

**Video surveillance systems for use in security applications -- Part 2-3: Video transmission protocols - IP interoperability implementation based on Web services**

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 62676-2-3:2014 sisaldab Euroopa standardi EN 62676-2-3:2014 inglisekeelset teksti.	This Estonian standard EVS-EN 62676-2-3:2014 consists of the English text of the European standard EN 62676-2-3:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 17.01.2014.	Date of Availability of the European standard is 17.01.2014.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 13.320

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**Video surveillance systems for use in security applications -  
Part 2-3: Video transmission protocols -  
IP interoperability implementation based on Web services  
(IEC 62676-2-3:2013)**

Systèmes de vidéosurveillance destinés à  
être utilisés dans les applications de  
sécurité -  
Partie 2-3: Protocoles de transmission  
vidéo -  
Mise en oeuvre de l'interopérabilité IP en  
fonction des services Web  
(CEI 62676-2-3:2013)

Videoüberwachungsanlagen für  
Sicherungsanwendungen -  
Teil 2 3: Videoübertragungsprotokolle -  
IP-Interoperabilität auf Basis von  
Webservices  
(IEC 62676-2-3:2013)

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 79/437/FDIS, future edition 1 of IEC 62676-2-3, prepared by IEC TC 79 "Alarm and electronic security systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62676-2-3:2014.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2014-09-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-12-12

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## Endorsement notice

The text of the International Standard IEC 62676-2-3:2013 was approved by CENELEC as a European Standard without any modification.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ITU-T G711	-	Pulse code modulation (PCM) of voice frequencies	-	-
ITU-T Recommendation X.680	1997	Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation	-	-
ITU-T Recommendation X.681	1997	Information technology - Abstract Syntax Notation One (ASN.1): Information object specification	-	-
ITU-T Recommendation X.682	1997	Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification	-	-
ITU-T Recommendation X.683	1997	Information technology – Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications	-	-
ITU-T Recommendation X.690	1997	Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)	-	-
NIST FIPS 180-2	-	Secure Hash Standard	-	-
IETF RFC 1305	-	Network Time Protocol, Version 3 - Specification and Implementation	-	-
IETF RFC 2131	-	Dynamic Host Configuration Protocol	-	-
IETF RFC 2136	-	Dynamic Updates in the Domain Name System (DNS UPDATE)	-	-
IETF RFC 2246	-	The TLS Protocol Version 1.0	-	-
IETF RFC 2326	-	Real time Streaming protocol (RTSP)	-	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IETF RFC 2435	-	RTP Payload Format for JPEG-compressed Video	-	-
IETF RFC 2616	-	Hypertext Transfer Protocol HTTP/1.1.	-	-
IETF RFC 2617	-	HTTP Authentication: Basic and Digest Access Authentication	-	-
IETF RFC 2782	-	A DNS RR for specifying the location of services (DNS SRV)	-	-
IETF RFC 3268	-	Advanced Encryption Standard (AES) Ciphersuites for Transport Layer Security (TLS)	-	-
IETF RFC 3315	-	Dynamic Host Configuration Protocol for IPv6 (DHCPv6)	-	-
IETF RFC 3550	-	A Transport Protocol for Real-Time Applications	-	-
IETF RFC 3551	-	RTP Profile for Audio and Video Conferences with Minimal Control	-	-
IETF RFC 3927	-	Dynamic Configuration of IPv4 Link-Local Addresses	-	-
IETF RFC 3984	-	RTP Payload Format for H.264 Video	-	-
IETF RFC 3986	-	Uniform Resource Identifier (URI): Generic Syntax	-	-
IETF RFC 4514	-	Lightweight Directory Access Protocol (LDAP): String Representation of Distinguished Names	-	-
IETF RFC 4566	-	SDP: Session Description Protocol	-	-
IETF RFC 4571	-	Framing Real-time Transport Protocol (RTP) and RTP Control Protocol (RTCP) Packets over Connection-Oriented Transport	-	-
IETF RFC 4702	-	The Dynamic Host Configuration Protocol (DHCP) Client Fully Qualified Domain Name (FQDN) Option	-	-
IETF RFC 4861	-	Neighbor Discovery for IP version 6 (IPv6)	-	-
IETF RFC 4862	-	IPv6 Stateless Address Autoconfiguration	-	-
W3C SOAP 1.2 Part 1	-	Messaging Framework	-	-
W3C SOAP Version 1.2 Part 2	-	Adjuncts (Second Edition)	-	-
OASIS Web Services Base Notification 1.3	-		-	-
OASIS Web Services Security Username Token Profile 1.0	-		-	-
W3C XML Schema Part 1	-	Structures Second Edition	-	-
W3C XML Schema Part 2	-	Datatypes Second Edition	-	-
W3C XML-binary Optimized Packaging	-		-	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
W3C XML Path Language (XPath) Version 1.0	-		-	-
IEEE 802.11	2007	IEEE Standard for Information Technology - Telecommunications and Information Exchange Between Systems - Local and Metropolitan Area Networks - Specific Requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications	-	-
IEEE 802.1X	-	Port Based Network Access Control	-	-
UDDI Version 2.04	-	API Specification UDDI Committee Specification, 19 July 2002	-	-
UDDI Version 2.03	-	Data Structure Reference UDDI Committee Specification, 19 July 2002	-	-
Web Services Security X.509	-	Certificate Token Profile 1.1	-	-

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## INTRODUCTION

The IEC Technical Committee 79 in charge of alarm and electronic security systems together with many governmental organisations, test houses and equipment manufacturers have defined a common framework for video surveillance transmission in order to achieve interoperability between products.

The IEC 62676 series of standards on video surveillance system is divided into 4 independent parts:

- Part 1      System requirements
- Part 2:     Video transmission protocols
- Part 3:     Analog and digital video interfaces
- Part 4 :    Application guidelines (to be published)

Each part has its own clauses on scope, references, definitions and requirements.

This IEC 62676-2 series consists of 3 subparts, numbered parts 2-1, 2-2 and 2-3 respectively:

IEC 62676-2-1, *Video transmission protocols – General requirements*

IEC 62676-2-2, *Video transmission protocols – IP interoperability implementation based on HTTP and REST services*

IEC 62676-2-3, *Video transmission protocols – IP interoperability implementation based on Web services*

This third subpart of IEC 62676-2 covers IP Interoperability Implementation Based Web Services. It is based on the requirements for IP video transmission protocols covered in IEC 62676-2-1, which defines protocol requirements to be fulfilled by any high-level IP video device interface.

## **VIDEO SURVEILLANCE SYSTEMS FOR USE IN SECURITY APPLICATIONS –**

### **Part 2-3: Video transmission protocols – IP interoperability implementation based on Web services**

#### **1 Scope**

This part 2-3 of IEC 62676 defines procedures for communication between network video clients and video transmitter devices based on Web Services. This new set of specifications makes it possible to build network video systems with devices and receivers from different manufacturers using common and well defined interfaces. These interfaces cover functions such as device management, real-time streaming of audio and video, event handling, Pan, Tilt and Zoom (PTZ) control, video analytics as well as control, search and replay of recordings.

The management and control interfaces defined in this standard are described as Web services. This international standard also contains full XML schema and Web Service Description Language (WSDL) definitions for the introduced network video services.

In order to offer full plug-and-play interoperability, the standard defines procedures for device discovery. The device discovery mechanisms in the standard are based on the WS-Discovery specification with extensions. These extensions have been introduced in order to cover the specific network video discovery needs.

This standard is not limited to discovery, configuration and control functions, but defines precise formats for media and metadata streaming in IP networks using suitable profiling of IETF standards. Furthermore, appropriate protocol extensions have been introduced in order to make it possible for network video manufacturers to offer a fully standardized network video transfer solution to its customers and integrators.

A video transmission device supporting compliance to the requirements of this standard with the help of Web services according to the specification of this part is declared as compatible to IEC 62676-2 Web service Interoperability.

The goal of this standard is to realize a fully interoperable network video implementation comprised of products from different network video vendors. This standard describes the network video model, interfaces, data types and data exchange patterns. The standard reuses existing relevant standards where available, and introduces new specifications only where necessary to support the specific requirements for network video surveillance. This is the Open Network Video Interface Forum (ONVIF) core specification. In addition, ONVIF has released the following related specifications:

- ONVIF Schema [see C.15]
- ONVIF Analytics Service WSDL [see C.1]
- ONVIF Analytics Device Service [see C.2]
- ONVIF Device Service WSDL [see C.4]
- ONVIF DeviceIO Service WSDL [see C.3]
- ONVIF Display Service WSDL [see C.5]
- ONVIF Event Service WSDL [see C.6]
- ONVIF Imaging Service WSDL [see C.7]
- ONVIF Media Service WSDL [see C.8]

- ONVIF PTZ Service WSDL [see C.9]
- ONVIF Receiver Service WSDL [see C.10]
- ONVIF Recording Service WSDL [see C.11]
- ONVIF Remote Discovery WSDL [see C.12]
- ONVIF Replay Service WSDL [see C.13]
- ONVIF Search Service WSDL [see C.14]
- ONVIF Topic Namespace XML [see C.16]

The purpose of this standard is to define the ONVIF specification framework, and is divided into the following sections:

Specification overview: Gives an overview of the different specification parts and how they are related to each other.

Web Services Framework: Offers a brief introduction to Web Services and the Web Services basis for the ONVIF specifications.

IP configuration: Defines the ONVIF network video IP configuration requirements.

Device discovery: Describes how devices are discovered in local and remote networks.

Device management: Defines the network video transmitter management commands.

DeviceIO: Defines commands to handle physical inputs and outputs.

Display: Defines commands to deal with display devices.

Imaging and media: Defines the configuration commands related to imaging and media settings.

Real time streaming: Provides requirements for interoperable video, audio and metadata streaming.

Event handling: Defines how to subscribe to and receive data from network video events (notifications).

PTZ control: Provides commands for pan, tilt and zoom control.

Video analytics: Defines the ONVIF analytics model, analytics object description and analytics rules configurations.

Video analytics device: Defines commands to deal with a video analytics device.

Recording control: Defines mechanism for the configuring of recordings.

Recording search and replay control: Provides commands for retrieval of recorded media including metadata.

Security section: Defines the transport and message level security requirements on ONVIF compliant implementations.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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### 3 Terms, definitions and abbreviations

#### 3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

##### 3.1.1

##### **ad-hoc network**

an independent basic service set

[SOURCE: IEEE 802.11:2007]

##### 3.1.2

##### **basic service set**

a set of IEEE 802.11 stations that have successfully joined in a common network

[SOURCE: IEEE 802.11:2007]

##### 3.1.3

##### **capability**

ability of a device that allows a client to ask for its services

##### 3.1.4

##### **configuration entity**

a network video device media abstract component that is used to produce a media stream on the network

Note 1 to entry: The media stream is a video and/or an audio stream.

##### 3.1.5

##### **control plane**

plane consisting of media control functions

Note 1 to entry: Media control functions are device control, media configuration and PTZ commands.

##### 3.1.6

##### **digital PTZ**

function that diminishes or crops an image to adjust the image position and ratio