

Source : Chia-Chang Li

Title: MPEG DSM-CC Meeting at Lausanne, Switzerland, March 20-24, 1995

Purpose: Report

1. Introduction

DSM-CC Subgroup met for five days on March 20-24, 1995, in the 29th MPEG meeting at Lausanne, Switzerland and produced the second Working Draft of ISO/IEC 13818-6 at the end of the meeting. The promotion to CD was postponed to a special meeting, which has been empowered by WG11, on May 22-24, 1995, in the Boston area of USA. The DIS and IS schedules are not affected by this decision (DIS in November '95 and IS in July '96.) There is a possibility that the promotion to IS may be pulled up to March '96.

2. Participants and Contributions

Regular attendance was approximately 45 people with many other people dropping by. Companies represented were:

Apple	GCL (Japan)	Nokia	Sybase
Bell Atlantic	General Instruments	NYNEX	Tektronix
Bell South	Hyundai	Philips	USWest
Bellcore	H-P	Oracle	Toshiba
BNR	IDS	SAGEM (France)	AT&T
CCETT	JVC	S-A	
DEC	MATRA	Sharp	
Digital Video	Microsoft	Siemens	
DiviCom	Mitsubishi	Sun	

About 40 contributions were submitted in the following areas:

- Simplifications to the U-U object hierarchy and structure
- Introduction of a service gateway concept, somewhat analogous to the U.S. Level 2 gateway function.
- Definition and coding the Normal Play Time (NPT).
- Issues of interoperability and compliance testing regarding the RPC approach of U-U primitives.
- Simplifications to the stream playback primitives.
- Proposals to carry IP data packets in MPEG transport streams
- Application Download procedures and methods for identifying client capabilities.
- Changes to the session_id format to ensure global uniqueness
- Introduction of a new user_id to identify a user independently from the physical device
- Changes to the client_id from a MAC address to various other schemes such as an IP address, E.164 or even a generic approach allowing several possible types.
- Changes to allow a session_id to be assigned by the entity that initiates the session (e.g., client or server) or the network
- Changes to improve resource negotiation and refine ATM resource descriptors
- Descriptions of Q.2931 Signaling relationships with DSM-CC in ATM applications
- Proposals for session transfer and forwarding
- Proposals to simplify and reduce the number of messages, while making their use more symmetrical between client and server.
- Proposal to have a confirmed PssThru message scenario
- Proposal for message_id encoding
- Proposal for a new ServerSessionResourceQuery

3. Summary of Related Results

This section summarizes the results that are either directly related to or may potentially impact the work in ITU-T SG15.

3.1 *User-to-Network Operations*

- On the identification of sessions, end-points (Client, Server, Network), and resources
 - The sessionId are globally unique and assignable by the entity which initiates the session setup or network. It consists of the deviceId (6 Bytes) and a sessionNum (4 Bytes).
 - The clientId, serverId, and networkId (origId) are globally unique and must be a specific address or resolvable to one. These Ids consist of an idMode (1 Byte), idLength (1 Byte), and idByte. Identified idModes include NSAP (20 Bytes), (4 or 16 Bytes), E.164 (8 or 16 Bytes), etc.
 - The resourceNum is locally unique and assignable by the requester.
- On the messages and message flows
 - Simplified messageId encoding by using the indication of Client or Server side, message class (e.g., SessionSetUp, SessionTearDown, etc.) and message type (e.g., request, confirm, indication or response).
 - Zero resource sessions were allowed.
 - Added a ServerSessionResourceQuery message to allow the Server to determine if a resource is available and/or supported for a client.
 - The Session Forward/Transfer scenarios will be furthered discussed in May.
 - Resource descriptor was modified to add a range field to allow negotiation of resources within the range.
 - Resource descriptor was modified to indicate if the requested resource is Mandatory&Non-negotiable, Mandatory&Negotiable, Non-Mandatory&Non-negotiable, or Non-Mandatory&Negotiable.
- On the use of DSM-CC in ATM environments
 - Informative Annex F was revised significantly to provide examples of using DSM-CC User-Network messages in ATM environments. Configurations discussed were:
 - > Hybrid ATM Core-Shared Access MPEG Transport Stream (e.g., on Hybrid Fiber Coax)
 - > Hybrid ATM Core-Shared Access ATM (e.g., on Hybrid Fiber Coax)
 - > End-to-end ATM segregated with Proxy (e.g., ATM network with Client and/or Server Q.2931 proxy signaling, but Session control done outside Q.2931)
 - > End-to-end ATM segregated direct (e.g., ATM network with Q.2931 by Client and Server, but Session control done outside Q.2931)
 - > End-to-end ATM integrated (e.g., ATM network with Session control done on future "extended" Q.2931)
 - The sessionId (10 Bytes) and resourceNum (24 Bytes) need to be included in the BHLI in order to be able to associate the connection to the session. A request will be made to the ATM Forum and ITU-T to increase the size of the BHLI from 8 Bytes to 34 Bytes.
 - The proposal to transport DSM-CC messages in ATM BHLI/BLLI was rejected since it requires a larger BHLI/BLLI (e.g., 250 Bytes plus).

3.2 *User-to-User Operations*

User-to-User operations continue to take the approach of Object Management Group (OMG) Interface Definition Language (IDL) to specify the primitives at the interfaces. The object structure now consists of the following logical interface classes:

- Base - operations common to all DSM objects
- LifeCycle - creation of objects
- Access - enables access to an object for manipulation purposes
- Persistent - enables transfer of objects between client and server
- Stream - enables client to interactively control MPEG streams. Includes a Playback extension
- File - access data within an object
- Directory - browse hierarchical graphs for service and multimedia object names and information

- Service - activation and deactivation of user connections to a service
- ServiceGateway - enables information provider to register new services and interfaces
- View - create and access views of object relationships via SQL statements
- Interfaces - provides a method for defining and verifying new interfaces
- Security - provides a method to pass authentication parameters with access or persistent operations

New in the structure is the ServiceGateway concept, which is somewhat analogous to the Level 2 Gateway in U.S. terminology.

The issue of Remote Procedure Call (RPC) independence continued to be discussed within the context of specifying the "bits on the wire" for compliance and interoperability. It was decided to include a client's RPC capabilities in its profile. This approach allows the server to discover the client's RPC capabilities and decide whether to match a client RPC, implement or connect to a gateway to convert its RPC to the clients, or to download a compatible RPC to the client.

3.3 *Transport of DSM-CC Messages*

DSM-CC messages can be carried over completely non-MPEG paths using a DSM-CC defined General Message Format. If they are carried in MPEG-2 Transport Streams, the DSM-CC stream types are used as follows:

stream_type	Description
0x0A	Multiprotocol (U-U RPC)
0x0B	DSM-CC Messages Header (U-N)
0x0C	DSM-CC Descriptors (NPT)
0x0D	TBD

3.4 *Normal Play Time (NPT)*

DSM-CC needs a continuous timeline over the duration of an "Event" for operations such as "Jump". STC by itself does not satisfy the requirements since it always moves forward at a normal rate and may be discontinuous. The relationship of NPT and STC is explained, at the concept level but not precisely, by the following equation:

$$NPT - NPT_reference = (STC - STC_reference) \times Play_rate$$

3.5 *Downloads*

Download facilities continued to be discussed extensively in the meeting. Three types of download were identified and used as a framework for discussion:

- DL1 (Download Level 1) is done at time of network boot and a client is downloaded, if necessary, with the minimal OS/Networking required to execute U-N primitives and the software needed to execute next level of download.
- DL2 is to download the reliable protocol stack to execute U-U primitives and the initial application to invoke service gateway.
- DL3 downloads the service specific protocol stack and application components.

DL1 and DL2 are currently specified separately in DSM-CC as User-to-Network Configuration and Initial Download, respectively. DL3 can be done using the U-U File primitives.

A mechanism was adopted to identify a client's configuration. The following rules apply to the coding of a client's configuration.

1. The first field shall be the **Manufacturer_OUI_code**, as specified by IEEE802-1990.
2. The **Manufacturer_OUI_code** shall be encoded as two hexadecimal digits per byte with no delimiters.
3. The second field shall be the **Manufacturer_id**, which is specified by the manufacturer.
4. All remaining fields shall consist of tags and their arguments if they take any.

5. Tags and arguments shall be ASCII strings which can contain any non-blank characters excluding the characters reserved by the syntax, as specified in 13818-6.
6. Arguments shall be separated from the tag by an Ò=Ò sign (0xd3).
7. A reserved list of tags is defined in 13818-6.
8. A semicolon (0xb3) in the argument can be used to indicate an embedded list.

- END -