ITU Telecommunication Standardization Sector
Study Group 15
Experts Group for Video Coding and Systems
in ATM and Other Network Environments

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TITLE: Draft Recommendation H.32X
PURPOSE: Discussion

This document contains the draft text for ITU-T Recommendation H.32X, "Broadband audiovisual communication systems and terminal equipment."

Draft Recommendation H.32X

BROADBAND AUDIOVISUAL COMMUNICATION SYSTEMS AND TERMINAL EQUIPMENT

1. Scope

This Draft Recommendation covers the technical requirements for the systems and terminal equipment of broadband audiovisual communication services defined in H.200/AV.100-Series Recommendations.

The video and audio coding and other technical aspects that are applicable to more than one distinct services are covered in H.200/AV.200-Series Recommendations.

2. Definitions

3. Applications

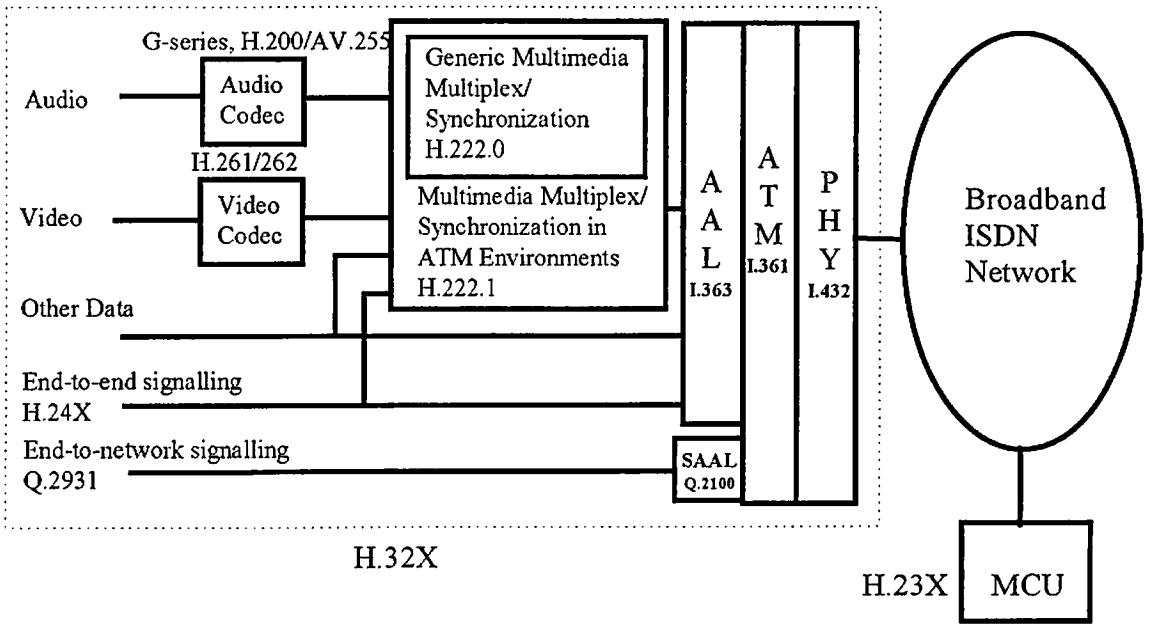
- Conversational services
- Retrieval services
- Messaging services
- Distribution services with user individual presentation control
- Distribution services without user individual presentation control

4. System description

4.1 System configuration

Figure 1/H.32X shows a generic broadband audiovisual communication system. It consists of terminal equipment, network, multipoint control unit (MCU) and the constituent elements of the terminal equipment. The corresponding Recommendations/Draft Recommendations are also identified.

Figure 1/H.32X: Broadband audiovisual communication system and terminal configuration



{Editor: Other Data and H.24X signalling can be multiplexed by H.222.0 or by AAL/ATM layers. The need to multiplex at AAL/ATM layers is exemplified by a possible scenario that H.222.0 is not used in a control-only channel from a terminal to a server. The exact definition of the appropriate multiplex mechanism in different scenarios is for further study.}

4.2 Communication Mode

The capabilities of H.32X terminals are separated into four attributes: Video Codec Capabilities (VCC), Audio Codec Capabilities (ACC), Network Adaptation Capabilities (NAC), and Control & Indication Capabilities (CIC). A communication mode is defined as a combination of these capabilities that are employed by a terminal at an instance of audiovisual communication. Since a communication session may be asymmetric for many applications in the broadband environment, these attributes are specified separately for the transmit end (TE) and the receive end (RE).

4.2.1 Video Codec Capability (VCC)

Possible values of this attribute at the transmit end and receive end are:

- H.261
- H.262 MP@ML
- H.262 MP@HL

{Editor: Do we need finer granularity of specification than this?}

4.2.2 Audio Codec Capability (ACC)

Possible values of this attribute at the transmit end and receive end are:

- G.711
- G.722
- MPEG-1 Audio
- MPEG-2 Audio
- MPEG-2 Audio Extension

{Editor: Do we need G.728?}

4.2.3 Network Adaptation Capabilities (NAC)

A possible value of this attribute is a combination of the choices of multimedia multiplex and synchronization mechanism, AAL, and peak transfer rate.

4.2.3.1 Multimedia Multiplex and Synchronization

Per Recommendation/Draft Recommendation H.221, H.222.0, and H.222.1.

Choices of multimedia multiplex and synchronization include:

- H.221 in a single VC
- H.221 in multiple VCs
- H.222.1 Transport Stream in a single VC
- H.222.1 Transport Stream in multiple VCs
  {Editor: The need and solutions of multiple VCs are still topics for further study.}
- H.222.1 Program Stream in a single VC
- H.222.1 Program Stream in multiple VCs
- Null
  {Editor: Comments are invited for including "Null" as a choice. A null multimedia multiplex and synchronization would allow such functions being provided in AAL/ATM layers. This may be the choice for the control channel of an asymmetrical application of which control signals are sent without H.222.0/H.222.1 multiplex and synchronization.}

4.2.3.2 AAL

As per Recommendation I.363.

Choices of AAL are:

- AAL1
- AAL2
- AAL5

4.2.3.3 Transfer Rate

For further study.

{Editor: The peak transfer rates should correspond to the maximum data rates of video and audio codec capabilities. Could this be a derived attribute?}

4.2.4 Control & Indication Capabilities

For further study.
{Editor: Subsets of H.24X should be defined as the possible values of CIC attribute. Will we have different CIC "profiles" for different types of services? Harmonization with MPEG DSM-CC work is needed, especially for retrieval and distribution services.}

4.2.5 Hierarchy of Communication Modes

For further study.
{Editor: Not all the combinations of terminal capabilities are possible. A "profile" approach would simplify the architecture of H.32X terminals and facilitate the procedures of establishing a common mode of operation for a audiovisual communication session.}

4.3 Terminal Type

The terminal types are defined based on the capabilities that a terminal is capable of.

4.3.1 Type A

Type A terminals are further divided into two sub-types. Type A1 terminals can only receive and function as viewing stations. Type A2 terminals' capabilities are symmetrical.

4.3.1.1 Type A1

4.3.1.1.1 VCC

- H.261 at RE
- MPEG-2 MP@ML at RE

4.3.1.1.2 ACC

- G.-series Audio at RE
- MPEG-2 Audio at RE

4.3.1.1.3 NAC

- H.221 in a single VC, AAL1 with Circuit Emulation, appropriate bit rates at RE
- Other appropriate network adaptation capabilities at RE

4.3.1.1.4 CIC

For further study.

4.3.1.2 Type A2

4.3.1.2.1 VCC

- H.261 at RE and TE
- MPEG-2 MP@ML at RE and TE

4.3.1.2.2 ACC

- G.-series Audio at RE and TE
- MPEG-2 Audio at RE and TE

4.3.1.2.3 NAC

- H.221 in a single/multiple VCs, AAL1 with Circuit Emulation, appropriate bit rates at RE and TE
- Other appropriate network adaptation capabilities at RE and TE

4.3.1.2.4 CIC

For further study.

4.3.2 Type B

Type B terminals are further divided into two sub-types. Type B1 terminals can only receive and function as viewing stations. Type B2 terminals' capabilities are symmetrical.

4.3.2.1 Type B1

4.3.2.1.1 VCC

- H.261 at RE
- MPEG-2 MP@ML at RE
- MPEG-2 MP@HL at RE

4.3.2.1.2 ACC

- G.-series Audio at RE
- MPEG-2 Audio at RE

4.3.2.1.3 NAC

- H.221 in a single VC, AAL1 with Circuit Emulation, appropriate bit rates at RE
- Other appropriate network adaptation capabilities at RE

4.3.2.1.4 CIC

For further study.

4.3.2.2 Type B2

4.3.2.2.1 VCC

- H.261 at RE and TE
- MPEG-2 MP@ML at RE and TE
- MPEG-2 MP@HL at RE and TE

4.3.2.2.2 ACC

- G.-series Audio at RE and TE
- MPEG-2 Audio at RE and TE

4.3.2.2.3 NAC

- H.221 in a single VC, AAL1 with Circuit Emulation, appropriate bit rates at RE and TE
- Other appropriate network adaptation capabilities at RE and TE

4.3.2.2.4 CIC

For further study.

4.4 Call/Connection Controls

- AV.42X

4.5 Point to point communication

For further study.

4.6 Multipoint communication

For further study.

- Use of B-ISDN services such as multicasting
- Use of AV servers such as MCU
- System solution for the mixture of H.32X and H.320

5. Terminal equipment

5.1 Environments

For further study.

5.2 Audio arrangement

I. Input equipment
   A. Microphone (Stereo; videoconferencing)
   B. Music source (Compact Disc etc.)
   C. Cinema sound (Surround)
   D. Echo cancelor (videoconferencing , videophone)
II. Output equipment
   A. Loudspeaker

5.3 Video arrangement

I. Input equipment
   A. Camera
      1. 4:3 Display aspect ratio
         (1) NTSC Camera

b) PAL/SECAM Camera

2. 16:9 Display aspect ratio

a) NTSC/PAL Camera (Letter Box) ;Video coding algorithm using MP@ML

b) HDTV Camera ;Video coding algorithm using MP@HL or H14L

B. VTR

1. with precise time base corrector

2. without time base corrector

a) In this case Decoder doesn't synchronize with Encoder.

II. Output Equipment

A. Monitor

1. NTSC monitor

a) PAL/SECAM monitor

b) NTSC/PAL monitor (Letter Box)

2. HDTV monitor

III. Picture format

IV. Format conversion for interregional communication (informative)

5.4 Data and other auxiliary equipment

I. Input Equipment

A. FAX

B. Telematic Equipment

1. Pointing Device

C. Telewriting Equipment

II. Output Equipment

A. FAX

B. Telematic Equipment

1. Pointing Device

C. Telewriting Equipment

5.5 Optional enhancements

For further study.

5.6 Error resilience

5.6.1 Video layer

For further study.

5.6.2 Multimedia multiplex layer

For further study.

6. Intercommunications

6.1 Intercommunication between different terminal types

For further study.

6.2 *Intercommunication with N-ISDN terminals*

For further study.
- H.320 connected to N-ISDN
- H.320 emulation mode is mandatory (switchable)

6.3 *Intercommunication with telephony*

For further study.

6.4 *Intercommunication with audiovisual terminals connected to other networks*

For further study.
- H.32Y for H.320 adaptation to B-ISDN
- H.32Z for LANs