



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.223

Annex A
(02/98)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Transmission
multiplexing and synchronization

Multiplexing protocol for low bit rate multimedia
communication

**Annex A: Multiplexing protocol for low bit rate
multimedia mobile communication over low
error-prone channels**

ITU-T Recommendation H.223 – Annex A

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION H.223

MULTIPLEXING PROTOCOL FOR LOW BIT RATE MULTIMEDIA COMMUNICATION

ANNEX A

Multiplexing protocol for low bit rate multimedia mobile communication over low error-prone channels

Summary

This Annex specifies an error robust framing scheme for multiplexing protocol H.223. The protocol provides robustness against transmission errors occurring in error-prone environment like mobile channels. HDLC framing defined in Recommendation H.223 is replaced by a longer flag without performing HDLC zero bit insertion.

Source

Annex A to ITU-T Recommendation H.223 was prepared by ITU-T Study Group 16 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 6th of February 1998.

FOREWORD

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The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 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.

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As of the date of approval of this Recommendation, the ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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Recommendation H.223

MULTIPLEXING PROTOCOL FOR LOW BIT RATE MULTIMEDIA COMMUNICATION

ANNEX A

Multiplexing protocol for low bit rate multimedia mobile communication over low error-prone channels

(Geneva, 1998)

A.1 General

This Annex specifies the level 1 protocol of the mobile H.223 extensions as described in Annex C/H.324. This Annex only changes MUX-PDU framing of the multiplex layer; however, the adaptation layer of Recommendation H.223 stays unchanged.

A.2 Multiplex (MUX) layer specification

The MUX-PDU framing of Recommendation H.223 is changed. Instead of 6.3/H.223, H.223 level 1 shall use the procedure in A.2.1.

A.2.1 MUX-PDU framing

In the basic mode, which is mandatory, all MUX-PDUs shall be delimited using 16-bit flags. Level 1 transmissions shall start in this basic mode.

In double-flag mode, which is optional, all MUX-PDUs shall be delimited by two consecutive 16-bit flags. All transmitters conforming to Recommendation H.223 shall signal their capability to delimit MUX-PDUs with two consecutive flags using the capability indication **h223AnnexADoubleFlag**, specified in Recommendation H.245.

A.2.1.1 Recommendation Flag

In the basic mode, all MUX-PDUs shall be preceded and followed by the 16-bit flag consisting of the following unique bit pattern:

8	7	6	5	4	3	2	1	Octet
1	1	1	0	0	0	0	1	1
0	1	0	0	1	1	0	1	2

Figure A.1/H.223 – 16-bit flag

The flag preceding the MUX-PDU is defined as the opening flag. The flag following the MUX-PDU is defined as the closing flag. The closing flag may also serve as the opening flag of the next MUX-PDU. However, all receivers conforming to Recommendation H.223 shall accommodate receipt of more than one consecutive flag, as the flag may be transmitted repetitively between MUX PDUs.

In the double-flag mode all MUX-PDUs shall be preceded and followed by two consecutive 16-bit flags ("double-flag"). The double-flag preceding the MUX-PDU is defined as the opening

flag. The double-flag following the MUX-PDU is defined as the closing flag. The closing flag may also serve as the opening flag of the next MUX-PDU. All receivers working in the double-flag mode shall accommodate receipt of more than one consecutive double-flag, as the double-flag may be transmitted repetitively between MUX-PDUs.

A transmitter working in double-flag mode shall always transmit an even number of the 16-bit flags specified in Figure A.1.

If a transmitter has signalled MultiplexDoubleFlag capability it shall start delimiting the MUX-PDUs with double-flags when it receives the **h223MultiplexReconfiguration.h223AnnexADoubleFlag.start** command.

It shall stop delimiting MUX-PDUs with double-flags when it receives the **h223MultiplexReconfiguration.h223AnnexADoubleFlag.stop** command.

In the period between requesting the change from basic mode to double-flag mode or vice-versa and receiving the first flag of the new mode, the receiver should search for both single and double-flags. The first detected new flag should only be accepted as a valid flag if it is followed by a multiplex header with valid HEC. In order to increase the robustness of the change this search should be repeated multiple times until the new mode is established.

NOTE – Since Annexes B/H.223 and C/H.223 use an enhanced synchronization strategy, the delimiting of MUX-PDUs with double-flags is only performed in this Annex.

A.2.1.2 Flag detection

The detection of the start of a MUX-PDU by the receiver may be done by correlation of the incoming bit stream with the synchronization flag. The output of the correlator may be compared with a Correlation Threshold (CT). The value of CT is not specified in this annex. Whenever the output is equal or greater than the threshold, the receiver should decide that a flag has been detected.

The octet aligned structure of the MUX-PDUs should be used to reduce the emulation of flags. Emulation may further be reduced by using the HEC check of the multiplex header.

NOTE – The level 1 procedure uses no 0-insertion method as described for HDLC flags in Recommendation H.223. This level does not prevent flag emulation in the bit stream and does not guarantee transparency.

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