ITU-T TELECOMMUNICATION STANDARDIZATION SECTOR
Study Group 15
Experts Group for Video Coding and Systems
in ATM and other Environments

(Rapporteur's Group on part of Q.2/15)

Document AVC-737
January 1995

---

**Study Group 15 - CONTRIBUTION**

**Question:** 2/15

**SOURCE:** IBM

**TITLE:** **Q.2931 Signaling Enhancements to support Video-on-Demand**

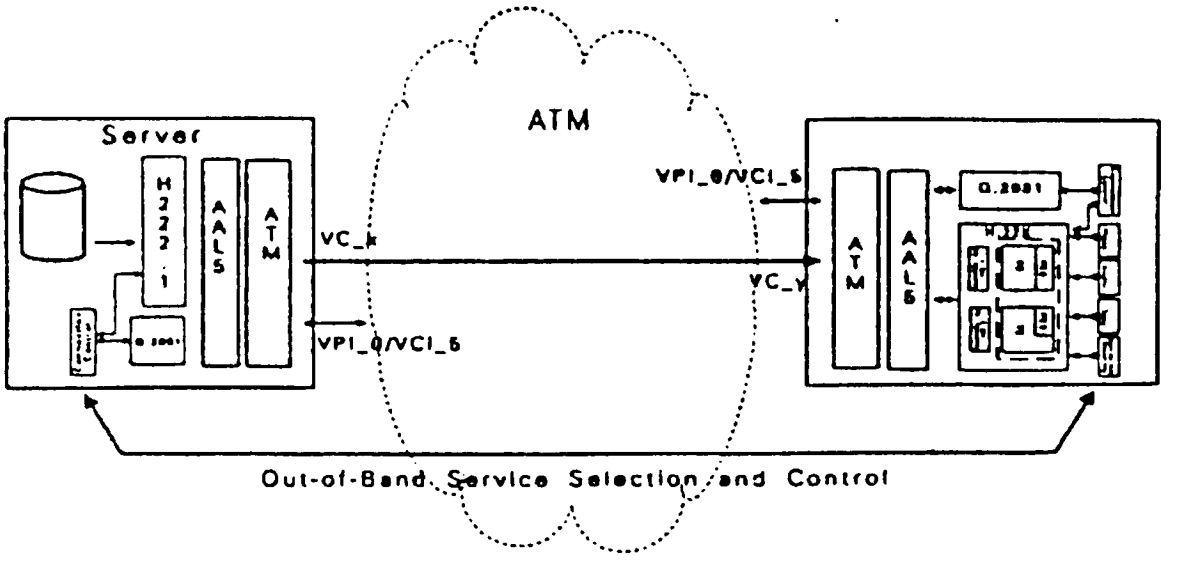
**ABSTRACT:** In addition to QOS parameters, the following signaling requirements are needed by the Video-on-Demand (VOD) application and must be passed through both private and public ATM networks:

- The H.222.1 profile to be used must be exchanged between the systems. Enhancing the Low Layer Information element to identify H.222.1 and whether TS or PS is being used should suffice.
- Content (Movie) and service selection request correlation ID

---

## INTRODUCTION AND BACKGROUND

The following figure from contribution AVC-679 (November 1994) depicts a generic reference configuration for stored CBR MPEG-2 video distribution over ATM.




The figure highlights the essential components necessary for transmitting stored video across an ATM network. The MPEG-2 data flows from a file system through H.222.1 and across an AAL-5 ATM Virtual Circuit to the target system. Where it is received, passed up to H.222.1 and is eventually delivered to the MPEG-2 Systems layer (H.222.0) for demultiplexing and eventual presentation.

The information (movies, commercials, etc. ) is stored in files in MPEG-2 Single Program Transport Stream format. Metadata associated with the file provides:

- the MPEG-2 Bit Rate,
- whether the compressed data is VBR/CBR,
- and any other necessary QOS information.

Since the video and audio information is already compressed and formatted, no encoder or multiplexer is present at the Server.

The actual service and content selection (movie to be played) is performed via an out-of-band data exchange. This exchange must provide the ATM Address (E.164 or Private ATM address), the movie title, and assign a request ID to help correlate multiple requests when more than one connection is set up between the server and client.

This information is used to establish a unidirectional VC (possibly an asymmetrical bi-directional VC with limited back channel capability) between the server and the client. The circuit setup is initiated by the server, and each VC carries one MPEG-2 single program transport stream. The ATM cell transfer rate is the MPEG-2 rate specified in the file metadata plus all transmission overhead (headers, cell and AAL structures, and so on).

## Q.2931 SIGNALING REQUIREMENTS

Q.2931 currently has the capability to indicate/negotiate:

- Asymmetrical upstream and downstream QOS and bandwidth requirements
- Constant-bit-rate (CBR) or Variable-bit-rate (VBR) operation
- The Maximum Transfer Unit (MTU) size from which the number of MPEG-2 TS packets per AAL-5 PDU can be easily derived.

In addition to the QOS parameters that are already being worked on, the following signaling parameters are needed by the VOD application and must be passed through both private and public ATM networks:

- The H.222.1 profile to be used must be exchanged between the systems.
- Content (Movie) and service selection request correlation ID

### H.222.1 PROFILE

Enhancing the Low Layer Information element to identify H.222.1 and whether the MPEG-2 TS or PS is being used should suffice. In the Low Layer Information Element:

- The 5 bit User information layer 2 Protocol field in Byte 6 set to 'xxxxx'b to indicate H.222.1.
- MPEG-2 TS or MPEG-2 PS operation identified in Byte 6a.

SELECTION REQUEST CORRELATION ID

A one byte parameter whose contents are user defined should be sufficient. It must be carried across both public and private ATM networks.

## PROPOSAL

The VOD application information is exchanged during call setup using B_LLI information element. The H.222.1 information is coded in layer 2 protocol field in octet 6. The next two octets (6a and 6b) will contain profile and selection request correlation ID.

B_LLI INFORMATION ELEMENT

| | | | |
|---|---|---|---|
| 1 | 0 | H.222.1 User information layer 2 Protocol Indicator | Byte 6 |
| 0 | Profile | | Byte 6a (Note 5) |
| 0 | Selection Request Correlation ID | | Byte 6b (Note 5) |

Note 5: This octet may be present only if octet 6 indicates Recommendation H.222.1

USER INFORMATION LAYER 2 PROTOCOL (OCTET 6, BITS 54321)

10010 Multimedia Multiplex and Synchronization for Audiovisual Communication In ATM (H.222.1)

## CONCLUSION

Recommend that the Video and Systems Expert Group request SG15 to send a liaison to SG 11 requesting the H.222.1 Profile and Selection Request Correlation ID parameters be added to Q.2931.

REFERENCES


1. "MPEG-2", *International Organization for Standardisation, Organization Internationale De Normalisation (ISO/IEC JTC1/SC29/WG11), Coding of Moving Pictures and Associated Audio.*

2. Okubo S., "Report of the Seventeenth Experts Group Meeting in Singapore (1-11 November 1994)- Part I and II" *Document AVC-707R, ITU-T SG 15 Experts Group for ATM Video Coding and Systems in ATM and Other Environments, Questions: 2/15, 3/15,* 11 November 1994.

3. "Video Distribution using CBR MPEG-2 over AAL5" *Document AVC-679, ITU-T SG 15 Video and Systems Expert Group,* November 1, 1994.

4. "Draft Recommendation H.222.1" *ITU-T SG 15 Video and Systems Expert Group,* November 1, 1994.