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Date: 16 May 2022

Origin: International

Latest date for receipt of comments: 22 June 2022

Project No. 2021/01829

Responsible committee: IST/37 Coding of picture, audio, multimedia and hypermedia information

Interested committees:

Title: BS ISO/IEC 23009-1 AMD 1 - Information technology - Dynamic adaptive streaming over HTTP (DASH) Part 1:
Media presentation description and segment formats

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Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

DRAFT AMENDMENT

ISO/IEC 23009-1:2022/DAM 1

ISO/IEC JTC 1/SC 29

Secretariat: JISC

Voting begins on:
2022-04-29

Voting terminates on:
2022-07-22

Information technology — Dynamic adaptive streaming over HTTP (DASH) —

Part 1:

Media presentation description and segment formats

AMENDMENT 1: Preroll, nonlinear playback and other extensions

Partie 1: Description de la présentation et formats de remise des médias

AMENDEMENT 1: Titre manque

ICS: 35.040.40

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Reference number
ISO/IEC 23009-1:2022/DAM 1:2022(E)
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Published in Switzerland

1 Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

A list of all parts in the ISO/IEC 23009 series can be found on the ISO website.

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Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats, Amendment 1: Preroll, nonlinear playback and other extensions

2 General Updates

Replace Foreword

This fifth edition cancels and replaces the fourth edition (ISO/IEC 23009-1:2020), which has been technically revised. It also incorporates the Amendment ISO 23009-1:2020/Amd.1:2020 and ISO 23009-1:2020/Amd.2:2021. The main changes compared to the previous edition are as follows:

- A bandwidth signalling track;

Add to 3.1 Terms and definitions

3.1.X

Preroll

on-demand content which is played before start of playback of a live content

Add new clause 5.2.3.4

5.2.3.5 Elements and Attributes added in the fifth edition of this document (ISO/IEC 23009-1:20xx)

This revision adds the following elements and attributes to the schema defined in Annex B compared to the 2020 revision (ISO/IEC 23009-1:2020) of this document:

- tbd

Replace in Annex B

The schema of the MPD for this document is provided at <https://standards.iso.org/iso-iec/23009/-1/ed-4/en> (DASH-MPD.xsd).

NOTE For the FDIS ballot, the accompanied zip archive contains the schema in the file DASH-MPD.xsd. The schema will eventually be made available at the above URL.

with

The schema of the MPD for this document is provided at <https://standards.iso.org/iso-iec/23009/-1/ed-5/en> (DASH-MPD.xsd).

NOTE For the DAM ballot, the accompanied zip archive contains the schema in the file DASH-MPD.xsd. The schema will eventually be made available at the above URL.

Editor's Note: Several pull requests have been created to add the changes in this Amendment. Please check here and comment <https://github.com/MPEGGroup/DASHSchema/pulls>

Replace in Annex G

All examples documented in this annex are provided at <https://standards.iso.org/iso-iec/23009/-1/ed-4/en> with the following file naming convention:

example-G<subsection>[<order in subsection>].mpd

with

All examples documented in this annex are provided at <https://standards.iso.org/iso-iec/23009/-1/ed-5/en> with the following file naming convention:

example-G<subsection>[<order in subsection>].mpd

Replace in Annex G.11

NOTE: The example code is accessible here: <https://standards.iso.org/iso-iec/23009/-1/ed-4/en> (example_G11_remote.period.xml)

With

NOTE: The example code is accessible here: <https://standards.iso.org/iso-iec/23009/-1/ed-5/en> (example_G11_remote.period.xml)

Replace in Annex H.3

All examples documented in this Annex are provided at <https://standards.iso.org/iso-iec/23009/-1/ed-4/en> with the following file naming convention referring to H.3.

<subsection>: example-H<subsection>.mpd

With

All examples documented in this Annex are provided at <https://standards.iso.org/iso-iec/23009/-1/ed-5/en> with the following file naming convention referring to H.3.

<subsection>: example-H<subsection>.mpd

Replace in Annex I.2.1

The initial part of the XML schema of the URL Query Information is provided below, including namespace and other definitions. Specific types, elements and attributes are introduced in the remainder of this subclause. The complete normative URL Query Information schema is provided at <https://standards.iso.org/iso-iec/23009/-1/ed-4/en> (DASH-MPD-UP.xsd). In case of inconsistencies, this schema takes precedence both over the XML syntax snippets provided in this clause and all prose text in this document.

Implementors are supported by additional files available at: <https://standards.iso.org/iso-iec/23009/-1/ed-4/en>. These files include the schema as well as all examples provided in this annex.

with

The initial part of the XML schema of the URL Query Information is provided below, including namespace and other definitions. Specific types, elements and attributes are introduced in the remainder of this subclause. The complete normative URL Query Information schema is provided at <https://standards.iso.org/iso-iec/23009/-1/ed-5/en> (DASH-MPD-UP.xsd). In case of inconsistencies, this schema takes precedence both over the XML syntax snippets provided in this clause and all prose text in this document.

Implementors are supported by additional files available at: <https://standards.iso.org/iso-iec/23009/-1/ed-5/en>. These files include the schema as well as all examples provided in this annex.

3 Change 1: Alternative MPD event

Add in clause 4.7, Table 2

urn:mpeg:dash:event:alternative:2022	5.13	Scheme Identifier for alternative MPD event
--------------------------------------	------	---

Add after 5.12

5.13 Media Presentation Insertion

5.13.1 General

Media Presentation Insertion provides a mechanism to indicate the insertion of an alternative Media Presentation into the main Media Presentation at a certain point of the Media Presentation timeline. After the playback of the alternative Media Presentation, the playback is continued with the main Media Presentation. The alternative Media Presentation may be inserted in the media time of the Main Presentation, or it may replace a time segment of the main Media Presentation.

After the playback of the alternative Media Presentation, the playback of the main Media Presentation is typically be continued. Transitioning between the two Media Presentations is expected to be without any latencies, i.e. the timelines of the main Media Presentation and the inserted Media Presentation are sequential with no gaps during playback.

This tool provides the ability to switch between two independent Media Presentations, for applications such as preroll and mid-roll during a live-streaming session. It may also be used to insert content such as ads into an On-Demand Media Presentation.

The alternative Media Presentation, the start time of the alternative Media Presentation, and the rejoin time to the main Media Presentation are signaled using a DASH event scheme. While the general processing of this event is similar to other DASH events, a specific post-processing procedure is defined in this clause for transition between the two timelines during the playback.

5.13.2 Alternative MPD event

This event scheme is identified by the URN

"urn:mpeg:dash:event:alternativeMPD:2022". The event scheme has the dispatch mode of on-receive.

Table XYYX1 defines the relevant MPD parameters for the alternative MPD event.

Table XYYX1 — Relevant parameters for alternative MPD event in MPD

Attribute	Value
EventStream @schemeIdUri/ InbandEventStream @schemeIdUri	"urn:mpeg:dash:event:alternative:2022"
EventStream @value/ InbandEventStream @value	- "replace" to return to the Media Presentation live edge - "insert" to return to the moment in Media Presentation that the playback is switched to the alternative Media Presentation
Event @presentationTime	The offset from the start of Period in which the playback is switched from the main Media Presentation to the alternative Media Presentation.

Attribute	Value
Event @duration	The duration of the event in which the playback is switched.
Event body	URL of the MPD representing the alternative Media Presentation. If this URL does not resolve to a valid MPD, the playback is continued with the main Media Presentation.

Table XYXY3 shows the relevant emsg parameters for alternative MPD events.

Table XYXY3— Relevant emsg parameters for alternative MPD event

Attribute	Value
scheme_id_uri	"urn:mpeg:dash:event:alternative:2022"
value	- "replace" to return to the Media Presentation live edge - "insert" to return to the moment in Media Presentation that the playback is switched to the alternative Media Presentation
presentation_time_delta/ presentation_time	The offset in which the playback is switched from the main Media Presentation to the alternative Media Presentation. The anchor for each offset parameter is defined in 5.10.3.2 accordingly.
event_duration	The duration of the event in which the playback is switched.
message_data	The MPD URL of the alternative Media Presentation. If this URL does not resolve to a valid MPD, the playback is continued with the main Media Presentation.

Add to Annex A after A.13

A.14 Alternative MPD event post-processing model

The Alternative MPD event is processed and dispatched according to clause A.13. This clause defines the post-processing of this event after being dispatched. This clause is informative and is intended to show the expected behavior from the DASH client.

The post-processing procedure of the event relies on the parameters shown in Table A.XYXY2.

Table A. YYYY2 Event/timed metadata API parameters and datatypes

API Parameter	MPD event	Inband event	values
<code>scheme_id</code>	EventStream @schemeIdUri	<code>scheme_id_uri</code>	"urn:mpeg:dash:event:alternative:2022"
<code>value</code>	EventStream @value	<code>value</code>	- "replace" to return to the Media Presentation live edge - "insert" to return to the moment in Media Presentation that the playback is switched to the alternative Media Presentation
<code>presentation_time</code>	Event @presentationTime	<code>presentation_time</code>	The offset in which the playback is switched from the main Media Presentation to the alternative Media Presentation.
<code>duration</code>	Event @duration	<code>duration</code>	The duration of the event in which the playback is switched.
<code>message</code>	Event body	<code>message_data</code>	The MPD URL of the alternative Media Presentation.

The client alternative MPD switching event post-processing procedure is as the following:

- a. The client checks if the alternative MPD URL in `message` is in its Previously Played List (PPL). If so, it doesn't take any further action, otherwise, it continues the following steps.
- b. It downloads the alternative MPD.
- c. One of the following cases:
 - I. If $presentation_time \leq \text{current playback time} \leq presentation_time + duration$, it immediately start the playback of the alternative Media Presentation.
 - II. If $\text{current playback time} < presentation_time$, it switches the playback from the main Media Presentation to the alternative Media Presentation at current $\text{playback time} = presentation_time$ as long as the main Media Presentation is not ended. Otherwise, it stops and clears its MUS and LL buffers.
- d. It stores the main MPD URL and `presentation_time`.
- e. It adds the `message` to its PPL.
- f. At the end of the alternative Media Presentation, it pulls the main MPD URL from the MUS.
- g. It continues playing back the main Media Presentation according to the value of `value`:
 - I. For **MPD**@type='dynamic':
 - i. From the live edge if `value = 'replace'`.
 - ii. From the earliest segment available at or after $presentation_time$ if `value = 'insert'`.
 - II. For **MPD**@type='static':
 - i. From $(presentation_time + \text{duration of alternative Media})$ Presentation if `value = 'replace'`.
 - ii. From $presentation_time$ if `value = 'insert'`.

Note 1: The DASH client clears its URL, `presentation_time`, and PPL values starting at the first parsing of the main MPD and continues maintaining them during the entire playback.

Note 2: In the case of *, setting @timeshiftBufferDepth to a value equal to or larger than the maximum alternative Media Presentation duration assures that the media segments would be available at `presentation_time` when playback is returned to the main Media Presentation.

Add to Annex G

G.23 Insert Preroll at the beginning of a live content

An example of inserting one Preroll ad at the beginning of each playback of a live content using the alternative MPD event is provided below.

```

<?xml version="1.0" encoding="utf-8"?>
<MPD
  xmlns="urn:mpeg:dash:schema:mpd:2011"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:mpeg:dash:schema:mpd:2011 DASH-MPD.xsd"

  availabilityStartTime="1970-01-01T00:00:00Z" maxSegmentDuration="PT6S"
  minBufferTime="PT2S" minimumUpdatePeriod="PT5M"
  profiles="urn:mpeg:dash:profile:isoff-live:2011" publishTime="2019-03-12T01:17:30Z"
  timeShiftBufferDepth="PT8M20S" type="dynamic">
  <Period id="p0" start="PT0S">
    <EventStream schemeIdUri="urn:mpeg:dash:event:alternative:2022S" value="replace">
      < Event http://acmeadsertver.com/preroll.mpd presentationTime="PT0S"
        duration="10000000"/>
    </EventStream>
    <BaseURL>http://liveserver.com/live/live1/</BaseURL>
    <AdaptationSet contentType="video" maxHeight="1920" maxWidth="1080"
      mimeType="video/mp4" par="16:9" segmentAlignment="true" startWithSAP="1">
      <SegmentTemplate duration="2" initialization="$RepresentationID$/init.mp4"
        media="$RepresentationID$/Number$.m4s" startNumber="0" />
      <Representation id="V300" bandwidth="300000" codecs="avc1.64001e"
        frameRate="60/2" />
      <Representation id="V600" bandwidth="600000" codecs="avc1.64001e"
        frameRate="60/2" />
    </AdaptationSet>
  </Period>
</MPD>

```

In this example, when the client starts playing the live content, first it plays the Preroll content represented by the MPD obtained from <http://acmeadsertver.com/preroll.mpd> and then it plays the live streaming session represented by Period with @id='p0' by joining the live edge of this media presentation.

G.24 Insert one midroll in the live content

An example of inserting one midroll 1 minute after the start of Period using the alternative MPD event is provided below.

```

<?xml version="1.0" encoding="utf-8"?>
<MPD
  xmlns="urn:mpeg:dash:schema:mpd:2011"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:mpeg:dash:schema:mpd:2011 DASH-MPD.xsd"

  availabilityStartTime="1970-01-01T00:00:00Z" maxSegmentDuration="PT6S"
  minBufferTime="PT2S" minimumUpdatePeriod="PT5M"
  profiles="urn:mpeg:dash:profile:isoff-live:2011" publishTime="2019-03-12T01:17:30Z"

```

```

timeShiftBufferDepth="PT8M20S" type="dynamic">

<Period id="p0" start="PT0S">
  <EventStream schemeIdUri="urn:mpeg:dash:event:alternative:2022S" value="replace">
    < Event http://acmeadsertver.com/preroll.mpd presentationTime="PT60S"
      duration="10000000"/>
  </EventStream>
  <BaseURL>http://liveserver.com/live/live1/</BaseURL>
  <AdaptationSet contentType="video" maxHeight="1920" maxWidth="1080"
    mimeType="video/mp4" par="16:9" segmentAlignment="true" startWithSAP="1">
    <SegmentTemplate duration="2" initialization="$RepresentationID$/init.mp4"
      media="$RepresentationID$/Number$.m4s" startNumber="0" />
    <Representation id="V300" bandwidth="300000" codecs="avc1.64001e"
      frameRate="60/2" />
    <Representation id="V600" bandwidth="600000" codecs="avc1.64001e"
      frameRate="60/2" />
  </AdaptationSet>
</Period>
</MPD>

```

In this example, after playback of 1 minute of the live content in Period with @id='p0', the playback is switched to playing the midroll content with the corresponding MPD obtained from <http://acmeadsertver.com/preroll.mpd>. Then, the playback is continued by rejoining the live streaming session at its live edge represented.

G.24 Insert one midroll in the live content with a time shift

An example of inserting one midroll 1 minute after the start of Period using the alternative MPD event is provided below.

```

<?xml version="1.0" encoding="utf-8"?>
<MPD
  xmlns="urn:mpeg:dash:schema:mpd:2011"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:mpeg:dash:schema:mpd:2011 DASH-MPD.xsd"

  availabilityStartTime="1970-01-01T00:00:00Z" maxSegmentDuration="PT6S"
  minBufferTime="PT2S" minimumUpdatePeriod="PT5M"
  profiles="urn:mpeg:dash:profile:isoff-live:2011" publishTime="2019-03-12T01:17:30Z"
  timeShiftBufferDepth="PT8M20S" type="dynamic">

  <Period id="p0" start="PT0S">
    <EventStream schemeIdUri="urn:mpeg:dash:event:alternative:2022S" value="insert">
      < Event http://acmeadsertver.com/preroll.mpd presentationTime="PT60S"
        duration="0"/>
    </EventStream>
    <BaseURL>http://liveserver.com/live/live1/</BaseURL>
    <AdaptationSet contentType="video" maxHeight="1920" maxWidth="1080"
      mimeType="video/mp4" par="16:9" segmentAlignment="true" startWithSAP="1">
      <SegmentTemplate duration="2" initialization="$RepresentationID$/init.mp4"
        media="$RepresentationID$/Number$.m4s" startNumber="0" />
      <Representation id="V300" bandwidth="300000" codecs="avc1.64001e"
        frameRate="60/2" />
      <Representation id="V600" bandwidth="600000" codecs="avc1.64001e"
        frameRate="60/2" />
    </AdaptationSet>
  </Period>
</MPD>

```

In this example, after playback of 1 minute of the live content in Period with @id='p0', the