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

**Part 5:  
Server and network assisted DASH  
(SAND)**

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

*Partie 5: DASH assisté par serveur et réseau (SAND)*





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## 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](http://www.iso.org/directives)).

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

## Introduction

In order to enhance the delivery of DASH content, this document introduces messages between DASH clients and network elements or between various network elements for the purpose of improving the efficiency of streaming sessions by providing information about real-time operational characteristics of networks, servers, proxies, caches, CDNs, as well as DASH client's performance and status.

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

## Part 5: Server and network assisted DASH (SAND)

### 1 Scope

This document defines the following:

- the functional SAND architecture which identifies the SAND network elements and the nature of SAND messages exchanged among them;
- the semantics of SAND messages exchanged between the network elements present in the SAND architecture;
- an encoding scheme for the SAND messages;
- the SAND message delivery protocol.

### 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 8601, *Data elements and interchange formats — Information interchange — Representation of dates and times*

ISO/IEC 23009-1:2014, *Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats*

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

IETF RFC 6455, *The WebSocket Protocol*

IETF RFC 7233:2014, *Hypertext Transfer Protocol (HTTP/1.1): Range Requests*