   **Multiplexing Negotiation Using Session Description Protocol (SDP) Port
                              Numbers**
          draft-ietf-mmusic-sdp-bundle-negotiation-03.txt

Abstract

   This specification defines a new SDP Grouping Framework extension,
   "BUNDLE", that can be used with the Session Description Protocol
   (SDP) Offer/Answer mechanism to negotiate the usage of bundled media,
   which refers to the usage of a single 5-tuple for media associated
   with multiple SDP media descriptions ("m=" lines).

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1. Introduction

   In the IETF RTCWEB WG, a need to use a single 5-tuple for sending and
   receiving media associated with multiple SDP media descriptions ("m="
   lines) has been identified. This would e.g. allow the usage of a
   single set of Interactive Connectivity Establishment (ICE) [RFC5245]
   candidates for multiple media descriptions. Normally different media
   types (audio, video etc) will be described using different media
   descriptions.

   This specification defines a new SDP Grouping Framework [RFC5888]
   extension, "BUNDLE", that can be used with the Session Description
   Protocol (SDP) Offer/Answer mechanism [RFC3264] to negotiate the
   usage of bundled media, which refers to the usage of a single 5-tuple
   for media associated with multiple SDP media descriptions ("m="
   lines).

   The SDP Offerer and SDP Answerer [RFC3264] use the "BUNDLE" grouping
   extension to indicate which media is associated with a single
   5-tuple. For each media, the associated "m=" line is associated with
   a "BUNDLE" group.

   For each "BUNDLE" group, the SDP Offerer and SDP Answerer use an
   identical port number value in each "m=" line associated with the
   "BUNDLE" group. However, until it is known that the SDP Answerer
   supports the "BUNDLE" grouping extension, when the SDP Offerer
   generates an SDP Offer, a different port number value is inserted for
   each "m=" line associated with the "BUNDLE" group. The port number
   value associated with the first "m=" line associated with the
   "BUNDLE" group represents the port value number offered to be used in
   the single 5-tuple.

   NOTE: As defined in RFC 4566 [RFC4566], the semantics of multiple
   "m=" lines using the same port number value are undefined, and there
   is no grouping defined by such means. Instead, an explicit grouping
   mechanism needs to be used to express the intended semantics. This
   specification provides such extension.

   SDP Offers and SDP Answer can contain multiple "BUNDLE" groups. For
   each "BUNDLE" group, a different port number value MUST be used.

   When media is transported using the Real-Time Protocol (RTP)
   [RFC3550], the default assumption of the mechanism is that all media
   associated with a "BUNDLE" group will form a single RTP Session
   [RFC3550]. However, future specifications can extend the mechanism,
   in order to negotiate RTP Session multiplexing, i.e. "BUNDLE" groups
   where media associated with a group form multiple RTP Sessions.

The mechanism is backward compatible. Endpoints that do not support
the "BUNDLE" grouping extension are expected to generate SDP Offers
and SDP Answers without inserting a "BUNDLE" group, and to insert
different port number values in each "m=" line, in the SDP Offers and
SDP Answers, as defined in RFC 4566 and RFC 3264.

2. Terminology

5-tuple: A collection of the following values: source address, source
port, destination address, destination port and protocol.

Bundled media: Two or more RTP streams using a single 5-tuple. The
RTCP streams associated with the RTP streams also use a single
5-tuple, which might be the same, but can also be different, as the
one used by the RTP streams.

3. Conventions

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
[RFC2119].

4. Applicability Statement

The mechanism in this specification only applies to the Session
Description Protocol (SDP) [RFC4566], when used together with the SDP
Offer/Answer mechanism [RFC3264].

5. SDP Grouping Framework BUNDLE Extension Semantics

This section defines a new SDP Grouping Framework extension,
"BUNDLE".

The "BUNDLE" extension can be indicated using an SDP session-level
'group' attribute. Each SDP media description ("m=" line) that is
grouped together, using an SDP media-level 'mid' attribute, is part
of a specific "BUNDLE" group.

6. SDP Offer/Answer Procedures

6.1. General

   When an endpoint generates an SDP Offer or SDP Answer, which contains
   a "BUNDLE" group, it MUST insert an SDP session-level 'group'
   attribute, with a "BUNDLE" value, and assign SDP media-level 'mid'
   attribute values for each "m=" line associated the "BUNDLE" group.

   Until it is known whether the SDP Answerer supports the "BUNDLE"
   grouping extension, the SDP Offerer MUST, for each "m=" line
   associated with a "BUNDLE" group:

   o 1. Insert different port number values.
   o 2. Insert identical connection data ("c=" line) value.
   o 3. Insert different SDP 'rtcp' attribute value, when used.
   o 4. Insert different ICE candidate values, when used.
   o 5. Insert an SDP 'rtpc-mux' attribute.
   o 6. Insert identical DTLS-SRTP fingerprint attribute, when used
   o 7. Insert different SDES crypto attribute, when used

   Once it is known that both endpoints support the "BUNDLE" grouping
   extension, the SDP Offerer and SDP Answerer MUST, for each "m=" line
   associated with a "BUNDLE" group:

   o 1. Insert identical port number values.
   o 2. Insert identical connection data ("c=" line) value.
   o 3. Insert identical SDP 'rtcp' attribute value, when used.
   o 4. Insert identical ICE candidate values, when used.
   o 5. Insert an SDP 'rtpc-mux' attribute.
   o 6. Insert identical DTLS-SRTP fingerprint attribute, when used
   o 7. Insert different SDES crypto attribute, when used

   Once both endpoints have indicated support of the "BUNDLE" grouping
   extension, they can start using the single port for the media
   associated with each "m=" line in the "BUNDLE group".

   OPEN ISSUE #1: If the SDP Answerer supports "BUNDLE", do we mandate
   that "m=" lines must be grouped in the same way in the SDP Answer as
   they are grouped in the SDP Offer?

6.2. SDP Offerer Procedures

   When the SDP Offerer generates an SDP Offer that contains a "BUNDLE"
   group, the SDP Offer MUST be generated according to the procedures in
   Section 6.1.

   If the associated SDP Answer contains a "BUNDLE" group, and the SDP
   Offer contained different port number values in each "m=" line
   associated with the "BUNDLE" group, the SDP Offerer MUST generate a

new SDP Offer, and insert an identical port number value for each
"m=" line associated with the "BUNDLE" group. Unless ICE is used,
the SDP Offerer MUST generate the new SDP Offer immediately when it
has received the SDP Answer indicating that the SDP Answerer supports
the "BUNDLE" grouping extension. If ICE is used, the SDP Offer can
wait until the SDP Offer indicating that ICE is finished is sent, as
defined in RFC 5245.

NOTE: The reason for sending the new SDP Offer, which includes an
identical port number value in each "m=" line associated with the
"BUNDLE" group, is to ensure that intermediary entities that look at
SDP information e.g. for different type of policing functions, have
the correct information regarding which ports will be used for media.

If the SDP Offer contains different port number values for each "m="
lines associated with the "BUNDLE" group, and if the associated SDP
Answer does not contain a "BUNDLE" group, the SDP Offerer MUST use
the different port number values that were included in the SDP Offer.

Once it is known that both the SDP Offerer and SDP Answerer support
the "BUNDLE" grouping extension, in each subsequent SDP Offer towards
the SDP Answerer, the SDP Offer MUST insert an identical port number
value in each "m=" line associated with the "BUNDLE" group.

NOTE: If needed, the SDP Offerer is allowed to change the port number
value in an subsequent SDP Offer, but it still inserts the same
identical port number value in each "m=" line associated with the
"BUNDLE" group.

When generating an SDP Offer, if the SDP Offerer wants to disable
media associated with an "m=" line in a "BUNDLE" group, it will
insert a zero port number value in the disabled "m=" line, as defined
in RFC 3264. However, if the "m=" lines associated with the "BUNDLE"
group contain different port number values (i.e. the SDP Offer is
generated until it is known whether the SDP Answerer supports the
"BUNDLE" grouping extension) the SDP Offerer MUST NOT set the port
number value of the first "m=" line associated with the "BUNDLE"
group to zero.

The SDP Offerer MUST NOT insert an identical port number value in
multiple "m=" lines, unless the "m=" lines are associated with a
"BUNDLE" group.

OPEN ISSUE #2: If the session has been established without BUNDLE, do
we allow BUNDLE to be enabled later during the session?

OPEN ISSUE #3: If the session has been established with BUNDLE, do we
allow BUNDLE to be disabled later during the session, meaning that

different port number values will be used for media associated with
each "m=" line?

6.3. SDP Answerer Procedures

When an SDP Answerer receives an SDP Offer which contains a "BUNDLE"
group, and the SDP Answerer accepts the offered "BUNDLE" group, the
SDP Answerer MUST generate an SDP Answer according to the procedures
in Section 6.1.

When generating the SDP Answer, if the SDP Answerer wants to reject
media associated with an "m=" line in the "BUNDLE" group, it will
insert a zero port number value in the disabled "m=" line, as defined
in RFC 3264.

The SDP Answerer MUST NOT insert a "BUNDLE" group in an SDP Answer,
unless the associated SDP Offer contains a "BUNDLE" group.

The SDP Answerer MUST NOT insert an identical port number value in
multiple "m=" lines, unless the "m=" lines are associated with a
"BUNDLE" group.

Until the SDP Answerer receives the new SDP Offer, which contains an
identical port number value for each "m=" line associated with a
"BUNDLE" group, it MUST use the port, and related information (ICE
candidates, SDES keys etc) associated with the first "m=" line in the
"BUNDLE" group.

6.4. Bundled SDP Information

6.4.1. General

This section describes how SDP information, given for each media
description, is calculated into a single value for a "BUNDLE" group.

6.4.2. Bandwidth (b=)

The total proposed bandwidth is the sum of the proposed bandwidth for
each "m=" line associated with a negotiated BUNDLE group.

6.4.3. Attributes (a=)

There are also special rules for handling many different attributes
as defined in [I-D.nandakumar-mmusic-sdp-attributes]. It might not
possible to use bundle with some attributes.

[7](). Single vs Multiple RTP Sessions

[7.1](). General

When entities negotiate the usage of bundled media, the default
assumption is that all media associated with the bundled media will
form a single RTP session.

The usage of multiple RTP Sessions within a "BUNDLE" group is outside
the scope of this specification. Other specification needs to extend
the mechanism in order to allow negotiation of such bundle groups.

It is possible to use multiple "BUNDLE" groups, in case the RTP media
within each group will be part of different RTP Sessions.

[7.2](). Single RTP Session

When a single RTP Session is used, media associated with all "m="
lines part of a bundle group share a single SSRC [[RFC3550]()] numbering
space.

In addition, the following rules and restrictions apply for a single
RTP Session:

o - The dynamic payload type values used in the "m=" lines MUST NOT
   overlap.
o - The "proto" value in each "m=" line MUST be identical (e.g.
   RTP/AVPF).
o - A given SSRC SHOULD NOT transmit RTP packets using payload types
   that originates from different "m=" lines.

NOTE: The last bullet above is to avoid sending multiple media types
from the same SSRC. If transmission of multiple media types are done
with time overlap RTP and RTCP fails to function. Even if done in
proper sequence this causes RTP Timestamp rate switching issues [ref
to [draft-ietf-avtext-multiple-clock-rates]()].

[8](). Usage With ICE

[8.1](). General

This section describes how to use the "BUNDLE" grouping extension
together with the Interactive Connectivity Establishment (ICE)
mechanism [[RFC5245]()].

8.2. Candidates

When an ICE-enabled endpoint generates an SDP Offer, which contains a
"BUNDLE" group, the SDP Offerer MUST include ICE candidates for each
"m=" line associated with a "BUNDLE" group, except for any "m=" line
with a zero port number value. If the "m=" lines associated with the
"BUNDLE" group contain different port number values, the SDP Offerer
MUST also insert different candidate values in each "m=" line
associated with the "BUNDLE" group. If the "m=" lines associated
with the "BUNDLE" group contain an identical port number value, the
candidate values MUST also be identical.

When an ICE-enabled endpoint generates and SDP Answer, which contains
a "BUNDLE" group, the SDP Answerer MUST include ICE candidates for
each "m=" line associated with the "BUNDLE" group, except for any
"m=" line where the port number value is set to zero. The SDP
Answerer MUST insert identical candidate values in each "m=" line
associated with the "BUNDLE" group.

8.3. Candidates

Once it is known that both endpoints support, and accept to use, the
"BUNDLE" grouping extension, ICE connectivity checks and keep-alives
only needs to be performed for the whole "BUNDLE" group, instead of
for each individual "m=" line associated with the group.

9. Security Considerations

This specification does not significantly change the security
considerations of SDP which can be found in Section X of TBD.

TODO: Think carefully about security analysis of reuse of same SDES
key on multiple "m=" lines when the far end does not use BUNDLE and
warn developers of any risks.

10. Example: SDP Offer with different port number values

The example below shows an SDP Offer, where bundled media is offered
using different port number values in the "m=" lines associated with
the "BUNDLE" group. The example also shows two SDP Answer
alternatives: one where bundled media is accepted, and one where
bundled media is rejected (or, not even supported) by the SDP
Answerer.

SDP Offer (Bundled media offered)

```
v=0
o=alice 2890844526 2890844526 IN IP4 host.atlanta.com
s=
c=IN IP4 host.atlanta.com
t=0 0
a=group:BUNDLE foo bar
m=audio 10000 RTP/AVP 0 8 97
a=mid:foo
b=AS:200
a=rtpmap:0 PCMU/8000
a=rtpmap:8 PCMA/8000
a=rtpmap:97 iLBC/8000
m=video 10002 RTP/AVP 31 32
a=mid:bar
b=AS:1000
a=rtpmap:31 H261/90000
a=rtpmap:32 MPV/90000
```

SDP Answer (Bundled media accepted)

```
v=0
o=bob 2808844564 2808844564 IN IP4 host.biloxi.com
s=
c=IN IP4 host.biloxi.com
t=0 0
a=group:BUNDLE foo bar
m=audio 20000 RTP/AVP 0
a=mid:foo
b=AS:200
a=rtpmap:0 PCMU/8000
m=video 20000 RTP/AVP 32
a=mid:bar
b=AS:1000
a=rtpmap:32 MPV/90000
```

SDP Answer (Bundled media not accepted)

```
v=0
o=bob 2808844564 2808844564 IN IP4 host.biloxi.com
s=
c=IN IP4 host.biloxi.com
t=0 0
m=audio 20000 RTP/AVP 0
b=AS:200
a=rtpmap:0 PCMU/8000
m=video 30000 RTP/AVP 32
b=AS:1000
a=rtpmap:32 MPV/90000
```

SDP Offer with ICE (Bundled media offered)

```
v=0
o=alice 2890844526 2890844526 IN IP4 host.atlanta.com
s=
c=IN IP4 host.atlanta.com
t=0 0
a=group:BUNDLE foo bar
m=audio 10000 RTP/AVP 0 8 97
a=mid:foo
b=AS:200
a=rtpmap:0 PCMU/8000
a=rtpmap:8 PCMA/8000
a=rtpmap:97 iLBC/8000
a=candidate:1 1 UDP 1694498815 host.atlanta.com 10000 typ host
m=video 10002 RTP/AVP 31 32
a=mid:bar
b=AS:1000
a=rtpmap:31 H261/90000
a=rtpmap:32 MPV/90000
a=candidate:1 1 UDP 1694498815 host.atlanta.com 10002 typ host
```

11. Example: SDP Offer with identical port number values

The example below shows an SDP Offer, where bundled media is offered
an identical port number value in the "m=" lines associated with the
"BUNDLE" group. The example also shows two SDP Answer alternatives:
one where bundled media is accepted, and one where bundled media is
rejected (or, not even supported) by the SDP Answerer.

SDP Offer (Bundled media offered)

```
v=0
o=alice 2890844526 2890844526 IN IP4 host.atlanta.com
s=
c=IN IP4 host.atlanta.com
t=0 0
a=group:BUNDLE foo bar
m=audio 10000 RTP/AVP 0 8 97
a=mid:foo
b=AS:200
a=rtpmap:0 PCMU/8000
a=rtpmap:8 PCMA/8000
a=rtpmap:97 iLBC/8000
m=video 10000 RTP/AVP 31 32
a=mid:bar
b=AS:1000
a=rtpmap:31 H261/90000
a=rtpmap:32 MPV/90000
```

SDP Answer (Bundled media accepted)

```
v=0
o=bob 2808844564 2808844564 IN IP4 host.biloxi.com
s=
c=IN IP4 host.biloxi.com
t=0 0
a=group:BUNDLE foo bar
m=audio 20000 RTP/AVP 0
a=mid:foo
b=AS:200
a=rtpmap:0 PCMU/8000
m=video 20000 RTP/AVP 32
a=mid:bar
b=AS:1000
a=rtpmap:32 MPV/90000
```

SDP Answer (Bundled media not accepted)

```
v=0
o=bob 2808844564 2808844564 IN IP4 host.biloxi.com
s=
c=IN IP4 host.biloxi.com
t=0 0
m=audio 20000 RTP/AVP 0
b=AS:200
```

```
        a=rtpmap:0 PCMU/8000
        m=video 30000 RTP/AVP 32
        b=AS:1000
        a=rtpmap:32 MPV/90000
```

   SDP Offer with ICE (Bundled media offered)

```
        v=0
        o=alice 2890844526 2890844526 IN IP4 host.atlanta.com
        s=
        c=IN IP4 host.atlanta.com
        t=0 0
        a=group:BUNDLE foo bar
        m=audio 10000 RTP/AVP 0 8 97
        a=mid:foo
        b=AS:200
        a=rtpmap:0 PCMU/8000
        a=rtpmap:8 PCMA/8000
        a=rtpmap:97 iLBC/8000
        a=candidate:1 1 UDP 1694498815 host.atlanta.com 10000 typ host
        m=video 10000 RTP/AVP 31 32
        a=mid:bar
        b=AS:1000
        a=rtpmap:31 H261/90000
        a=rtpmap:32 MPV/90000
        a=candidate:1 1 UDP 1694498815 host.atlanta.com 10000 typ host
```

12. IANA Considerations

   This document requests IANA to register the new SDP Grouping semantic
   extension called BUNDLE.

13. Acknowledgements

   The usage of the SDP grouping extension for negotiating bundled media
   is based on a similar alternative proposed by Harald Alvestrand. The
   SDP examples are also modified versions from the ones in the
   Alvestrand proposal.

14. Change Log

   [RFC EDITOR NOTE: Please remove this section when publishing]

   Changes from draft-ietf-mmusic-sdp-bundle-negotiation-02
   o Mechanism modified, to be based on usage of SDP Offers with both
      different and identical port number values, depending on whether
      it is known if the remote endpoint supports the extension.
   o Cullen Jennings added as co-author.

   Changes from draft-ietf-mmusic-sdp-bundle-negotiation-01
   o No changes. New version due to expiration.

   Changes from draft-ietf-mmusic-sdp-bundle-negotiation-00
   o No changes. New version due to expiration.

   Changes from draft-holmberg-mmusic-sdp-multiplex-negotiation-00
   o Draft name changed.
   o Harald Alvestrand added as co-author.
   o "Multiplex" terminology changed to "bundle".
   o Added text about single versus multiple RTP Sessions.
   o Added reference to RFC 3550.

15. References

15.1. Normative References

   [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate
              Requirement Levels", BCP 14, RFC 2119, March 1997.

   [RFC3264] Rosenberg, J. and H. Schulzrinne, "An Offer/Answer Model
              with Session Description Protocol (SDP)", RFC 3264,
              June 2002.

   [RFC4566] Handley, M., Jacobson, V., and C. Perkins, "SDP: Session
              Description Protocol", RFC 4566, July 2006.

   [RFC5888] Camarillo, G. and H. Schulzrinne, "The Session Description
              Protocol (SDP) Grouping Framework", RFC 5888, June 2010.

   [I-D.nandakumar-mmusic-sdp-attributes]
              Nandakumar, S. and C. Jennings, "A Framework for SDP
              Attributes when Multiplexing",
              draft-nandakumar-mmusic-sdp-attributes-00 (work in
              progress), February 2013.

15.2. Informative References

   [RFC3550] Schulzrinne, H., Casner, S., Frederick, R., and V.
              Jacobson, "RTP: A Transport Protocol for Real-Time
              Applications", STD 64, RFC 3550, July 2003.

   [RFC5245]   Rosenberg, J., "Interactive Connectivity Establishment
               (ICE): A Protocol for Network Address Translator (NAT)
               Traversal for Offer/Answer Protocols", RFC 5245,
               April 2010.

Appendix A. Design Considerations

A.1. General

   One of the main issues regarding the "BUNDLE" grouping extensions has
   been whether, in SDP Offers and SDP Answers, the same port number
   value should be inserted in "m=" lines associated with a "BUNDLE"
   group, as the purpose of the extension is to negotiate the usage of a
   single 5-tuple for media associated with the "m=" lines. Issues with
   both approaches, discussed in the Appendix have been raised. The
   outcome was to specify a mechanism which uses SDP Offers with both
   different and identical port number values.

   Below are the primary issues that have been considered when defining
   the "BUNDLE" grouping extension:
   o 1) Interoperability with existing UAs.
   o 2) Interoperability with intermediary B2BUA- and proxy entities.
   o 3) Time to gather, and the number of, ICE candidates.
   o 4) Different error scenarios, and when they occur.
   o 5) SDP Offer/Answer impacts, including usage of port number value
      zero.

   NOTE: Before this document is published as an RFC, this Appendix
   might be removed.

A.2. UA Interoperability

   Consider the following SDP Offer/Answer exchange, where Alice sends
   an SDP Offer to Bob:

   SDP Offer

      v=0
      o=alice 2890844526 2890844526 IN IP4 host.atlanta.com
      s=
      c=IN IP4 host.atlanta.com
      t=0 0
      m=audio 10000 RTP/AVP 97
      a=rtpmap:97 iLBC/8000
      m=video 10002 RTP/AVP 97
      a=rtpmap:97 H261/90000

SDP Answer

```
v=0
o=bob 2808844564 2808844564 IN IP4 host.biloxi.com
s=
c=IN IP4 host.biloxi.com
t=0 0
m=audio 20000 RTP/AVP 97
a=rtpmap:97 iLBC/8000
m=video 20002 RTP/AVP 97
a=rtpmap:97 H261/90000
```

RFC 4961 specifies a way of doing symmetric RTP but that is an a
later invention to RTP and Bob can not assume that Alice supports RFC
4961. This means that Alice may be sending RTP from a different port
than 10000 or 10002 - some implementation simply send the RTP from an
ephemeral port. When Bob's endpoint receives an RTP packet, the only
way that Bob know if it should be passed to the video or audio codec
is by looking at the port it was received on. This lead some SDP
implementations to use the fact that each "m=" line had a different
port number to use that port number as an index to find the correct m
line in the SDP. As a result, some implementations that do support
symmetric RTP and ICE still use a SDP data structure where SDP with
"m=" lines with the same port such as:

SDP Offer

```
v=0
o=alice 2890844526 2890844526 IN IP4 host.atlanta.com
s=
c=IN IP4 host.atlanta.com
t=0 0
m=audio 10000 RTP/AVP 97
a=rtpmap:97 iLBC/8000
m=video 10000 RTP/AVP 98
a=rtpmap:98 H261/90000
```

will result in the second "m=" line being considered an SDP error
because it has the same port as the first line.

A.3. Usage of port number value zero

In an SDP Offer or SDP Answer, the media associated with an "m=" line
can be disabled/rejected by setting the port number value to zero.

This is different from e.g. using the SDP direction attributes, where
RTCP traffic will continue even if the SDP "inactive" attribute is
indicated for the associated "m=" line.

If each "m=" line associated with a "BUNDLE" group would contain
different port number values, and one of those port would be used for
the 5-tuple, problems would occur if an endpoint wants to disable/
reject the "m=" line associated with that port, by setting the port
number value to zero. After that, no "m=" line would contain the
port number value which is used for the 5-tuple. In addition, it is
unclear what would happen to the ICE candidates associated with the
"m=" line, as they are also used for the 5-tuple.

A.4. B2BUA And Proxy Interoperability

Some back to back user agents may be configured in a mode where if
the incoming call leg contains an SDP attribute the B2BUA does not
understand, the B2BUS still generates that SDP attribute in the Offer
for the outgoing call leg. Consider an B2BUA that did not understand
the SDP "rtcp" attribute, defined in RFC 3605, yet acted this way.
Further assume that the B2BUA was configured to tear down any call
where it did not see any RTCP for 5 minutes. In this cases, if the
B2BUA received an Offer like:

SDP Offer

    v=0
    o=alice 2890844526 2890844526 IN IP4 host.atlanta.com
    s=
    c=IN IP4 host.atlanta.com
    t=0 0
    m=audio 49170 RTP/AVP 0
    a=rtcp:53020

It would be looking for RTCP on port 49172 but would not see any
because the RTCP would be on port 53020 and after five minutes, it
would tear down the call. Similarly, an SBC that did not understand
BUNDLE yet put BUNDLE in it's offer may be looking for media on the
wrong port and tear down the call. It is worth noting that a B2BUA
that generated an Offer with capabilities it does not understand is
not compliant with the specifications.

A.4.1. Traffic Policing

   Sometimes intermediaries do not act as B2BUA, in the sense that they
   don't modify SDP bodies, nor do they terminate SIP dialogs. Still,
   however, they may use SDP information (e.g. IP address and port) in
   order to control traffic gating functions, and to set traffic
   policing rules. There might be rules which will trigger a session to
   be terminated in case media is not sent or received on the ports
   retrieved from the SDP. This typically occurs once the session is
   already established and ongoing.

A.4.2. Bandwidth Allocation

   Sometimes intermediaries do not act as B2BUA, in the sense that they
   don't modify SDP bodies, nor do they terminate SIP dialogs. Still,
   however, they may use SDP information (e.g. codecs and media types)
   in order to control bandwidth allocation functions. The bandwidth
   allocation is done per "m=" line, which means that it might not be
   enough if media associated with all "m=" lines try to use that
   bandwidth. That may either simply lead to bad user experience, or to
   termination of the call.

A.5. Candidate Gathering

   When using ICE, an candidate needs to be gathered for each port.
   This takes approximately 20 ms extra for each extra "m=" line due to
   the NAT pacing requirements. All of this gather can be overlapped
   with other things while the page is loading to minimize the impact.
   If the client only wants to generate TURN or STUN ICE candidates for
   one of the "m=" lines and then use trickle ICE [TODO REF] to get the
   non host ICE candidates for the rest of the "m=" lines, it MAY do
   that and will not need any additional gathering time.

   Some people have suggested a TURN extension to get a bunch of TURN
   allocation at once. This would only provide a single STUN result so
   in cases where the other end did not support BUNDLE, may cause more
   use of the TURN server but would be quick in the cases where both
   sides supported BUNDLE and would fall back to a successful call in
   the other cases.

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