

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Video surveillance systems for use in security applications –
Part 1-2: System requirements – Performance requirements for video
transmission**

**Systèmes de vidéosurveillance destinés à être utilisés dans les applications de
sécurité –
Partie 1-2: Exigences systèmes – Exigences de performances pour la
transmission vidéo**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2013 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.

If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de la CEI ou du Comité national de la CEI du pays du demandeur.

Si vous avez des questions sur le copyright de la CEI ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de la CEI de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

Useful links:

IEC publications search - www.iec.ch/searchpub

The advanced search enables you to find IEC publications by a variety of criteria (reference number, text, technical committee,...).

It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available on-line and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary (IEV) on-line.

Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de la CEI

La Commission Electrotechnique Internationale (CEI) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications CEI

Le contenu technique des publications de la CEI est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Liens utiles:

Recherche de publications CEI - www.iec.ch/searchpub

La recherche avancée vous permet de trouver des publications CEI en utilisant différents critères (numéro de référence, texte, comité d'études,...).

Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

Just Published CEI - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications de la CEI. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne au monde de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans les langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (VEI) en ligne.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Video surveillance systems for use in security applications –
Part 1-2: System requirements – Performance requirements for video
transmission**

**Systèmes de vidéosurveillance destinés à être utilisés dans les applications de
sécurité –
Partie 1-2: Exigences systèmes – Exigences de performances pour la
transmission vidéo**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

XA

ICS 13.320

ISBN 978-2-8322-1158-8

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms, definitions and abbreviations	10
3.1 Terms and definitions	10
3.2 Abbreviations	24
4 Performance requirements	26
4.1 General.....	26
4.2 Network time services	27
4.2.1 General	27
4.2.2 Real-time clock.....	27
4.2.3 Accurate time services for the transport stream	27
4.3 Video transmission timing requirements	27
4.3.1 General	27
4.3.2 Connection time	27
4.3.3 Connection capabilities.....	28
4.4 Performance requirements on streaming video	28
4.4.1 Introduction latency, jitter, throughput.....	28
4.4.2 Requirements on network jitter.....	29
4.4.3 Packet loss.....	29
4.4.4 Level of performance IEC 62676-1-2:2013.....	30
4.4.5 Packet jitter.....	30
4.4.6 Monitoring of interconnections.....	31
5 IP video transmission network design requirements.....	31
5.1 General.....	31
5.2 Overview	31
5.3 Digital network planning	32
5.3.1 General	32
5.3.2 Critical requirements for IP video streaming performance	32
5.3.3 Availability	33
5.4 Additional architecture principles	34
5.5 Network design	34
5.5.1 Small unicast network.....	34
5.5.2 Small multicast video network.....	35
5.5.3 Hierarchical VSS network	35
5.5.4 Effective video IP network capacity planning	36
5.5.5 Wireless interconnections.....	37
5.6 Replacement and redundancy	37
5.6.1 Redundant network design	37
5.6.2 Availability	38
5.7 Centralized and decentralized network recording and video content analytics	38
6 General IP requirements.....	39
6.1 General.....	39
6.2 IP – ISO Layer 3.....	39
6.3 Addressing	39

6.4	Internet control message protocol (ICMP).....	40
6.4.1	General	40
6.4.2	Diagnostic requirements	40
6.5	Diagnostics	41
6.6	IP multicast	41
6.6.1	General	41
6.6.2	Internet group multicast protocol (IGMP) requirements	41
7	Video streaming requirements	41
7.1	General	41
7.2	Transport protocol	42
7.2.1	General	42
7.2.2	JPEG over RTP	42
7.2.3	JPEG over HTTP	42
7.3	Documentation and specification	43
7.3.1	General	43
7.3.2	Non-compliant, proprietary and vendor specific payload formats.....	43
7.3.3	Receiving unsupported RTP payload formats.....	44
7.4	Streaming of metadata	44
7.4.1	General	44
7.4.2	XML documents as payload.....	44
7.4.3	General	44
8	Video stream control requirements	45
8.1	General	45
8.2	Usage of RTSP in video transmission devices	45
8.2.1	General	45
8.2.2	The use of RTSP with multicast	45
8.3	RTSP standards track requirements	46
8.3.1	General	46
8.3.2	High level IP video streaming and control interfaces	46
8.3.3	Minimal RTSP method and header implementation	46
8.3.4	RTSP authentication.....	46
9	Device discovery and description requirements	46
10	Eventing requirements.....	47
11	Network device management requirements.....	47
11.1	General	47
11.2	IP video MIB example.....	48
11.3	The SNMP agent and manager for video transmission devices	48
11.4	Performance requirements on the SNMP agent	49
11.5	VSS SNMP trap requirements for event management	50
12	Network security requirements	50
12.1	General	50
12.2	Transport level security requirements for SG4 transmission	51
	Bibliography.....	52
	Figure 1 – Network buffer	29
	Figure 2 – Network latency, jitter, loss	33
	Figure 3 – System design	34

Figure 4 – Small network	35
Figure 5 – Multicast network	35
Figure 6 – Hierarchical network.....	36
Figure 7 – Redundant network	38
Figure 8 – MIB structure	48
Table 1 – Time service accuracy for video transport stream	27
Table 2 – Interconnections – Timing requirements	28
Table 3 – Video transmission network requirements	28
Table 4 – Video transmission network requirements	28
Table 5 – Performance requirements video streaming and stream display	30
Table 6 – Video stream network packet jitter.....	31
Table 7 – Monitoring of interconnections.....	31

iTeh STANDARD PREVIEW (standards.iteh.ai)

[IEC 62676-1-2:2013](https://standards.iteh.ai/catalog/standards/sist/6895ef9d-6944-4702-93d6-4f84f70a2179/iec-62676-1-2-2013)

<https://standards.iteh.ai/catalog/standards/sist/6895ef9d-6944-4702-93d6-4f84f70a2179/iec-62676-1-2-2013>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

VIDEO SURVEILLANCE SYSTEMS FOR USE IN SECURITY APPLICATIONS –

Part 1-2: System requirements – Performance requirements for video transmission

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62676-1-2 has been prepared by IEC technical committee 79: Alarm and electronic security systems.

The text of this standard is based on the following documents:

FDIS	Report on voting
79/433/FDIS	79/446/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62676, published under the general title *Video surveillance systems for use in security applications*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[IEC 62676-1-2:2013](https://standards.iteh.ai/catalog/standards/sist/6895ef9d-6944-4702-93d6-4f84f70a2179/iec-62676-1-2-2013)

<https://standards.iteh.ai/catalog/standards/sist/6895ef9d-6944-4702-93d6-4f84f70a2179/iec-62676-1-2-2013>

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

IEC 62676-1-1, *System requirements – General*

IEC 62676-1-2, *System requirements – Performance requirements for video transmission*

The second subpart of this IEC 62676-1 series applies to video transmission. The purpose of the transmission system in a Video Surveillance System (VSS) installation is to provide reliable transmission of video signals between the different types of VSS equipment in security, safety and monitoring applications.

Today VSS reside in security networks using IT infrastructure, equipment and connections within the protected site itself.

VIDEO SURVEILLANCE SYSTEMS FOR USE IN SECURITY APPLICATIONS –

Part 1-2: System requirements – Performance requirements for video transmission

1 Scope

This part of IEC 62676 introduces general requirements on video transmission. This standard covers the general requirements for video transmissions on performance, security and conformance to basic IP connectivity, based on available, well-known, international standards.

Clauses 4 and 5 of this standard define the minimum performance requirements on video transmission for security applications in IP networks. In surveillance applications the requirements on timing, quality and availability are strict and defined in the last section of this standard. Guidelines for network architecture are given, how these requirements can be fulfilled.

Clause 6 and the next clauses of this standard define requirements on basic IP connectivity of video transmission devices to be used in security applications. If a video transmission device is used in security, certain basic requirements apply. First of all a basic understanding of IP connectivity needs to be introduced which requests the device to be compliant to fundamental network protocols. These could be requirements which may be applied to all IP security devices even beyond IP video. For this reason requirements are introduced in a second step for compliance to basic streaming protocols, used in this standard for video streaming and stream control. Since security applications need high availability and reliability, general means for the transmission of the video status and health check events have to be covered. These are defined in general requirements on eventing and network device management. In security proper maintenance and setup is essential for the functioning of the video transmission device. Locating streaming devices and their capabilities is a basic requirement and covered in 'device discovery and description'.

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.

IEC 61709, *Electric components – Reliability – Reference conditions for failure rates and stress models for conversion*

IEC/TR 62380, *Reliability data handbook – Universal model for reliability prediction of electronics components, PCBs and equipment*

IEC 62676-1-1, *Video surveillance systems for use in security applications – Part 1-1: System requirements – General*

IEC 62676-2-1, *Video surveillance systems for use in security applications – Part 2-1: Video transmission protocols – General requirements*

ISO/IEC 10646, *Information technology – Universal multiple-octet coded character set (UCS)*

ISO/IEC 13818-9, *Information technology – Generic coding of moving pictures and associated audio information – Part 9: Extension for real time interface for systems decoders*

ISO/IEC 14496-2, *Information technology – Coding of audio-visual objects – Part 2: Visual*

ISO/IEC 14496-3, *Information technology – Coding of audio-visual objects – Part 3: Audio*

ISO/IEC 14496-10, *Information technology – Coding of audio-visual objects – Part 10: Advanced Video Coding*

ITU-T Rec. G.711, *Pulse code modulation (PCM) of voice frequencies*

ITU-T Rec. G.726, 40, 32, 24, 16 kbit/s adaptive differential pulse code modulation (ADPCM)

IEEE Std 1413.1, *IEEE Guide for selecting and using reliability predictions based on IEEE 1413*

IETF RFC 1122, *Requirements for Internet Hosts – communication Layers*

IETF RFC 1157, *Simple Network Management Protocol*

IETF RFC 1441, *Introduction to version 2 of the Internet-standard Network Management Framework*

IETF RFC 2030, *Simple Network Time Protocol (SNTP) Version 4 for IPv4, IPv6 and OSI*

RFC 2069, *Digest Access Authentication*

IETF RFC 2131, *Dynamic Host Configuration Protocol*

IETF RFC 2246, *The TLS Protocol Version 1.0*

IETF RFC 2326:1998, *Real Time Streaming Protocol (RTSP)*

IETF RFC 2435, *RTP Payload Format for JPEG-compressed Video*

IETF RFC 2453, *RIP - Routing Information Protocol*

IETF RFC 2617, *HTTP Authentication Basic and Digest Access Authentication, June 1999.*

IETF RFC 3016, *RTP Payload Format for MPEG-4 Audio/Visual Streams.*

IETF RFC 3268, *Advanced Encryption Standard (AES) Cipher suites for Transport Layer Security (TLS)*

IETF RFC 3315, *Dynamic Host Configuration Protocol for IPv6 (DHCPv6)*

IETF RFC 3410, *Introduction and Applicability Statements for Internet Standard Management Framework*

IETF RFC 3550, *RTP A Transport Protocol for Real-Time Applications*

IETF RFC 3551, *RTP Profile for Audio and Video Conferences with Minimal Control*

IETF RFC 3984, *RTP Payload Format for H.264 Video*.

IETF RFC 4346, *The Transport Layer Security (TLS) Protocol Version 1.1*

IETF RFC 4541, *IGMP and MLD Snooping Switches*

IETF RFC 4566, *SDP Session Description Protocol*

IETF RFC 4607, *Source Specific Multicast for IP*

IETF RFC 4862, *IPv6 Stateless Address Auto configuration*

3 Terms, definitions and abbreviations

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

3.1 Terms and definitions

3.1.1

adaptive jitter buffering

queuing of packets in switched networks exposed to unwanted variations in the communications signal to ensure the continuous video transmission over a network supported by the 'Adaptive' ability to adjust the size of the jitter buffer based on the measured jitter in the network

EXAMPLE: If the jitter increases, the buffer becomes larger and can store more packets; if the jitter decreases, the buffer becomes smaller and stores fewer packets.

[IEC 62676-1-2:2013](https://standards.iteh.ai/catalog/standards/sist/6895ef9d-6944-4702-93d6-4f84f70a2179/iec-62676-1-2-2013)

3.1.2

advanced encryption standard

NIST encryption standard, also known as Rijndael, specified as unclassified, publicly-disclosed, symmetric encryption algorithm with a fixed block size of 128 bits and a key size of 128, 192 or 256 bits according to the Federal Information Processing Standards Publication 197

3.1.3

American Standard Code for Information Interchange

de-facto world-wide standard for the code numbers used by computers to represent all the upper and lower-case characters

3.1.4

asymmetric algorithm

algorithm used in the asymmetric cryptography, in which a pair of keys (a private key and a public key) is used to encrypt and decrypt a message to ensure the privacy of communications

3.1.5

authentication

process where an operators or systems identity is checked within a network

EXAMPLE: In networks, authentication is commonly done through the use of logon passwords.

3.1.6

authentication server

device used in network access control

Note 1 to entry: It stores the usernames and passwords that identify the clients logging on or it may hold the algorithms for access. For access to specific network resources, the server may itself store user permissions and

company policies or provide access to directories that contain the information. Protocols such as RADIUS, Kerberos and TACACS+, and 802.1x are implemented in an authentication server to perform user authentications.

3.1.7

authenticity

integrity and trustworthiness of data or an entity; validity and conformance of the information, or identity of a user

Note 1 to entry: The authenticity can be secured and verified using cryptographic methods.

3.1.8

authorization

approval, permission, or empowerment for a user or a component to do something

3.1.9

backbone

high-speed line or series of connections that forms a major pathway within a network

3.1.10

backbone layer

larger transmission line that carries data gathered from smaller communication lines that interconnect with it, e.g. a line or set of lines that local area networks connect to, in order to span distances efficiently e.g. between buildings

3.1.11

Bit/s

bit per second

unit of measurement of how fast data is transferred from one node to another

3.1.12

bridge

device that is used to connect two networks including passing data packets between them using the same protocols

3.1.13

client

component that contacts and obtains data from a server

3.1.14

client/server

communication system providing services e.g. video streams, storage, logon access, data communication management and clients (workstations) subscribing these services

3.1.15

codec

compression-decompression or enCOder/DECoder process

3.1.16

common gateway interface

CGI

standardized method of communication between a client, e.g. web browser, and a server, e.g. web server

Note 1 to entry: This note applies to the French language only.

3.1.17

compression delay

delay caused by the compression of data

iTeh STANDARD PREVIEW
(standards.iteh.ai)

IEC 62676-1-2:2013

<https://standards.iteh.ai/catalog/standards/sist/6895ef9d-6944-4702-93d6-4b41f06c0000/iec-62676-1-2-2013>

3.1.18

congestion

situation in which the traffic presents on the network exceeds available network throughput/capacity

3.1.19

core layer

part of the network providing optimal transport between sites or system functionality e.g. recording

3.1.20

data encryption standard

DES

cryptographic algorithm method developed by the US National Bureau Standards

Note 1 to entry: This note applies to the French language only.

3.1.21

dynamic host configuration protocol

DHCP

protocol by which a network component obtains an IP address (and other network configuration information) from a server on the local network

Note 1 to entry: This note applies to the French language only.

3.1.22

distribution layer

part of the network providing policy-based connectivity

3.1.23

domain name system

DNS

system that translates Internet domain names into IP addresses

Note 1 to entry: This note applies to the French language only.

3.1.24

dual homing

single device offering two or more network interfaces

3.1.25

dynamic jitter buffer

collecting and storing video data packets for processing them in evenly spaced intervals to reduce distortions in the display

3.1.26

encryption

type of network security used to encode data so that only the intended destination can access or decode the information

3.1.27

fail-over

the capability of an application to recover from a failure on an entity by automatically switching over to a surviving instance, providing no loss of data or continuity, also known as 'run-time failover' and often used in connection with

3.1.28

forensics

field of science of applying digital technologies to legal questions arising from criminal investigations

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC 62676-1-2:2013](https://standards.iteh.ai/catalog/standards/sist/6895ef9d-6944-4702-93d6-4f84f70a2179/iec-62676-1-2-2013)

<https://standards.iteh.ai/catalog/standards/sist/6895ef9d-6944-4702-93d6-4f84f70a2179/iec-62676-1-2-2013>

3.1.29**frame**

data structure that collectively represents a transmission stream including headers, data, and the payload and provides information necessary for the correct delivery of the data

3.1.30**gateway**

hardware or software set-up that translates between two dissimilar protocols

3.1.31**H.261**

ITU video coding standard originally designed for ISDN lines and data rate with multiples of 64 Kbit/s using real time protocol (RTP)

3.1.32**H.263**

ITU standard supporting video compression (coding) for streaming video via RTP based on and replacing the H.261 codec

3.1.33**H.264**

ISO ITU-T MPEG-4 Part 10 standard, also named Advanced Video Coding (AVC) supporting video compression (coding) from low bit-rate network streaming applications to HD video applications with near-lossless coding for network-friendly video representation

iteh STANDARD PREVIEW
(standards.iteh.ai)

3.1.34**host**

computer on a network that is a repository for services available to other components on the network

[IEC 62676-1-2:2013](https://standards.iteh.ai/catalog/standards/sist/6895ef9d-6944-4702-93d6-4f84f70a2179/iec-62676-1-2-2013)

<https://standards.iteh.ai/catalog/standards/sist/6895ef9d-6944-4702-93d6-4f84f70a2179/iec-62676-1-2-2013>

3.1.35**hot-swap**

property of controller which allows circuit boards or other devices to be removed and replaced while the system remains powered up and in operation

3.1.36**Hyper Text Mark-up Language****HTML**

coding language used to create Hypertext documents for use on the World Wide Web

Note 1 to entry: This note applies to the French language only.

3.1.37**Hypertext Transfer Protocol****HTTP**

connection oriented protocol for transmitting data over a network or protocol for moving hyper text files across the Internet

Note 1 to entry: This note applies to the French language only.

3.1.38**Hypertext Transfer Protocol Secure****HTTPS**

encrypts and authenticates communication between server and clients

Note 1 to entry: This note applies to the French language only.