SDP Descriptors for MMTP
draft-bouazizi-sdp-descriptors-mmtp-01

Abstract

   This document specifies the use of SDP for the description of MPEG
   Media Transport protocol (MMTP) sessions. It defines the parameters
   required to begin, join, receive data from, and/or end MMTP sessions.

Table of Contents

1. Introduction

The MMTP protocol is an application layer transport protocol that is
designed to transport different types of media objects under real-
time delivery constraints. In particular, MMTP provides a delivery
mode that is optimized for low-delay delivery of fragmented ISOBMFF
media files. The Session Description Protocol (SDP) [RFC4566])
provides a general-purpose format for describing multimedia sessions
in announcements or invitations. SDP uses an entirely textual data
format (the US-ASCII subset of UTF-8 [RFC3629]) to simplify authoring
and increase readability. SDP only defines the syntax to describe
multimedia sessions with sufficient information to enable receivers
to participate in the session. SDP does not restrict the way the
session description is distributed to the receivers, so that
potentially any transport protocol (e.g. HTTP [RFC2616], MMTP
[draftMMTP], SAP [RFC2974], SIP [RFC3261]) may be used for this
purpose. This document defines a new protocol identifier for the
MPEG Media Transport Protocol (MMTP) as well as other SDP attributes
for describing and initiating an MMTP session. The formal ABNF
syntax [RFC5234] is used for defining the syntax of the new SDP
attributes. The defined SDP descriptors apply independently of
whether Any Source Multicast (ASM) or Source Specific Multicast (SSM)
is used to route the media.

2. MMTP Descriptors

The MMTP specification [draftMMTP] describes the required and
optional parameters for describing an MMTP session. This document
specifies the SDP parameters for MMTP sessions that can be used for

the discovery of MMTP sessions. The required SDP parameters for
describing an MMTP session are:

    The destination information, consisting of the destination IP
    address and port number.

    An indication that the session is an MMTP session

    The version number of the MMTP protocol used in the current MMTP
    session

The optional SDP parameters are:

    The start and end time of the MMTP session

    Bandwidth specification

    Description of the object flows of the MMTP session

An MMTP session consists of one or more object flows, each of which
is identified by a unique packet identifier. The packets that belong
to the same object flow use the same packet identifier and build a
sub-flow of the MMTP flow. The description of the SDP parameters is
provided in the following sections.

2.1. MMTP Protocol Identifier

The ABNF syntax for the "m=" line as specified by [RFC4566] is
defined as follows: media-field = "m=" media SP port {"/" integer] SP
proto 1*(SP fmt) CRLF proto = "MMTP/UDP" The "MMTP/UDP" protocol
identifier specifies that the the session being described will use
the MMTP protocol [draftMMTP] on top of a UDP connection. The "fmt"
list may be used to describe the object flows that are delivered as
part of the MMTP session.

2.2. Object Flow Semantics

An MMTP session consists of an MMTP flow that is delivered during a
designated period of time that is indicated by the session start and
end time or through external means. Each MMTP sub-flow carries
objects of an object flow. An object flow is composed of a set of
related objects that are meant to be consumed together by the
receiver. An object flow may carry objects of one of the following
types:

    media objects that are formatted as fragmented ISOBMFF files and
    that are meant to be consumed sequentially. In MMT terms, MPUs

would constitute the objects of such an object flow, which is
named as Asset.

the object flow consists of generic objects that are meant to be
consumed simultaneously or in sequence.

the object flow consists of objects that carry signaling messages
that are relevant to the consumption of the MMTP flow.

the object flow carries FEC repair packets.

The SDP descriptors enables providing basic descriptive information
about the object flow. The related SDP parameters are described in
the following section.

2.3. Object Flow Descriptors

This internet draft specifies a set of SDP descriptors to describe
the content of an MMTP session. It uses the "fmt" to identify the
relevant object flows of an MMTP session and indicate its type. In
addition, a textual description of the object flow may be provided
separately. The ABNF syntax of the object flow description is
defined as follows: of-descriptor = "a=of:" fmt SP of-identifier SP
type-indicator CRLF of-identifier = "flowid=" 1*DIGIT type-indicator
= "type=" type ["/" subtype] type = "MPU" / "GF" / "Signaling" /
"FEC" The flowid is set to the packet_id of the MMTP subflow that
carries the objects of this object flow. The type of the object flow
corresponds to one of the object flow types described in Section 2.2.
The subtype field is a type specific optional field that can be used
to indicate a more specific type of the object flow. As an example,
a subtype "MP" of type "signaling" may be used to indicate that the
object flow carries (possibly among others) the MP tables of this
MMTP session.

3. SDP Syntax Examples

This section gives examples of the use of SDP attributes to describe
an MMTP session.

```
                                        v=0
                                        o=user  6431641313 1 IN IP4
10.10.52.13
                                        s=An MMTP session
                                        t=1411639200 1427277600
                                        a=source-filter: incl IN IP4 *
10.10.52.13
                                        m=application 12345 MMTP/UDP
100 101 102 103 104
                                        a=of:100 flowid=0 Signaling/PA
                                        a=of:101 flowid=7623 MPU
                                        a=of:102 flowid=7624 MPU
                                        a=of:103 flowid=7625 GF
                                        a=of:104 flowid=7626 FEC
```

Figure 1: An example SDP describing an MMTP session

Section 3 shows an example SDP instance for an MMTP session. The
MMTP session declares a set of 5 object flows. The first object
flow, which has the packet_id 0, is the flow that carries signaling
messages and in particular PA messages that describe the MMT
services. Object flows with packet_id 7623 and 7624 carry media data
of 2 different assets using the MPU mode. Object flow with packet_id
7625 carries generic files that are carried using the GFD mode.
Finally, object flow with packet_id 7626 carries FEC repair data for
one or more other object flows. The description of the FEC protected
object flows is provided through the FEC signaling message.

4. IANA Considerations

4.1. Transport Protocol

The "proto" sub-field of media description field ("m=") describes the
transport protocol used. This document registers the following value
"MMTP/UDP" as the MMTP transport protocol [draftMMTP] over UDP/IP.

4.2. Media Formats

This document registers the following "fmt" values: "Signaling",
"MPU", "GF", and "FEC". These values correspond to the payload type
fields of MMTP. The MMTP media line may use "*" as the "fmt" value.
In that case, no specific indication of the contained object flows is
made.

4.3. Attribute Names

This document registers the following attribute: "of" with IANA, with
the following information:

                                              SDP Attribute ("att-field")
                                              Attribute name: of
                                              Long form:

MMTP Object Flow description

                                              Type of attribute: media
level

                                              Subject to charset: No
                                              Purpose:

See this document

                                              Reference:

This document

                                              Values:

See this document

                              Figure 2

5. Security Considerations

   Refer to [RFC4566] for security considerations specific to the
   Session Description Protocol in general. For security considerations
   related to the MMTP protocol, refer to [draftMMTP].

6. References

6.1. Normative References

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