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

Document AVC-743R
January 27, 1995

Source: RAPPORTEUR (Sakae OKUBO)
Title: REPORT OF THE EIGHTEENTH EXPERTS GROUP MEETING IN KAMIFUKUOKA (24-27 January 1995)
Purpose: Report

---

1. General

The eighteenth meeting of the Experts Group was held under chairmanship of Rapporteur (Mr. Sakae Okubo) during 24-27 January 1995 in KDD R&D Laboratories, Kamifukuoka, Japan, at the kind invitation of Ministry of Posts and Telecommunications. At the start of the meeting, Dr. Yoshiyori Urano, Director of KDD R&D Laboratories, gave a welcoming address on behalf of the hosting organization.

It is noted that the discussion session for H.222.1, H.32X, H.32Y, H.32Z and related matters was co-chaired by Rapporteur and each Editor; Mr. Stuart Dunstan, Mr. Chia-Chang Li, Mr. Hayder Radha and Mr. Geoff Morrison. It is also noted that the network adaptation related sections of this report were provided by Mr. S. Dunstan.

In addition to the meeting sessions at large, we had two small group discussions regarding requirements to the signalling and network adaptation in the Wednesday evening, and organized ten editing teams to draft Recommendations and correspondence to other groups.

At the end of the sessions, Rapporteur thanked the hosting organization and its staff for providing excellent facilities and services to support the meeting. The participation of Mr. K. Yamazaki, Rapporteur for Q.6/13, and Mr. S. Kuribayashi, active member of SG11, was highly appreciated to liaise the work of this Experts Group with that of SG13 and SG11.

2. Documentation (TD-2)

For this meeting, 36 AVC-numbered documents and 23 temporary documents have been made available as listed in Annex 1.

3. Review of the previous meetings

3.1 Experts Group Singapore meeting in November 1994 (AVC-707R, 708R)

Rapporteur drew attention to §13.2 which reported the work plan discussion at the closing session in Singapore, which was suspended due to lack of time.

There were no comments on the two meeting reports.

3.2 Meetings of related organizations

Progress of the meetings related to the activities of this Experts Group was briefly presented as follows:

- SG13 meeting in November 1994 by Mr. H. Radha
- SA&A meeting in November 1994 by Mr. T. Kasahara
- SG15 Rapporteur meeting in November 1994 by Mr. S. Okubo
- DAVIC meetings in December 1994 and January 1995 by Mr. O. Poncin
- DAVIC liaison meetings in December 1994 and January 1995 by Mr. S. Okubo and Mr. O. Poncin

3.3 List of open issues (AVC-713)

AVC-713 provided a list of open issues which were identified after the Singapore meeting. Rapporteur requested to use it as a check list of this week achievements.

4. Common text Recommendations

4.1 H.222.0|ISO/IEC 13818-1 Systems (AVC-709; TD-5)

AVC-709 provided the disposition of ITU-T comments on the DIS version of Systems specifications. It also contained a list of further corrections to the Singapore IS version. The meeting decided to send the list of corrections to the Editing Group which is finalizing the text. This was put into action during the meeting and an acknowledgment of receipt was obtained from Mr. S. MacInnis.

We will review the final text referring to AVC-709. If we find necessity of further corrections, we will make an input to the March MPEG meeting to apply the Defect Report procedure as set out in TD-5.

4.2 Input to SG15 meeting for approval

Rapporteur advised the meeting that delta documents for H.222.0 and H.262 between Singapore IS version and DIS version have been sent to Geneva for the SG15 February meeting, and the final text of H.262 has been completed.

5. Video coding matters and VBR (AVC-732, 733, 734)

AVC-732 and 733 proposed pre-transmission of High Priority data when data partitioning is used and inclusion of frame numbers in the transport stream packets both of which are useful in high packet loss environments. The meeting requested further review of the members by the next meeting and also further clarification of the proposer regarding necessary actions in related ITU-T Recommendations and/or ISO/IEC Standards.

AVC-734 proposed additional syntax for multiple picture presentation. The meeting appreciates further clarification of the system configuration where the proposed technique is effective.

6. Network adaptation

6.1 C&I and DSM-CC channels

6.1.1 C&I signals (AVC-725)

AVC-725 considered different types of C&I signalling for the H.32X terminal;

- Video frame synchronous signals
- H.24X capability exchange signals
- H.230 like signals
- DSM-CC signals
- Mode change control signals

During the discussion on C&I categories, specific signals and channels to convey respective C&I signals, the following clarification and questions were obtained:

- The MPEG DSM group view is that DSM-CC be carried in PES if MPEG System is available.
- Server to network communication is also relevant to C&I if we define sending only terminals in H.32X.
- A question raised on the required bandwidth of the control channel when it is separate from the channel transporting audiovisual signal.

- A separate control channel is useful for communicating stored information because no recoding of PCRs etc. is necessary.
- With respect to the video frame asynchronous H.230 like signals, it was explained that H.200 series Recommendations describe a generic set of C&I signals, while H.300 series Recommendations choose a necessary sub-set form the generic lists.

After the discussion, the meeting concluded as follows:

- The framework for type of C&I signal categories with specific examples has been agreed as in AVC-725, leaving the linkage with possible channels to further discussion.
- H.222.1 defines channels for each of these signals, the exact method is to be clarified.
- As agreed to in Singapore the method of transporting the video frame synchronous signals will be described in H.222.1. However, the actual signals will be described in H.32X.
- Since the exact relationship between DSM-CC and H.24X is unclear, the development of H.24X will proceed independently of DSM-CC at this stage.

6.1.2 Channel for H.24X capability signals (AVC-724)

AVC-724 advocated the use of a separate VC for use by H.24X. The meeting discussed whether H.24X signalling be inside or outside the H.222.1 multiplex and relevance to user-network signalling.

As to the fist aspect, the following was discussed:

- In addition to the two solutions considered in AVC-724, the "look ahead procedure" may be the third solution.
- A question was raised to the necessity of a residential channel for H.24X; it is only necessary at the start of the call. It was responded that renegotiation may be necessary during the communication.
- Switching cost should be counted. Multiple VCs need additional cost, but how much can not be known.
- Single VC solution is better for hybrid network where multiple VCs may not always be available.
- Use of user-to-user signalling is a possibility for transporting H.24X signalling; its capacity is up to 4Kbyte.
- H.24X may be supported by an asymmetrical connection in that selection of PS, TS or no H.222.1 multiplex may be determined independently in each direction.

As to the Q.2931 signalling capabilities, the following was clarified:

- SG11 will make necessary user-network signalling specifications if user requirements are clarified; delay, data length, bandwidth for the message.
- The negotiation capabilities of Q.2931 was explained. A called terminal can only indicate something less than the calling terminal's capabilities. An example is the selection of AAL5 PDU size.
- There was much discussion regarding signalling support for multiple VCs. Q.2931 release 1 does not support multiple connections, hence multiple VC case could result in different physical paths through the network. In addition the signalling set up time for the additional VCs may not be tolerable.
- In the separate VC solution, the second VC has a chance of blocking.
- A question was raised regarding the delay of the second VC setup after the request from the terminal; if it is not quick, human users will not accept. The call set up delay was explained to be largely due to the detection of the end of dials.
- The time to renegotiate traffic parameters on a VC may be of similar order to the time to establish additional connections.
- H.24X should tolerate this delay of establishing the second call or change of bandwidth.

A representative from SG11 explained that SG11 is producing draft Q.2931 release 2, which will allow multiple connections within one call. SG11 requires input on what is a real scenario

under which multiple VCs would be used, and what are the requirements of this scenario. The meeting identified the following requirements:

- Additional connection should be routed in a way that minimizes VC differential delay.
- It should be possible to establish additional connections in less time than that required to establish the call. It is noted that additional connections do not require to gather called party digits.

The meeting decided to send a liaison statement describing the above to SG11 as contained in Annex 5. The former might be satisfied by routing the call through the same Virtual Paths or simply through the same ATM nodes.

After the discussion, the meeting obtained the following conclusion:

- Speech should be made available as soon as the called user responds to the incoming call in conversational services, as occurs in H.320.
- H.32X must support the use of one VC.
- H.32X should also support the use of multiple VCs, as required by the user or application.

6.1.3 DSM-CC (AVC-730, 731)

AVC-730 and 731 considered architectures and protocols for DSM-CC. The meeting appreciated this input to clarify the audiovisual system configuration. During the discussion, the following was found:

- Adding something (like H.24X signalling) to pre-stored MPEG multiplex is not a good idea because restamping is involved.
- We first concentrate on the definition of H.24X capability messages, then we further consider common parts with DSM-CC messages. It was confirmed that H.24X covers only the capability exchange, including the protocols and procedures to achieve this. H.24X appears to be something different from DSM-CC.
- We need to make distinction between capability and other C&I messages; the former is necessary for starting a communication.
- Clarification is needed for the control protocol configuration when H.32X A2 type includes the capability of A1 where DSM-CC may be involved.

As a conclusion, the meeting agreed to include the three configurations in AVC-730 in the meeting report as reference material. This is contained in Annex 2 to this report.

6.2 Error free transport for H.24X and T.120 data (AVC-721; AVC-640, 675; TD-19, 20)

AVC-721 provided protocol stack options for the reliable support of H.24X capability exchange. It was questioned and confirmed that H.24X is applicable to the receive only terminal. It would appear that H.24X is still applicable here. It may be that a capability exchange takes place out of band, before the main audio visual VC has been established. The meeting also confirmed that the protocol stack must work with different underlying networks in each direction.

Though the document advocated X.224 class 0 with SSCF and SSCOP, a question was raised whether X.224 is really necessary in the interest of commonality with different underlayers other than ATM.

It was noted that in the Low Bitrate Coding audiovisual recommendations, V.42 is employed as the support for H.24P and that H.24X and H.24P should be as common as possible since both are operating on packet based systems. It was also noted that in addition to the options shown in AVC-721, a method of using the H.24X protocol stack with H.222.1 must be decided and that this method might also support the T.120 series data transfer protocol.

LAPM was suggested for error free transport of H.24X signals; it is bit stream oriented with flags and close to V.42, thus also suitable to be on top of AAL1. SSCOP is packet oriented, thus suitable for being on top of AAL5.

As to the multiple VC use for T.120 data which was communicated between SG8 and SG15 as reported in AVC-640 ad AVC-675, the meeting confirmed that we consider both cases of using a dedicated VC and H.222.1 subchannel for T.120 series data.

After the discussion, the meeting asked Mr. K. Hibi to coordinate a small group to further discuss and conclude on the protocol stack for error free transport of H.24X signalling and to produce a liaison statement to SG8 on this matter and use of multiple VCs in broadband audiovisual communication. During the review of its draft (TD-19, 20), the following comments were obtained and resolved:

- A single VC non-ATM case should be added in Figure 1/TD-19, where "non-ATM" means bit oriented network.
- PSTN stacks, one in H.24P and another we recommend, should be included.
- Probably SG8 will not accept the stack for separate VC in Figure 1 because they are supportive of SSCOP. In any case we seek their views.

The outcome is contained in Annex 3 (protocol stack) and Annex 4 (liaison statement to SG8).

6.3 Requirements to the user-network signalling (AVC-737)

AVC-737 proposed that indications of PS or TS selection should be placed in the Q.2931 B_LLI information element and requested a liaison to SG11 which is going to meet next week. The requirement is that the session should be started up in a reasonable way without re-establishment of some layers of the session. AVC-726 also addressed indication of terminal type (see §6.6 below).

The following comments were obtained:

- We need a philosophy to split the terminal identification messages between Q.2931 use-network signalling and H.24X end-end signalling; a whole picture need be drawn covering the both procedures.
- Q.2931 should cover global identification pointers, H.24X should cover further details.
- A framework for terminal identification should be given to SG11 together with specific requests, otherwise there will be a confusion in the future when more terminal types are involved.
- Definition of LLC messages should be in Q.2931, but the procedures to use them should be in H-series terminal specifications.

A small group discussion on Wednesday coordinated by Mr. V. Balabanian resolved some of these issues regarding the use of Q.2931 information elements. A guiding rule, however, was that only essential elements should be indicated in Q.2931 which were determined to be terminal type and the start up options as shown in Table 1.

Table 1. Terminal type indication and start up indications in Q.2931

Terminal type	Start up options2
H.32X A1 & B11	PS TS
H.32X A2 & B2	no multiplex3 PS TS
H.32Y	-4
H.320	-4

Notes:

1) The H.32X receive only terminal does not use H.24X. This may not always be true.
2) If the FEC is used with the PS or TS, then it is assured that it is always used at the transmitter. It may of course be another option to be indicated.
3) "no multiplex" implies that only the H.24X protocol stack uses the VC.
4) H.32Y and H.320 use H.221 by default.

It is important to note that the start up parameters for H.32X A2 & B2 can by asymmetrical; e.g. the send side indicates to the receive side that it will use the TS multiplex, while the receive side indicates to the send terminal that it will use no multiplex.

It is also noted that the choice of AAL type, as currently defined, can not be asymmetrical. In one VC (which is by definition bi-directional) the AAL must be the same in the forward and backward directions. This concern should be expressed to SG11 and SG13. (A typical scenario might be TS on AAL type 1 in one direction, with H.24X protocol stack and AAL type 5 in the return direction).

Even if the AAL type can not be asymmetrical, there is still the requirement to have different AAL parameters in each direction. This appears to be currently included in AAL type 3/4 and type 5, but not type 1. It is noted that the traffic descriptor information element in Q.2931 currently defines a forward and backward peak cell rate.

For each terminal type default modes should be selected for those parts of H.32X not explicitly indicated by Q.2931; e.g. default audio and video coding algorithms. Default H.222.1 multiplex channels might also be assigned. This solution allows audio (and video) communications to begin as soon as the VC is established, and even before the first H.24X capability exchange.

These results are to be contained in the liaison statement to SG11.

After the discussion, the meeting asked Mr. V. Balabanian to continue the small group work to make further discussions and produce a liaison statement to SG11 and its outcome is contained in Annex 5 which the meeting at large approved. During the review of its draft, it was recognized necessary to seek advice of SG11 and SG13 on the use of asymmetrical traffic descriptors, asymmetrical AALs and asymmetrical AAL1 parameters. This aspect is also included in Annex 5. Correspondence to SG13 is to be produced towards the SG13 AAL meeting in May.

6.4 H.222.1 specific functions

6.4.1 Network performance (AVC-712; TD-6)

AVC-712 provides the SG13 response to the Experts Group ATM network performance parameters assumptions, asking a few questions to the Experts Group. The following was found:

- SG13 advice on the worst case bit error rate (<10-7) does not affect our conclusion that error correction is required somewhere in the network adaptation layers.
- Mr. H. Radha undertakes to update AVC-635 reflecting the SG13 advice.
- Two views were expressed to the question with which we are more concerned; short term CDV or long term CDV. In the lack of quantitative data, we will state that both should be as small as possible to reduce the terminal equipment complexity.
- Mr. K. Yamazaki gave us a tutorial on the mechanism of CDV occurrence; 1) multiplexing in the CPE, 2) statistical multiplexing in the network which is expressed in terms of the number of cells, 3) insertion of OAM and Resource Management cells which is only a problem if the UPC mechanism is applied to the aggregate user plus OAM traffic. He also stressed that the absolute CDV value is highly dependent on the channel rate.

Based on this discussion, Mr. H. Radha undertook to coordinate an editing team to produce a liaison response to SG13 and to ask further questions. The outcome is contained in Annex 6.

6.4.2 Bit error correction (AVC-727, 742; TD-22)

AVC-727 presented hardware experiment results on the effect of bit errors on coded HDTV pictures when a modest error concealment technique is applied to the H.261 based algorithm. The reconstructed HDTV sequences were demonstrated. The results confirmed previous contributions that some bit error correction is required even in the case of low bit error rates.

AVC-742 proposed H.222.1 specific functions to deal with bit error correction and timing recovery. It was generally agreed that the 255 byte frame is appropriate. However, the exact RS code, and the required bit error capability needs further study. It was emphasized that scramblers used in the physical layers cause multiple (correlated) bit errors in the user data.

It was unclear as to whether such an error correction function should be in H.222.1 or in the AAL. The opinion was expressed that FEC of any kind should be in the physical layer, and not done end to end. However, as far as we take the network performance scenario approach, end to end bit error correction is necessary. This was considered to be a safer approach since various transmission environments are foreseen in the future.

During the discussion, the following views and information were also stated:

- The FEC solution should be single in the interest of securing interoperability.
- Information was given on availability of RS chips for blocksize <=255.
- Indication of lost cell from AAL is useful for the user to conceal the error; AAL1 allows this indication at the start of cell, AAL5 allows error indication at the end of AAL SDU.

The meeting asked Mr. R. terHorst to coordinate a small group to further discuss and conclude regarding allocation of this function in the network adaptation (H.222.1 or AAL) and alignment of the FEC frame to the ATM cell.

The outcome is contained in Annex 7 (see §6.7.1 below).

6.4.3 CDV reduction (AVC-742, 735; TD-22)

AVC-742 discussed the CDV reduction with respect to its position in the network adaptation model and a specific scheme. The technical details were further discussed in Mr. R. terHorst's small group. The outcome is contained in Annex 7 (see §6.7.1 below).

AVC-735 proposed that receiver estimates of network jitter be fed back to the transmitter, so as to use the VBV in an effective manner. The meeting agreed to consider inclusion of the proposed C&I signals, awaiting further review of the members by the next meeting. It was pointed out that this kind of signals are also useful in the H.320 and H.32Z.2 systems where rate or flow control is involved in multipoint or point-to-point communications.

6.4.4 Mapping between TS packet and AAL (AVC-738, 736)

AVC-738 reported on decisions taken by the ATM Forum with regard to packing of TS packets in the AAL5 CPCS PDU. When a PCR appears in the TS, then that TS packet is always placed nearest the AAL5 CPCS trailer. This eliminates jitter due to AAL5 packing.

The meeting agreed to reflect the ATM Forum solution in H.222.1, noting that this particular mapping is for VOD services. Some comments were obtained during the discussion:

- MTU size negotiation is for two channels; calling to called and called to calling.
- If one TS packet to 5 cells mapping and two TS packets to 8 cells mapping are mixed, additional jitter of up to 3 cells occurs in the terminal.
- "CBR" has a particular meaning in the ATM network with respect to traffic management, it should be carefully used if it addresses video coding in the MPEG sense.

- Impact of FEC discussed above on this mapping needs further consideration in a small group.

AVC-736 discussed possible merging of some fields which have similar functions in TS and AAL. However, Mr. J-S. Kim expressed to withdraw the comment considering the interest of commonality among applications to allow bitstream interchange.

6.5 AAL (AVC-711, 741; TD-22)

AVC-711 contained SG13 liaison documents, including one to the Experts Group clarifying the use of the STATUS and PRIORITY parameters. It was also stressed that while the AAL1 SAR is common, the AAL1 CS should be viewed as a toolkit. Details of the next meeting were included.

AVC-741 proposed an AAL for real time audiovisual services. "piecewise constant bit rate" is through the use of VBR network service. The timestamping proposed here needs to be resolved with what proposed in AVC-742. This was a subject of Mr. R. terHorst's small group discussion. See §6.7 of this report.

Mr. K. Yamazaki gave a status report on the traffic control work; the parameters to be policed in VBR include the peak cell rate (PCR) with parameters (T, t), where T is minimum time interval and t is its tolerance, and the sustainable cell rate (SCR) with parameters (T0, t0). PCR and SCR both specify a leaky bucket algorithm of depth t/t0, and of token generation rate T/T0. He also stressed that implementation of VBR can not be obtained unless traffic control is clarified, and that definition of AAL2 is under joint responsibility of SG13 and SG15.

It should be noted that the real time delivery schedule at the transmitter of a VBR bitstream can be done independent of timestamping, which allows regeneration of a piecewise constant rate signal implied by at the receiver. A piecewise constant rate is the only thing that the timestamping can regenerate in the presence of jitter.

6.6 Network aspects (AVC-726; AVC-712, 723, 727, 737)

AVC-726 discussed identification of H.32X, H.32Y and H.320 terminals at the start of the communication. It highlighted indication of terminal type and interworking problems, providing alternatives of indication via Q.2931 and redialing.

The meeting recognized that support of Q.2931 user-network signalling is required for identification of H.32X/Y/0. Possible difficulty for this method of identification was raised for configuring H.32Y as a combination of TA plus existing H.320. If Q.2931 includes this specification in due time, TA products may support it.

These aspects will be communicated with SG11 as contained in Annex 5 (see §6.3 above).

6.7 Summary of the network adaptation discussion

6.7.1 H.222.1 and AAL functions (TD-22)

After the first round discussion on the network adaptation related agenda items, the meeting asked Mr. R. terHorst to coordinate a small group to obtain deeper insight and agreements regarding H.222.1 and AAL functions. During the review of its draft report (TD-22), specification for the use of FEC was clarified as follows:

- Its use is mandatory at the encoder for communications between A2-A2, A2-B2 and B2-B2 type terminals. Use of FEC is optional at the decoder as agreed in Singapore (see §6.2.3/AVC-707R).
- Other cases need further consideration. Contributions are solicited by the next meeting.
- Two different RS polynomials are used in available chips. Choice of a polynomial also needs contributions by the next meeting.

The final report is contained in Annex 7. The meeting agreed on sending correspondence to SA&A/The ATM Forum and SAM/ETSI NA5 as in Annex 8 to obtain harmonized solutions for the network adaptation between SG15 , The ATM Forum and ETSI.

6.7.2 Network adaptation protocol reference model (TD-18)

The network adaptation protocol reference model as in TD-3 (Singapore) was updated by incorporating this week achievements, particularly discussion on AAL and H.222.1 specific functions as given in Annex 7. The outcome is contained in Annex 9. The meeting considered that this useful information should appear in some Recommendation and concluded that H.222.1 is the most appropriate.

7. Draft H.222.1

7.1 **stream_id** definition (AVC-719, 740, TD-6)

AVC-719 and AVC-740 examined use of ITU-T stream types.

The former proposed use of a stream_id_extension field as the first byte of the PES packet payload, and proposed in its annex coding for this field and allocation of each of the four ITU-T stream_ids to control, audio, video and auxiliary data.

The latter, together with TD-6, similarly proposed the first byte of the PES packet payload to be a multiplexing identification field, in the case of Program Stream. However, the Transport Stream required no such field. A flat codespace of H.32X elementary stream types was proposed. PSI/PSM signalling maps these stream types to multiplex identified values. Further discussion is requires to choose one or integrate the two proposals.

The meeting agreed to include the outcome in H.222.1.

7.2 Descriptors (AVC-720)

AVC-720 proposed semantic constraints on program and program element descriptors usage. The meeting agreed to include §2/AVC-720 in H.222.1.

7.3 Acknowledged signalling procedures (AVC-739)

AVC-739 proposed subchannel establishment and release protocol procedures for inclusion in H.222.1, with respect to H.222.1 acknowledged signalling procedures. The meeting agreed to include these specifications in H.222.1, with review required by the next meeting.

During the discussion, it was clarified that two tools are in H.222.1, acknowledged and unacknowledged procedures and that use of them should be defined in H.300 series Recommendations.

7.4 Text for input to the SG15 meeting (AVC-715, AVC-713, TD-4; TD-13)

The H.222.1 text in AVC-715 was further elaborated by a editing team which Mr. S. Dunstan coordinated. During the review of its outcome TD-13, the following comments were obtained and resolved:

- Term "H.222.1 elementary stream" should be defined in §3.
- Specifications which are mandatory to H.222.1 implementation may be derived from Conformance Part of the MPEG Systems standard. Definition of capabilities is needed for other optional specifications.
- Reference to the use of time stamps should be made in §§7.1, 8.1.
- It may induce criticism at the SG15 meeting that such an essential content as §10 is left to further study. The intention was explained to specify how the primitives at AAL-SAP be related to the H.222.1 data unit, but we need coordination with The ATM Forum solution

which currently addresses specifically VOD. Contributions are requested to fill this section.
- Coding rule of H.222.1 specific descriptors should be included in §13.2.
- Table 2 on p.12 should be moved to H.32X. The current table indicates a framework, providing specific combination of "multiplex_id field" and "meaning" for understanding how to specify the default channel.

The updated text for the SG15 meeting is issued as a separate document AVC-744.

8. Draft H.24X (AVC-710, 722; AVC-713, TD-4, 7; TD-14)

AVC-710 provided a new text for H.24X capability exchange using ASN.1 representation, while AVC-722 proposed some amendments for the text.

During the discussion, the following comments were obtained:

- We should clarify C&I signals and their transmission channels before deciding in which Recommendation to house C&I signals other than capability. A support was expressed for including those C&I signals in a separate Recommendation.
- We should seek alignment between H.24P and H.24X. Rapporteur will contact Mr. R. Schaphorst. It was pointed out that bitstreams become different when one uses ASN.1 representation and the other uses table representation even if the message definition is the same.

After the discussion, the meeting concluded as follows:

- ACK/NACK procedures are introduced in the capability exchange. This is useful to confirm the state (sleeping or not) of the higher layer even if the transport is error free.
- Top level definition is included.
- Tagging is added to OPTIONAL and CHOICE elements.
- BITSTRING is employed instead of BOOLEAN for indication of specific capabilities in the message.

The H.24X text in AVC-710 was further elaborated by an editing team which Mr. D. Beaumont coordinated with the support of Mr. M. Nilsson back home. During the review of its outcome TD-14, addition of "vintage" (year of establishment or revision of this Recommendation) indication was proposed and agreed. Participants are requested to review the text further and advise Mr. Beaumont by Tuesday, January 31 of their findings.

The updated text for the SG15 meeting is issued as a separate document AVC-745.

9. Draft H.32X

9.1 Transfer rate representation (AVC-723)

AVC-723 discussed definition of transfer rate for the H.32X capability and operational parameter, proposing to represent transfer rate as the value n of n x 64 kbit/s. The meeting accepted this proposal.

The meeting confirmed that the calling side decides operational transfer rates of both channels (calling side to called side, called side to calling side) in terms of value n, and that asymmetry of transfer rate is allowed; service logic of the caller decides appropriate transfer rates taking into account transmit capability, receive capability and requested transfer rate from the remote end. Bit rate at the start up of the call still needs resolution as discussed in §6.3 above.

The meeting discussed relationship between the transfer rate and traffic descriptor parameters. The following needs further study and actions:

- Request for definition of necessary AAL parameter values to use AAL1 SAR for piecewise constant bit rate operation; e.g. "undefined" bit rate value.

- Examination of the impact of projected traffic parameter definition on the piecewise constant VBR operation.
- Algorithm in the terminal to decide necessary minimum values of traffic descriptor parameters (peak cell rate, etc.) to accommodate variable bit rate source information.

The meeting recognized the necessity to define sending only terminals in H.32X. Contributions are solicited by the next meeting.

In this context, requirements of mandatory support of B, 2B, H0, H11 and H12 rates were questioned; if a two way terminal is a combination of sending only and receiving only terminals and one way terminal is not required to support interworking modes, then eventually two way terminals conforming to H.32X need not support interworking modes. Rapporteur requested to discuss these matters independently.

9.2 Text for input to the SG15 meeting (AVC-716; AVC-713, TD-4; TD-15)

The H.32X text in AVC-716 was further elaborated by an editing team which Mr. C-C. Li coordinated. During the review of its outcome TD-15, the following comments were obtained and resolved:

- In Table 1, video frame asynchronous signals -1, -2, 3 should be given concrete names.
- In §4.3, a general description should be given to indicate that the encoder should produce a bitstream compliant to the specifications for a given capability but needs not support whole tools of the defined capability, whereas the decoder should be able to accept any bit streams conforming to the specifications.
- Multipoint capabilities should be included in A2 and B2 terminals.
- In Figure 2, phase names in alphabet and number should better be aligned with those of H.320 in the next version. Indication of default audio(visual) channel need be considered. Two modes of subchannel setup should be reflected in the diagram.
- Intercommunication diagrams such as those in H.32Y should be included in §7.
- In §7.2, mandatory interworking modes of operation are specified as B, 2B, H0, H11 and H12. Some members expressed concern of extra hardware burden for H.32X terminals. This specification still awaits firm consensus as discussed in Singapore, thus an Editor's note is included to reflect this situation.

The updated text for the SG15 meeting is issued as a separate document AVC-746.

10. Draft H.32Y

10.1 Use of AAL5 for H.320 terminal adaptation (AVC-728; TD-4)

This document discusses H.320 adaptation to the ATM environments by using AAL5. After some discussion the meeting recognized the need to study this configuration in the Experts Group; members are requested to respond to this proposal and comment on how to map this configuration in H.300 series Recommendations.

Related to this input, the issue of network synchronization has been raised. It was clarified that the current H.32Y takes into account asynchronous environments as an option (use of AAL1 adaptive clock instead of synchronous transfer).

10.2 Text for input to the SG15 meeting (AVC-717; AVC-713; TD-16)

The H.32Y text in AVC-717 was further elaborated by an editing team which Mr. H. Radha coordinated. During the review of its outcome TD-16, the following comments were obtained and resolved:

- Mr. K. Yamazaki clarified the use of SDT in B-N interworking situations.
- Multipoint description should be included.
- Description of H.32Y interworking with H.32X, H.32Z.1, H.32Z.2 should be included.

- Q.2931 related questions should be sent to SG11 regarding specific Q.2931 values, interworking parameters, necessary call progress indications for interworking.

The updated text for the SG15 meeting is issued as a separate document AVC-747.

11. Draft H.32Z

11.1 Scope (AVC-714, 729, TD-7)

AVC-714 discussed that the guaranteed bandwidth LAN solution is not sufficient, that ITU-T should make Recommendation(s) to accommodate non-guaranteed bandwidth LAN systems as well by defining QoS and implicitly exclude transcoding which causes extra end-to-end delay. It also provided some ideas to advise users that poor quality is caused by network problem, not ITU-T standard or terminal equipment and to automatically reject calls if QoS is too low. As a conclusion, it proposed to split H.32Z into two Recommendations; H.32Z.1 for guaranteed bandwidth and H.32Z.2 for non-guaranteed bandwidth systems.

AVC-729 discussed that the issue is not in whether the LAN is bandwidth guaranteed or not, and provided a concept of virtual H.320 terminals (combination of terminal, LAN and gateway) for Recommendation H.32Z.

Mr. D. Skran provided information on PCWG, an industry group, for open personal conferencing specification.

During the discussion, the following views were expressed:

- Defining QoS is not practical if we consider the fact that QoS has not been specified in H.320, leaving cost and complexity trade-off to design, and that technically defining QoS is not straightforward.
- Users select acceptable QoS, not QoS fixed by ITU-T.
- There is no mechanism for informing H.320 terminals on ISDN about problems on LAN.
- For interoperability between H.32Z to H.32Z on the same LAN, we need more than the "virtual H.320" specifications. Issue is open for the H.32Z terminal specification to allow different vendors.
- Some members suggested to request PCWG to bring information to our meeting, but some other members thought it unlikely.
- It should be our objective to seek maximum interoperability of audiovisual terminals regardless of the difference in networks where respective terminals are accommodated.
- ITU-T should indicate its intention to standardize the visual telephone in LAN environments by issuing H.32Z as scheduled.

After considerable discussion, the meeting concluded as follows:

- H.32Z is split into H.32Z.1 for GBW (guaranteed QoS) LANs and H.32Z.2 for NGBW (other than guaranteed QoS) LANs.
- H.32Z.1 indicates examples of guaranteed QoS LANs; Iso-Ethernet, FDDI, etc.
- We freeze H.32Z.1 in February, indicating the plan to subsequently generate H.32Z.2 in the scope.
- Further commitments are solicited for producing H.32Z.2 and possibly H.22Z; some members informally expressed possibility.

The meeting also reviewed shortly the clocking issue in the LAN environments; AVC-728 gives an example solution for N-ISDN (synchronous) and LAN(asynchronous) interconnection. This matter should be further studied towards the next meeting.

11.2 Text for input to the SG15 meeting (AVC-718, AVC-714; TD-17)

The H.32Z.1 text in AVC-718 was further elaborated by an editing team which Mr. G. Morrison coordinated. During the review of its outcome TD-17, the following comments were obtained and resolved:

- The title should indicate guaranteed QoS instead of original "guaranteed delivery", where guaranteed QoS is defined to be equivalent to that of N-ISDN.
- Inclusion of ATM LAN in H.32Z.1 is not appropriate; H.320 adaptation to ATM environments has already been defined as H.32Y.
- Standard interface of H.32Z.1 terminal and gateway with QoS guaranteed LAN, particularly with respect to user-to-network signalling, should be given to allow interoperability among different equipment manufactured by different providers, otherwise H.32Z.1 becomes a Recommendation addressing a black box of gateway, LAN and terminal combined, then the specifications become identical to H.320 and H.32Z.1 loses its raison d'etre. In this sense, listing FDDI as an example of H.32Z.1 system is not appropriate because it does not have a signalling standard. This comment was resolved by specifying that such LANs should conform to the terminal addressing specification which is to appear in the projected H.32Z.2.
- In Figure 1, an H.32Z.2 regime should be included.
- Possible support of MCU by the gateway should be mentioned in §3. It is noted that such MCU may incorporate H.331 type (broadcasting type) facilities.

The updated text for the SG15 meeting is issued as a separate document AVC-748.

12. Work plan and work method

12.1 H.32X hardware trials

Four organizations (GCL, KDD, NTT, Sharp) in Japan are preparing for the field trial. New volunteers are encouraged to participate as stated in Singapore (see §9.3/AVC-707R).

12.2 Second phase work (TD-3)

Rapporteur requested to consider the future work plan on the expectation that basic specifications and verification of core technology will be obtained by November 1995. Enhanced functionalities such as continuous presence multipoint utilizing the B-ISDN features are to be studied among others.

Correspondence and discussions at the next meetings are needed to help SG15 to identify its tasks in audiovisual / multimedia areas during and beyond the next study period (1997-2000).

12.3 Harmonization with other group activities (TD-3)

As a continuation of the Singapore closing session, the meeting discussed how to collaborate with MPEG on DSM-CC and RTI.

We identified that DSM-CC will constitute an essential element of H.32X A1 and B1 terminals and need alignment with H.24X signalling. Though some members expressed concern for lack of expertise in the current Experts Group regarding application protocols, the meeting concluded that ITU-T SG15 should make commitments in the development of DSM-CC specifications. We will seek advice of SG15 in this respect, suggesting tentatively to seek the common text approach.

As to RTI, the meeting concluded it appropriate for us to seek another common text Recommendation which complements H.222.0.

Since it is not practical to have synchronized meetings this year, the meeting decided to collaborate with MPEG by sending delegates to the MPEG meetings.

12.4 Future meetings till November 1995

Meeting	Date	Place
19th	15-18 May 1995	Telia Research, Stockholm
20th	week of 23 or 30 October 1995	to be determined

END

Annexes

Annex 1 Documents for the Kamifukuoka meeting
Annex 2 DSM-CC over ATM architectures and session descriptions
Annex 3 Protocol stack for H.24X
Annex 4 Liaison to SG8 on multiple VCs and error free transport protocol for H.24X
Annex 5 Requirements for Q.2931 signalling in form of liaison statement
Annex 6 Liaison on ATM performance assumptions
Annex 7 Network adaptation for the broadband audiovisual communication
Annex 8 Correspondence to SA&A/The ATM Forum and SAM / ETSI NA5
Annex 9 Network adaptation Protocol Reference Model

Participants of the eighteenth meeting of the Experts Group for Video Coding and Systems in ATM and Other Network Environments held in Kamifukuoka, Japan

Country	*Name*	*Organization*
Australia	Mr. Stuart Dunstan	Siemens
Belgium	Mr. Olivier Poncin	BELGACOM
Canada	Mr. Vahe Balabanian	BNR
Korea	Mr. Jin-Soo Kim	KAIST
USA	Mr. Chia-Chang Li	AT&T
	Mr. Jeffrey J. Lynch	IBM
	Mr. Hayder Radha	AT&T
	Mr. Dale Skran	AT&T
	Mr. Gary A. Thom	DIS
	Ms. Andria Wong	Bellcore
Finland	Mr. Ron Brown	Nokia
France	Mr. Eric Gonfia	CNET
Japan	Mr. Keiichi Hibi	Sharp
	Mr. Takao Kasahara	GCL
	Mr. Masahisa Kawashima	NTT
	Mr. Takayuki Kobayashi	GCL
	Mr. Yasuhiro Kosugi	Tokyo Electric Power Company
	Mr. Shin-ichi Kuribayshi	NTT
	Mr. Takayuki Kushida	IBM Japan
	Mr. Kazuhiro Matsuzaki	Mitsubishi
	Mr. Yuichiro Nakaya	Hitachi
	Mr. Sakae Okubo	GCL
	Mr. Kiyoshi Sakai	Fujitsu
	Mr. Shigeyuki Sakazawa	KDD
	Mr. Yasuhiro Takishima	KDD
	Mr. Tomoaki Tanaka	NTT
	Mr. Hideyuki Ueno	Toshiba
	Mr. Masahiro Wada	KDD
	Mr. Tsutomu Washida	NITUAJ
	Mr. katsuyuki Yamazaki	KDD
Netherlands	Mr. Roel ter Horst	KPN-PTT
UK	Mr. David Beaumont	BT
	Mr. Geoff Morrison	BT
Sweden	Mr. Sven O. Akerlund	Ericsson Business Networks

Documents for the Kamifukuoka meeting (24-27 January 1995)

Normal Documents

AVC number	Pur-pose	Title (Source)
AVC-708R	R	Report of the seventeenth Experts Group meeting in Singapore(1-11 November 1994) - Part I and Part II (Rapporteur)
AVC-708R	R	Report of the seventeenth Experts Group meeting in Singapore(1-11 November 1994) - Part III (Rapporteur)
AVC-709	R	Response to Draft ITU-T Rec. H.222.0 I ISO/IEC 13818-comments (S. Dunstan)
AVC-710	P	Draft H.24X (M. Nilsson)
AVC-711	R	SG13 Report and Liaison Statement on AAL Matters (SG13 Rapporteurs for Q.6/13)
AVC-712	R	Liaison Statement on ATM Network Performance (SG13 Rapporteurs for Q.16/13)
AVC-713	R	List of open issues towards the Kamifukuoka meeting (Rapporteur)
AVC-714	D	LAN video standardization (AT&T)
AVC-715	P	Draft H.222.1 (Editor, Stuart Dunstan)
AVC-716	P	Draft H.32X (Editor, Chia-Chang Li)
AVC-717	P	Draft H.32Y (Editor, Hayder Radha)
AVC-718	P	Draft H.32Z (Editor, Geoff Morrison)
AVC-719	P	Usage of ITU-T stream_id (Japan)
AVC-720	P	Usage of program and program element descriptors (Japan)
AVC-721	P	Protocol Stack for H.24X Negotiation Channel (Japan)
AVC-722	P	Amendment to Capability Description in H.24X (Japan)
AVC-723	D	Representation of transfer rate in broadband audiovisual communications (Japan)
AVC-724	D	H.24X channel (Japan)
AVC-725	D	C&I signals and their channels (Japan)
AVC-726	D	Identification of H.32X, H.32Y and H.320 at the start of the call (Japan)
AVC-727	I	Hardware Experiment on Bit Errors (Japan)
AVC-728	D	Use of AAL5 for adapting narrow-band audiovisual terminals to broad-band ISDN environments (Japan)
AVC-729	D	Comments on H.32Z (Japan)
AVC-730	P	DSM-CC over ATM architectures and session descriptions (BNR)
AVC-731	D	DSM-CC over ATM profiles for hybrid ATM/MPEG and full ATM architectures (BNR)
AVC-732	P	Pretransmission of high priority information (AT&T)
AVC-733	P	On the need for including frame numbers in transport stream packets (AT&T)
AVC-734	P	Only P-frame coding for multipoint video (AT&T)
AVC-735	I&P	Feedback of received jitter for RTD model (AT&T)
AVC-736	D	Comments on the decision of H.222.1 TS PDU (KAIST)
AVC-737	P	Q.2931 Signaling Enhancements to support Video-on-Demand (IBM)
AVC-738	I	ATM Forum AMS Status (IBM)
AVC-739	P	Proposal for H.222.1 acknowledged signalling procedures (Siemens)
AVC-740	P	Use of new H.222.1 stream id (Siemens)
AVC-741	P	An AAL for variable bit rate services (KPN, BT)
AVC-742	I&P	H.222.1 issues (BT)

Abstract

AVC-707R Report of the seventeenth Experts Group meeting in Singapore (1-11 November 1994) - Part I and Part II (Rapporteur)

This document records the outcome of the Singapore sole sessions held in November 1994, summarizing the discussion and identifying action items.

AVC-708R Report of the seventeenth Experts Group meeting in Singapore (1-11 November 1994) - Part III (Rapporteur)

This document records the outcome of the Singapore joint sessions held in November 1994, covering Requirements, Video, Systems and DSM sub-groups

AVC-709 Response to Draft ITU-T Rec. H.222.0 | ISO/IEC 13818-comments (S. Dunstan)

This document reports the response of the Singapore meeting to ITU-T comments on Draft International Standard ISO/IEC 13818-1: Systems in AVC-688. It also lists a number of editorial errors in IS which should be addressed.

AVC-710 Draft H.24X (M. Nilsson)

This document is a draft for the definition of terminal capabilities and their exchange procedures at the start of or during communication. The capabilities are represented in ASN.1 notation.

AVC-711 SG13 Report and Liaison Statement on AAL Matters (SG13 Rapporteurs for Q.6/13)

This document contains the outcome of the SG13 meeting in November 1994 on the AAL1/2 matters. It also includes a liaison response to SG15 and our original questions.

AVC-712 Liaison Statement on ATM Network Performance (SG13 Rapporteurs for Q.16/13)

This document provides the SG13 comments on the network performance scenario as contained in AVC-635; the assumption is reasonable for CLR, pessimistic for BER and end-to-end delay, optimistic for CDV which is noted to be strongly dependent on bit rate. There are also included several questions regarding required performance for video services.

AVC-713 List of open issues towards the Kamifukuoka meeting (Rapporteur)

This document lists open issues which were identified after the Singapore meeting. They are classified into categories of "H.222.0, H.262", "network adaptation", "C&I and DSM-CC" and Draft Recommendations "H.222.1", "H.32X", "H.32Y", "H.32Z", "H.24X".

AVC-714 LAN video standardization (AT&T)

This document discusses the importance of incorporating non-guaranteed bandwidth LANs into H.32Z from interoperability point of view, or ITU-T's role. It also addresses some technical issues with a stress on end-to-end delay. After listing two directions (to standardize the gateway interface and to standardize the gateway processing as well), this document suggests that the H.32Z effort be split into two parts; H.32Z.1 to focus on GBW LANs, and H.32Z.2 to focus on NGBW LANs, an associated H.22Z and H.24Z (it is noted that this might well be the same as H.24X, which will be used for ATM and PSTN).

AVC-715 Draft H.222.1 (Editor, Stuart Dunstan)
AVC-716 Draft H.32X (Editor, Chia-Chang Li)
AVC-717 Draft H.32Y (Editor, Hayder Radha)
AVC-718 Draft H.32Z (Editor, Geoff Morrison)

These documents contain updated drafts which reflect discussion at the Singapore meeting and subsequent correspondence. Many open issues are indicated in form of editor's comments.

AVC-719 Usage of ITU-T stream_id (Japan)

This document lists two possible methods to use the four stream_id's allocated to the ITU-T applications; 1) to make one-to-one correspondence between each stream_id of Type A - D and media, 2) to make the correspondence dynamic. It compares the two methods with respect to demultiplexing, maximum number of streams to be dealt with, and media identification at the PES level. As a conclusion, the first method is proposed as exemplified in the Annex where the first 4 bits are allocated for coding algorithm identifiers and the following 4 bits are allocated for stream numbers. Usage of Type E is proposed to be reserved without clear applications at the moment.

AVC-720 Usage of program and program element descriptors (Japan)

This document proposes H.222.1 specifications on the decoder interpretation of program and program element descriptors for the receiver and a recommended coding method for the transmitter to guarantee interoperability among audiovisual terminals. The recommended coding syntax forms a subset of the decodable set of syntax.

AVC-721 Protocol Stack for H.24X Negotiation Channel (Japan)

This document discusses three protocol stacks for the error free transport of H.24X signalling in terms of characteristics required for the H.24X signalling and functions provided by the protocol stack. It suggests to choose X.224 class 0 on top of SSCF + SSCOP and AAL5, and proposes to seek advice of SG8 in the interest of harmonization with the T.120-series protocol stacks.

AVC-722 Amendment to Capability Description in H.24X (Japan)

This document proposes to improve the ASN.1 representation of the draft H.24X specifications (AVC-710) in three ways; 1) addition of top level definition , 2) use of tagging for OPTIONAL and CHOICE type elements, 3) use of BIT STRING type instead of BOOLEAN for capability indication.

AVC-723 Representation of transfer rate in broadband audiovisual communications (Japan)

This document discusses transfer related issues such as; 1) relationship between the value declared against the network and the value at AAL-SAP, 2) transfer rate value determined by the end-to-end negotiation and its relevance to AAL parameters in Q.2931, 3) representation of bit rate values for transfer rate capability. As a conclusion, it is suggested to represent the transfer rate capability and the operational rate in 16 bit integer as the multiplier of 64 kbit/s.

AVC-724 H.24X channel (Japan)

This document compares two solutions to provide a channel for H.24X negotiation signals; 1) single solution where a VC is initially used for only H.24X signalling and subsequently expanded to accommodate audiovisual signals as well, 2) dedicated VC solution where a separate VC is used for H.24X signalling other than a VC for audiovisual signals. Since the negotiation includes choice of AAL, H.222.1 multiplex and bit rate, the dedicated VC solution is supported because of its simplicity and flexibility.

AVC-725 C&I signals and their channels (Japan)

This document lists five different type of C&I signals for broadband audiovisual communication terminals; 0) video frame synchronous control signals, 1) video frame asynchronous H.24X capability information, 2) video frame asynchronous control and

indication signals like H.230 ones, 3) video frame asynchronous DSM-CC signals, 4) video frame asynchronous mode change signals. Then it discusses appropriate channels for each category and in what Recommendation each category be specified.

AVC-726 Identification of H.32X, H.32Y and H.320 at the start of the call (Japan)

This document analyzes interworking among H.32X, H.32Y and H.320 terminals at the call setup phase of communication, pointing out that a potential problem is in H.32X placing a call in the broadband proper mode of operation. It provides three possible solutions; 1) inclusion of two or more operational modes in the setup message, 2) redialing if no response is obtained, 3) use of a priori knowledge.

AVC-727 Hardware Experiment on Bit Errors (Japan)

This document reports experimental results on visual impact of bit error on decoded pictures using an H.261 base HDTV codec. Error rates of 10-3 - 10-8 have been tested, switching on/off RS(112,108) error correction. It concludes that the results support the argument of AVC-657 that bit error correction is necessary even for the best case network performance scenario in AVC-635. Processed pictures are demonstrated.

AVC-728 Use of AAL5 for adapting narrow-band audiovisual terminals to broad-band ISDN environments (Japan)

This document discusses H.320 adaptation to the ATM environments by using AAL5, where the received clock from the N-ISDN is used for transmitting the CBR signal in case of interworking, while an independent clock is used in case of communicating with another ATM terminal. It raises that the Experts Group should urgently consider such terminal configuration and gateway functions.

AVC-729 Comments on H.32Z (Japan)

This document discusses the issue of guaranteed bandwidth vs. non-guaranteed bandwidth LAN's for generating Recommendation H.32Z. It suggests for H.32Z to require that ' H.32Z terminal + Gateway ' work as a 'virtual' H.320 terminal, not to specify whether LAN is guaranteed bandwidth and to describe the H.32Z terminal configuration and protocol for Iso-Ethernet as an example.

AVC-730 DSM-CC over ATM architectures and session descriptions (BNR)

This document identifies three potential architectures for operating MPEG DSM-CC over the ATM network; 1) hybrid ATM and MPEG switching of MPEG TS, 2) full ATM switching of MPEG TS with segregated Session Signaling, 3) full ATM switching of MPEG TS with integrated Session Signaling. It proposes that the three architectures and the two session implementation descriptions be included in the meeting report for future reference.

AVC-731 DSM-CC over ATM profiles for hybrid ATM/MPEG and full ATM architectures (BNR)

This document identifies standards profiles for the three MPEG DSM-CC over ATM architectures; Hybrid ATM/MPEG, Full ATM with segregated Session Signaling and Full ATM integrated Session Signaling. It discusses interpretations of H.32X, H.24X and H.222.1 for different DSM-CC over ATM architectures and urges SG15 to establish a work for harmonizing H.32X, H.24X and H.222.1 with DSM-CC for customer premise equipment compatibility and efficiency.

AVC-732 Pretransmission of high priority information (AT&T)

This document discusses the use of data partitioning in the network environments where different priorities are not supported, proposing that in such cases the HP information can be

pre-transmitted using a reliable transport protocol and stored in the decoder's memory to be used during the real-time decoding when cell losses occur. It lists several functionalities and corresponding syntax to achieve them.

AVC-733 On the need for including frame numbers in transport stream packets (AT&T)

This document proposes to include **frame_sequence_counter** in the Transport Stream adaptation field to facilitate the decoder recovering from moderately large packet losses , which may occur on conventional networks.

AVC-734 Only P-frame coding for multipoint video (AT&T)

This document proposes inclusion of a sequence level indicator for P-only coding to allow merging of multiple video streams with simple header manipulations so that the merged stream can be decoded by a regular decoder.

AVC-735 Feedback of received jitter for RTD model (AT&T)

This document proposes to optionally send information about the CDV, as estimated at the decoder, back to the encoder; which consists of three pieces of information an estimate of the received jitter, the available physical buffer size (once), and information about frames skipped due to decoder buffer underflow. Then the encoder can optionally adjust its coding to accommodate the CDV. This alleviates the need for the decoder to be designed with enough buffering to prevent overflow and underflow given the maximum possible jitter, it also minimizes the delay.

AVC-736 Comments on the decision of H.222.1 TS PDU (KAIST)

This document discusses overlapping fields of the MPEG-2 TS packet header and the ATM cell header towards obtaining high transmission efficiency. It indicates a possible structure of H.222.1 TS PDU where sync-byte and PID are removed to accommodate H.222.1 specific functions.

AVC-737 Q.2931 Signaling Enhancements to support Video-on-Demand (IBM)

This document proposes that the VOD application information be exchanged during call setup using B_LLI information element, that the H.222.1 information be coded in layer 2 protocol field in octet 6, and that the next two octets (6a and 6b) contain profile and selection request correlation ID. It also proposes that this request be forwarded to SG11 through SG15.

AVC-738 ATM Forum AMS Status (IBM)

This document reports the outcome of the ATM Forum AMS group meeting in December 1994, highlighting the agreement to adopt the 1-N PCR aware AAL5 packing and a baselevel of N = 2 (5/8 cell PDUs) as the default PDU size to be supported. Larger MTU size (>2) can be negotiated via signaling for SVC or network provisioning by PVCs.

AVC-739 Proposal for H.222.1 acknowledged signalling procedures (Siemens)

This document presents details of the terminal to terminal signalling using acknowledgment procedures for the set up and release of H.222.1 subchannels where PDUs are coded using PSM and PSI tables in the Program Stream and Transport Stream respectively and a descriptor identifies the meaning of the tables. Proposed text for H.222.1 is contained in Annex to this document including SDL diagrams.

AVC-740 Use of new H.222.1 stream id (Siemens)

This document proposes that only one of the ITU-T Rec. H.222.1 type A-E stream_ids is required, with the first byte of the PES packet payload (labeled as **stream_id_extension**)

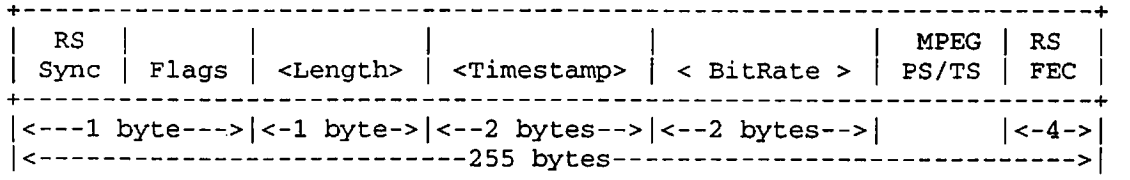
being a multiplexing field. It further proposes that the complete codespace in the **stream_id_extension** field be freely assignable.

AVC-741 An AAL for variable bit rate services (KPN, BT)

The document provides ETSI NA5 SAM's current progress on an AAL definition for variable bit rate services to assist SG15 in its development of an AAL for variable bit rate services. It states three VBR service specific functions; 1) detection and recovery of lost or misinserted cells, 2) either correction of CDV introduced by the network or passing of CDV information to the next higher (application) layer, 3) bit rate recovery, and then lists two alternative positions for those functions; 1) AAL2 to be defined, 2) H.222.1 layer on top of AAL1 SAR with null CS or AAL5 SAR and CPCS with null SSCS.

AVC-742 H.222.1 issues (BT)

This document addresses bit error correction and timing recovery functionality in the network adaptation, proposing the following FEC block structure providing Reed Solomon FEC and jitter removal and timebase recovery functionality in the H.222.1 layer.



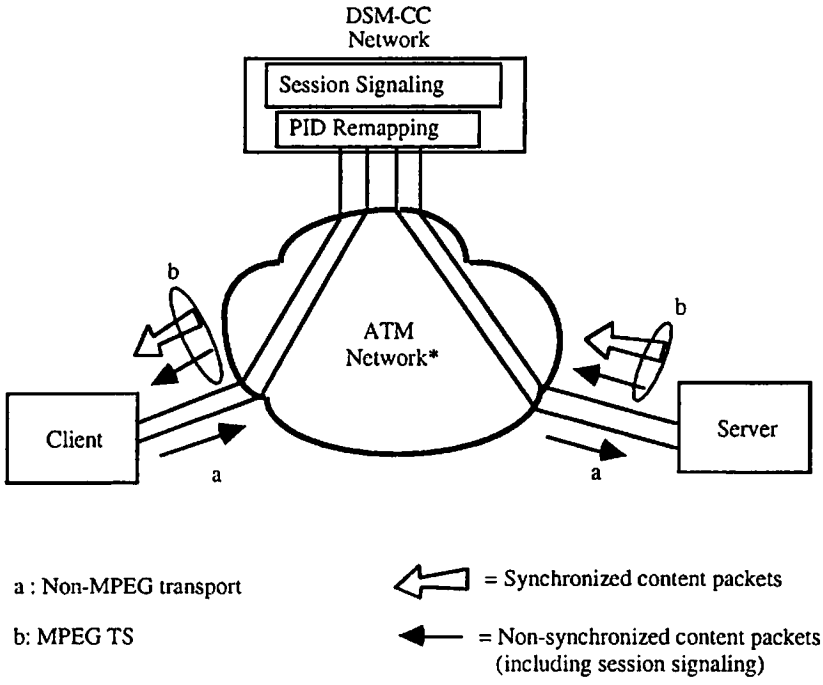
Temporary Documents

TD-1	Rapporteur	Agenda for the Kamifukuoka meeting
TD-2	Rapporteur	Available documents for the Kamifukuoka meeting
TD-3	Rapporteur	Work plan after February 1995
TD-4	S. Okubo	Observations regarding Draft Recommendations
TD-5	ITU-T|ISO/IEC	Defect report procedure
TD-6	S. Dunstan	Possible use of stream ids in H.222.1
TD-7	LBC Group	Draft Recommendation H.24P - Version 3A
TD-8	K. Yamazaki	Origin of CDV
TD-9	D. Skran	PCWG press release
TD-10	S. Dunstan	Report on network adaptation and Draft Rec. H.222.1, 24-25 January 1995
TD-11	V. Balabanian	Terminal information exchange during call set-up
TD-12	Secretariat	List of participants
TD-13	S. Dunstan	Draft of H.222.1 following the Kamifukuoka meeting
TD-14	Editorial Group on Draft H.24X	Actions to revise AVC-710
TD-15	C-C. Li	Draft Recommendation H.32X
TD-16	H. Radha	Draft Recommendation H.32Y
TD-17	G. Morrison	Draft Recommendation H.32Z.1
TD-18	S. Dunstan	Update of H.32X network adaptation protocol reference model
TD-19	K. Hibi	Consideration on H.24X protocol stack
TD-20	K. Hibi	Draft correspondence to SG8 on multiple VCs and error free transport for H.24X
TD-21	H. Radha	Response to a previous Liaison and request for comments
TD-22	L. terHorst	Network adaptation and profiling for the broadband audiovisual communication systems and terminals
TD-23	Rapporteur	Draft meeting report

END

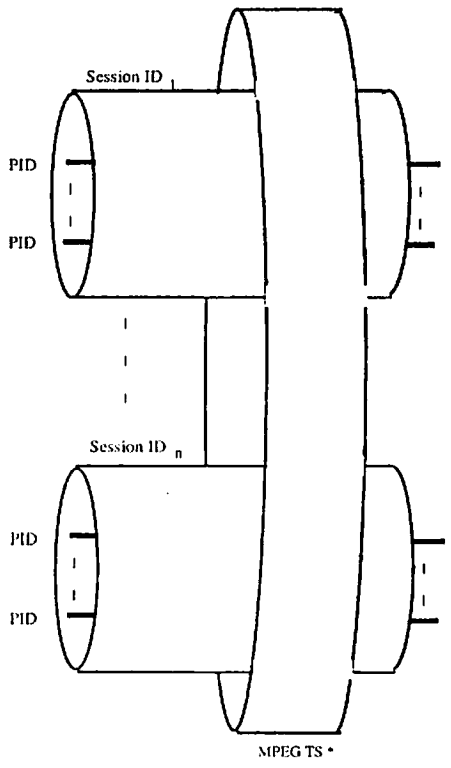
DSM-CC over ATM Architectures and Session Descriptions

This annex reproduces three architectures and the two session implementation descriptions in AVC-730 for future reference.



*Note: ATM Network includes ATM core, access and premise networks

Figure 1: Hybrid ATM/MPEG switching of MPEG TS architecture



* Note: The MPEG TS is carried over an ATM Virtual Channel (VC)

Figure 2: Session make-up in architecture 1

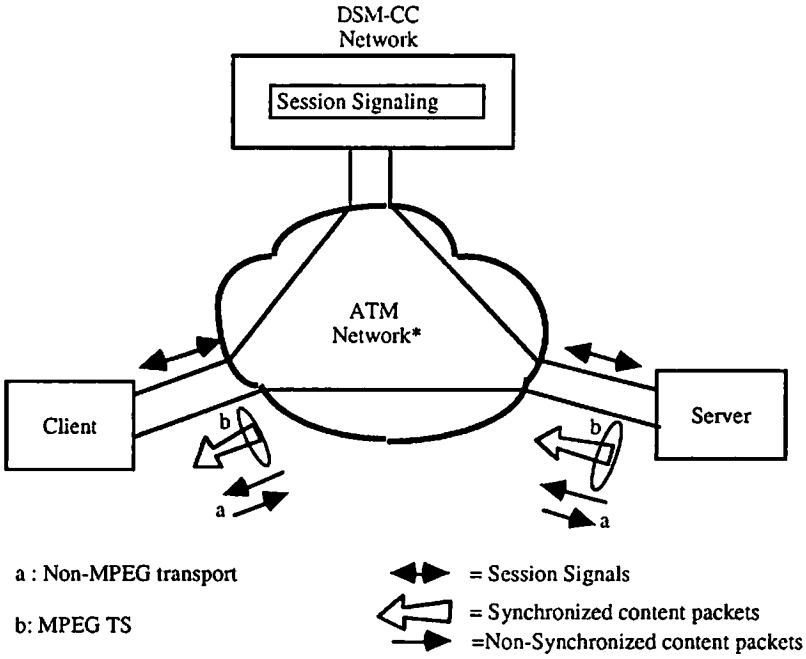


Figure 3: Full ATM switching of MPEG TS with segregated session signaling

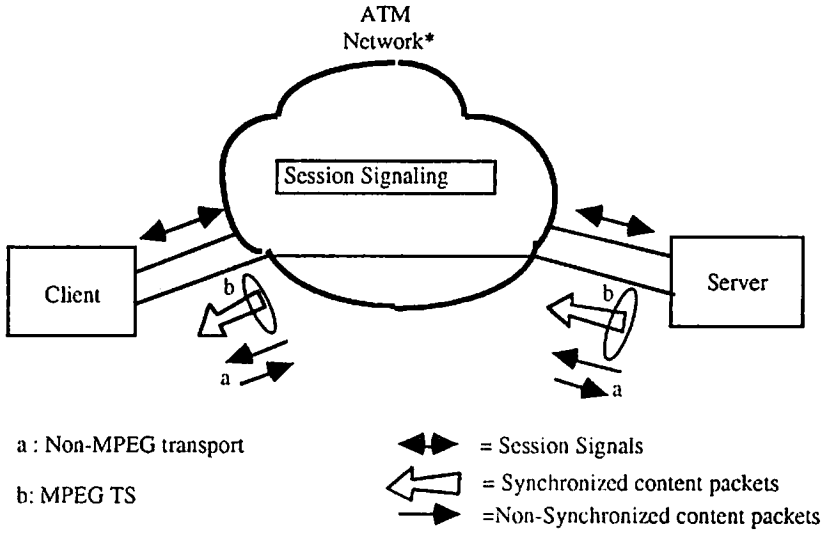


Figure 4: Full ATM switching of MPEG TS with integrated session signaling

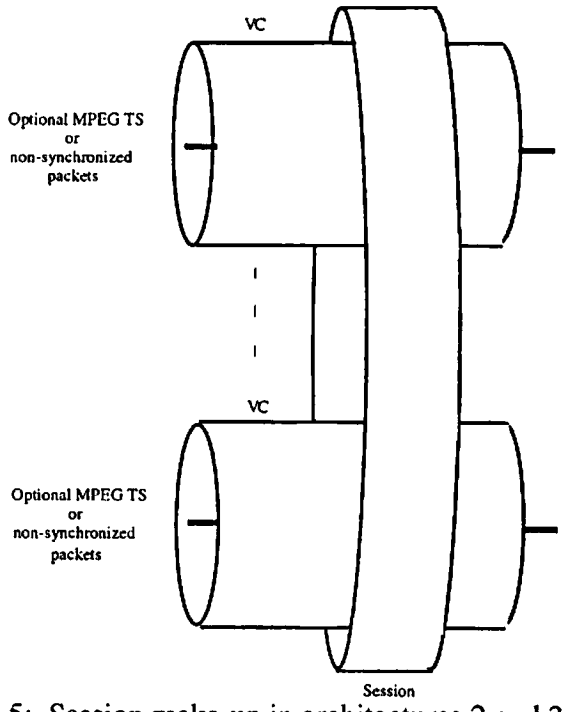


Figure 5: Session make-up in architectures 2 and 3

Reference

AVC-730 "DSM-CC over ATM Architectures and Session Descriptions (BNR)", Janury 1995.

END

H.24X Protocol Stack

1. Introduction

Protocol stack for H.24X channel is considered taking the following points into account.

- applicable to both multiple VC and single VC solution
- alignment with H.24P protocol specification
- commonality with T.120 series protocol

2. SSCOP and SSCF

AVC-721 suggested X.224 class 0 with SSCF and SSCOP. Considering a single VC solution, where H.24X channel is multiplexed in H.222.1 stream, SSCOP cannot be applied. SSCOP should be allocated directly onto the AAL5 CPCS, because they are tightly coupled. In our current understandings, H.222.1 will be mapped on either AAL1 or AAL5. Therefore, we need another data link control protocol instead of SSCOP in case of single VC.

3. H.24P and T.120 series protocol

H.24P uses V.42 (LAPM) protocol as underlying transport mechanism. On the other hand, SG8 has been already using LAPF (Q.922) as a lower layer protocol for T.120 series in N-ISDN environments. The LAPM has very similar functionality and characteristics to LAPF. Therefore, LAPF is considered to be suitable for our purpose.

4. Necessity of X.224 class 0

We further discussed the necessity of X.224 class 0 protocol just below H.24X. At first, X.214 service is agreed to be suitable for lower layer interface of H.24X, considering the applicability to various network environment without the change in H.24X specification.

As pointed out in AVC-721, we have concluded that H.24X protocol stack includes X.224 class 0 to provide X.214 service. The reasons are;

- that T.120 protocol stack has both LAPF and X.224 class 0 in N-ISDN.
- that the end-to-end protocol should be necessary, in case of signaling through non-ATM network with and without network gateway.
- that it is desirable to be extendable to connection multiplexing and an application to other network environments for the future use.

5. Proposed protocol stack

Proposed protocol stack for single and multiple VC is shown in Fig. 1. The scope of H.32X type A2 and B2 terminals includes Fig.1 (a) and (b).

For achieving the alignment between H.24X and H.24P, H.24X needs to have the specification to directly interface with LAPM. However, we recommend LBC Experts group to include X.224 class 0 between H.24P and LAPM in the interest of commonality with T.120 series protocol stack.

END

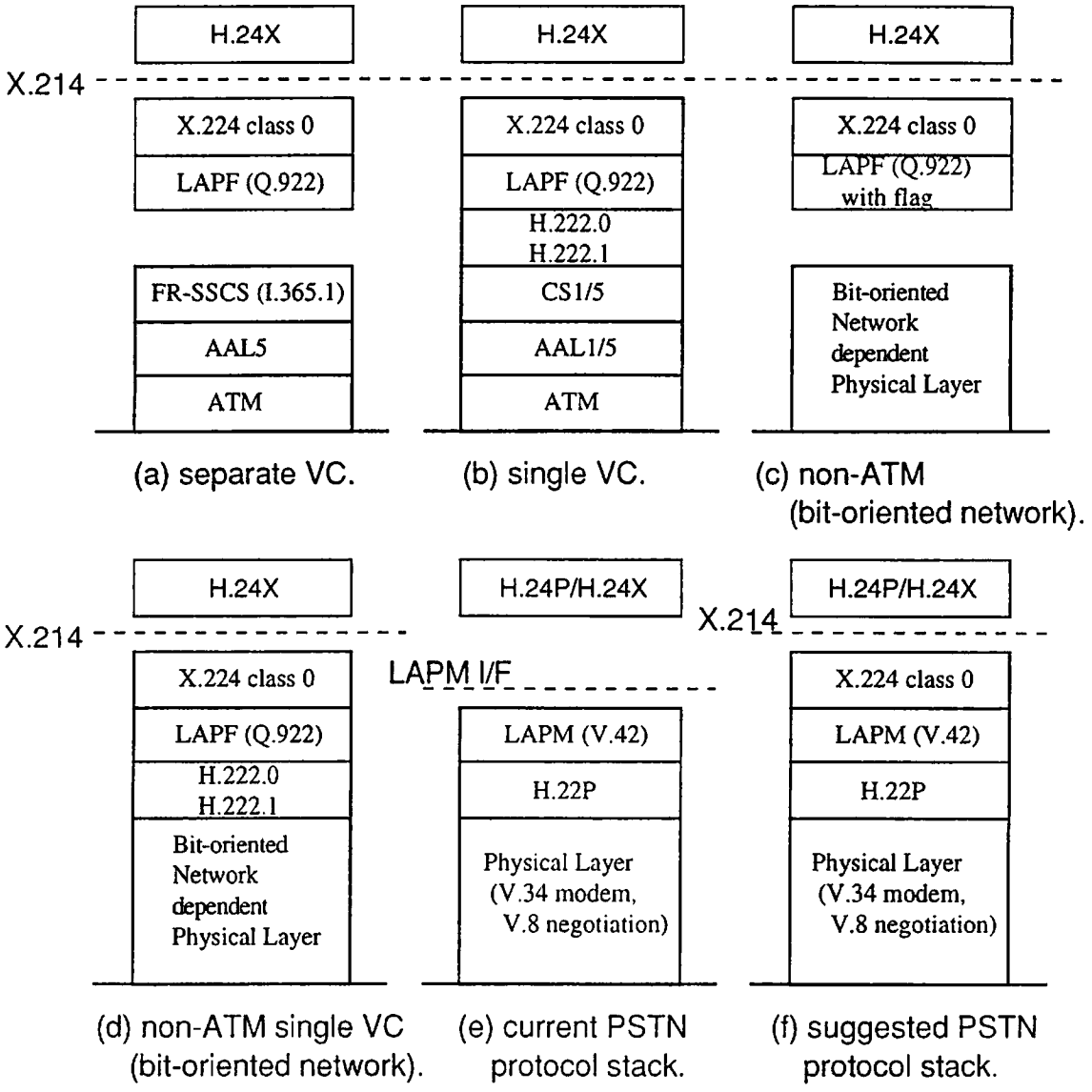


Fig.1 Proposed H.24X protocol stack.

Liaison to SG8 on multiple VCs and error free transport protocol for H.24X

SOURCE : Q.2/15
TITLE : Liaison to SG8 on multiple VCs and error free transport protocol for H.24X
PURPOSE : Response to a previous Liaison and request for comments

CONTACT : Sakae OKUBO
Rapporteur for Q.2/15
Graphics Communication Laboratories
6F ANNEX TOSHIN BLDG, 4-36-19 Yoyogi,
Shibuya-ku, Tokyo 151 Japan
Phone : +81 3 5351 0181
Fax : +81 3 5351 0185
e-mail : okubo@gctech.co.jp

Experts Group for Video Coding and Systems in ATM and Other Network Environments further discussed the highly reliable transmission for conveying H.24X negotiation information taking the harmonization with Q10/8 into consideration toward the service integration in B-ISDN generation. We tried to define the protocol stack of H.24X channel. We could reach a conclusion that H.24X should have X.214 (COTS) interface with the lower layer to be applicable to various network environments. That is the same approach as T.120 series protocol which is being studied in Q10/8. According to our progress of work, Experts Group for Video Coding and Systems in ATM and Other Network Environments makes the following comment as a reply to the liaison statement from Q10/8.

Transparent data channel in single VC

SSCOP was examined as a candidate for our protocol stack in case of multiple VC usage. We also considered the support of H.24X information transmission in single VC, using the multiplex mechanism with audio and video provided by H.222.1. In this case, H.222.1 can use either AAL type 1, 2 or 5, and data channel should be transparent and reliable for the purpose of H.24X information transmission. ATM specific method, e.g. SSCOP, cannot be applied, because H.222.1 is located just above the one of AALs in the protocol model.

Another important issue is alignment with H.24P, which is the negotiation protocol for low bitrate PSTN videophone also studied under Q2/15, the same question as B-ISDN audiovisual terminals. H.24P will use V.42 (LAPM) as underlying transport mechanism.

As the result of discussion, we decided to use LAPF (Q.922) combined with X.224 class 0 as a lower layer protocol for H.24X channel, considering the LAPM has very similar functionality and characteristics to LAPF. Proposed protocol stack is shown in the attached figure.

We can now have common protocol stack providing X.214 service for both single VC and multiple VC. We think that T.120 protocol can be embedded in H.222.1 multiplexed stream for single VC without any change. T.120 protocol stack for ATM environment will be hopefully the same as our H.24X protocol stack. Advice and comments from Q10/8 are highly appreciated for further collaborative and harmonized development of audiovisual Recommendations..

Q.2931 vs. H.24X

We have decided that indication via Q.2931 should be kept minimum. Signaling using Q.2931 information elements is focused on terminal type and stream type indication at the start up of the call. Our scope of H.24X is now capability exchange, e.g. video coding/decoding capability, audio coding/decoding capability etc. The transmission mechanism of H.230 like video frame asynchronous C&I signals will be specified in H.222.1.

ATTACHMENTS: H.24X Protocol Stack (Fig. 1 in Annex 3 to AVC-743R)
H.32X Protocol Reference Model (Annex 9 to AVC-743R)

END

Requirements for Q.2931 signalling

Source : Q.2/15
Title : Terminal Information Exchange During Call Set-up
Purpose : Request for comments

CONTACT: Sakae OKUBO
Rapporteur for Q.2/15
Graphics Communication Laboratories
6F ANNEX TOSHIN BLDG, 4-36-19 Yoyogi,
Shibuya-ku, Tokyo 151 Japan
Phone: +81 3 5351 0181
Fax: +81 3 5351 0185
e-mail: okubo@gctech.co.jp

Experts Group for Video Coding and Systems in ATM and Other Network Environment in Study Group 15 has been studying the methods by which terminal related information can be exchanged between the calling and called end points.

Two methods are being considered that can be used in a complementary fashion. These are out-of-band signaling (e.g., Q.2931) and in-band signaling (e.g., H.24X).

1. Requests on VC signaling operation

The following scenarios are envisaged:

1- A single VC established between the calling and the called terminal

In this scenario the network delay in renegotiating the QoS of the VC becomes important. Advice is sought on estimates of such delay for renegotiation.

2- Multiple VCs established between the calling and the called terminal

In this scenario the following are required:

a) Additional connections should be routed in a way that minimizes VC differential delay,
b)Since the initial call set up delay in B-ISDN (e.g., in the order of 10 seconds) is not acceptable for subsequent VCs there is a need to establish additional connections in less time.

We wish to be informed on any activity in SG11 related to item a) above and receive advice on order of magnitude estimates for item b).

In addition Q2/15 wishes to be informed on activities within SG11 that relate to specifications on end-to-end negotiation and renegotiation and the time frames for the availability of these specifications.

2. Requests on Asymmetric VC Capabilities

SG11's input is requested regarding the feasibility of the following:

a) Specification of asymmetric traffic descriptors and AAL1 parameters on Q.2931 both user-to-network and user-to-user.

b) Specification of asymmetric AAL i.e., AAL1 on one direction and AAL5 on the reverse direction

3. Request of Code Points

For both of the above scenarios 1 and 2, a decision should be made as to how terminal information can be exchanged i.e., either out-of-band or in-band.

The choice depends on the following factors:

a) The type of information exchanged e.g., terminal compatibility, capability etc.
b) The impact of this information on the connection efficiency

As a guideline Q 2/15 is following the principle that the information be carried out-of-band only if absolutely necessary.

Table 1 lists the information types, information in each type and the potential field in Q.2931. It is assumed that the terminal information is sent by the calling terminal to the called terminal to which the called terminal responds correspondingly . Based on the response the calling terminal decides whether to continue operation or disconnect the VC and specify the reason for disconnection.

Table 1: Requested terminal information on Q.2931

Information Type	Information	Information Element
Terminal Protocol	H.32X A1 & B1 H.32X A2 & B2 H.32Y H.320	B-LLI byte 6
Forward Multiplexing Capability	No multiplex TS TS with FEC PS PS with FEC H.221	B-LLI byte 6A
Backward Multiplexing Capability	No multiplex TS TS with FEC PS PS with FEC H.221	
Session ID	Session_ID	B-LLI byte 6B

Under the terminal protocol, H.32X A1 & B1 refer to mainly receive B-ISDN terminal protocols; H.32X A2 & B2 refer to both transmit and receive B-ISDN terminal protocols, H.32Y refers to an H.320 equivalent B-ISDN terminal protocol and H.320 refers to a N-ISDN H.320 terminal protocol. In the last case it is noted that the H.320 terminal is not equipped to respond with Q.2931 and an equivalent action can be taken on H.32Y (by a terminal adapter on behalf of the H.320 terminal). If the H.32Y feature is not be implemented on the adapter then no response would follow and the default of H.320 should be assumed by the H.32X A2 & B2 calling terminals. In order to study further the case of N-B ISDN interworking, SG15 seeks advice from SG11 on the status of signaling for N-B ISDN interworking e.g., Progress Indication.

Under multiplexing capability on table 1, indicated are initial conditions on the established VC. A number of options are present depending on the terminal protocol, see table 2:

H.32X A1 & B1 H.222.1 is used and the choice to be indicated is between Transport stream (TS) or Program Stream (PS) mode and whether Forward Error Correction (FEC) is used.

H.32X A2 & B2	The choice is between either not using multiplexing or using H.222.1. In the latter case a choice should be made between using a TS or a PS.
H.32Y	This case offers no choice and does not need to be explicitly indicated, however an explicit indication is preferred.
H.320	This case represent no choice and does not need to be explicitly indicated, however an explicit indication is preferred.

Session_ID is a generic parameter that indicates the correspondence of the VC to a certain previously established request carried outside Q.2931. This case arises only when the terminal protocol indications are H.32X A1 & B1.

Table 2: Relevance of information to terminal protocols

	H.32X A1 & B1	H.32X A2 & B2	H.32Y	H.320
No multiplex		√		
TS	√			
TS with FEC	√	√		
PS	√			
PS with FEC	√	√		
H.221			√	√
Session_ID	√			

Q2/15 wishes to relate to SG11 the need for the above information types with the express request for code point assignments and the earliest time for such accommodation. For this purpose suggestions for fields are provide under the column for Information Element in table 1.

End

ATM performance assumptions

Source : Q.2/15

Title : Liaison on ATM Performance Assumptions

Purpose : Response to a previous Liaison and request for comments

Contact : Sakae OKUBO
Rapporteur for Q.2/15
Graphics Communication Laboratories
6F ANNEX TOSHIN BLDG, 4-36-19 Yoyogi,
Shibuya-ku, Tokyo 151 Japan
Phone : +81 3 5351 0181
Fax : +81 3 5351 0185
e-mail : okubo@gctech.co.jp

We highly appreciate your informative input regarding our questions on our ATM Performance Assumptions which were reflected in AVC-635 (July 5, 1995 - DRAFT V1.0). Based on your input, we plan to modify our ATM performance assumptions as follows:

1) CDV values will be expressed as a function of the cell transfer time (T). We will also note in the new version of AVC-635 that (a) the shown values are applicable for high bitrate links (e.g., 155 Mb/s OC-3) and not for lower speed links for which the CDV value can be much higher than the assumed numbers, and (b) these CDV assumptions are for CBR traffic only.

2) Worst, average, and best case CDV assumptions will be modified to [400-1000T], [200-400T], and [150-200T], respectively.

3) Our worst case BER assumption will be modified to 10-7 as you recommended.

4) Our worst case delay assumption will be modified to 10 ms, and the best case assumption to 1 ms. (Both numbers exclude propagation delays)

5) Recommendation G.826 will be referenced for the definition of SES.

In response to your questions, we have the following clarifications:

1) Currently, we are in the process of defining a FEC frame for our broad band audiovisual terminals (H.32X). This FEC frame will occupy the payload of several (around five) ATM cells. It is not clear, however, if the selected FEC frame format will align itself with an (integer) multiple of ATM cells or not. Once we make our final decision of the FEC frame format, we would be more than happy to provide you with our preferred values for the N and M parameters of the SECB definition.

2) Normally, the audiovisual terminals that we are concerned with interwork among themselves over N-ISDN and/or B-ISDN networks. However these terminals have to also interwork with ordinary telephones connected to the analogue network. This is the main reason for our question about end-to-end delays. Our concern is that if the delay is on the order of 10 ms then echo cancellers would be required when communicating with ordinary telephones.

3) Time stamps with absolute values (i.e., not differential values as in SRTS) will be included in our payload. Although the particular implementation of the timing recovery method used by the decoder is not standardized, a typical implementation would use the time stamps values in conjunction with a low-pass filter and a PLL to derive the timing. The value of the CDV influences the buffer size needed to buffer the incoming payload

(which include the time stamps), and the length of the LPF used to smooth the variation between the time stamp values and the locally derived timing. Based on this typical implementation, our objective is to minimize the buffer size and the length of the LPF (in terms of the number of taps in the time-domain). Therefore, our desire is to have the CDV values as small as possible.

4) Based on our current understanding of our ATM performance assumptions, and with the help of your input, we have made the following conclusions:

   a) The recovery of lost cells will not be necessary in our broadband audiovisual terminals (H.32Y and H.32X).

   b) Protection against error events will be needed. This is the reason behind our attempt in defining a FEC mechanism for H.32X terminals. For H.32Y terminals, it is expected that the FEC capability included in Recommendation H.261 will be adequate.

   c) The assumed end-to-end delays do not represent any problem for our typical audiovisual services.

Finally, we would appreciate your help in clarifying the following issues:

1) Our previous assumption for the average BER was 10-7. After your input, this value became the worst case scenario. What would you recommend for an average value of the BER parameter? Also, what would be your advice regarding a best case BER assumption?

2) Similar question (although not as critical), regarding the average (or typical) end-to-end delay.

3) Do you have any advice regarding CDV values for the lower bitrate links (e.g., DS-1 and DS-3 rates)?

4) You mentioned the low and high-frequency CDV types in your liaison. Is it possible to control one type of CDV at the expense of the other type?

END

Network adaptation for the broadband audiovisual communication

SOURCE: ITU-T SG15 Experts group for video coding and systems in ATM and other environments
TITLE: Network adaptation for the broadband audiovisual communication systems and terminals
PURPOSE: Information

Annex 1: Report of the discussion on AAL issues in November 1994 (Annex 3 to AVC-707R)
Annex 2: Complete network adaptation protocol reference model for H.32X (Annex 9 to AVC-743R)

---

1. Introduction

In its January meeting, the ITU-T SG15 AVC experts group reconsidered the H.32X Network Adaptation Protocol Reference Model (NA-PRM) with respect to the AAL and H.222.1 functionalities. Inputs for the discussion were the report of the discussion on AAL issues from the Experts group meeting in November 1994 and the input documents AVC-741 and AVC-742.

AVC-741 was the outcome of the ETSI NA5 SAM group discussion on AAL2 and presented a proposal for a generic AAL for VBR services. AVC-742 proposed similar functionalities for inclusion in the H.222.1 specific layer of the NA-PRM.
The result of the discussion is presented here.

2. Allocation of the functions to the layers

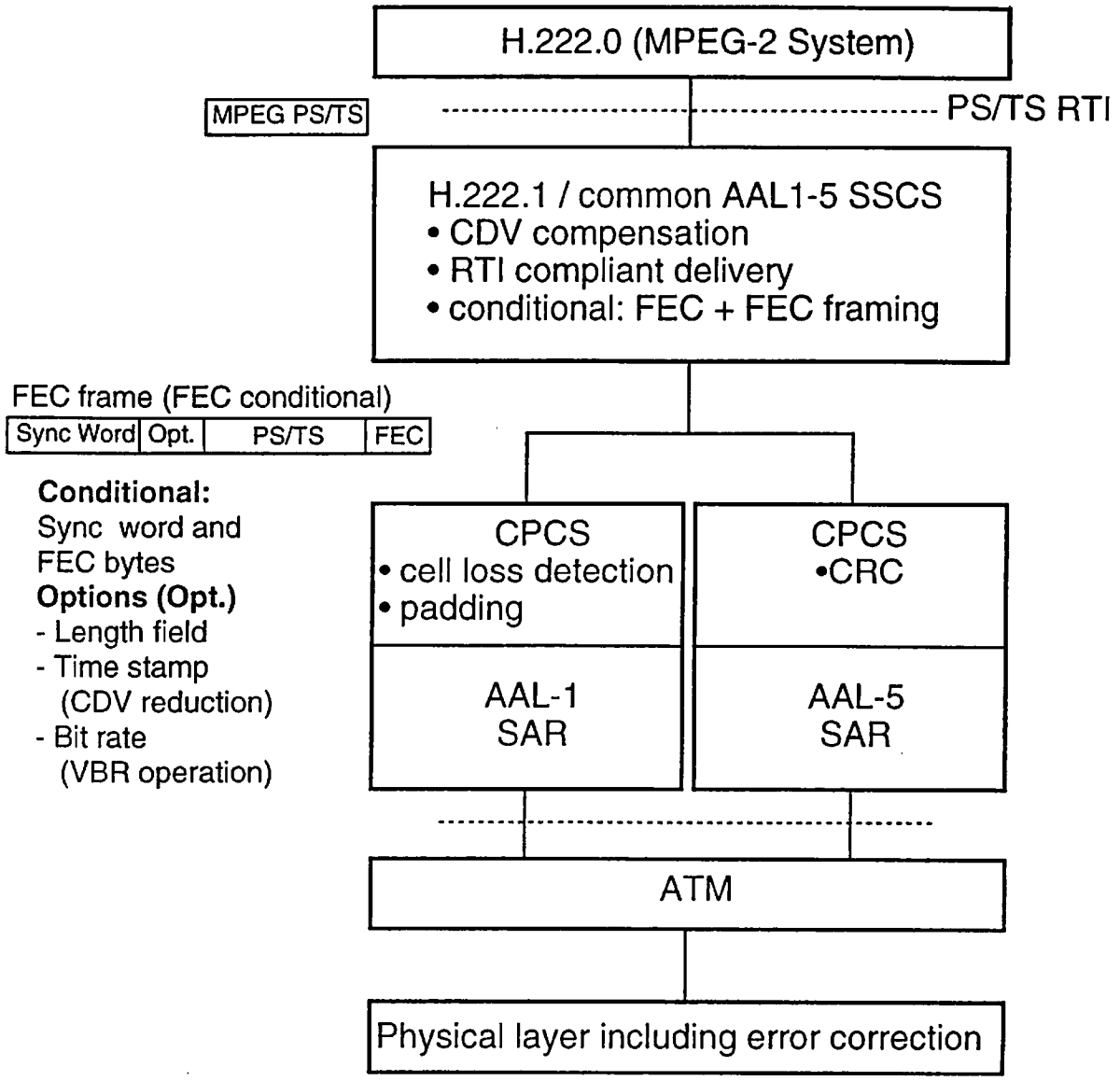
Figure 1 presents the agreed function allocation in the NA-PRM model.
This is a simplified model for the purpose of discussion that doesn't show signalling (the complete version is in Annex 2). It focusses on the AAL and H.222.1 specific layer functionalities.

The physical layer is considered to be a high quality transmission channel. This is usually achieved by inclusion of channel specific error correction for the physical transmission medium. The bit error rate available to the ATM layer is assumed to be BER < 10-7 (AVC-635: ATM performance assumptions). Although these BER figures may be sufficient for many services, we consider them as too high for high bit rate audiovisual services. Table 1 shows an indication of the mean time between errors at BER = 10-7 and BER = 10-8.

Table 1

	BER = 10^{-7}				BER = 10^{-8}			
Service bit rate [Mbit/s]	1	5	10	20	1	5	10	20
Mean time between errors [s]	10	2	1	0.5	100	20	10	5

We therefore need a service specific forward error correction for bit errors. The lowest layer in the model where it can be placed is either the AAL-CS or the H.222.1 specific layer. As the AAL-SAR and AAL-CPCS should be generic, we concluded that the H.222.1 specific layer is the appropriate one. It should be noticed that the namegiving of this layer is arbitrary: it may be indicated as H.222.1 specific layer (H.222.1 SL) or the Service Specific part of an AAL-CS (AAL-SSCS). In this document we will further indicate it as H.222.1 SL/SSCS.



a) Definition of H.222.1 / common AAL1-5 SSCS

```
+------+--------+----------+-----------------------------------+-----+
|  RS  | Option | Optional |  MPEG PS or TS bytes              | RS  |
| Sync | flags  | fields   |                                   | FEC |
+------+--------+----------+-----------------------------------+-----+
|<----1 byte--->|<--0..5-->|                                   |<-4->|
|<-------------------------------N bytes------------------------->|
```

b) Details of the FEC frame

Figure 1

The FEC and FEC framing are conditional: they are mandatory in the case of transmit and receive terminals (conversational), H.32x terminal types A2 and B2. For receive only terminals A1 and B1 and interworking mode between A2/B2 and A1/B1 further study is needed.

We concluded that in our model also the compensation for cell delay variation (CDV) is appropriate in the H.222.1 SL/SSCS. The purpose of the CDV compensation function in the receiving terminal is to deliver the user information - MPEG transports stream (TS) or program stream (PS) - to the MPEG/H.222.0 decoder, conforming to the MPEG/H.222.0 real time interface (RTI) specification. In the constant bit rate (CBR) case, this may be achieved by an adaptive clock method once the bit rate of delivery is known.

For MPEG/H.222.0 we also considered the case of piecewise continuous bit rate (PCBR), as an MPEG specific case for VBR. In this case an indication is needed for the intended delivery times of the user bytes to the RTI. Although the intended delivery schedule is in principle provided by the MPEG/H.222.0 stream itself, an independent delivery function in the H.222.1 SL/SSCS layer could be advantageous. This could be supported by optional time stamp and delivery bit rate fields in the H.222.1 SL/SSCS FEC frames. To avoid possible long framing delays in the PCBR case, partially filled FEC frames may be transmitted, with use of the lenth indication field.

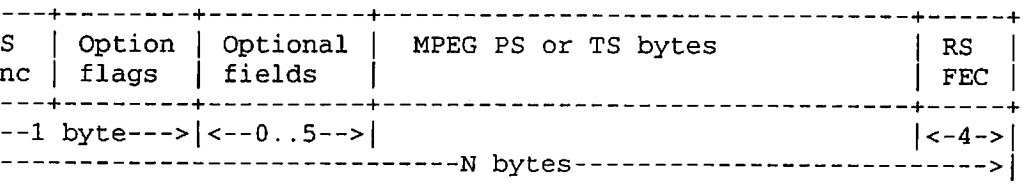
It should be realized that implementers may consider the combination of the CDV compensation function in the H.222.1 SL/SSCS layer and the clock recovery in MPEG/H.222.0 layer.

3. Protocol data unit in the H.222.1 specific or AAL-SSCS layer

The agreed proposal for the protocol data unit (PDU) in terminal types A2 and B2 is a Reed-Solomon (RS) FEC frame. Its length and number of FEC redundancy bytes have not been fully agreed yet. The advantage of the byte oriented RS code is that it is capable to correct random bit errors and short bursts of bit errors.

Document AVC-742 proposes a FEC frame length of 255 byte, with 1 byte for RS sync + options flags and 4 RS FEC redundancy bytes. This allows the correction of any two errorred bytes in the block of 255 with a FEC overhead of only 1.96 % (= (1+4)/255).
Considering the hardware availability we identified no advantage in a FEC frame length longer than 255 byte.

The FEC frame has the following structure:



Presence of the optional fields is indicated by the option flags. An illustration of possible optional fields for the support of piecewise continuous bit rate delivery is presented in AVC-742.

The experts group considered the desirability of alignment of the FEC frame in the AAL SAR-PDU. The group concluded that such alignment would be desirable to allow for easier implementation of the FEC frame synchronization, but it is not essential, since synchronization is primarily supported by the RS sync word. There was no proposal for common and useful value of N that would align well in both AAL1 and AAL5 SAR PDU's.

4. The AAL SAR and CPCS layers

The proposed FEC framing in H.222.1 / AAL-SSCS is intended to be generic for both AAL type 1 and 5 SAR and CPCS. Both of them are suitable for CBR, PCBR. Their suitability for VBR in general is for further study.

The fundamental differences between the two AAL types are:

-The AAL1 SAR supports detection of cell losses by its cell sequence counter. The generic common part CS function needed is a cell loss detection/insertion function operating on the received sequence count values. This allows to specify the exact position and number of missing bytes when cell loss is detected and for padding of the correct number of dummy bytes at this position.

-The AAL5 supports error detection in its PDU by its CRC field. In case of errors the complete PDU becomes invalid, without indication of the number of bytes that are lost or invalid. Use of a fixed PDU size would assist in padding the correct number of bytes if a PDU is invalid.

-The AAL1 SAR-PDU is fixed to a single ATM cell payload: 47 + 1

-The AAL5 SAR-PDU can be variable in length. This length will in general cover several to many ATM cells. If the CRC check is done in the receiving terminal, delivery of the PDU to the higher layer can only take place after reception of the CPCS trailer and the CRC processing. This implies a higher delay than in the AAL1.

Several views were expressed in the meeting concerning the hardware complexity and availability of AAL1 and AAL5 chips. We concluded that there is no significant difference in complexity for AAL1 SAR + sequence number processing or AAL5 CPCS including CRC check. The major difference is in the fact that AAL1 chips normally include CS functions like adaptive clock recovery or error correction, which are not essential in our NA-PRM.

5. Impact on signalling protocol

The proposed NA-PRM is not reflected in the signalling options that are currently present in the ATM Adaptation Layer parameters information element for AAL1 in Q.2931. The requested AAL parameters for AAL1 currently contain a fixed CBR value only. A new entry in the CBR rate field table for AAL1 indicating PCBR would give the correct indication. Verification is needed whether such a new entry is completely consistent in Q.2931.

6. Conclusion

There currently is no agreed opinion in the experts group on the preferred AAL type for SAR and CPCS. As we agreed that FEC is needed in the H.222.1 / AAL-SSCS, we defined a PDU for the H.222.1 / AAL-SSCS layer that is a RS FEC frame of max. 255 bytes that is independent of the choice of AAL types.

END

Correspondence to SA&A/The ATM Forum and SAM/ETSI NA5

To:	George Dubrowski	Chair, ATM Forum Technical Committee
	Dean Skidmore	Chair SA&A / AMS
	David Beaumont	Chair of SAM in ETSI NA5
From:	ITU-T SG15 Experts group for video coding and systems in ATM and other environments	
Subject:	Network adaptation and profiling for the broadband audiovisual communication systems and terminals	

ITU-T SG 15 has described its progress on standardisation of ATM network adaptation profiling for audio-visual and multimedia terminals.

ITU-T SG 15 requests that the ATM Forum and ETSI NA5 considers this work in its development on interworking agreements for audio-visual and multimedia services.

Attached is a report of the SG15 experts group discussion on the subject matter in January 1995 with an annex reporting on earlier discussions on network adaptation profiling.

ATTCHMENT: Annex 7 to AVC-743R

END

Update of H.32X Network Adaptation Protocol Reference Model

The update of the H.32X Network Adaptation Protocol Reference Model following discussions at the Kamifukuoka meeting, is shown attached.

Some issues with respect to this new diagram are as follows;

- explicit mention of the PES part of H.222.0 has been removed, mainly due to lack of space. The PES layer can be re inserted if there is strong feeling that it should be shown.

- the H.24X (TD19 Kamifukuoka) and T.120 (AVC-640) protocol stacks are illustrated. It is not the intent of the diagram to specify either the H.24X, or the T.120 series, protocol stack, but to show the point of connection with H.222.1, if H.222.1 is to be used to transport these protocols.

- H.261 is mentioned in the video coding part, but H.221 is not mentioned in the multiplex part. Perhaps H.221 should be shown as an alternative multiplex.

- review of the list of H.222.1 and AAL functions is required. The list of functions are now listed in the notes on the following page.

- it is intended that this diagram will become Appendix II of Recommendation H.222.1. Its purpose is informative.

...

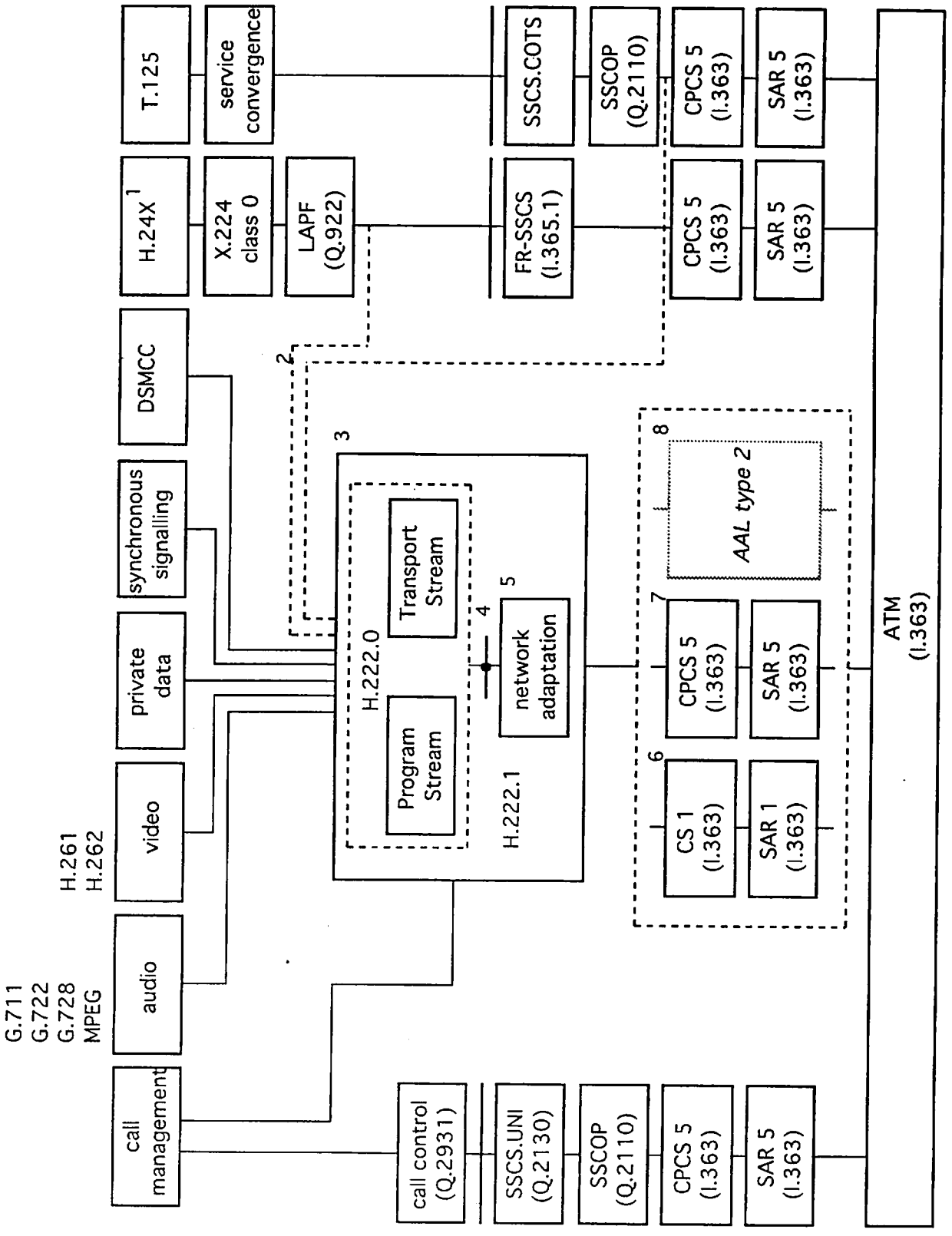


Figure 1. H.32X network adaptation protocol reference model.

Notes to Figure 1.

1) Video frame asynchronous signals are not shown explicitly in this Figure. Whether or not there are included in H.24X, a similar protocol stack will be applicable.

2) The H.24X and the T.120 protocol stacks may use H.222.1. The Figure shows the anticipated points of connection.

3) H.222.1/H.222.0 functions:
- multiplexing
- timebase recovery
- media synchronization
- jitter removal
- buffer management
- security and access control
- inband signalling
  - unacknowledged
  - acknowledged
- trick modes

4) This point represents the point at which the ISO/IEC 13818-9: Real Time Interface applies, if it is applicable. This point may not always be physically realised.

5) H.222.1 network adaptation functions:
- jitter removal
- bit error correction

6) Although AAL type 1 currently addresses constant bit rate operation, it is anticipated that the AAL type 1 SAR sublayer, and perhaps some of the AAL type 1 CS toolkit, will be used for variable bit rate operation. In the case of variable bit rate operation not all of the following AAL type 1 CS sublayer functions are applicable.

AAL type 1 CS functions:
- transmission clock recovery
- jitter removal
- bit error correction
- cell loss correction
- data structure preservation

7) AAL type 5 (CPCS) functions:
- bit error detection
- cell loss detection
- data structure preservation

8) There are no proposals for a new AAL type 2.

- end -