (Gilman, R., Even, R., and F.

Andreasen, "SDP media capabilities Negotiation," February 2010.) [I-D.ietf-mmusic-sdp-media-capabilities] with an "lcfg" attribute that conveys latent configurations.

In this document we define a <connection-config> parameter to be used to specify a connection data capability in a potential or latent configuration attribute. The parameter follows the form of an extension-config-list, with

```
ext-cap-name = "c"

ext-cap-list = conn-cap-list
```

where, according to the following Augmented Backus-Naur Form (ABNF) (Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF," January 2008.) [RFC5234] syntax:

```
    extension-config-list = conn-config-list
    conn-config-list      = "c=" conn-cap-list
    conn-cap-list         = conn-cap-num *(BAR conn-cap-num)
    conn-cap-num          = 1*DIGIT   ; 1 to 2^32-1 inclusive
```

Figure 3: Syntax of the connection data parameter in lcfg and pcfg attributes

---

Each capability configuration alternative contains a single connection data capability attribute number and refers to the conn-cap-num capability number defined explicitly earlier in this document, and hence must be between 1 and 2^31-1 (both included). The connection data capability allows the expression of only a single capability in each alternative, rather than a list of capabilities, since no more than a single connection data field is permitted per media block. Nevertheless, it is still allowed to express alternative potential connection configurations separated by a vertical bar ("|").

The connection data parameter to the actual configuration attribute ("a=acfg") is formulated as a sel-extension-config with

```
ext-cap-name = "c"
```

hence

```
    sel-extension-config = sel-connection-config
    sel-connection-config = "c=" conn-cap-num  ; as defined above.
```

Figure 4: Syntax of the connection data parameter in acfg attributes

3.1.2.2. Option tag

The SDP Capability Negotiation Framework (Andreasen, F., "SDP Capability Negotiation," March 2010.) [I-D.ietf-mmusic-sdp-capability-negotiation] solution allows for capability negotiation extensions to be defined. Associated with each such extension is an option tag that identifies the extension in question. Hereby, we define a new option tag of "ccap-v0" that identifies support for the connection data capability. This option tag SHOULD be added to other existing option tags present in the "csup" and "creq" attributes in SDP, according to the procedures defined in the SDP Capability Negotiation Framework (Andreasen, F., "SDP Capability Negotiation," March 2010.) [I-D.ietf-mmusic-sdp-capability-negotiation].

3.1.3. Information Capability

RFC 4566 (Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol," July 2006.) [RFC4566] provides for the existence of an information field expressed in the format of the "i=" line, which can appear either at the session level or at the media level. An "i=" line that is present at the session level is known as the "session name", and its purpose is to convey a human-readable textual information about the session. We don't see much usage of capabilities related to the "i=" line at the session level.
The "i=" line in SDP can also appear at the media level, in which case it is used to provide human-readable information about the media stream to which it is related, e.g., it may indicate the purpose of the media stream. The information field is not to be confused with the label attribute ("a=label:...), [RFC4574] (Levin, O. and G. Camarillo, "The Session Description Protocol (SDP) Label Attribute," August 2006.)) which provides a machine-readable tag. It is foreseen that applications declaring capabilities related to different configurations of a media stream may need to provide different identifying information for each of those configurations. That is, a party might offer alternative media configurations for a stream, each of which represents a different presentation of the same or similar information. For example, an audio stream might offer English or Spanish configurations, or a video stream might offer a choice of video source such as speaker camera, group camera, or document viewer. The information capability is needed to

inform the answering user in order to select the proper choice, and the label is used to inform the offering machine which choice the answerer has selected. Hence, there is value in defining a mechanism to provide information of media streams as capabilities.

According to SDP (Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol," July 2006.) [RFC4566], the media label has the following syntax:

    "i="text

where "text" represents a human-readable text indicating the purpose of the media stream.

In this document we define a new capability attribute: the information media capability, "icap". This attribute lists information media labels as capabilities, according to the following definition:

    "a=icap:" info-cap-num 1*WSP text

where <info-cap-num> is the ordinal identifier of the particular media information capability and <text> is a human-readable text that indicates the purpose of the media stream it is supposed to characterize.

As an example, one might use:

    a=icap:1 Document Camera

to represent a purpose of a media stream identified with the capability number 1.

The media information capability attribute satisfies the general attribute production rules in [RFC4566] (Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol," July 2006.) according to the following Augmented Backus-Naur Form (ABNF) (Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF," January 2008.) [RFC5234] syntax:

    att-field   = "icap"
    att-value   = info-cap-num 1*WSP text
                               ; text is defined in RFC 4566
    info-cap-num   = 1*DIGIT   ; integer between 1 and 2^31-1

3.1.3.1. Configuration Parameters

The SDP Capability Negotiation Framework (Andreasen, F., "SDP Capability Negotiation," March 2010.) [I-D.ietf-mmusic-sdp-capability-negotiation] provides for the existence of the "pcfg" and "acfg" attributes, which can carry one or more

potential configurations to be negotiated. The concept is extended by the the [Media Capabilities Negotiation (Gilman, R., Even, R., and F. Andreasen, "SDP media capabilities Negotiation," February 2010.)](#) [I-D.ietf-mmusic-sdp-media-capabilities] with an "lcfg" attribute that conveys latent configurations.

In this document, we define an <info-config-list> parameter to be used to convey information capabilities in a potential or latent configuration. This parameter is defined as an <extension-config-list> with the following associations:

    ext-cap-name = "i"

    ext-cap-list = info-cap-list

This leads to the following definition for the information capability parameter:

```
    extension-config-list = info-config-list
    info-config-list      = "i=" info-cap-list
    info-cap-list         = info-cap-num *(BAR info-cap-num)
    info-cap-num          = 1*DIGIT   ; 1 to 2^32-1 inclusive
                                      ; BAR defined in SDP capabilities
                                      ; negotiation
```

Figure 5: Syntax of the information capability parameter in lcfg and pcfg attributes

---

Each potential capability configuration contains a single information capability attribute number where 'info-cap-num' is the information capability number defined explicitly earlier in this document, and hence must be between 1 and 2^31-1 (both included). The information capability allows the expression of only a single capability in each alternative, since no more than a single information field is permitted per media block. Nevertheless, it is still allowed to express alternative potential information configurations separated by a vertical bar ("|").

3.1.3.2. Option Tag [TOC](#)

At present, it is difficult to envision a scenario in which the 'icap' attribute must be supported or the offer must be rejected. In most cases, if the icap attribute or its contents were to be ignored, an

offered configuration could still be chosen based on other criteria
such as configuration numbering. However, one might imagine an SDP
offer that contained English and Spanish potential configurations for
an audio stream. The session might be unintelligible if the choice is
based on configuration numbering, rather than informed user selection.
Based on such considerations, it may well prove useful to announce the
ability to use the icap attribute and its contents to select media
configurations, or to inform the user about the selected
configuration(s). Therefore, we define a new option tag of "icap-v0"
that identifies support for the media information capability. This
option tag SHOULD be added to other existing option tags present in the
"csup" and/or "creq" attributes in SDP, according to the procedures
defined in the [SDP Capability Negotiation Framework (Andreasen, F.,
"SDP Capability Negotiation," March 2010.)](#)
[I-D.ietf-mmusic-sdp-capability-negotiation]. The discusion above
suggests that "icap-v0" will typically appear in a "csup" attribute,
but rarely in a "creq" attribute.

3.2. Session Level versus Media Level

The icap, ccap, and bcap attributes can appear at the session level
and/or at the media level, but MUST be interpreted as a media-level
capability. To avoid confusion, the <type-attr-num> for each line must
be unique across all capability attributes of the same type within the
entire session description. As described below, these capability
attributes may be referenced by acfg, pcfg and/or lcfg attributes.

4. Field Replacement Rules

To simplify the construction of SDP records, given the need to include
fields at the base level for endpoints that do not support capabilities
negotiation, we define some simple field-replacement rules for those
fields invoked by potential or latent configurations. In particular,
any i-field or c-field invoked by a configuration MUST replace the
corresponding field, if present at the base media level. Any b-field
invoked by a configuration MUST replace any b-field of the same
bandwidth type at the media level.

5. IANA Considerations

5.1. New SDP Attributes

IANA is hereby requested to register the following new SDP attributes:

Attribute name: icap

Long form name: Information Capability

Type of attribute: Media-level

Subject to charset: Yes

Purpose: Negotiate human-readable media information

Appropriate values: See Section 3.1.3 (Information Capability)

Attribute name: ccap

Long form name: Connection Data Capability

Type of attribute: Media-level

Subject to charset: No

Purpose: Negotiate media-level connection data

Appropriate values: See Section 3.1.2 (Connection Data Capability)

Attribute name: bcap

Long form name: Bandwidth Capability

Type of attribute: Media-level

Subject to charset: No

Purpose: Negotiate media-level bandwidths

Appropriate values: See Section 3.1.1 (Bandwidth Capability)

5.2. New Option Tags

IANA is hereby requested to add the new option tags "ccap-v0", "icap-v0", and "bcap-v0", defined herein, to the SDP Capability Negotiation Option Tag Registry.

5.3. New SDP Capability Negotiation Configuration Parameters

6. Security Considerations

This document provides an extension on top of RFC 4566 (Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol," July 2006.) [RFC4566], RFC 3264 (Rosenberg, J. and H. Schulzrinne, "An Offer/Answer Model with Session Description Protocol (SDP)," June 2002.) [RFC3264], SDP Capability Negotiation Framework (Andreasen, F., "SDP Capability Negotiation," March 2010.) [I-D.ietf-mmusic-sdp-capability-negotiation], and SDP Media Capabilities Negotiation (Gilman, R., Even, R., and F. Andreasen, "SDP media capabilities Negotiation," February 2010.) [I-D.ietf-mmusic-sdp-media-capabilities]. As such, the security considerations of those documents apply.

7. Acknowledgments

Thanks to Christer Holmberg, Alf Heidermark, and Ingemar Johansson for arguing for the existence of this document and early reviewing it.

8. References

8.1. Normative References

[I-D.ietf-mmusic-sdp-capability-negotiation]	Andreasen, F., "SDP Capability Negotiation," draft-ietf-mmusic-sdp-capability-negotiation-13 (work in progress), March 2010 (TXT).
[I-D.ietf-mmusic-sdp-media-capabilities]	Gilman, R., Even, R., and F. Andreasen, "SDP media capabilities Negotiation," draft-ietf-mmusic-sdp-media-capabilities-09 (work in progress), February 2010 (TXT).
[RFC2119]	

	Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels," BCP 14, RFC 2119, March 1997 (TXT, HTML, XML).
[RFC3264]	Rosenberg, J. and H. Schulzrinne, "An Offer/Answer Model with Session Description Protocol (SDP)," RFC 3264, June 2002 (TXT).
[RFC4566]	Handley, M., Jacobson, V., and C. Perkins, "SDP: Session Description Protocol," RFC 4566, July 2006 (TXT).
[RFC5234]	Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF," STD 68, RFC 5234, January 2008 (TXT).

8.2. Informative References

[I-D.ietf-mmusic-ice]	Rosenberg, J., "Interactive Connectivity Establishment (ICE): A Protocol for Network Address Translator (NAT) Traversal for Offer/Answer Protocols," draft-ietf-mmusic-ice-19 (work in progress), October 2007 (TXT).
[RFC3550]	Schulzrinne, H., Casner, S., Frederick, R., and V. Jacobson, "RTP: A Transport Protocol for Real-Time Applications," STD 64, RFC 3550, July 2003 (TXT, PS, PDF).
[RFC3711]	Baugher, M., McGrew, D., Naslund, M., Carrara, E., and K. Norrman, "The Secure Real-time Transport Protocol (SRTP)," RFC 3711, March 2004 (TXT).
[RFC4574]	Levin, O. and G. Camarillo, "The Session Description Protocol (SDP) Label Attribute," RFC 4574, August 2006 (TXT).

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