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Session Recording Protocol
draft-ietf-siprec-protocol-03

Abstract

   This document specifies the use of the Session Initiation Protocol
   (SIP), the Session Description Protocol (SDP), and the Real Time
   Protocol (RTP) for delivering real-time media and metadata from a
   Communication Session (CS) to a recording device. The Session
   Recording Protocol specifies the use of SIP, SDP, and RTP to
   establish a Recording Session (RS) between the Session Recording
   Client (SRC), which is on the path of the CS, and a Session Recording
   Server (SRS) at the recording device.

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   This Internet-Draft is submitted in full conformance with the
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1. Introduction

This document specifies the mechanism to record a Communication
Session (CS) by delivering real-time media and metadata from the CS
to a recording device. In accordance to the architecture
[I-D.ietf-siprec-architecture], the Session Recording Protocol
specifies the use of SIP, SDP, and RTP to establish a Recording
Session (RS) between the Session Recording Client (SRC), which is on
the path of the CS, and a Session Recording Server (SRS) at the
recording device.

SIP is also used to deliver metadata to the recording device, as
specified in [I-D.ietf-siprec-metadata]. Metadata is information
that describes recorded media and the CS to which they relate.

The Session Recording Protocol intends to satisfy the SIP-based Media
Recording requirements listed in [RFC6341].

2. Definitions

This document refers to the core definitions provided in the
architecture document [I-D.ietf-siprec-architecture].

3. Scope

The scope of the Session Recording Protocol includes the
establishment of the recording sessions and the reporting of the
metadata. The scope also includes extensions supported by User
Agents participating in the CS such as indication of recording. The
user agents need not be recording-aware in order to participate in a
CS being recorded.

The following items, which are not an exhaustive list, do not
represent the protocol itself and are considered out of the scope of
the Session Recording Protocol:

o Delivering recorded media in real-time as the CS media

o Specifications of criteria to select a specific CS to be recorded
   or triggers to record a certain CS in the future

o Recording policies that determine whether the CS should be
   recorded and whether parts of the CS are to be recorded

o Retention policies that determine how long a recording is stored

o Searching and accessing the recorded media and metadata

o Policies governing how CS users are made aware of recording

o Delivering additional recording session metadata through non-SIP
   mechanism

4. Overview of operations

This section is informative and provides a description of recording
operations.

As mentioned in the architecture document
[I-D.ietf-siprec-architecture], there are a number of types of call
flows based on the location of the Session Recording Client. The
following sample call flows provide a quick overview of the
operations between the SRC and the SRS.

4.1. Delivering recorded media

When a SIP Back-to-back User Agent (B2BUA) with SRC functionality
routes a call from UA(A) to UA(B), the SRC has access to the media
path between the user agents. When the SRC is aware that it should
be recording the conversation, the SRC can cause the B2BUA to bridge
the media between UA(A) and UA(B). The SRC then establishes the
Recording Session with the SRS and sends replicated media towards the
SRS.

An endpoint may also have SRC functionality, where the endpoint
itself establishes the Recording Session to the SRS. Since the
endpoint has access to the media in the Communication Session, the
endpoint can send replicated media towards the SRS.

The following is a sample call flow that shows the SRC establishing a
recording session towards the SRS. The call flow is essentially
identical when the SRC is a B2BUA or as the endpoint itself. Note
that the SRC can choose when to establish the Recording Session
independent of the Communication Session, even though the following
call flow suggests that the SRC is establishing the Recording Session
(message #5) after the Communication Session is established.

```
   UA A            SRC                    UA B                SRS
    |(1)CS INVITE  |                       |                   |
    |------------->|                       |                   |
    |              |(2)CS INVITE           |                   |
    |              |---------------------->|                   |
    |              |           (3) 200 OK  |                   |
    |              |<----------------------|                   |
    |   (4) 200 OK |                       |                   |
    |<-------------|                       |                   |
    |              |(5)RS INVITE with SDP  |                   |
    |              |---------------------------------------------->|
    |              |                       | (6) 200 OK with SDP |
    |              |<----------------------------------------------|
    |(7)CS RTP     |                       |                   |
    |============>|=====================>|                   |
    |<============|<=====================|                   |
    |              |(8)RS RTP             |                   |
    |              |==============================================>|
    |              |==============================================>|
    |(9)CS BYE     |                       |                   |
    |------------->|                       |                   |
    |              |(10)CS BYE             |                   |
    |              |---------------------->|                   |
    |              |(11)RS BYE             |                   |
    |              |---------------------------------------------->|
    |              |                       |                   |
```
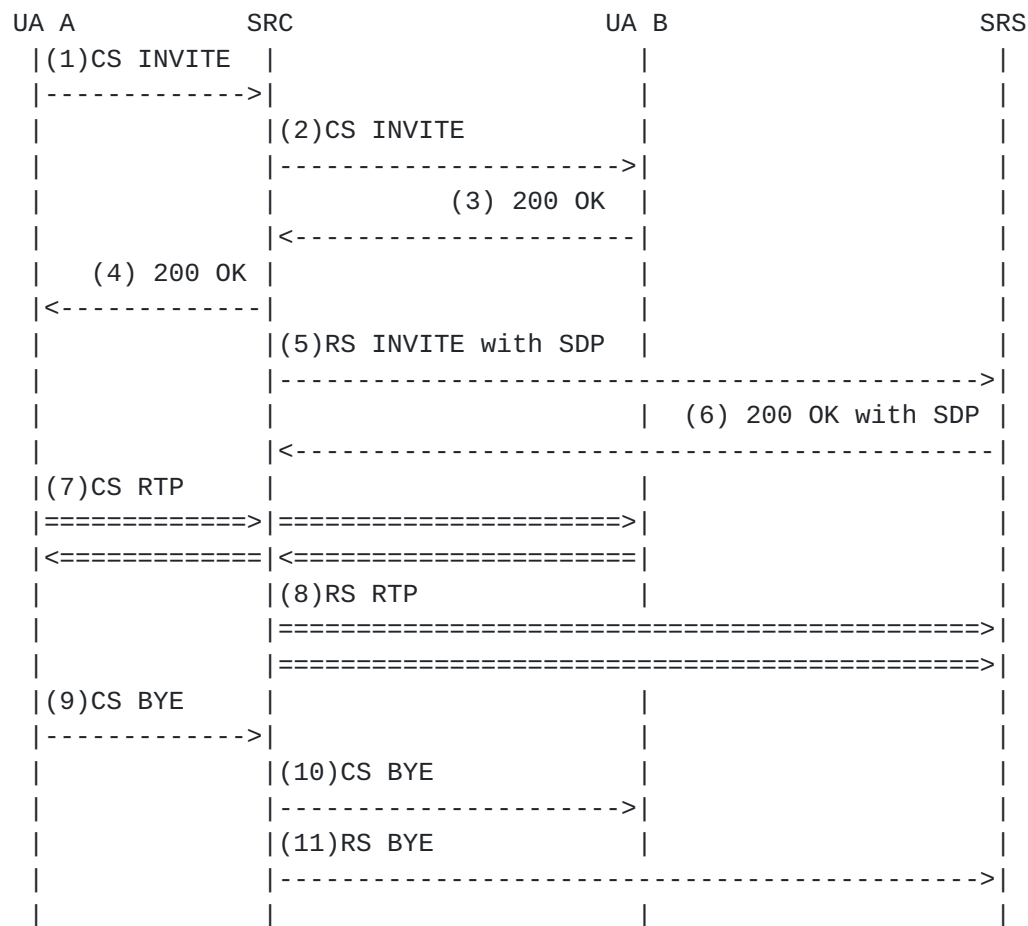
                 Figure 1: Basic Recording Call flow

   The above call flow can also apply to the case of a centralized
   conference with a mixer. For clarity, ACKs to INVITEs and 200 OKs to
   BYEs are not shown. The conference focus can provide the SRC
   functionality since the conference focus has access to all the media
   from each conference participant. When a recording is requested, the
   SRC delivers the metadata and the media streams to the SRS. Since
   the conference focus has access to a mixer, the SRC may choose to mix
   the media streams from all participants as a single mixed media
   stream towards the SRS.

   An SRC can use a single recording session to record multiple
   communication sessions. Every time the SRC wants to record a new
   call, the SRC updates the recording session with a new SDP offer to
   add new recorded streams to the recording session, and
   correspondingly also update the metadata for the new call.

4.2. Delivering recording metadata

   The SRC is responsible for the delivery of metadata to the SRS. The
   SRC may provide an initial metadata snapshot about recorded media
   streams in the initial INVITE content in the recording session.
   Subsequent metadata updates can be represented as a stream of events
   in UPDATE or reINVITE requests sent by the SRC. These metadata
   updates are normally incremental updates to the initial metadata
   snapshot to optimize on the size of updates, however, the SRC may
   also decide to send a new metadata snapshot anytime.

   Metadata is transported in the body of INVITE or UPDATE messages.
   Certain metadata, such as the attributes of the recorded media stream
   are located in the SDP of the recording session.

   The SRS has the ability to send a request to the SRC to request for a
   new metadata snapshot update from the SRC. This can happen when the
   SRS fails to understand the current stream of incremental updates for
   whatever reason, for example, when SRS loses the current state due to
   internal failure. The SRS may optionally attach a reason along with
   the snapshot request. This request allows both SRC and SRS to
   restart the states with a new metadata snapshot so that further
   metadata incremental updates will be based on the latest metadata
   snapshot. Similar to the metadata content, the metadata snapshot
   request is transported as content in UPDATE or INVITE sent by the SRS
   in the recording session.

```
     SRC                                                     SRS
      |                                                       |
      |(1) INVITE (metadata snapshot)                         |
      |------------------------------------------------------>|
      |                                          (2)200 OK    |
      |<------------------------------------------------------|
      |(3) ACK                                                |
      |------------------------------------------------------>|
      |(4) RTP                                                |
      |======================================================>|
      |======================================================>|
      |(5) UPDATE (metadata update 1)                         |
      |------------------------------------------------------>|
      |                                         (6) 200 OK    |
      |<------------------------------------------------------|
      |(7) UPDATE (metadata update 2)                         |
      |------------------------------------------------------>|
      |                                         (8) 200 OK    |
      |<------------------------------------------------------|
      |               (9) UPDATE (metadata snapshot request)  |
      |<------------------------------------------------------|
      |                                        (10) 200 OK    |
      |------------------------------------------------------>|
      |        (11) INVITE (metadata snapshot 2 + SDP offer)  |
      |------------------------------------------------------>|
      |                               (12) 200 OK (SDP answer)|
      |<------------------------------------------------------|
      | (13) UPDATE (metadata update 1 based on snapshot 2)   |
      |------------------------------------------------------>|
      |                                        (14) 200 OK    |
      |<------------------------------------------------------|
```

            Figure 3: Delivering metadata via SIP UPDATE

5. Initiating a Recording Session

5.1. Procedures at the SRC

   The SRC can initiate a recording session by sending a SIP INVITE
   request to the SRS. The SRC and the SRS are identified in the From
   and To headers, respectively.

   The SRC MUST include the '+sip.src' feature tag in the Contact URI,
   defined in this specification as an extension to [RFC3840], for all
   recording sessions. An SRS uses the presence of the '+sip.src'
   feature tag in dialog creating and modifying requests and responses

to confirm that the dialog being created is for the purpose of a
Recording Session. In addition, when an SRC sends a REGISTER request
to a registrar, the SRC MUST include the '+sip.src' feature tag to
indicate the that it is a SRC.

Since SIP Caller Preferences extensions are optional to implement for
routing proxies, there is no guarantee that a recording session will
be routed to an SRC or SRS. A new options tag is introduced:
"siprec". As per [RFC3261], only an SRC or an SRS can accept this
option tag in a recording session. An SRC MUST include the "siprec"
option tag in the Require header when initiating a Recording Session
so that UA's which do not support the session recording protocol
extensions will simply reject the INVITE request with a 420 Bad
Extension.

5.2. Procedures at the SRS

The SRS can initiate a recording session by sending a SIP INVITE
request to the SRC. The SRS and the SRC are identified in the From
and To headers, respectively.

The SRS MUST include the '+sip.srs' feature tag in the Contact URI,
as per [RFC3840], for all recording sessions. An SRC uses the
presence of this feature tag in dialog creating and modifying
requests and responses to confirm that the dialog being created is
for the purpose of a Recording Session (REQ-30). In addition, when
an SRS sends a REGISTER request to a registrar, the SRS MUST include
the '+sip.srs' feature tag to indicate that it is a SRS.

An SRS MUST include the "siprec" option tag in the Require header as
per [RFC3261] when initiating a Recording Session so that UA's which
do not support the session recording protocol extensions will simply
reject the INVITE request with a 420 Bad Extension.

6. SDP Handling

The SRC and SRS follows the SDP offer/answer model in [RFC3264]. The
rest of this section describes conventions used in a recording
session.

6.1. Procedures at the SRC

Since the SRC does not expect to receive media from the SRS, the SRC
typically sets each media stream of the SDP offer to only send media,
by qualifying them with the a=sendonly attribute, according to the
procedures in [RFC3264].

The SRC sends recorded streams of participants to the SRS, and the
SRC MUST provide a label attribute (a=label), as per [RFC4574], on
each media stream in order to identify the recorded stream with the
rest of the metadata. The a=label attribute identifies each recorded
media stream, and the label name is mapped to the Media Stream
Reference in the metadata as per [I-D.ietf-siprec-metadata]. The
scope of the label name only applies to the same SIP message as the
SDP, meaning that the label name can be reused by another media
stream within the same recording session. Note that a recorded
stream is distinct from a CS stream; the metadata provides a list of
participants that contributes to each recorded stream.

The following is an example of SDP with both audio and video recorded
streams. Note that the following example contain unfolded lines
longer than 72 characters. These are captured between <allOneLine>
tags.

```
v=0
o=SRS 2890844526 2890844526 IN IP4 198.51.100.1
s=-
c=IN IP4 198.51.100.1
t=0 0
m=audio 12240 RTP/AVP 0 4 8
a=sendonly
a=label:1
m=video 22456 RTP/AVP 98
a=rtpmap:98 H264/90000
<allOneLine>
a=fmtp:98 profile-level-id=42A01E;
        sprop-parameter-sets=Z0IACpZTBYmI,aMljiA==
</allOneLine>
a=sendonly
a=label:2
m=audio 12242 RTP/AVP 0 4 8
a=sendonly
a=label:3
m=audio 22458 RTP/AVP 98
a=rtpmap:98 H264/90000
<allOneLine>
a=fmtp:98 profile-level-id=42A01E;
        sprop-parameter-sets=Z0IACpZTBYmI,aMljiA==
</allOneLine>
a=sendonly
a=label:4
```

Figure 4: Sample SDP with audio and video streams

6.1.1. Handling media stream updates

Over the lifetime of a recording session, the SRC can add and remove
recorded streams from the recording session for various reasons. For
example, when a CS stream is added or removed from the CS, or when a
CS is created or terminated if a recording session handles multiple
CSes. To remove a recorded stream from the recording session, the
SRC sends a new SDP offer where the port of the media stream to be
removed is set to zero, according to the procedures in [RFC3264]. To
add a recorded stream to the recording session, the SRC sends a new
SDP offer by adding a new media stream description or by reusing an
old media stream which had been previously disabled, according to the
procedures in [RFC3264].

The SRC can temporarily discontinue streaming and collection of
recorded media from the SRC to the SRS for reason such as masking the
recording. In this case, the SRC sends a new SDP offer and sets the
media stream to inactive (a=inactive) for each recorded stream to be
paused, as per the procedures in [RFC3264]. To resume streaming and
collection of recorded media, the SRC sends a new SDP offer and sets
the media streams with a=sendonly attribute. Note that when a CS
stream is muted/unmuted, this information is conveyed in the metadata
by the SRC. The SRC SHOULD not modify the media stream with
a=inactive for mute since this operation is reserved for pausing the
RS media.

6.2. Procedures at the SRS

The SRS only receives RTP streams from the SRC, the SDP answer
normally sets each media stream to receive media, by setting them
with the a=recvonly attribute, according to the procedures of
[RFC3264]. When the SRS is not ready to receive a recorded stream,
the SRS sets the media stream as inactive in the SDP offer or answer
by setting it with a=inactive attribute, according to the procedures
of [RFC3264]. When the SRS is ready to receive recorded streams, the
SRS sends a new SDP offer and sets the media streams with a=recvonly
attribute.

Over the lifetime of a recording session, the SRS can remove recorded
streams from the recording session for various reasons. To remove a
recorded stream from the recording session, the SRS sends a new SDP
offer where the port of the media stream to be removed is set to
zero, according to the procedures in [RFC3264].

The following sequence diagram shows an example where the SRS is
initially not ready to receive recorded streams, and later updates
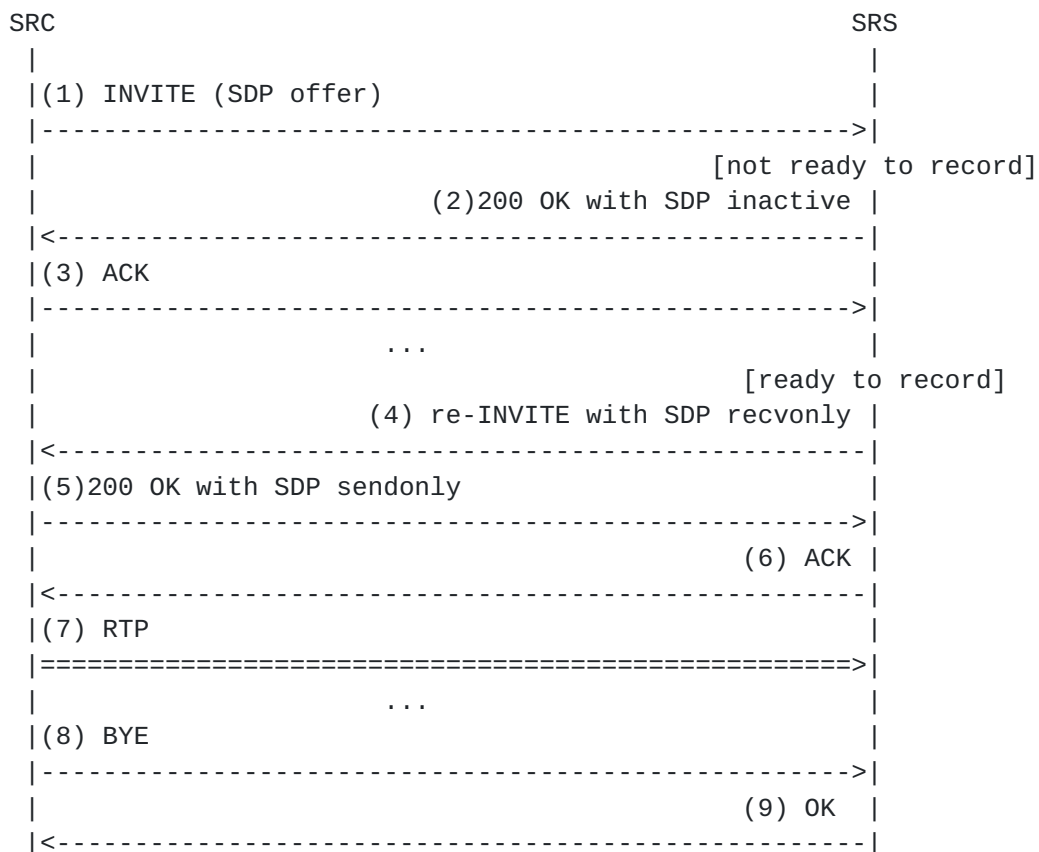the recording session when the SRS is ready to record.

```
   SRC                                                      SRS
    |                                                        |
    |(1) INVITE (SDP offer)                                  |
    |------------------------------------------------------->|
    |                                      [not ready to record]
    |                         (2)200 OK with SDP inactive    |
    |<-------------------------------------------------------|
    |(3) ACK                                                 |
    |------------------------------------------------------->|
    |                        ...                             |
    |                                      [ready to record] |
    |                         (4) re-INVITE with SDP recvonly |
    |<-------------------------------------------------------|
    |(5)200 OK with SDP sendonly                             |
    |------------------------------------------------------->|
    |                                              (6) ACK   |
    |<-------------------------------------------------------|
    |(7) RTP                                                 |
    |=======================================================>|
    |                        ...                             |
    |(8) BYE                                                 |
    |------------------------------------------------------->|
    |                                              (9) OK    |
    |<-------------------------------------------------------|
```

              Figure 5: SRS responding to offer with a=inactive

7. RTP Handling

   This is a placeholder section to specify any protocol impacts or
   recommendations for RTP usage in the session recording protocol. The
   details are listed in [I-D.eckel-siprec-rtp-rec]

8. Metadata

8.1. Procedures at the SRC

   The SRC is responsible to deliver metadata to the SRS in a recording
   session. Metadata can be provided by the SRC in the initial INVITE
   request when establishing the recording session, and subsequent
   metadata updates can be provided by the SRC in reINVITE and UPDATE
   requests and responses in the recording session.

   Certain metadata attributes are contained in the SDP, and others are
   contained in a new content type "application/rs-metadata". The

format of the metadata is described as part of the mechanism in
[I-D.ietf-siprec-metadata]. A new "disposition-type" of Content-
Disposition is defined for the purpose of carrying metadata and the
value is "recording-session". The "recording-session" value
indicates that the "application/rs-metadata" content contains
metadata to be handled by the SRS, and the disposition can be carried
in either INVITE or UPDATE requests or responses sent by the SRC.

Metadata sent by the SRC can be categorized as either a full metadata
snapshot or partial update. A full metadata snapshot describes all
the recorded streams and all metadata associated with the recording
session. When the SRC sends a full metadata snapshot, the SRC MUST
send an INVITE or an UPDATE request with an SDP offer and the
"recording-session" disposition. A partial update represents an
incremental update since the last metadata update sent by the SRC. A
partial update sent by the SRC can be an INVITE request or response
with an SDP offer, or an INVITE/UPDATE request or response containing
a "recording-session" disposition, or an INVITE request containing
both an SDP offer and the "recording-session" disposition.

The following is an example of a full metadata snapshot sent by the
SRC in the initial INVITE request:

```
INVITE sip:recorder@example.com SIP/2.0
Via: SIP/2.0/TCP src.example.com;branch=z9hG4bKdf6b622b648d9
From: <sip:2000@example.com>;tag=35e195d2-947d-4585-946f-098392474
To: <sip:recorder@example.com>
Call-ID: d253c800-b0d1ea39-4a7dd-3f0e20a
CSeq: 101 INVITE
Max-Forwards: 70
Require: siprec
Accept: application/sdp, application/rs-metadata,
  application/rs-metadata-request
Contact: <sip:2000@src.example.com>;+sip.src
Content-Type: multipart/mixed;boundary=foobar
Content-Length: [length]

--foobar
Content-Type: application/sdp

v=0
o=SRS 2890844526 2890844526 IN IP4 198.51.100.1
s=-
c=IN IP4 198.51.100.1
t=0 0
m=audio 12240 RTP/AVP 0 4 8
a=sendonly
a=label:1

--foobar
Content-Type: application/rs-metadata
Content-Disposition: recording-session

[metadata content]
```

          Figure 6: Sample INVITE request for the recording session

8.2. Procedures at the SRS

   The SRS receives metadata updates from the SRC in INVITE and UPDATE
   requests. Since the SRC can send partial updates based on the
   previous update, the SRS needs to keep track of the sequence of
   updates from the SRC.

   In the case of an internal failure at the SRS, the SRS may fail to
   recognize a partial update from the SRC. The SRS may be able to
   recover from the internal failure by requesting for a full metadata
   snapshot from the SRC. Certain errors, such syntax errors or
   semantic errors in the metadata information, are likely caused by an
   error on the SRC side, and it is likely the same error will occur

again even when a full metadata snapshot is requested. In order to
avoid repeating the same error, the SRS can simply terminate the
recording session when a syntax error or semantic error is detected
in the metadata.

When the SRS explicitly requests for a full metadata snapshot, the
SRS MUST send an UPDATE request without an SDP offer. A metadata
snapshot request contains a content with the content disposition type
"recording-session". Note that the SRS MAY generate an INVITE
request without an SDP offer but this MUST not include a metadata
snapshot request. The format of the content is "application/
rs-metadata-request", and the body format is chosen to be a simple
text-based format. The following shows an example:


```
UPDATE sip:2000@src.exmaple.com SIP/2.0
Via: SIP/2.0/UDP srs.example.com;branch=z9hG4bKdf6b622b648d9
To: <sip:2000@exmaple.com>;tag=35e195d2-947d-4585-946f-098392474
From: <sip:recorder@example.com>;tag=1234567890
Call-ID: d253c800-b0d1ea39-4a7dd-3f0e20a
CSeq: 1 UPDATE
Max-Forwards: 70
Require: siprec
Contact: <sip:recorder@srs.example.com>;+sip.srs
Accept: appliation/sdp, application/rs-metadata
Content-Disposition: recording-session
Content-Type: application/rs-metadata-request
Content-Length: [length]

SRS internal error
```

        Figure 7: Metadata Request

The SRS MAY include the reason why a metadata snapshot request is
being made to the SRC in the reason line. This reason line is free
form text, mainly designed for logging purposes on the SRC side. The
processing of the content by the SRC is entirely optional since the
content is for logging only, and the snapshot request itself is
indicated by the use of the application/rs-metadata-request content
type.

When the SRC receives the request for a metadata snapshot, the SRC
MUST provide a full metadata snapshot in a separate INVITE or UPDATE
transaction, along with an SDP offer. All subsequent metadata
updates sent by the SRC MUST be based on the new metadata snapshot.

8.2.1. Formal Syntax

   The formal syntax for the application/rs-metadata-request MIME is
   described below using the augmented Backus-Naur Form (BNF) as
   described in [RFC2234].

   snapshot-request = srs-reason-line CRLF

   srs-reason-line = [TEXT-UTF8-TRIM]

9. Persistent Recording

   Persistent recording is a specific use case outlined in REQ-005 or
   Use Case 4 in [RFC6341], where a recording session can be established
   in the absence of a communication session. The SRC continuously
   records media in a recording session to the SRS even in the absence
   of a CS for all user agents that are part of persistent recording.
   By allocating recorded streams and continuously sending recorded
   media to the SRS, the SRC does not have to prepare new recorded
   streams with new SDP offer when a new communication session is
   created and also does not impact the timing of the CS. The SRC only
   needs to update the metadata when new communication sessions are
   created.

   When there is no communication sessions running on the devices with
   persistent recording, there is no recorded media to stream from the
   SRC to the SRS. In certain environments where Network Address
   Translator (NAT) is used, typically a minimum of flow activity is
   required to maintain the NAT binding for each port opened. Agents
   that support Interactive Connectivity Establishment (ICE) solves this
   problem. For non-ICE agents, in order not to lose the NAT bindings
   for the RTP/RTCP ports opened for the recorded streams, the SRC and
   SRS SHOULD follow the recommendations provided in [RFC6263] to
   maintain the NAT bindings.

10. Extensions for Recording-aware User Agents

   The following sections describe the SIP and SDP extensions for
   recording-aware user agents. A recording-aware user agent is a
   participant in the CS that supports the SIP and SDP extensions for
   receiving recording indication and for requesting recording
   preferences for the call.

10.1. Procedures at the record-aware user agent

A recording-aware UA SHOULD indicate that it can accept reporting of
recording indication provided by the SRC. A new option tag "record-
aware" is introduced to indicate such awareness. The recording-aware
UA SHOULD include the "record-aware" option tag in the Supported
header when initiating or establishing a CS. A recording-aware UA
that has indicated recording awareness MUST provide at recording
indication to the end user through an appropriate user interface an
indication whether recording is on or off for a given medium based on
the most recently received a=record SDP attribute for that medium.

Some user agents that are automatons (eg. IVR, media server, PSTN
gateway) may not have a user interface to render recording
indication. When such user agent indicates recording awareness, the
UA SHOULD render recording indication through other means, such as
passing an inband tone on the PSTN gateway, putting the recording
indication in a log file, or raising an application event in a
VoiceXML dialog. These user agents MAY also choose not to indicate
recording awareness, thereby relying on whatever mechanism an SRC
chooses to indicate recording, such as playing a tone inband.

10.1.1. Recording preference

A recording-aware UA involved in a CS MAY request the CS to be
recorded or not recorded. This indication of recording preference
can be sent at session establishment time or during the session.

A new SDP attribute "recordpref" is introduced. The SDP attribute
appears at the media level or session level and can appear in an SDP
offer or answer. The recording indication applies to the specified
media stream only. The following is the ABNF of the recordpref
attribute:

```
recordpref-attr = "a=recordpref:" pref

pref = "on" / "off" / "pause" / "nopreference"
```

on Request for recording if it has not already been started. If the
   recording is currently paused, request to resume recording.

off Request for no recording. If recording has already been
     started, then this preference indicates a request to stop
     recording.

pause   Request to pause recording if recording is currently in
    progress.

nopreference   To indicate that the UA has no preference on recording.
    While the absence of this attribute indirectly implies the lack of
    preference, using this value allows the UA to explicitly state no
    preference to being recorded.

10.2. Procedures at the SRC

When a UA has indicated that it is recording-aware through the
"record-aware" option tag, the SRC MUST provide recording indications
in a new SDP attribute described in the following section. In the
absence of the "record-aware" option tag, meaning that the UA is not
recording-aware, an SRC MUST provide recording indications, where SRC
is required to do so based on policies, through other means such as
playing a tone inband.

10.2.1. Recording indication

While there are existing mechanisms for providing an indication that
a CS is being recorded, these mechanisms are usually delivered on the
CS media streams such as playing an in-band tone or an announcement
to the participants. A new SDP attribute is introduced to allow a
recording-aware UA to render recording indication at the user
interface.

The 'record' SDP attribute appears at the media level or session
level in either SDP offer or answer. The recording indication
applies to the specified media stream only, for example, only the
audio portion of the call is recorded in an audio/video call. The
following is the ABNF of the 'record' attribute:

    attribute /= record-attr

    ; attribute defined in RFC 4566

    record-attr = "record:" indication

    indication = "on" / "off" / "paused"

on Recording is in progress.

off No recording is in progress.

   paused   Recording is in progress by media is paused.

   The recording attribute is a declaration by the SRC in the CS to
   indicate whether recording is taking place. For example, if a UA (A)
   is initiating a call to UA (B) and UA (A) is also an SRC that is
   performing the recording, then UA (A) provides the recording
   indication in the SDP offer with a=record:on. When UA (B) receives
   the SDP offer, UA (B) will see that recording is happening on the
   other endpoint of this session. If UA (B) does not wish to perform
   recording itself, UA (B) provides the recording indication as
   a=record:off in the SDP answer.

   Whenever the recording indication needs to change, such as
   termination of recording, then the UA MUST initiate a reINVITE or
   UPDATE to update the SDP attribute to a=record:off. The following
   call flow shows an example of the offer/answer with the recording
   indication attribute.

```
    UA A                                                  UA B
    (SRC)                                                  |
      |                                                    |
      |                  [SRC recording starts]            |
      |(1) INVITE (SDP offer + a=record:on)                |
      |--------------------------------------------------->|
      |                                 200 OK (SDP answer) |
      |<---------------------------------------------------|
      |(3) ACK                                             |
      |--------------------------------------------------->|
      |(4) RTP                                             |
      |<==================================================>|
      |                  [SRC stops recording]             |
      |(5) re-INVITE (SDP + a=record:off)                  |
      |--------------------------------------------------->|
      |                       (6) 200 OK (SDP + a=record:off)|
      |<---------------------------------------------------|
      |                                           (6) ACK |
      |--------------------------------------------------->|
```
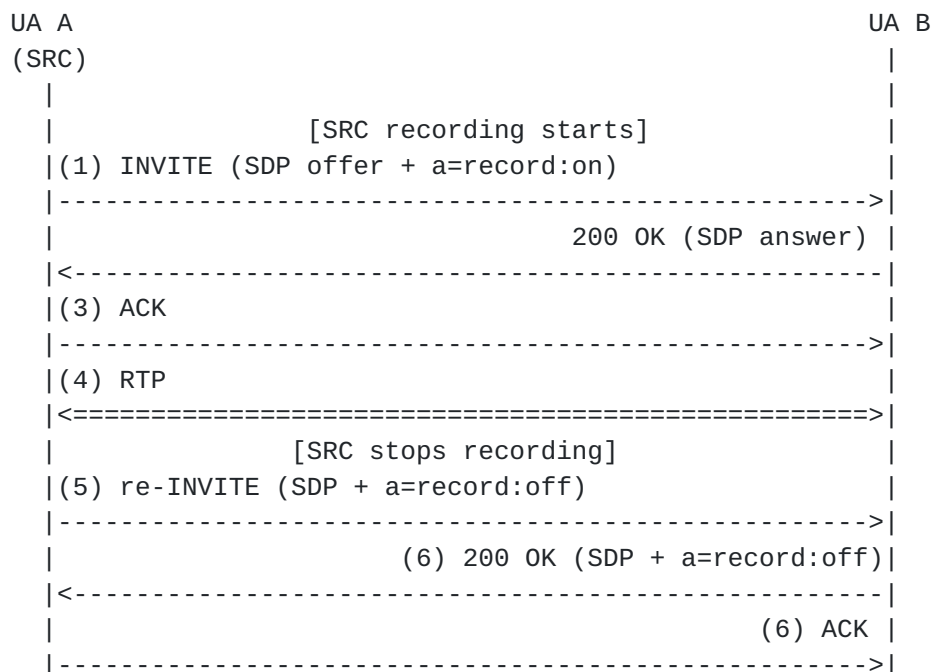
                Figure 8: Recording indication example

   If a call is traversed through one or more SIP B2BUA, and it happens
   that there are more than one SRC in the call path, the recording
   indication attribute does not provide any hint as to which SRC is
   performing the recording, meaning the endpoint only knows that the
   call is being recorded. This attribute is also not used as an
   indication to negotiate which SRC in the call path will perform

recording and is not used as a request to start/stop recording if
there are multiple SRCs in the call path.

10.2.2. Recording preference

When the SRC receives the a=recordpref SDP in an SDP offer or answer,
the SRC chooses to honor such request to record the request based on
local policy on the SRC. When the SRC honors the request, the SRC
MUST also update the recording indication to reflect the current
state of the recording (on/off/paused).

11. IANA Considerations

11.1. Registration of Option Tags

This specification registers two option tags. The required
information for this registration, as specified in [RFC3261], is as
follows.

11.1.1. siprec Option Tag

Name: siprec

Description: This option tag is for identifying the SIP session
for the purpose of recording session only. This is typically not
used in a Supported header. When present in a Require header in a
request, it indicates that the UAS MUST be either a SRC or SRS
capable of handling the contexts of a recording session.

11.1.2. record-aware Option Tag

Name: record-aware

Description: This option tag is to indicate the ability for the
user agent to receive recording indicators in media level or
session level SDP. When present in a Supported header, it
indicates that the UA can receive recording indicators in media
level or session level SDP.

11.2. Registration of media feature tags

This document registers two new media feature tags in the SIP tree
per the process defined in [RFC2506] and [RFC3840]

11.2.1. src feature tag

Media feature tag name: sip.src

ASN.1 Identifier: 25

Summary of the media feature indicated by this tag: This feature tag indicates that the user agent is a Session Recording Client for the purpose for Recording Session.

Values appropriate for use with this feature tag: boolean

The feature tag is intended primarily for use in the following applications, protocols, services, or negotiation mechanisms: This feature tag is only useful for a Recording Session.

Examples of typical use: Routing the request to a Session Recording Server.

Security Considerations: Security considerations for this media feature tag are discussed in Section 11.1 of RFC 3840.

11.2.2. srs feature tag

Media feature tag name: sip.srs

ASN.1 Identifier: 26

Summary of the media feature indicated by this tag: This feature tag indicates that the user agent is a Session Recording Server for the purpose for Recording Session.

Values appropriate for use with this feature tag: boolean

The feature tag is intended primarily for use in the following applications, protocols, services, or negotiation mechanisms: This feature tag is only useful for a Recording Session.

Examples of typical use: Routing the request to a Session Recording Client.

Security Considerations: Security considerations for this media feature tag are discussed in Section 11.1 of RFC 3840.

11.3. New Content-Disposition Parameter Registrations

   This document registers a new "disposition-type" value in Content-
   Disposition header: recording-session.

   recording-session the body describes the metadata information about
   the recording session

11.4. Media Type Registration

11.4.1. Registration of MIME Type application/rs-metadata

   This document registers the application/rs-metadata MIME media type
   in order to describe the recording session metadata. This media type
   is defined by the following information:

   Media type name: application

   Media subtype name: rs-metadata

   Required parameters: none

   Options parameters: none

11.4.2. Registration of MIME Type application/rs-metadata-request

   This document registers the application/rs-metadata-request MIME
   media type in order to describe a recording session metadata snapshot
   request. This media type is defined by the following information:

   Media type name: application

   Media subtype name: rs-metadata-request

   Required parameters: none

   Options parameters: none

11.5. SDP Attributes

   This document registers the following new SDP attributes.

11.5.1. 'record' SDP Attribute

   Contact names: Leon Portman leon.portman@nice.com, Henry Lum
   henry.lum@genesyslab.com

   Attribute name: record

Long form attribute name: Recording Indication

Type of attribute: session or media level

Subject to charset: no

This attribute provides the recording indication for the session or
media stream.

Allowed attribute values: on, off, paused

11.5.2. 'recordpref' SDP Attribute

Contact names: Leon Portman leon.portman@nice.com, Henry Lum
henry.lum@genesyslab.com

Attribute name: recordpref

Long form attribute name: Recording Preference

Type of attribute: session or media level

Subject to charset: no

This attribute provides the recording indication for the session or
media stream.

Allowed attribute values: on, off, pause, nopreference

12. Security Considerations

The recording session is fundamentally a standard SIP dialog
[RFC3261], therefore, the recording session can reuse any of the
existing SIP security mechanism available for securing the recorded
media as well as metadata. Other security considerations are
outlined in the use cases and requirements document [RFC6341].

12.1. Authentication and Authorization

The recording session reuses the SIP mechanism to challenge requests
that is based on HTTP authentication. The mechanism relies on 401
and 407 SIP responses as well as other SIP header fields for carrying
challenges and credentials.

The SRS may have its own set of recording policies to authorize
recording requests from the SRC. The use of recording policies is
outside the scope of the Session Recording Protocol.

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