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Title: DSM-CC over ATM Architectures and Session Descriptions
Purpose: Proposal

Abstract:

This contribution identifies three potential architectures for operating MPEG DSM-CC over the ATM network. It proposes that the three architectures and the two session implementation descriptions be included in a Temporary Document for future reference.

1. Introduction

This contribution uses the DSM-CC Working Draft [1] as a starting point. It outlines three potential architectures for implementing DSM-CC over ATM. Consistent implementations of sessions are described for these architectures.

2. MPEG DSM-CC over ATM

DSM-CC Extensions involves three functional systems. These are the client, the network and the server, see figure 1. These three functional systems are involved during a session establishment procedure, see figure 2 [1].

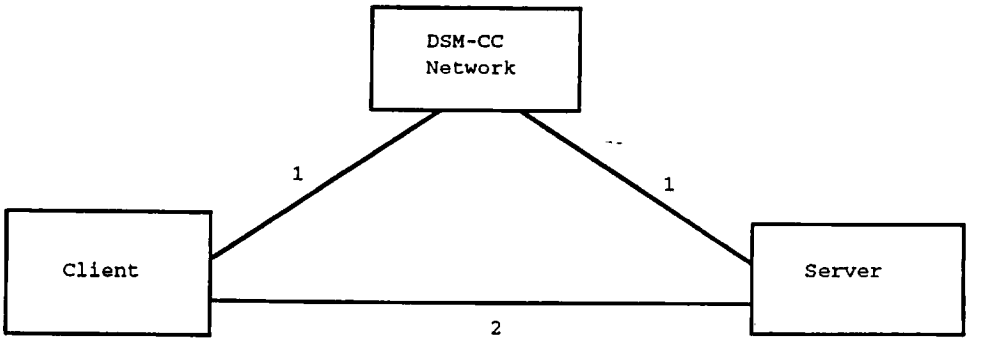
The three ATM architectures identified in this document impact on the functions performed within each system in DSM-CC shown in figure 1.

2.1 Architecture 1: Hybrid ATM and MPEG switching of MPEG TS

Figure 3 shows an example of architecture 1. In this architecture the DSM-CC Network includes the following functions:

a) Session signaling
The function of interest in this contribution is the grouping of a number of MPEG TS PIDs related to interactions between a client and a server(s), within a session.

b) PID (Packet ID) remapping
Ensures that the PIDs assigned by the server do not clash with the PIDs already in use at the client.



Key:
1: User-to-Network Primitives
2: User-to-User Primitives

Figure 1: The three systems involved in DSM-CC

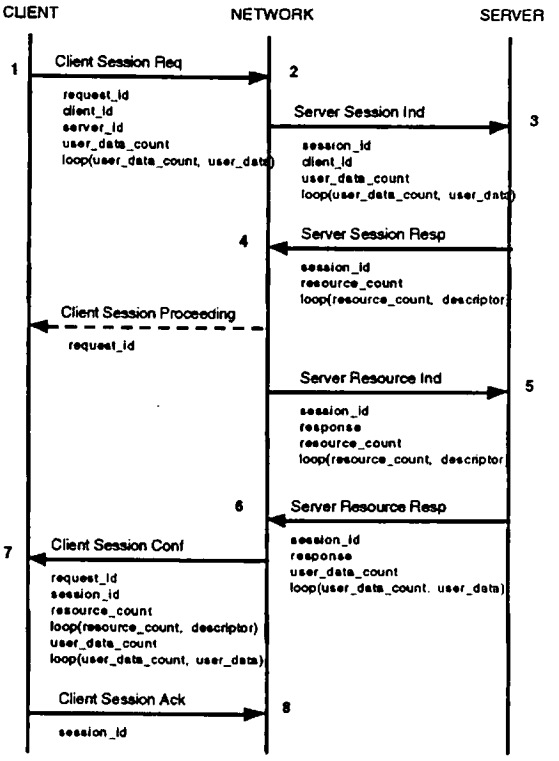
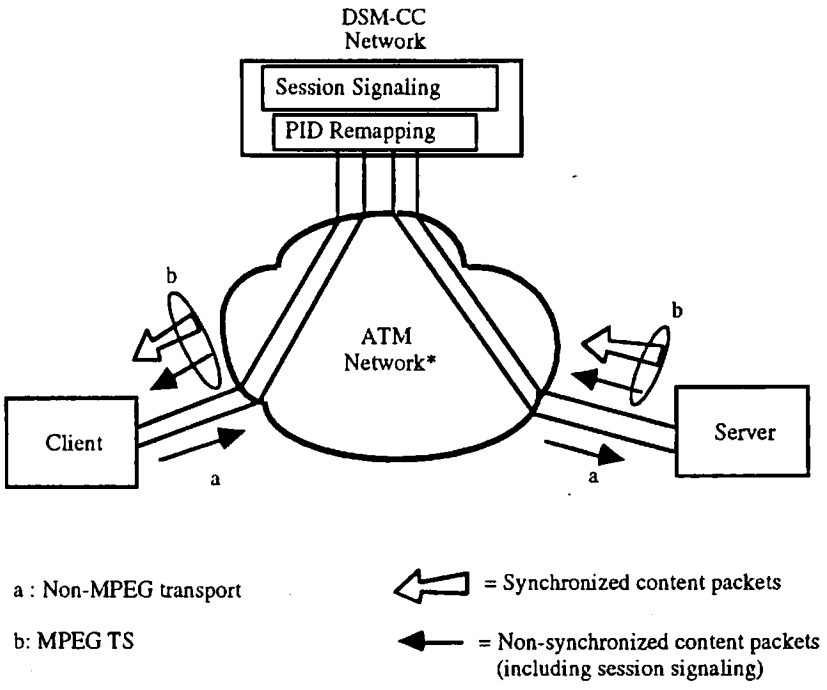


Figure 2: Sequence of Events for Client Session Set-up



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

Figure 3: Hybrid ATM/MPEG switching of MPEG TS architecture

Figure 3 for simplification shows the case of one server and one client. The arrows identified by "a" indicate non-MPEG packets (this includes packets used for session signaling). The arrows identified by "b" are MPEG packets and belong to a service session involving the client and the server. Each session consists of a group of contents, identified by different PIDs, of elementary streams carried over the MPEG TS.

Figure 4 shows a conceptual diagram of a session in architecture 1. Each line identifies a PID within a session. All the PIDs within a session are carried over an MPEG TS. An MPEG TS may comprise more than one session. The MPEG TS in turn is carried over one ATM VC. This VC could be an SVC established with the DSM-CC Network system at the start of a session establishment.

2.2 Architecture 2: Full ATM switching of MPEG TS with segregated Session Signaling

Figure 5 shows an example of architecture 2. In this architecture the DSM-CC Network only carries the session signaling function. However this function groups a number of VCs related to interactions between a client and a server(s), within a same session. Each VC in this case may carry an MPEG stream (synchronized contents) or a non-MPEG information (non-synchronized content).

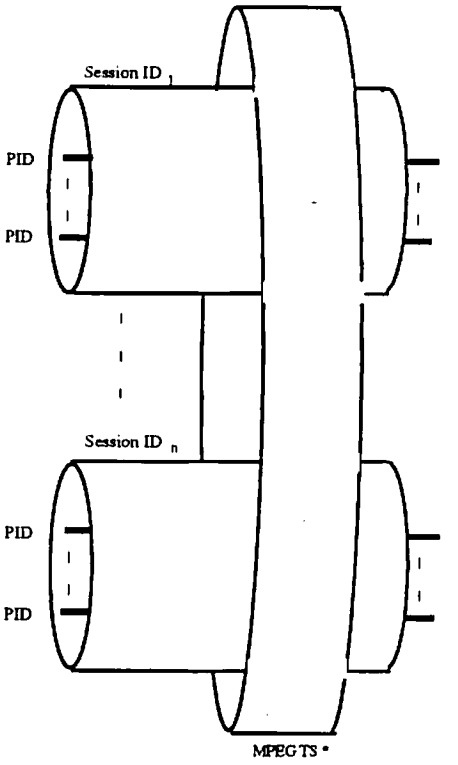


Figure 4: Session make-up in architecture 1

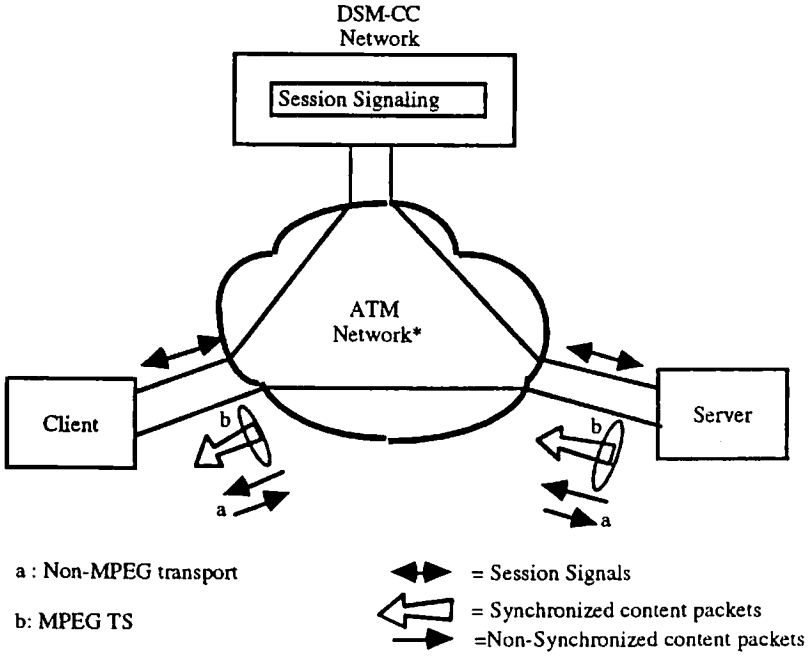


Figure 5: Full ATM switching of MPEG TS with segregated session signaling

Figure 5 for simplification shows the case of one server and one client. The arrows identified by "a" indicate non-MPEG packets. The arrows identified by "b" are MPEG packets and belong to a service session involving the client and the server.

Figure 6 shows the diagram of a session in architecture 2. Various contents are assigned to either an MPEG TS over a VC or directly to VCs. Thus more than one VC is grouped in a session and only some of these VCs contain MPEG TSs.

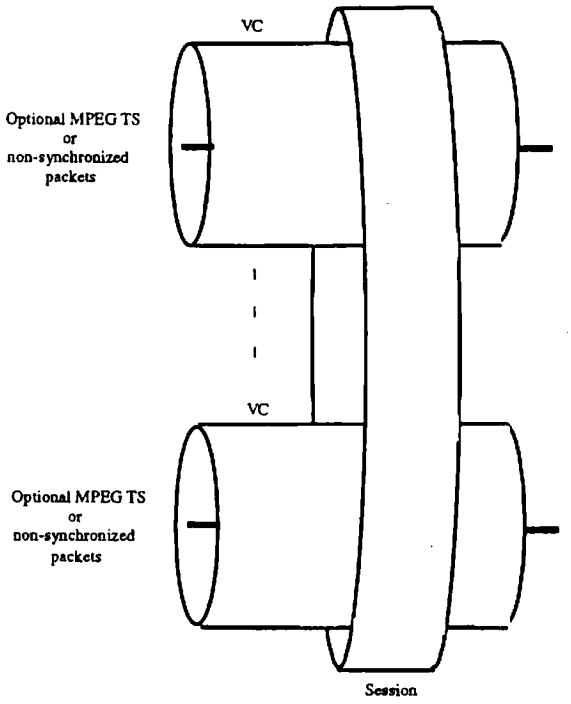


Figure 6: Session make-up in architectures 2 and 3

2.3 Architecture 3: Full ATM switching of MPEG TS with integrated Session Signaling

Figure 7 shows an example of architecture 3. In this architecture the DSM-CC Network is no longer present. The session signaling function is integrated with the ATM Network, but its function still remains the same as before in architecture 2 (i.e., full ATM with segregated session signaling). In other words it groups a number of VCs related to interactions between a client and a server(s), within a same session as shown in figure 6.

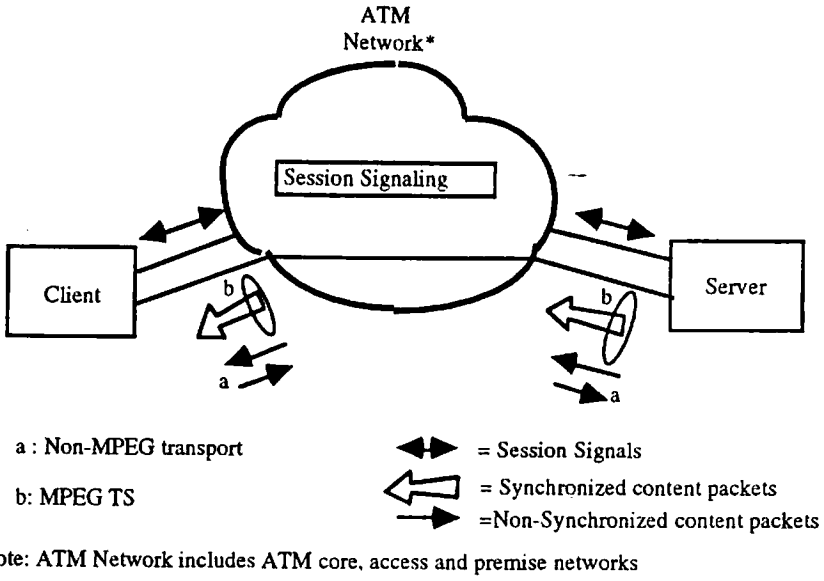


Figure 7: Full ATM switching of MPEG TS with integrated session signaling

4. Proposal:

This contribution outlined three architectures for DSM-CC over ATM. As a result the following it is proposed that the three architectures be included in a Temporary Document for future reference.

5. References:

[1] ISO/IEC MPEG 94/N0806 "Working Draft of ISO/IEC 13818-6: MPEG-2 Digital Storage Media Command and Control Extension" Nov./94.