   **TINS: A Transport for Initiating and Negotiating Sessions using SDPng
                             over XMPP
                   draft-hildebrand-xmpp-sdpng-00**

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Abstract

   This document describes a method of initiating and negotiating media
   sessions by using SDPng on top of the eXtensible Messaging and
   Presence Protocol (XMPP) as the signalling protocol.

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1. Introduction

The MMUSIC WG has defined an XML format for Session Description and Capability Negotiation (SDPng [1]). Given the availability of a native XML transport in the form of the Extensible Messaging and Presence Protocol (XMPP [2]), it may be valuable to explore how to build a framework for media stream/session initiation and negotiation over XMPP. This document explores such a framework, with SDPng over XMPP providing a semantics for signalling call setup that is similar to the semantics alternatively provided by the Session Initiation Protocol (SIP [3]).

1.1 Terminology

This document inherits terminology defined in SDPng [1] and in XMPP Core [2].

The capitalized 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 RFC 2119 [4].

1.2 Discussion Venue

The author welcomes discussion and comments related to the topics presented in this document. The preferred forum is the <xmppwg@jabber.org> mailing list, for which archives and subscription information are available at <http://www.jabber.org/cgi-bin/mailman/listinfo/xmppwg/>.

1.3 Intellectual Property Notice

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2. Stanza Flow Overview

The following is an example flow of XMPP stanzas to initiate a call.
The from addresses will usually be added by the XMPP server, but are
shown for clarity.

Step 1: A sends an invite to B:

```
<message from='A@example.com/work' to='B@example.com'>
  <thread>1234@hostA.example.com</thread>
  <body>This message contains a TINS invite,
        but your client does not support TINS.</body>
  <tins method='INVITE'
    xmlns='http://www.jabber.org/protocol/tins'>

    <def xmlns='http://www.iana.org/sdpng'>
      <codec name="audio-basic" encoding="PCMU"
        sampling="8000" channels="1"
        xmlns='http://www.iana.org/sdpng/audio'/>
      <pt name="rtp-avp-0" pt="0" format="audio-basic"
        xmlns='http://www.iana.org/sdpng/rtp'/>
    </def>

    <cfg xmlns='http://www.iana.org/sdpng'>
      <component name="interactive-audio" media="audio">
        <alt name="AVP-audio-0">
          <session format="rtp-avp-0"
                  xmlns='http://www.iana.org/sdpng/rtp'>
            <udp role="receive" endpoint="A" addr="192.168.1.1"
                  rtp-port="7800"/>
          </session>
        </alt>
      </component>
    </cfg>

    <conf xmlns='http://www.iana.org/sdpng'>
      <owner user="A@example.com" id="98765432" version="1" nettype="IN"
            addrtype="IP4" addr="192.168.1.1"/>
      <session name="SDPng questions"/>

      <info name="interactive-audio" function="voice">
        Telephony media stream
      <info>
    </conf>
  </tins>
</message>
```

Step 2: B tells A that it is trying:

```
<message from='B@example.com/laptop' to='A@example.com/work'>
  <thread>1234@hostA.example.com</thread>
  <tins method='result' code='100' reason='Trying'
    xmlns='http://www.jabber.org/protocol/tins'/>
</message>
```

Step 3: B tells A that it is ringing:

```
<message from='B@example.com/laptop' to='A@example.com/work'>
  <thread>1234@hostA.example.com</thread>
  <tins method='result' code='180' reason='Ringing'
    xmlns='http://www.jabber.org/protocol/tins'/>
</message>
```

Step 4: B sends A updated description:

```
<message from='B@example.com/laptop' to='A@example.com/work'>
  <thread>1234@hostA.example.com</thread>
  <tins method='result' code='200' reason='OK'
    xmlns='http://www.jabber.org/protocol/tins'>

    <def xmlns='http://www.iana.org/sdpng'>
      <codec name="audio-basic" encoding="PCMU"
        sampling="8000" channels="1"
         xmlns='http://www.iana.org/sdpng/audio'/>
      <pt name="rtp-avp-0" pt="0" format="audio-basic"
        xmlns='http://www.iana.org/sdpng/rtp'/>
    </def>

    <cfg xmlns='http://www.iana.org/sdpng'>
      <component name="interactive-audio" media="audio">
        <alt name="AVP-audio-0">
          <session format="rtp-avp-0"
            xmlns='http://www.iana.org/sdpng/rtp'>
            <udp role="receive" endpoint="A" addr="192.168.1.1"
              rtp-port="7800"/>
            <udp role="receive" endpoint="B" addr="192.168.1.2"
              rtp-port="9410"/>
          </session>
        </alt>
      </component>
    </cfg>
  </t:tins>
</message>
```

Step 5: A sends an ACKnowldgement:

```
<message to='B@example.com/laptop' from='A@example.com/work'>
  <thread>1234@hostA.example.com</thread>
  <tins method='ACK'
    xmlns='http://www.jabber.org/protocol/tins'/>
</message>
```

Step 6: B hangs up:

```
<message from='B@example.com/laptop' to='A@example.com/work'>
  <thread>1234@hostA.example.com</thread>
  <tins method='BYE'
    xmlns='http://www.jabber.org/protocol/tins'/>
</message>
```

Step 7: A acknowledges the hang up:

```
<message to='B@example.com/laptop' from='A@example.com/work'>
  <thread>1234@hostA.example.com</thread>
  <tins method='result' code='200' reason='OK'
    xmlns='http://www.jabber.org/protocol/tins'/>
</message>
```

3. Transactions

The <thread/> element from XMPP is used to group TINS messages
together into a shared context. A unique thread value MUST be used
for each transaction. An example of a transaction might be a single
voice call.

[4](#). **TINS Methods**

   The following methods can be used in a TINS message.

[4.1](#) **INVITE**

   Invite the target user to an out-of-band session. The content inside
   the <tins/> element MAY be SDPng descriptions of the connection types
   offered. If a session is already established for this transaction,
   the new INVITE serves as a renegotiation of session parameters.

[4.2](#) **ACK**

   The initiator tells the invitee that an out-of-band session has been
   established.

[4.3](#) **BYE**

   Either side of the conversation decides to terminate the transaction.
   This message SHOULD cause all resources associated with this
   transaction to be freed, and any associated network connections to be
   terminated.

5. Results

In reply to each of the method messages, the receiver sends 0 or more
replies, with the method set to 'result'. Result codes are as
specified in RFC 3261, section 21.

6. Security Considerations

   TINS is subject to the same security considerations as XMPP,
   particularly with regard to authentication and channel encryption.

   This document does not describe how the media protocols (e.g. RTP)
   traverse firewalls and NATs.

   There is no general-purpose way to ensure that media protocol
   connections are associated with the in-band TINS conversation.

7. IANA Considerations

   None

References

   [1]   Ott, J., Bormann, C. and D. Kutscher, "Session Description and
         Capability Negotiation", draft-ietf-mmusic-sdpng-05 (work in
         progress), July 2002.

   [2]   Saint-Andre, P. and J. Miller, "XMPP Core (draft-ietf-xmpp-core-
         03, work in progress)", February 2003.

   [3]   Rosenberg, J., Schulzrinne, H., Camarillo, G., Johnston, A.,
         Peterson, J., Sparks, R., Handley, M. and E. Schooler, "SIP:
         Session Initiation Protocol", RFC 3261, June 2002.

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

   [5]   Internet Assigned Numbers Authority, "Internet Assigned Numbers
         Authority", January 1998, <http://www.iana.org/>.

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