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

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SOURCE: Chia-Chang Li, AT&T Bell Laboratories
TITLE: Draft Recommendation H.32X
PURPOSE: Discussion

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

Draft Recommendation H.32X

BROADBAND AUDIOVISUAL COMMUNICATION SYSTEMS AND TERMINALS

1. Scope

This Draft Recommendation covers the technical requirements for the systems and terminals 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

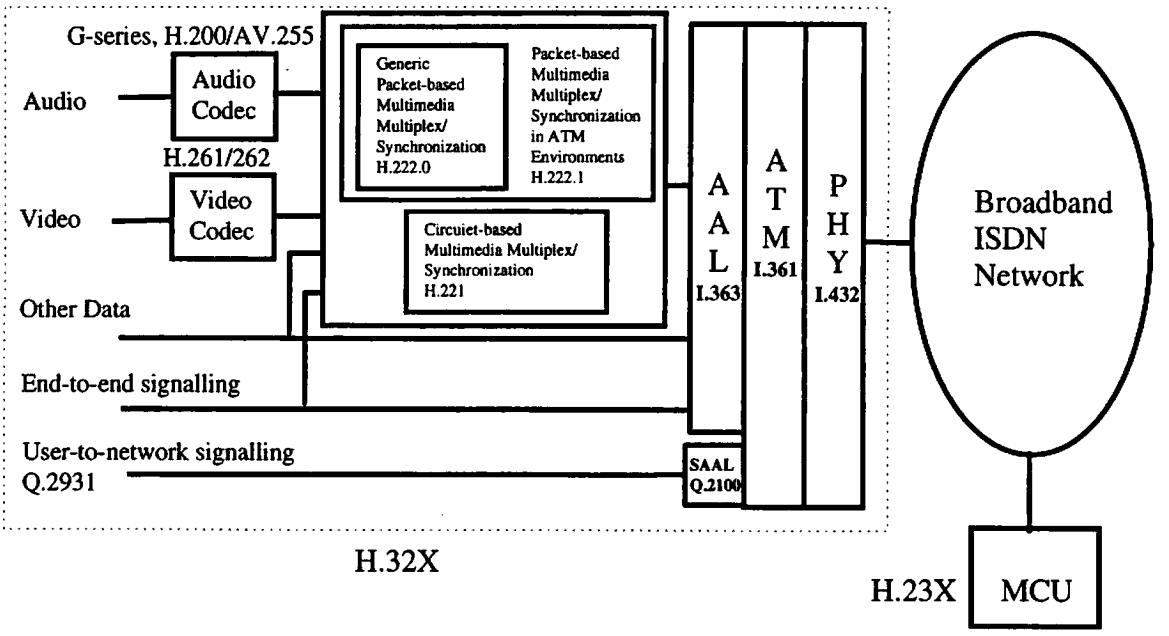
- Conversational services
- Retrieval services
- Messaging services
- Distribution services with user individual presentation control
- Distribution services without user individual presentation control

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



4.2 Communication Mode

The capabilities of H.32X terminals are separated into five attributes: Video Codec Capabilities (VCC), Audio Codec Capabilities (ACC), Network Adaptation Capabilities (NAC), Control & Indication Capabilities (CIC), and Other Data Capabilities (ODC). 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 Capabilities (VCC)

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

- H.261
- H.262 SP@ML
- H.262 MP@ML
- H.262 MP@H14L
- H.262 MP@HL

4.2.2 Audio Codec Capabilities (ACC)

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

- G.711
- G.722
- G.728
- MPEG-1 Audio
- MPEG-2 Audio
- MPEG-2 Audio Extension

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 transfer rate, for both CBR and VBR.

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
- H.222.1 Program Stream in a single VC
- H.222.1 Program Stream in multiple VCs
- Null

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 transfer rate needs to be specified for both CBR and VBR with proper level of quantization. ***Contributions are invited.*** *The editor will also post a strawman proposal on the reflector to stimulate discussion.}*

4.2.4 Control & Indication Capabilities (CIC)

There are four categories of C&I information. These four categories, their proposed methods of transport, and the Standards/Recommendations that they are described are shown in table 1.

C&I signal	transport	described in
frame synchronous	ITU-T auxiliary	H.32X
frame asynchronous	*ITU-T auxiliary/ DSM-CC*	*H.32X/ ISO 13818-6*
mode switching	PSI/PSM	H.222.1
capabilities exchange	ITU-T auxiliary	H.24X

Table 1. Categories of C&I signals

{Editor:

- *The editor has taken some liberty in adding a fourth category, shown in italics, to Table 1 of AVC707R Annex 2. Please indicate if there is any disagreement.*
- *Will we have different CIC "profiles" for different types of services? If so, what is the proper way of "profiling?"* ***Contributions are invited.***
- *Harmonization with MPEG DSM-CC work is needed, especially for retrieval and distribution services. Portion of DSM-CC specification may be considered as C&I, e.g., playback controls. Others may be considered as "Other Data", e.g., application download.*
- ***Contributions are invited*** *for a list of frame synchronous signals that should be supported in H.32X.}*

4.2.5 Other Data Capabilities (ODC)

{Editor: ***Contributions are invited*** *for possible codepoints.}*

4.2.6 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.262 SP@ML at RE
- H.262 MP@ML at RE

4.3.1.1.2 ACC

- G.-series Audio at RE
- MPEG-1 Audio at RE
- MPEG-2 Audio at RE (Optional)
- MPEG-2 Audio Extension at RE (Optional)

4.3.1.1.3 NAC

- Appropriate network adaptation capabilities at RE *{Editor: To be determined when "Transfer Rate" is properly defined.}*

4.3.1.1.4 CIC

For further study.

4.3.1.1.5 ODC

For further study.

4.3.1.2 Type A2

4.3.1.2.1 VCC

- H.261 at RE and TE
- H.262 SP@ML at RE and TE
- H.262 MP@ML at RE and TE

4.3.1.2.2 ACC

- G.-series Audio at RE and TE
- MPEG-1 Audio at RE and TE
- MPEG-2 Audio at RE and TE (Optional)
- MPEG-2 Audio Extension at RE and TE (Optional)

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 *{Editor: To be determined when "Transfer Rate" is properly defined.}*

4.3.1.2.4 CIC

For further study.

4.3.1.2.5 ODC

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.262 SP@ML at RE
- H.262 MP@ML at RE
- H.262 MP@H14L at RE
- H.262 MP@HL at RE

4.3.2.1.2 ACC

- G.-series Audio at RE
- MPEG-1 Audio at RE
- MPEG-2 Audio at RE *{Editor: Should this be optional?}*
- MPEG-2 Audio Extension at RE *{Editor: Should this be optional?}*

4.3.2.1.3 NAC

- Appropriate network adaptation capabilities at RE *{Editor: To be determined when "Transfer Rate" is properly defined.}*

4.3.2.1.4 CIC

For further study.

4.3.2.1.5 ODC

For further study.

4.3.2.2 Type B2

4.3.2.2.1 VCC

- H.261 at RE and TE
- H.262 SP@ML at RE and TE
- H.262 MP@ML at RE and TE
- H.262 MP@H14L at RE and TE
- H.262 MP@HL at RE and TE

4.3.2.2.2 ACC

- G.-series Audio at RE and TE
- MPEG-1 Audio at RE and TE
- MPEG-2 Audio at RE and TE *{Editor: Should this be optional?}*
- MPEG-2 Audio Extension at RE and TE *{Editor: Should this be optional?}*

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 *{Editor: To be determined when "Transfer Rate" is properly defined.}*

4.3.2.2.4 CIC

For further study.

4.3.2.2.5 ODC

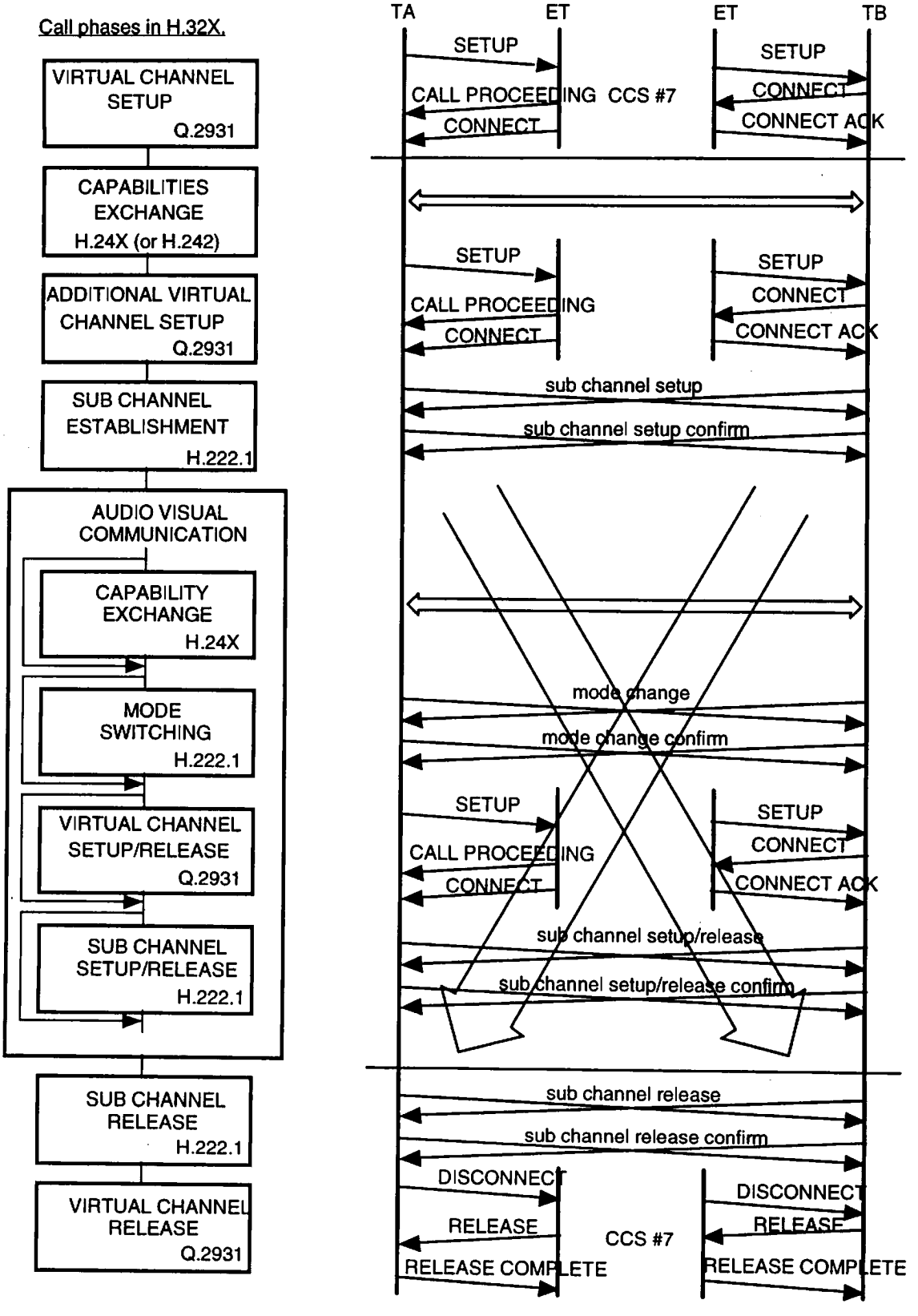
For further study.

4.4 Call/Connection Controls

The following figure presents the H.32X call phases of normal channel and sub-channel setup and release procedures.

{Editor: ***Contributions to further refine this figure are invited.****}*

Figure 2: H.32X Call Phases - Normal Procedure



5. Equipment Requirements

For further study.

{Editor: this section will contain information related to the equipment requirements for interworking, such as audio level setting. ***Contributions are welcome.****}*

6. Error Resilience

For further study.

{Editor: this section will contain information related to the error resilience of the system. ***Contributions are welcome.****}*

6.1 Video Layer

For further study.

6.2 Multimedia Multiplex Layer

For further study.

7. Intercommunications

7.1 Intercommunication Between Different Terminal Types

For further study.

7.2 Intercommunication With N-ISDN Terminals

Type A2 and B2 H.32X terminals must be able to interact with H.320 terminals. In an intercommunication session with an H.320 terminal, Type A2 and B2 H.32X terminals function as H.32Y terminals. Support of B, 2B, H0, H11, H12 communication modes of H.320 in A2 and B2 terminals are mandatory.

7.3 Intercommunication With Telephony

For further study.

7.4 Intercommunication With Audiovisual Terminals Connected To Other Networks

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

END