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ITU-T

TELECOMMUNICATION
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OF ITU

H.222.0

Corrigendum 3
(01/2005)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Transmission
multiplexing and synchronization

Information technology – Generic coding of moving
pictures and associated audio information: Systems
Technical Corrigendum 3

ITU-T Recommendation H.222.0 (2000) – Technical
Corrigendum 3

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**Information technology – Generic coding of moving pictures and
associated audio information: Systems**

Technical Corrigendum 3

Summary

This corrigendum corrects two technical errors in 13818-1. The first item corrects the time stamp constraint for MPEG-2 field pictures by replacing the term 'coded picture' (which is a single frame picture or a single field picture) by the term 'coded frame' (which is a single frame picture or a pair of field pictures). The second item removes the constraint for use of end_of_sequence before AVC still pictures when the still picture is the very first picture in the video stream.

Source

Corrigendum 3 to ITU-T Recommendation H.222.0 (2000) was approved on 8 January 2005 by ITU-T Study Group 16 (2005-2008) under the ITU-T Recommendation A.8 procedure. An identical text is also published as Technical Corrigendum 3 to ISO/IEC 13818-1.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. 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

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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.

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INTERNATIONAL STANDARD
ITU-T RECOMMENDATION

Information technology – Generic coding of moving pictures and
associated audio information: Systems

Technical Corrigendum 3

1) Subclause 2.1.4

Add the following definition for Coded B-frame, Coded frame, Coded I-frame and Coded P-frame after subclause 2.1.4:

Coded B-frame: A B-frame picture or a pair of B-field pictures.

Coded frame: A coded frame is a coded I-frame, coded B-frame or a coded P-frame.

Coded I-frame: An I-frame picture or a pair of field pictures where the first field picture is an I-picture and the second field picture is either an I-picture or a P-picture.

Coded P-frame: A P-frame picture or a pair of P-field pictures.

2) Subclause 2.1.5

Replace the definition of AVC still picture (system) from:

AVC still picture (system): An AVC still picture consists of an AVC access unit containing an IDR picture, preceded by SPS and PPS NAL units that carry sufficient information to correctly decode the IDR picture. Preceding an AVC still picture, there shall be another AVC still picture or an End of Sequence NAL unit terminating a preceding coded video sequence.

to:

AVC still picture (system): An AVC still picture consists of an AVC access unit containing an IDR picture, preceded by SPS and PPS NAL units that carry sufficient information to correctly decode the IDR picture. Preceding an AVC still picture, there shall be another AVC still picture or an End of Sequence NAL unit terminating a preceding coded video sequence unless the AVC still picture is the very first access unit in the video stream.

3) Subclause 2.4.3.7

Replace the semantics of PTS in subclause 2.4.3.7 from:

In the case of ISO/IEC 11172-2 video, ITU-T Rec. H.262 | ISO/IEC 13818-2 video, or ISO/IEC 14496-2 video, if a PTS is present in a PES packet header, it shall refer to the access unit containing the first picture start code that commences in this PES packet. A picture start code commences in a PES packet if the first byte of the picture start code is present in the PES packet. For I- and P-pictures in non-low_delay sequences and in the case when there is no decoding discontinuity between access units (AUs) k and k' , the presentation time $t_{pn}(k)$ shall be equal to the decoding time $t_{dn}(k')$ of the next transmitted I- or P-picture (refer to 2.7.5). If there is a decoding discontinuity, or the stream ends, the difference between $t_{pn}(k)$ and $t_{dn}(k)$ shall be the same as if the original stream had continued without a discontinuity and without ending.

NOTE 1 – A low_delay sequence is an ITU-T Rec. H.262 | ISO/IEC 13818-2 or ISO/IEC 14496-2 video sequence in which the low_delay flag is set to '1' (refer to 6.2.2.3 of ITU-T Rec. H.262 | ISO/IEC 13818-2 and to 6.2.3 of ISO/IEC 14496-2).

For ITU-T Recommendation H.264 | ISO/IEC 14496-10 video, if a PTS is present in the PES packet header, it shall refer to the first AVC access unit that commences in this PES packet. An AVC access unit commences in a PES packet if the first byte of the AVC access unit is present in the PES packet. To achieve consistency between the STD model and the HRD model defined in Annex C of ITU-T Rec. H.264 | ISO/IEC 14496-10, for each decoded AVC access unit, the PTS value in the STD shall, within the accuracy of their respective clocks, indicate the same instant in time as the

nominal DPB output time in the HRD, defined herein as $t_{o,n,dpb}(n) = t_{r,n}(n) + t_c * dpb_output_delay(n)$, where $t_{r,n}(n)$, t_c , and $dpb_output_delay(n)$ are defined as in Annex C of ITU-T Rec. H.264 | ISO/IEC 14496-10.

NOTE 2 – Different clocks may be used for derivation of PTS and $t_{o,n,dpb}(n)$.

The presentation time $t_{pn}(k)$ shall be equal to the decoding time $t_{dn}(k)$ for:

- audio access units;
- access units in ITU-T Rec. H.262 | ISO/IEC 13818-2 or ISO/IEC 14496-2 low delay video sequences;
- B-pictures in ISO/IEC 11172-2, ITU-T Rec. H.262 | ISO/IEC 13818-2 or ISO/IEC 14496-2 video streams.

to:

In the case of ISO/IEC 11172-2 video or ISO/IEC 14496-2 video, if a PTS is present in a PES packet header, it shall refer to the access unit containing the first picture start code that commences in this PES packet. A picture start code commences in a PES packet if the first byte of the picture start code is present in the PES packet. For I- and P-pictures in non-low_delay sequences and in the case when there is no decoding discontinuity between access units (AUs) k and k' , the presentation time $t_{pn}(k)$ shall be equal to the decoding time $t_{dn}(k')$ of the next transmitted I- or P-picture (refer to 2.7.5). If there is a decoding discontinuity, or the stream ends, the difference between $t_{pn}(k)$ and $t_{dn}(k)$ shall be the same as if the original stream had continued without a discontinuity and without ending.

NOTE 1 – A low_delay sequence is an ISO/IEC 14496-2 video sequence in which the low_delay flag is set to '1' (refer to 6.2.3 of ISO/IEC 14496-2).

For ITU-T Rec. H.262 | ISO/IEC 13818-2 video, if a PTS is present in a PES packet header, it shall refer to the access unit containing the first picture start code that commences in this PES packet. A picture start code commences in a PES packet if the first byte of the picture start code is present in the PES packet. For I- and P- coded frames in non-low_delay sequences and in the case when there is no decoding discontinuity between access units (AUs) k and k' , the presentation time $t_{pn}(k)$ shall be equal to the decoding time $t_{dn}(k')$ of the next transmitted I- or P- coded frame (refer to 2.7.5). If there is a decoding discontinuity, or the stream ends, the difference between $t_{pn}(k)$ and $t_{dn}(k)$ shall be the same as if the original stream had continued without a discontinuity and without ending.

NOTE 2 – A low_delay sequence is an ITU-T Rec. H.262 | ISO/IEC 13818-2 video sequence in which the low_delay flag is set to '1' (refer to 6.2.2.3 of ITU-T Rec. H.262 | ISO/IEC 13818-2). Also note that for field pictures the presentation time refers to the first field picture of the coded frame.

For ITU-T Recommendation H.264 | ISO/IEC 14496-10 video, if a PTS is present in the PES packet header, it shall refer to the first AVC access unit that commences in this PES packet. An AVC access unit commences in a PES packet if the first byte of the AVC access unit is present in the PES packet. To achieve consistency between the STD model and the HRD model defined in Annex C of ITU-T Rec. H.264 | ISO/IEC 14496-10, for each decoded AVC access unit, the PTS value in the STD shall, within the accuracy of their respective clocks, indicate the same instant in time as the nominal DPB output time in the HRD, defined herein as $t_{o,n,dpb}(n) = t_{r,n}(n) + t_c * dpb_output_delay(n)$, where $t_{r,n}(n)$, t_c , and $dpb_output_delay(n)$ are defined as in Annex C of ITU-T Rec. H.264 | ISO/IEC 14496-10.

NOTE 3 – Different clocks may be used for derivation of PTS and $t_{o,n,dpb}(n)$.

The presentation time $t_{pn}(k)$ shall be equal to the decoding time $t_{dn}(k)$ for:

- audio access units;
- access units in ITU-T Rec. H.262 | ISO/IEC 13818-2 or ISO/IEC 14496-2 low delay video sequences;
- B-pictures in ISO/IEC 11172-2, ITU-T Rec. H.262 | ISO/IEC 13818-2 or ISO/IEC 14496-2 video streams.

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