Guideline for dynamic payload type number usage policy
draft-wu-avtcore-dynamic-pt-usage-02

Abstract

   The RTP Profile for Audio and Video Conferences with Minimal Control
   (RTP/AVP) is the basis for many other profiles, such as the Secure
   Real-time Transport Protocol (RTP/SAVP), the Extended RTP Profile for
   Real-time Transport Control Protocol (RTCP)-Based Feedback (RTP/
   AVPF), and the Extended Secure RTP Profile for RTCP-Based Feedback
   (RTP/SAVPF). This document provides guidelines for payload type
   number usage policy when dynamic payload type allocation is used.
   Also this document updates closed IANA registry "RTP Payload types
   (PT) for standard audio and video encodings".

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1. Introduction

The RTP Profile for Audio and Video Conferences with Minimal Control
(RTP/AVP) [RFC3551]is the basis for many other profiles, such as the
Secure Real-time Transport Protocol (RTP/SAVP), the Extended RTP
Profile for Real-time Transport Control Protocol (RTCP)-Based
Feedback (RTP/ AVPF), and the Extended Secure RTP Profile for RTCP-
Based Feedback (RTP/SAVPF). RTP Payload type can have the values 0
to 127. The binding of RTP payload format to Payload type can be
static or dynamic. [RFC3551] establishes the policy that no
additional static payload types will be assigned beyond the ones
defined. As described in RFC5761, dynamic RTP payload types SHOULD
be chosen first from the range 96-127. Values below 64 MAY be used
if that is insufficient.

However some implementations may still exhaust the dynamic payload
type numbering space before re-using a payload type within the scope
of a local transport address. This document provides guidelines for
payload type number usage policy when dynamic payload type allocation
is used. Also this document updates closed IANA registry "RTP
Payload types (PT) for standard audio and video encodings".

2. Conventions used in this document

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 RFC2119 [RFC2119].

3. Use of Dynamic payload type

   As described in [section 3 of RFC3551](#) [[RFC3551](#)], the payload type
   number space is relatively small and cannot accommodate assignments
   for all existing and future encodings. The registry for RTP Payload
   types (PT) for standard audio and video encodings [http://
   www.iana.org/assignments/rtp-parameters/rtp-parameters.xhtml#rtp-
   parameters-1] is closed. New payload formats(e.g.,H.264,VP8) MUST
   use dynamic payload type number assignment. Each new payload format
   MUST be named as "encoding name" by a registered media subtype
   defined in the "RTP Payload Format media types" registry. The
   "encoding name" in the RTP payload type registry is also registered
   as a media subtype under the media type "audio" or "video" in the
   "RTP Payload Format media types" registry.

   When these dynamic payload types are used, SDP [[RFC4566](#)] or other
   protocols such as ITU-T Recommendation H.323/H.245[H323] [H245] are
   used to establish dynamic mapping between a payload type and an
   encoding.

   [RFC5761] discusses conflicts that may happen when multiplexing RTP
   and RTCP is the same transport stream. When considering which
   payload type numbers should be used for mapping RTP dynamic streams,
   the documents does not differentiate between the cases when RTP and
   RTCP are multiplexed or not.

   When the dynamic mapping is needed, implementers can use the payload
   types in the lower range for dynamic payload type allocation,
   including the overriding the static ones. Applications SHOULD first
   use values in the range [96-127]for dynamic payload types. Those
   applications which need to define more than 32 dynamic payload types
   MAY bind codes below 96, in which case it is RECOMMENDED that
   unassigned payload type numbers [35-63] followed by [20-24], 27,
   [29-30]. If more payload type numbers are needed, the application
   may use the reserved values 1,2,19 (see [[RFC3551](#)]for reserved values)
   and 64, 65 (see [[RFC5761](#)]for reserved value)if H.261 FIR or H.261
   NACK is not used. However using 64,65 may potentially cause
   collisions with legacy use. If more Payload type numbers are needed,
   then applications may override the static types[0,
   3-18,25,26,28,31-34] and map encodings to these defined static
   payload type but this may cause problems for applications that ignore
   the mapping in the signaling and may assume a specific payload format
   based on the Payload Type. If the application is sure that
   multiplexing RTP and RTCP are not used, the range 66 and 95 MAY be
   used but to add extra caution it will be better to use the pt numbers
   that are not conflicting with the currently assigned RTCP values.

The closed IANA registry "RTP Payload types (PT) for standard audio
and video encodings" is updated as follows:

RTP Payload types (PT) for standard audio and video encodings - Closed

Registration Procedure(s)

Registry closed; see [RFC3551], Section 3

Reference
          [RFC3551] [RFC5761][RFCxxxx]
 Note

The RFC "RTP Profile for Audio and Video Conferences with Minimal
Control" [RFC3551] specifies an initial set "payload types".
This list maintains and extends that list. The list is update by
[RFCxxxx] to allow using more pt numbers for dynamic mapping.

PT	Encoding Name	Audio/Video (A/V)	Clock Rate	Channels	Reference
0	PCMU	A	8000	1	[RFC3551]
1	Reserved-may be used for dynamic mapping				[RFCxxxx]
2	Reserved-may be used for dynamic mapping				[RFCxxxx]
3	GSM	A	8000	1	[RFC3551]
4	G723	A	8000	1	[Vineet_Kumar][RFC3551]
5	DVI4	A	8000	1	[RFC3551]
6	DVI4	A	16000	1	[RFC3551]
7	LPC	A	8000	1	[RFC3551]
8	PCMA	A	8000	1	[RFC3551]
9	G722	A	8000	1	[RFC3551]
10	L16	A	44100	2	[RFC3551]
11	L16	A	44100	1	[RFC3551]
12	QCELP	A	8000	1	[RFC3551]
13	CN	A	8000	1	[RFC3389]

14	MPA	A	90000		[RFC3551][RFC2250]
15	G728	A	8000	1	[RFC3551]
16	DVI4	A	11025	1	[Joseph_Di_Pol]
17	DVI4	A	22050	1	[Joseph_Di_Pol]
18	G729	A	8000	1	[RFC3551]
19	Reserved-may be used for dynamic mapping				[RFCxxxx]
20	Unassigned	A			
21	Unassigned	A			
22	Unassigned	A			
23	Unassigned	A			
24	Unassigned	V			
25	CelB	V	90000		[RFC2029]
26	JPEG	V	90000		[RFC2435]
27	Unassigned	V			
28	nv	V	90000		[RFC3551]
29	Unassigned	V			
30	Unassigned	V			
31	H261	V	90000		[RFC4587]
32	MPV	V	90000		[RFC2250]
33	MP2T	AV	90000		[RFC2250]
34	H263	V	90000		[Chunrong_Zhu]
35-63	Unassigned				
64-65	Reserved-may be used for dynamic mapping				[RFCxxxx]
66-71	Reserved for RTCP conflict avoidance				[RFC5761]

 72-82 Reserved already used by RTCP   [RFC5761]

 83-95 Reserved for RTCP conflict avoidance   [RFC5761]

 96-127 dynamic   [RFC3551]

   The table includes the different set of changes and make the current
   state clear. This should have the original table in the "RTP Payload
   types (PT) for standard audio and video encodings"registry with the
   following changes:

   o Change 1,2, 19 64-65 from "Reserved" to "reserved may be used for
      dynamic mapping" and reference this document.

   o Change 66-71 to reserved for rtcp conflict avoidance.

   o Change 72-82 to reserved used by RTCP.

   o Change 83-95 to reserved for RTCP conflict avoidance.

      Editor note: do we want to recommend re-use of payload type in
      bundled m-lines if they map to the same payload format here?

4. Security Considerations

   This document modifies the IANA allocation of RTP Payload Types in
   relationship to RFC 3551. This policy change itself does not add
   security concerns to the ones in [RFC3551] and [RFC5761].

5. IANA Considerations

   This section describes changes to the IANA Considerations sections
   outlined in RFC 3551 regarding the allocation of payload type number
   by IANA.

   Add to the note in http://www.iana.org/assignments/rtp-parameters/
   rtp-parameters.xhtml the following text "Policy for mapping of
   dynamic payload type numbers to payload format is defined in RFCxxxx
   [this document].

   The table in section 3 replaces the current closed table.

6. Acknowledgements

   The content of this document is the result of the work in the IETF
   Audio/Video Transport Core Maintenance (AVTCORE) working group. We
   would therefore like to thank all the working group members who were
   involved in that discussion. While it appears to be a fairly small
   change in the usage policy and allocation policy, the effect on
   implementations is rather dramatic.

7. References

7.1. Normative References

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

   [RFC3551]   Schulzrinne, H. and S. Casner, "RTP Profile for Audio and
               Video Conferences with Minimal Control", RFC 3551, July
               2003.

   [RFC5761]   Perkins, C. and M. Westerlund, "Multiplexing RTP Data and
               Control Packets on a Single Port", RFC 5761, April 2010.

7.2. Informative References

   [H246]   ITU, "Advanced video coding for generic audiovisual
               services", Recommendation H.264, January 2012.

   [H323]   ITU, "Packet based multimedia communication systems",
               Recommendation H.323, July 2003.

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

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