        Multimedia Conference Recording Use Cases and Requirements
              draft-kyzivat-siprec-conference-use-cases-01

Abstract

   The current work of SIPREC will soon finish. As conferences are the
   key requirement for some environments, it is worth to explore several
   extensions and additional functionality to support multimedia
   conference recording. SIPREC is not sufficient to record all the
   conference sessions via certain interactive media channels, like
   multi-user chat or screen sharing.

   This draft tries to show the use cases for multimedia conference
   recording and the requirements for how to work well under SIPREC
   mechanism. The requirements ask for extensions to SIP that will
   manage delivery of RTP media sessions, including content media
   defined by [RFC4796] , and MSRP media sessions to a recording device.
   The recorded media sessions are all SIP-based.

Requirements Language

   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 RFC 2119 [RFC2119] .

Status of This Memo

This Internet-Draft will expire on August 16, 2014.

Copyright Notice

Table of Contents

1. Introduction

   In general, a basic video conference has participants with video
   channels, audio channels and DTMF ability. An advanced multimedia
   conference would have extended channels like text, interactive text

and presentation graphics [RFC4597] . These extended channels
recording have the same strong needs as audio or video, especially in
some conference use cases. The conference's host and participants,
even nonparticipants, would like to play back the recordings in real-
time or non-real-time for different purposes, like editing summary,
reviewing outlines or monitoring process. The recordings should have
the ability to reconstruct the conference richly, with adequate media
and metadata recorded, which are not only audio/video but also IM and
shared content. Such an exhaustive reconstruction could give
audiences more information and a better experience. The recorded
sessions can be any RTP media sessions, including the content media
(as defined by [RFC4796]) transferred as video stream, and MSRP
media session which is SIP based media session.

2. Multimedia Conference Recording Overview

   There is one use case (use case 11) covering the recording of a
   multi-channel and multimedia session in the existing use case
   document [RFC6341] . Aside from audio, video, DTMF (as defined by
   [RFC4733]) and text (as defined by [RFC4103]), it does not include
   other interactive channels. The limitations to the multi-channel
   types leads to poor support for recording multimedia conferences. A
   multimedia conference has various channels, including audio, video,
   IM, data sharing (screen/document/application), etc. SIPREC is
   mostly capable of recording any sort of RTP media sessions, including
   voice, video, DTMF (as defined by [RFC4733]) and text [RFC6341] with
   SDP negotiation [I-D.ietf-siprec-protocol] and certain metadata
   [I-D.ietf-siprec-metadata] . But it is not evident how to support the
   remaining media, like multi-user chat or screen sharing.

   Multi-user chat is one of key cases about the IM session in
   multimedia conference. A multi-user chat or simple-chat session is
   to handle the media to relay instant messages received from one
   participant to the rest of the participants in the conference
   [I-D.ietf-simple-chat] , especially for the MSRP session which is a
   SIP based system. The host and participants in a conference might
   start MSRP sessions among each other for public group chat, sidebar
   chat or whisper chat. These MSRP content could be replicated by SRC
   (might be the MSRP switch or certain MSRP replay or MSRP client) to
   deliver to SRS via special RS channel(s). The replicated content
   could be the Message/CPIM message that contains text, HTML and
   images, etc. The document only considers the SIP based system,
   recording XMPP based IM in CS is out of the scope.

   The data sharing session, known as content sharing or content streams
   as well, in a multimedia conference's CS has functionality like
   screen sharing, application sharing, document sharing, etc. These
   data streams could be managed as still images (snapshots with

increments) or as dynamic streams (video streams) to carry details
like slide presentation, annotations, direct editing or page turning.
Especially, the screen sharing would have different ways to get its
data streams, like the video streams directly offered from VGA port
or encoded/decoded by an application on peer's client, or turned from
multiple screenshots, or even the still images carried by MSRP
channels.

One way for a conference focus/mixer to record a conference is
introduced in [I-D.ietf-siprec-architecture] . This defines how the
conference focus works as a SRC to deliver RTP streams and associate
recording metadata with SRS. It may choose the recording RTP stream
type, separated or mixed. There are more details about how to use
SDP, RTP for recording by participant or by media type in
[I-D.ietf-siprec-protocol] . The focus may setup different recording
sessions for different media streams recorded separately, or one
recording session for a mixed media stream created by the SRC, or
even multiplexing different media streams in a single RTP recording
session [I-D.ietf-siprec-protocol] .

But more is needed to support other media streams in a multimedia
conference. There is need for MSRP switch/relay/client as SRC to
replicate MSRP sessions to the recorder, with a new "media stream"
type in RS for delivering MSRP based streams or contents. There is
another need for a new type of metadata to indicate when media
streams are being used to represent screen/application/data sharing
sessions, distinct from the main video streams. There is also need
of a mechanism for the SRC to bound the number of media streams to be
recorded, especially when the participants number in a conference is
extremely large. The document does not include recording any of the
extended session attributes being defined by the CLUE WG.

3. Definitions

Instant Message Stream: instant message stream refers to the streams
transferred by messages between users in near real-time [RFC3248] .

Data Sharing: Data sharing is to use a content channel for
collaboratively working on documents, files, images, desktops, etc in
real time. It is also called as content sharing, including
application sharing, screen sharing, document sharing, etc.

Application Sharing: application sharing is the sharing of the
graphical user-interface of an application amongst multiple users
simultaneously in real time. The slide sharing could be one special
case.

Screen Sharing: screen sharing is the sharing of a computer desktop amongst multiple users simultaneously in real time, also called desktop sharing. Comparing to application sharing, which is always a single one, screen sharing is for the whole screen.

Document Sharing: document sharing is the sharing to help multiple users work simultaneously on a single document or file to achieve a single final version. It is also called file sharing or document collaboration.

Audio/Video Conference: Audio/video conference is one sort of various conferences. In SIP, an audio/video conference is an instance of a multi-party conversation that matches the definition in [RFC4353] and the framework in [RFC5239] , with the media channels as audio and video.

Chat Conference: a synonym for a multi-party chat conference [I-D.ietf-simple-chat] .

Multimedia Conference: multimedia conference is the multi-party conversation including any combination of different media types such as audio, video, text, interactive text, or presentation graphics [RFC4597] .

4. Use cases

4.1. MSRP Instant Message Stream Recording

Use Case 1: MSRP Instant Message Stream Recording.

Instant message is the function offered to chat between/among peers. There are page mode and session mode (MSRP [RFC6914]). Here we are concerned with instant message sessions in the context of a point to point call using session mode, which treats the MSRP instant message session as a media type.

For example, in a call center or emergency (first-responder) center, a customer could use the web client to start a chat with an agent about his questions or describing the situation happened around him. Call center or emergency center would need to record those chat sessions between customers and agents.

4.2. Screen Sharing Stream Recording

Use Case 2: Screen Sharing Stream Recording.

This is also well known as desktop sharing or remote sharing between peers. This function could be also used in a point to point call directly.

In an enterprise, the softphone calls between colleagues would choose screen sharing to illustrate their views clearly if the voice discussing is not enough. The enterprise would ask to record those screen sharing sessions for security check.

Another example is the remote education training, which needs to record the screen to keep track of the whole training class.

The state of the shared screen is recorded as video (and possibly audio) media, with metadata indicating that the stream represents screen sharing.

4.3. Application Sharing Stream Recording

   Use Case 3: Application Sharing Stream Recording.

   Users would choose application sharing instead of screen sharing to avoid exposing the privacy content on their computer desktop, when have the point-to-point call with others or have a conference call. And the recorded streams are the content of applications shown in CS.

   The state of the application window is recorded as video (and possibly audio) media, with metadata indicating that the stream represents application sharing.

4.4. Document Sharing Stream Recording

   Use Case 4: Document Sharing Stream Recording.

   Users would work on one document simultaneously in real time. The content of document would be recorded (which is close to use case 3).

   The state of the document sharing window is recorded as video media, with metadata indicating that the stream represents data sharing.

4.5. Audio/Video Conference Recording

   Use Case 5: audio/video conference Recording.

   The recording for audio/video conference is basic. All the channels in a conference would be recorded as one mixed stream or as separate streams by participants. It has been supported by current SIPREC mechanism.

4.6. Chat Conference Recording

   Use Case 6: chat conference Recording.

   There is another Conference type, known as multi-user chat conference
   or chat-rooms. The chat conference would have participants in a
   conference to chat or text each other with nicknames and provide
   private chat using the Message Session Relay Protocol (MSRP)
   [I-D.ietf-simple-chat] . In this case, there would be a need to
   record the chat content and details like nicknames.

4.7. Multimedia conference Recording

   Use Case 7: Multimedia conference Recording.

   This is a special use case to indicate the multimedia conference
   recording environment. When there is a common education class or
   skill training conference, the audiences who are not in the
   conference session would prefer replaying the conference in real-time
   with professor or lecturer's voice with their slides, better include
   the video of if available. The recording of this education
   conferences need to record audio, video from hosts and data sharing
   of theirs.

   While the audiences(out-conference) need to know what the audiences
   (in-conference) feedback to the training, they might also want to
   know what those audiences(in-conference) have been discussing in IM
   session. Thus the recording need record the IM sessions.

5. Requirements

5.1. REQ-001

   REQ-001: The mechanism MUST support recording of MSRP media sessions.
   This requirement derives from use cases 1,6,7.

5.2. REQ-002

   REQ-002: The mechanism MUST support recording of screen sharing using
   audio and video media. This requirement derives from use cases 2,7.

5.3. REQ-003

   REQ-004: The mechanism MUST support recording of application sharing
   using audio and video. This requirement derives from use cases 3,7.

5.4. REQ-004

   REQ-003: The mechanism MUST support recording of document sharing
   using video media. This requirement derives from use cases 4,7.

5.5. REQ-005

   REQ-005: The mechanism MUST support metadata or SDP to identify media
   streams used to record screen/application/document sharing. This
   requirement derives from use cases 2,3,4,7.

6. IANA Considerations

   This document contains no IANA considerations.

7. Security Considerations

   Not explicitly covered in this version.

8. References

8.1. Normative References

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

   [RFC3261] 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.

   [RFC6341] Rehor, K., Portman, L., Hutton, A., and R. Jain, "Use
              Cases and Requirements for SIP-Based Media Recording
              (SIPREC)", RFC 6341, August 2011.

   [I-D.ietf-siprec-architecture]
              Hutton, A., Portman, L., Jain, R., and K. Rehor, "An
              Architecture for Media Recording using the Session
              Initiation Protocol", draft-ietf-siprec-architecture-11
              (work in progress), December 2013.

   [I-D.ietf-siprec-protocol]
              Portman, L., Lum, H., Eckel, C., Johnston, A., and A.
              Hutton, "Session Recording Protocol", draft-ietf-siprec-
              protocol-11 (work in progress), October 2013.

[I-D.ietf-siprec-metadata]
          R, R., Ravindran, P., and P. Kyzivat, "Session Initiation
          Protocol (SIP) Recording Metadata", draft-ietf-siprec-
          metadata-14 (work in progress), February 2014.

[I-D.kyzivat-siprec-webconf-use-case]
          Kyzivat, P. and M. Yan, "Web Conference Recording Use
          Case", draft-kyzivat-siprec-webconf-use-case-00 (work in
          progress), May 2013.

[I-D.ietf-simple-chat]
          Niemi, A., Garcia, M., and G. Sandbakken, "Multi-party
          Chat Using the Message Session Relay Protocol (MSRP)",
          draft-ietf-simple-chat-18 (work in progress), January
          2013.

8.2. Informative References

[RFC3248] Armitage, G., Carpenter, B., Casati, A., Crowcroft, J.,
           Halpern, J., Kumar, B., and J. Schnizlein, "A Delay Bound
           alternative revision of RFC 2598", RFC 3248, March 2002.

[RFC4103] Hellstrom, G. and P. Jones, "RTP Payload for Text
           Conversation", RFC 4103, June 2005.

[RFC4353] Rosenberg, J., "A Framework for Conferencing with the
           Session Initiation Protocol (SIP)", RFC 4353, February
           2006.

[RFC4597] Even, R. and N. Ismail, "Conferencing Scenarios", RFC
           4597, August 2006.

[RFC4733] Schulzrinne, H. and T. Taylor, "RTP Payload for DTMF
           Digits, Telephony Tones, and Telephony Signals", RFC 4733,
           December 2006.

[RFC4796] Hautakorpi, J. and G. Camarillo, "The Session Description
           Protocol (SDP) Content Attribute", RFC 4796, February
           2007.

[RFC4975] Campbell, B., Mahy, R., and C. Jennings, "The Message
           Session Relay Protocol (MSRP)", RFC 4975, September 2007.

[RFC5239] Barnes, M., Boulton, C., and O. Levin, "A Framework for
           Centralized Conferencing", RFC 5239, June 2008.

   [RFC6914]   Rosenberg, J., "SIMPLE Made Simple: An Overview of the
               IETF Specifications for Instant Messaging and Presence
               Using the Session Initiation Protocol (SIP)", RFC 6914,
               April 2013.

Authors' Addresses

   Paul H. Kyzivat
   Huawei

   Email: pkyzivat@alum.mit.edu

   Michael Yan
   Huawei

   Email: michael.yan@huawei.com

   Simon Pietro Romano
   University of Napoli

   Email: spromano@unina.it