

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.241

Corrigendum 1
(05/2011)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS
Infrastructure of audiovisual services – Communication
procedures

Extended video procedures and control signals for
H.300-series terminals

**Corrigendum 1: Corrections to the
CustomMaxDPB capability parameter**

Recommendation ITU-T H.241 (2006) – Corrigendum 1

ITU-T H-SERIES RECOMMENDATIONS
AUDIOVISUAL AND MULTIMEDIA SYSTEMS

CHARACTERISTICS OF VISUAL TELEPHONE SYSTEMS	H.100–H.199
INFRASTRUCTURE OF AUDIOVISUAL SERVICES	
General	H.200–H.219
Transmission multiplexing and synchronization	H.220–H.229
Systems aspects	H.230–H.239
Communication procedures	H.240–H.259
Coding of moving video	H.260–H.279
Related systems aspects	H.280–H.299
Systems and terminal equipment for audiovisual services	H.300–H.349
Directory services architecture for audiovisual and multimedia services	H.350–H.359
Quality of service architecture for audiovisual and multimedia services	H.360–H.369
Supplementary services for multimedia	H.450–H.499
MOBILITY AND COLLABORATION PROCEDURES	
Overview of Mobility and Collaboration, definitions, protocols and procedures	H.500–H.509
Mobility for H-Series multimedia systems and services	H.510–H.519
Mobile multimedia collaboration applications and services	H.520–H.529
Security for mobile multimedia systems and services	H.530–H.539
Security for mobile multimedia collaboration applications and services	H.540–H.549
Mobility interworking procedures	H.550–H.559
Mobile multimedia collaboration inter-working procedures	H.560–H.569
BROADBAND, TRIPLE-PLAY AND ADVANCED MULTIMEDIA SERVICES	
Broadband multimedia services over VDSL	H.610–H.619
Advanced multimedia services and applications	H.620–H.629
IPTV MULTIMEDIA SERVICES AND APPLICATIONS FOR IPTV	
General aspects	H.700–H.719
IPTV terminal devices	H.720–H.729
IPTV middleware	H.730–H.739
IPTV application event handling	H.740–H.749
IPTV metadata	H.750–H.759
IPTV multimedia application frameworks	H.760–H.769
IPTV service discovery up to consumption	H.770–H.779

For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T H.241

Extended video procedures and control signals for H.300-series terminals

Corrigendum 1

Corrections to the CustomMaxDPB capability parameter

Summary

This Recommendation defines the use of advanced video codecs, including ITU-T Rec. H.264, in ITU-T Recs H.310, H.320, H.321, H.322, H.323 and H.324 terminals. It also defines generic extended signalling for use with all video codecs in the H.300-series terminals.

This revised version adds clarifications regarding H.264 VCL HRD (Type I HRD) versus NAL HRD (Type II HRD) bit rate usage, sample aspect ratio capabilities for H.264, signalling for Reduced Complexity Decoding Operation (RCDO) for H.264 bitstreams, and a new Annex B, "RCDO for H.264 Baseline Profile bitstreams". Annex A has been replaced with an inclusion by reference of the recently approved RFC 3984 (without actual change in content). New Annex B specifies a reduced-complexity decoding process to be applied to H.264 Baseline profile bitstreams when such use has been negotiated using ITU-T Rec. H.241.

Amendment 1 to this Recommendation provides a new clause 6.2.5 allowing for the negotiation of particular video submodes of H.264 encoding along with associated additions to Appendix I. It also includes a new Appendix II which contains non-normative examples describing the use of this new clause.

Amendment 2 to this Recommendation provides a new clause 8.3.2.14 defining a new optional H.264 capability parameter (MaxFPS). It also includes revised text for Appendix II.

Corrigendum 1 to this Recommendation revises the units used for the CustomMaxDPB parameter value to 256/3 macroblocks, which makes this parameter consistent with Table A.1/H.264 (2010). The scaling of this revised parameter is carefully chosen to maintain interoperability with existing systems. The equation for the number of decoded frames in clause 8.3.2.6 is removed, as it produces incorrect results when applied to some ITU-T H.264 picture formats. It is replaced with new text that applies to all picture formats and profiles. Corrigendum 1 also includes a Note added to Table 8-8/H.241, clarifying that cpbBrVclFactor and cpbBrNALFactor units are not used for the value of the CustomMaxBRandCPB parameter.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T H.241	2003-07-14	16
1.1	ITU-T H.241 (2003) Cor. 1	2004-03-15	16
1.2	ITU-T H.241 (2003) Amd. 1	2005-01-08	16
2.0	ITU-T H.241	2005-09-13	16
3.0	ITU-T H.241	2006-05-29	16
3.1	ITU-T H.241 (2006) Amd. 1	2008-06-13	16
3.2	ITU-T H.241 (2006) Amd. 2	2009-12-14	16
3.3	ITU-T H.241 (2006) Cor. 1	2011-05-14	16

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2012

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Recommendation ITU-T H.241

Extended video procedures and control signals for H.300-series terminals

Corrigendum 1

Corrections to the CustomMaxDPB capability parameter

Modifications introduced by this corrigendum are shown in revision marks. Unchanged text is replaced by ellipsis (...). Some parts of unchanged texts (clause numbers, etc.) may be kept to indicate the correct insertion points.

...

2 References

...

- ITU-T Recommendation H.264 (201005), *Advanced video coding for generic audiovisual services*.

...

8.3.2.6 H.264 CustomMaxDPB memory parameter

The optional CustomMaxDPB parameter permits a decoder to signal that it has more than the minimum amount of decoded picture buffer memory required by the signalled Level. Encoders may use this knowledge to construct coded video streams with improved compression.

A system which signals CustomMaxDPB shall be capable of storing the value of (CustomMaxDPB × 256/3) macroblocks~~following number of decoded frames~~ in its decoded picture buffer.:

$$\text{Min} (32768 \times \text{CustomMaxDPB} \div (\text{PicWidthInMbs} \times \text{FrameHeightInMbs} \times 256 \times \text{ChromaFormatFactor}), 16)$$

~~PicWidthInMbs, FrameHeightInMbs, and ChromaFormatFactor are defined in ITU-T Rec. H.264.~~

Table 8-7 – H.264 Capability Parameter – CustomMaxDPB

Parameter name	CustomMaxDPB
Parameter description	CustomMaxDPB is the maximum decoded picture buffer size, in units of <u>256/3 macroblocks</u> 32 768 bytes . This optional parameter, when present, shall be considered to replace the MaxDpbMbs <u>CustomMaxDPB</u> value in Table A-1/H.264 for the signalled Level. The value of (CustomMaxDPB × 256/3) 32 768 shall not be less than the value (MaxDpbMbs <u>CustomMaxDPB</u> × 1024) for the Level given in Table A-1/H.264.
Parameter identifier value	5
Parameter status	Optional. This parameter shall appear at most once in each Generic Capability.
Parameter type	unsignedMin
Supersedes	This field shall not be included.

8.3.2.7 H.264 CustomMaxBRandCPB bitrate and coded picture buffer size parameter

The optional CustomMaxBRandCPB parameter permits a decoder to signal that it is capable of decoding video streams of higher bitrate, and that it has a correspondingly larger coded picture buffer, than required by the signalled Level. Encoders may use this knowledge to, for example, send higher bitrate video to achieve improved video quality.

Table 8-8 – H.264 Capability Parameter – CustomMaxBRandCPB

Parameter name	CustomMaxBRandCPB
Parameter description	<p>CustomMaxBRandCPB is the maximum video bitrate. The maximum coded picture buffer (CPB) size is derived from the maximum video bitrate.</p> <p>The units for maximum video bitrate are 25 000 bit/s for the VCL HRD parameters (see A.3.1 item i/H.264) and 30 000 bit/s for the NAL HRD parameters (see A.3.1 item j/H.264).</p> <p>NOTE – For transport of H.264 bitstreams in H.310, H.320, H.323, and H.324 the appropriate video bitrate unit is 30 000 bit/s, because these systems transport Type II H.264 bitstreams as defined in Annex C/H.264. <u>This parameter does not use units of cpbBrVclFactor and cpbBrNALFactor, (see Table A-1/H.264 and Table A-2/H.264).</u></p> <p>The CPB size shall be derived as equal to the MaxCPB for the signalled Level (see Table A-1/H.264), multiplied by the ratio of the signalled maximum bitrate to the MaxBR for the signalled level.</p> <p>For example, if a terminal signals Level 1.2 with CustomMaxBRandCPB equal to 62, this indicates a maximum video bitrate of 1.550 Mbit/s for VCL HRD parameters, a maximum video bitrate of 1.860 Mbit/s for NAL HRD parameters, and a CPB size of 4 036 458 bits $((62 \times 25\,000)/384\,000) \times 1000 \times 1000$.</p> <p>This optional parameter, when present, shall be considered to replace the MaxBR and MaxCPB values in Table A-1/H.264 for the signalled Level. The bit rate signalled by the CustomMaxBRandCPB parameter shall not be less than the maximum bit rate given in the MaxBR column of Table A-1/H.264, for the Level signalled.</p>
Parameter identifier value	6
Parameter status	Optional. This parameter shall appear at most once in each Generic Capability.
Parameter type	unsignedMin
Supersedes	This field shall not be included.

...

SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Cable networks and transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	Telecommunication management, including TMN and network maintenance
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Terminals and subjective and objective assessment methods
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks, open system communications and security
Series Y	Global information infrastructure, Internet protocol aspects and next-generation networks
Series Z	Languages and general software aspects for telecommunication systems