



**International
Standard**

ISO/IEC 23009-1

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

**Part 1:
Media presentation description and
segment formats**

*Technologies de l'information — Diffusion en flux adaptatif
dynamique sur HTTP (DASH) —*

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

**Sixth edition
2026-07**

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Contents

Foreword.....	v
Introduction	vii
1 Scope.....	1
2 Normative references.....	1
3 Terms, definitions, symbols and abbreviated terms	2
3.1 Terms and definitions	2
3.2 Symbols and abbreviated terms.....	7
3.3 Conventions	9
4 Overview	10
4.1 System description	10
4.2 DASH Client model.....	11
4.3 DASH data model overview	12
4.4 Protocols	16
4.5 Media stream and Representation properties	16
4.6 Brands.....	19
4.7 Schemes.....	19
5 Media Presentation	23
5.1 General.....	23
5.2 Media Presentation Description.....	23
5.3 Hierarchical data model	28
5.4 Media Presentation Description updates.....	111
5.5 MPD Assembly.....	113
5.6 Base URL Processing.....	115
5.7 Program information	118
5.8 Descriptors.....	119
5.9 DASH metrics descriptor	141
5.10 Events	143
5.11 MPD Chaining	158
5.12 Producer Reference Time	160
5.13 Leap seconds.....	162
5.14 Content Popularity Rate	164
5.15 MPD Patch Framework	166
5.16 Alternative Media Presentations	171
6 Segment formats	187
6.1 General.....	187
6.2 Segment types	187
6.3 Segment formats for ISO base media file format.....	190
6.4 Segment formats for MPEG-2 transport streams	194
7 Combined semantics of MPD and Segment formats	200
7.1 Overview	200
7.2 General.....	200
7.3 Media Presentation based on the ISO base media file format	202
7.4 Media Presentation based on MPEG-2 TS	204
8 Profiles.....	206
8.1 Definition	206
8.2 Full profile	208

8.3	ISO Base media file format On Demand profile.....	208
8.4	ISO Base media file format live profile.....	210
8.5	ISO Base media file format main profile.....	211
8.6	MPEG-2 TS main profile.....	212
8.7	MPEG-2 TS simple profile.....	213
8.8	ISO Base media file format extended live profile.....	214
8.9	ISO Base media file format extended On Demand profile.....	216
8.10	ISO Base media file format common profile.....	218
8.11	ISO Base media file format broadcast TV profile	218
8.12	DASH profile for CMAF content.....	221
8.13	ISO Base media file format Advanced Linear profile	235
8.14	ISO Base Media File Format List Profile.....	238
8.15	Single-Period Static Profile	238
	Annex A (informative) Example DASH Client behaviour	240
	Annex B (normative) MPD schema	265
	Annex C (normative) MIME type registration for MPD and other resources	266
	Annex D (normative) DASH Metrics	272
	Annex E (normative) Byte range requests with regular HTTP GET methods	280
	Annex F (informative) Guidelines for extending DASH with other delivery formats.....	282
	Annex G (informative) MPD Examples and MPD Usage	284
	Annex H (normative) Spatial Relationship Description.....	324
	Annex I (normative) Flexible Insertion of URL Parameters.....	332
	Annex J (normative) Open GOP resolution change	345
	Annex K (normative) DASH Service Description	346
	Annex L (normative) Implementation of Nonlinear Playback	364
	Annex M (normative) Addressable Resource Index Track	368
	Bibliography	374

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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 or www.iec.ch/members_experts/refdocs).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

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

This sixth edition cancels and replaces the fifth edition (ISO/IEC 23009-1:2022), which has been technically revised.

The main changes are as follows:

- Introduction of Media Presentation Insertion events.
- Introduction of List MPDs.
- Significant overhaul of segment sequences, offering new functionality for low-latency and low-delay applications.
- Introduction of segment duration patterns.
- Updates to [Annex I](#), including new pre-defined parameters.
- Introduction of Content Steering.
- Introduction of reporting using CTA-5004 (CMCD).
- Introduction of ARI (Addressable Resource Index) Tracks.

- Introduction of supplemental video services.
- Introduction of non-linear timelines.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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Introduction

Dynamic adaptive streaming over HTTP (DASH) is intended to support a media-streaming model for delivery of media content in which control lies primarily with the client. Clients may request data using the HTTP protocol from standard web servers that have no DASH-specific capabilities. Consequently, this document focuses not on client or server procedures but on the data formats used to provide a DASH Media Presentation.

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

Part 1: Media presentation description and segment formats

1 Scope

This document primarily specifies formats for the Media Presentation Description and Segments for dynamic adaptive streaming delivery of MPEG media over HTTP. It is applicable to streaming services over the Internet.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 13818-1, *Information technology — Generic coding of moving pictures and associated audio information — Part 1: Systems*

ISO/IEC 14496-12, *Information technology — Coding of audio-visual objects — Part 12: ISO base media file format*

ISO/IEC 23000-19, *Information technology — Multimedia application format (MPEG-A) — Part 19: Common media application format (CMAF) for segmented media*

ISO/IEC 23091-2, *Information technology — Coding-independent code points — Part 2: Video*

ISO/IEC 23091-3, *Information technology — Coding-independent code points — Part 3: Audio*

IETF RFC 2397, *The “data” URL scheme*

IETF RFC 3629, *UTF-8, a transformation format of ISO 10646*

IETF RFC 3986, *Uniform Resource Identifier (URI): Generic Syntax*

IETF RFC 4337, *MIME Type Registration for MPEG-4*

IETF RFC 4648, *The Base16, Base32, and Base64 Data Encodings*

IETF RFC 5234, *Augmented BNF for Syntax Specifications: ABNF*

IETF RFC 5261, *An Extensible Markup Language (XML) Patch Operations Framework Utilizing XML Path Language (XPath) Selectors*

IETF RFC 5646, *Tags for Identifying Languages*

IETF RFC 6381, *The ‘Codecs’ and ‘Profiles’ Parameters for “Bucket” Media Types*

IETF RFC 6838, *Media Type Specifications and Registration Procedures*

IETF RFC 8141, *URN Syntax*

IETF RFC 8673, *HTTP Random Access and Live Content*

IETF RFC 9110, *HTTP Semantics*

IETF RFC 9562, *Universally Unique IDentifiers (UUIDs)*

HTML 4.01 Specification, W3C Recommendation, 24 December 1999

ETSI TS 103 998, *DASH-IF: Content Steering for DASH*

W3C, *Canonical XML*, Version 1.1

W3C, *Extensible Markup Language (XML)*, Version 1.0

W3C, *XML Linking Language (XLink)*, Version 1.1

W3C, *Media Fragments URI*, Version 1.0

CTA-5004, Web Application Video Ecosystem, *Common Media Client Data (CMCD)*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 23000-19 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1.1

access unit

unit of a *media stream* (3.1.31) with an assigned Media Presentation time

3.1.2

accessibility

degree to which a media content or certain *media content components* (3.1.23) are available to as many people as possible

3.1.3

Adaptation Set

set of interchangeable encoded versions of one or several *media content components* (3.1.23)

3.1.4

asset

content including media and metadata together with the rights to use the content by the content provider

3.1.5

associated Representation

Representation (3.1.43) which provides supplemental or descriptive information for at least one other Representation

3.1.6

available Segment

Segment (3.1.45) that is accessible at its assigned *HTTP-URL* (3.1.17) and a possibly assigned byte range that is the request with an HTTP GET results in a reply of the Segment and 2xx status code

3.1.7

Bitstream Switching Segment

Segment (3.1.45) that if present contains essential data to switch to the *Representation* (3.1.43) it is assigned to

3.1.8

complementary Representation

Representation (3.1.43) which complements at least one *dependent Representation* (3.1.12)

3.1.9

continuous media

media with an inherent notion of time

EXAMPLE Speech, audio, video, timed text or timed metadata.

3.1.10

DASH metric

metric computed by the DASH Client and uniquely identified by a key

3.1.11

data URL

URL with a fixed scheme "data"

3.1.12

dependent Representation

Representation (3.1.43) for which *Segments* (3.1.45) from its *complementary Representations* (3.1.8) are necessary for presentation and/or decoding of the contained *media content components* (3.1.23)

3.1.13

earliest presentation time

smallest *presentation time* (3.1.41) of any *access unit* (3.1.1) of a *Media Segment* (3.1.30) or *Subsegment* (3.1.57) for a *media stream* (3.1.31)

3.1.14

event

aperiodic sparse media-time related auxiliary information to the DASH Client or to an application

3.1.15

event stream

sequence of related *events* (3.1.14)

3.1.16

group

collection of *Adaptation Sets* (3.1.3) that are not expected to be presented simultaneously

3.1.17

HTTP-URL

URL with a fixed scheme of "http" or "https"

3.1.18

Index Segment

Segment (3.1.45) that primarily contains indexing information for *Media Segments* (3.1.30)

3.1.19

Initialization Segment

Segment (3.1.45) containing metadata that is necessary to present the *media streams* (3.1.31) encapsulated in *Media Segments* (3.1.30)

3.1.20

Listen Mode

mode of operation where media time elapses (i.e. playhead moves normally), certain operational data is processed, but no media is rendered

3.1.21

Main Adaptation Set

Adaptation Set (3.1.3) in a *Preselection* (3.1.40) that contains the *Initialization Segment* (3.1.19) for the complete experience

3.1.22

media content

single *media content period* (3.1.25) or contiguous sequence of media content periods

3.1.23

media content component

single continuous component of the *media content* (3.1.22) with an assigned *media content component type* (3.1.24)

3.1.24

media content component type

single type of *media content* (3.1.22)

EXAMPLE Audio, video, or text.

3.1.25

media content period

set of *media content components* (3.1.23) that have a common timeline as well as relationships on how they can be presented

3.1.26

Media Presentation

collection of data that establishes a bounded or unbounded presentation of *media content* (3.1.21)

3.1.27

Media Presentation Description

MPD

formalized description for a *Media Presentation* (3.1.26) for the purpose of providing a streaming service

3.1.28

Media Presentation Insertion

Insertion of media content from a second *Media Presentation* (3.1.26) in the timeline of a first *Media Presentation* (3.1.26)

3.1.29

Media Presentation timeline

concatenation of the timeline of all *Periods* (3.1.37) which itself is common to all *Representations* (3.1.43) in the Period

3.1.30

Media Segment

Segment (3.1.45) that complies with media format in use and enables playback when combined with zero or more preceding Segments and an *Initialization Segment* (3.1.19) (if any)

3.1.31

media stream

encoded version of a *media content component* (3.1.23)

3.1.32

Media Subsegment

Subsegment (3.1.57) that only contains media data but no *Segment Index* (3.1.49)

3.1.33

message

part of an *event* (3.1.14) containing information that is exclusively handled by the event handler

3.1.34

MPD start time

approximate presentation start time of a *Media Segment* (3.1.30) signalled in *MPD* (3.1.26)

3.1.35

MPD duration

approximate presentation duration of a *Media Segment* (3.1.30) signalled in *MPD* (3.1.26)

3.1.36

Partial Segment

Media Segment (3.1.30) included in a Segment Sequence Representation

3.1.37

Period

interval of the *Media Presentation* (3.1.24), where a contiguous sequence of all Periods constitutes the *Media Presentation*

3.1.38

playhead

current media time provided by the media engine that can be mapped to a time on the Media Presentation timeline

3.1.39

Preroll

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

3.1.40

Preselection

set of *media content components* (3.1.23) that are intended to be consumed jointly

3.1.41

presentation time

time associated to an *access unit* (3.1.1) that maps it to the *Media Presentation timeline* (3.1.29)

3.1.42

remote element entity

entity that contains one or more elements and is referenced in the *MPD* (3.1.27) with an *HTTP-URL* (3.1.17) contained in an @xlink:href attribute, referred to as "remote resource" by XLink

3.1.43

Representation

collection and encapsulation of one or more *media streams* (3.1.31) in a delivery format and associated with descriptive metadata

3.1.44

Resynchronization Point

point within a Segment from which it is possible to start processing the Representation

3.1.45

Segment

unit of data associated with an *HTTP-URL* (3.1.17) and optionally a byte range that are specified by an *MPD* (3.1.27), or with a *data URL* (3.1.11)

3.1.46

Segment availability start time

latest time instant in *wall-clock time* (3.1.60) at which a *Segment* (3.1.45) becomes an *available Segment* (3.1.6)

3.1.47

adjusted Segment availability start time

time instant in *wall-clock time* (3.1.60) at which a *Segment* (3.1.45) becomes an *available Segment* (3.1.6)

3.1.48

Segment availability end time

time instant in *wall-clock time* (3.1.60) at which a *Segment* (3.1.45) ceases to be an *available Segment* (3.1.6)

3.1.49

Segment Index

compact index of the time range to byte range mapping within a *Media Segment* (3.1.30) separately from the *MPD* (3.1.27)

3.1.50

Segment Sequence

sequence of all *Partial Segments* (3.1.36) that are sharing a common address prefix

3.1.51

Segment Sequence Representation

Representation (3.1.43) using *Segment Sequences* (3.1.50)

3.1.52

Segment Track

concatenation of *Segments* (3.1.45) forming a track with potential conformance properties

3.1.53

Service Location

collection of network resources that share commonalities and can be referred to by a common label

3.1.54

spatial object

media content component (3.1.23) corresponding to a region in a coordinate system associated to this media content component

3.1.55

stream access point

SAP

position in a *Representation* (3.1.43) enabling playback of a *media stream* (3.1.31) to be started using only the information contained in Representation data starting from that position onwards preceded by initializing data in the *Initialization Segment* (3.1.19), if any

3.1.56

sub-asset

media content component (3.1.23) (or part thereof) identified as corresponding to a part of an *asset* (3.1.4)

3.1.57

Sub-Representation

part of a *Representation* (3.1.43) described in the *MPD* (3.1.27) that is present in the entire *Period* (3.1.37)

3.1.58

Subsegment

unit within *Media Segments* (3.1.30) that is indexed by a *Segment Index* (3.1.49)

3.1.59

valid Segment URL

HTTP-URL (3.1.17) that is promised to reference a *Segment* (3.1.45) during its Segment availability period

3.1.60

wall-clock time

time as stated by UTC

3.2 Symbols and abbreviated terms

4CC	four character code
ABNF	augmented Backus-Naur form
ACK	acknowledgement message in TCP
AEMS	application event or metadata streams
API	application programming interface
ARI	addressable resource index
AVC	advanced video coding
CAT	conditional access table
CDN	content delivery network
CMAF	common media application format
CMCD	common media client data
DASH	dynamic adaptive streaming over HTTP
DCSM	DASH Content Steering Manifest
DM	DASH metrics
DOM	document object model
DRM	digital rights management
ECM	entitlement control message
EDRAP	extended dependent random access point