

**INTERNATIONAL ORGANISATION FOR STANDARDISATION
ORGANISATION INTERNATIONALE DE NORMALISATION
ISO/IEC JTC 1/SC 29/WG 11
CODING OF MOVING PICTURES AND AUDIO**

ISO/IEC JTC 1/SC 29/WG 11 **N2541**

December 1998

Source: Leonardo Chiariglione – Convenor
Title: Report of 46th WG 11 meeting
Status:

1 Opening

The 46th MPEG meeting was held in Rome 99/12/07-11 at the kind invitation of UNINFO, the Italian National Body.

2 Roll call of participants

Annex 1 gives the attendance list

3 Approval of agenda

The agenda was approved (Annex 2)

4 Allocation of contributions

Annex 3 gives the list of submissions

5 Communications from Convenor

There were no specific communications made

6 Report of previous meeting

The Atlantic City meeting report could not be approved because it had not been completed at the time of the Rome meeting.

7 Processing of NB Position Papers

These were processed and a response given to each of them

8 MPEG Phase 2

8.1 MPEG-2 parts

No MPEG-2 part was processed at this meeting

8.2 Verification of MPEG-2

No work was reported on this topic

8.3 Amendments

The following amendments were processed

ISO/IEC 13818-1/PDAM 7	N2617
ISO/IEC 13818-2/FDAM 5	N2547
ISO/IEC 13818-6 FDAM 1	N2546

8.4 Corrigenda

No corrigenda were processed at this meeting

8.5 Workplan

This was approved

9 MPEG Phase 4

9.1 Version 1

9.1.1 Final Draft International Standard

9.1.1.1 System

No changes compared to the decisions in Atlantic City were made

9.1.1.2 Visual

No changes compared to the decisions in Atlantic City were made

9.1.1.3 Audio

No changes compared to the decisions in Atlantic City were made

9.1.1.4 Reference software

No changes compared to the decisions in Atlantic City were made

9.1.1.5 DMIF

No changes compared to the decisions in Atlantic City were made

9.1.2 Verification Tests

9.1.2.1 Systems

No work was reported

9.1.2.2 Video

The following reports were approved

Report Of The Formal Verification Tests On MPEG-4 Video Error Resilience	2604
Report Of The Formal Verification Tests On MPEG-4 Temporal Scalability in Simple scalable Profile	2605

9.1.2.3 Audio

No further work was made

9.1.3 Quality of service

The Implementation Study Group continued its studies on the matter

9.1.4 Conformance Testing

14496-4 was approved as a CD.

9.2 Version 2

9.2.1 Patent statements

Members were reminded that version 2 patent statements were required.

9.2.2 Requirements

Further work to refine version 2 requirements was made

9.2.3 Tools

9.2.3.1 DMIF

DMIF tools were refined

9.2.3.2 Systems

Systems tools were refined

9.2.3.3 Natural Visual

Video tools were refined

9.2.3.4 Synthetic Visual

SHNC visual tools were refined

9.2.3.5 Natural Audio

Audio tools were refined

9.2.3.6 Synthetic Audio

SNHC Audio tools were refined

9.2.4 Verification Models**9.2.4.1 System**

Verification work progressed further

9.2.4.2 Video

Verification work progressed further

9.2.4.3 Audio

Verification work progressed further

9.2.4.4 SNHC

Verification work progressed further

9.2.5 Committee Draft

Because of the emphasis placed on conformance testing version 2 could not be promoted to CD level. This will be done in Seoul without impact on the final date of approval of version 2 FDIS.

9.3 Workplan

This was approved

10 MPEG Phase 7**10.1 Requirements**

Requirements were refined,

10.2 Call for proposals

The group noted with great interest that over 600 preregistrations were received from 74 organisations.

10.3 Experimentation Model

Further considerations were made on the way to manage the MPEG-7 XM.

10.4 Workplan

This was approved

11 Overall WG11 workplan

This was approved

12 Explorations

Work on ALC continued with the intention to have subjective tests carried out in Seoul for a final decision on the matter.

13 Liaison matters

14 Administrative matters

14.1 Schedule of future MPEG meetings

This was approved

14.2 Promotion of MPEG

Updates of material posted on several MPEG sites were made.

15 Organisation of this meeting

15.1 Tasks for subgroups

Tasks were assigned to subgroups.

15.2 Finalisation of meeting allocation

The following joint meeting were held

who	who	about	day	time	where
DMIF	Systems	2on4,4onIP	Tue	09:00-12:00	Systems
Audio	Requirem	MPEG-7	Tue	11:30-12:30	Audio
Audio	Systems	timing, conf.	Tue	16:00-17:00	Audio
Video	Test	Verification	Tue	10:00-11:00	Video
Video	Requirem	MPEG-7	Tue	17:00-18:00	Video
SNHC	Systems, Req	V1 profiles	Mon	17:00-18:00	Systems
DMIF	Video, Systems	UEP	Thu	14:00-15:00	DMIF
DMIF	Systems	Appl. Sign.	Wed	18:00-19:00	Systems
Video	ISG	VCV	Wed	14:00-15:00	Video
Video	Test	VVT	Thu	14:00-15:00	Video
Req	Audio	ver. 2	Thu	14:00-14:30	Audio
Req	Systems	ver. 2	Thu	09:00-10:30	Systems
Req	Video	ver. 2	Thu	18:00-18:30	Video
Req	SNHC	ver. 2	Thu	14:30-15:00	SNHC
Req	DMIF	ver. 2	Thu	08:30-09:00	Req.
SNHC	ISG	miscell	Thu	09:00-10:00	SNHC
ISG	Systems	IPMP	Thu	10:00-11:00	IPMP
ISG	Requirements	MPEG-7	Wed	13:00-13:30	Req.
Req	Video, Systems	Chromakey	Wed	11:30-12:00	Video
SNHC	Systems	Miscell	Thu	11:00-12:00	Systems
SNHC	DMIF, ISG	data partit.	Thu	14:00-14:30	SNHC
SNHC	Systems, Requ.	FA profile	Thu	10:00-10:30	Systems

16 Planning of future activities

The following ad hoc groups were established:

2628	AHG on 3D Model Coding
2619	AHG on Advanced BIFS
2586	AHG on audio part of MPEG-4 FDIS & Reference Software editing

2594	AHG on Computational Graceful Degradation
2556	AHG on core experiments in MPEG-4 video
2561	AHG on display of interlace material on progressive monitors
2558	AHG on editing the documents of the MPEG-4 Visual FDIS, the MPEG-4 video verification model and the MPEG-4 visual working draft
2627	AHG on Face and Body Animation
2623	AHG on IM 1
2629	AHG on integration of still texture and 2D/3D mesh coding
2622	AHG on Intellectual Property Management & Protection
2585	AHG on MPEG-4 Audio Conformance
2587	AHG on MPEG-4 Audio V2 editing and software progression
2591	AHG on MPEG-4 backchannel
2624	AHG on MPEG-4 Content on MPEG-2 Systems
2625	AHG on MPEG-4 Content on the Internet
2621	AHG on MPEG-4 File Format
2589	AHG on MPEG-4 V2 core experiments
2626	AHG on MPEG-4 Version 2 Systems Profiles and Levels
2559	AHG on MPEG-4 video encoder optimization
2560	AHG on MPEG-4 Video Verification tests
2588	AHG on MPEG-7 audio matters
2596	AHG on MPEG-7 Requirements
2597	AHG on MPEG-7 Test and Evaluation issues
2620	AHG on MPEG-J
2557	AHG on software integration and verification in MPEG-4 video
2618	AHG on Systems Conformance
2595	AHG on video Decoder Quality of Service
2598	AHG on XM development

17 Resolutions of this meeting

These were approved

18 A.O.B

There was no other business

19 Closing

The meeting was closed on 98/12/11 21:15.

Annex 1
Attendance list

Addington	Tim	Scientific Atlanta	US
Ahn	Chieteuk	ETRI	KR
Ando	Ichiro	JVC	JP
Ando	Tsutomu	Canon, Inc	JP
Araki	Tadashi	Ricoh Co., Ltd.	JP
Asai	Kohtaro	Mitsubishi Electric Corporation	JP
Au	Oscar	HKUST	HK
Avaro	Olivier	Deutsh Telekom	FR
Balabanian	Vahe	Nortel Networks	CA
Baroncini	Vittorio	FUB	IT
Battista	Stefano	ST Microsystems	IT
Bauer	Sven	Robert Bosch GmbH	DE
Belknap	William	IBM	US
Bell	Bob	Mitsubishi Electric America	US
Benzler	Ulrich	University of Hannover	DE
Bonnet	Michel	Laboratoires d'Electronique Philips	FR
Bormans	Jan	IMEC	BE
Bossen	Frank	EPFL	CH
Brandenburg	Karlheinz	FhG-11S	DE
Bray	Alvar	SRF/PACT	UK
Budagavi	Madhukar	Texas Instruments	US
Burns	Ron	Hughes Electronics	US
Buxton	Mark	Intel Corporation	US
Capin	Tolga	EPFL	CH
Carvalho	Antonio	Queen Mary & Westfield College	UK
Casalino	Franco	CSELT	IT
Cazoulat	Renaud	France Telecom	FR
Chau	Kwok	NJR Corporation	US
Chen	Yingwei	Philips Research	US
Chiang	Tihao	Sarnoff	US
Chiariglione	Leonardo	CSELT	IT
Choi	Jinsoo	ETRI	KR
Choi	Yanglim	Samsung Electric Company	KR
Christmas	William	Elec. Eng., University of Surrey	UK
Chung	Jae Won	Hundai	KR
Cieplinski	Leszek	Visual Information Laboratory, Mitsubishi Electric Europe	UK
Cognell	Anna	Telia Research	SE
Coleman	Mike	Five Bats Research	US
Collins	Andrew	Sony Broadcast & Professional Europe	UK
Curet	Dominique	France Telecom	FR
Daqing	Zhou	Institute of Microelectronics	SG
De Martin	Juan Carlos	CENS/CNR	IT
De Petris	Gianluca	CSELT	IT
Defee	Irek	DMI	FI
Devillers	Sylvain	Philips Laboratories	FR
Dhong	Yong-Bae	KETI	KR
DiCagno	Gianluca	CSELT	IT

Dietz	Martin	FHG IIS-A	DE
Dimino	Giorgio	RAI Research Centre	IT
Dimitrova	Nevenka	Philips Research	US
Doenges	Peter	Evans + Sutherland Computer	US
Ducrot	Andre	INRIA	FR
Duenas	Alberto	NDS	UK
Dufour	Cecile	Philips LEP	FR
Dufourd	Jean-Claude	ENST	FR
Dumitras	Adriana	University of British Columbia	CA
Ebrahimi	Touradj	EPFL	CH
Eifrig	Bob	General Instrument	US
Eklund	Roberta	Nokia Research Center	FI
Faudemay	Pascal	ASIM-LIP6-UPMC	FR
Feige	Frank	Deutsche Telekom Berkom	DE
Fernando	Gerard	Sun Microsystems	US
Fielder	Louis	Dolby Labs	US
Flaiani	Roberto	Aethra	IT
Franceschi	Olle	Ericsson Radio System AB	SE
Franceschini	Guido	CSELT	IT
Francois	Edouard	Thomson Multimedia	FR
Frater	Michael	University of New South Wales	AU
Fujita	Takehiro	Hitachi Ltd	JP
Fukunaga	Shigeru	Oki Electric Ind. Co., Ltd.	JP
Funken	Ralf	Philips Consumer Electronics	NL
Gandini	Marco	CSELT	IT
Gelissen	Jean	Philips Research	NL
Gewinner	Stefan	FHG 11S-A	DE
Glidden	Rob	Web 3D Consortium	US
Goldman	Matthew	Divicom	US
Gonno	Yoshihisa	IB Labs	JP
Grill	Bernhard	FHG IIS-A	DE
Haighton	Peter	Telexis Corporation	CA
Hartley	Ed	Lancaster University	UK
Haskell	Barry	AT&T Labs Research	US
Heising	Guido	Heinrich - Hertz - Institute, Berlin	DE
Herpel	Carsten	Deutsche Thomson Brandt GmbH	DE
Herre	Jürgen	FhG-11S	DE
Herrmann	Laurent	Philips LEP	FR
Hirose	Narumi	IPSI/ITSCJ	JP
Hoddie	Peter	Apple Computer	US
Hori	Osamu	Toshiba	JP
Horne	Caspar	Mediamatics, Inc.	US
Hotani	Sanae	NTT DoCoMo	JP
Hunter	Jane	DSTC PTY LTD	AU
Huopaniemi	Jyri	Nokia Research Center	FI
Hutter	Andreas	TV Munich	DE
Ikeda	Kazuyo	Canon, Inc.	JP
Imaizumi	Hiroyuki	NHK	JP
Imura	Koji	Matsushita Communication Industrial	JP
Inoue	Akira	Sony Corporation	JP

Inoue	Hiroshi	Canon, Inc	JP
Ito	Norio	Sharp Corporation	JP
Iwadare	Masahiro	NEC	JP
Jacob	Kilian	TU Munich	DE
Jang	Euee S.	Samsung AIT	KR
Jeannin	Sylvia	Philips LEP	FR
Jeong	Jechang	Hanyang University	KR
Joly	Philippe	ASIM-LIP6-UPMC	FR
Jot	Jean Marc	E-MU Ensoniq	US
Kalva	Hari	Columbia University	US
Kaneko	Itaru	ASCII Corporation	JP
Kar	Mukta	Cable Television Laboratories	US
Katayama	Yasuo	ASCII Labs Inc.	JP
Kawahara	Toshiroa	NTT DoCoMo	JP
Kawamura	Yoshihisa	Compaq Computer K.K.	JP
Kikuchi	Yoshihiro	Toshiba	JP
Kim	Hae Kwang	Hyundai Electronics	KR
Kim	Jinwoon	ETRI	KR
Kim	Michelle	IBM	US
Kim	Munchurl	ETRI	KR
Kim	Sang-Wook	Samsung AIT	KR
Kim	Yong Han	University of Seoul	KR
Kim	Hyeon June	LG Corporate Institute of Technology	KR
Kimata	Hideaki	NTT	JP
Knoll	Angelika	Deutsche Telekom Berkom	DE
Koenen	Rob	KPN Research	NL
Kogure	Takuyo	Matsushita Electric Industrial Co., LTD	JP
Koudoumakis	Panos	CRL	UK
Koyama	Hitoshi	NEC Corporation	JP
Kuhn	Peter	Sony Corp. Japan	JP
Lacy	Jack	AT&T Labs	US
Le Clerc	Francois	Thomson Multimedia	FR
Le Guyader	Alain	France Telecom	FR
Lee	Hung-Ju	Sarnoff Corporation	US
Leong	NG Kok	Panasonic Singapore Laboratories	SG
LeScurieux	Olivier	INA	FR
Li	Weiping	Optivision, Inc.	US
Lim	Young Kwon	ETRI	KR
Lindquist	Morgan	Ericsson	SE
Lindsay	Adam	Riverland Research	BE
Luthra	Ajay	General Instrument	US
Manjunath	B.S.	University of California at Santa Barbara	US
Martinez	Jose	Universidad Politecnica de Madrid	ES
Mary	Didier	FIAPF	FR
Mason	Arthur	NDS	UK
Matsui	Yoshinori	Matsushita Elecric Industrial Co., Ltd	JP
Mattavelli	Marco	EPFL	CH
McDermid	Ed	Avid Technology	US
McVeigh	Jeff	Intel Corporation	US
Meares	David	BBC R&D	UK

Miki	Toshio	NTT DoCoMo	JP
Miura	Norihiro	NTT	JP
Miyamoto	Yoshihiro	NEC	JP
Mlasko	Torsten	Robert Bosch GmbH	DE
Moccagatta	Iole	Rockwell	US
Moran	Francisco	Universidad Politecnica de Madrid	ES
Mori	Takeshi	NTT	JP
Morimatsu	Eishi	Fujitsu Laboratories	JP
Moriya	Takehiro	NTT	JP
Nagumo	Taketumi	Sony Corporation	JP
Nakamura	Takeshi	Pioneer Electronic Corporation	JP
Nakassis	Anastase	NIST	US
Nakaya	Yuichiro	Hitachi, Ltd	JP
Narasimhan	Mandayam A.	General Instrument	US
Neo	Sua-Hong	Panasonic Singapore Laboratories	SG
Nishiguchi	Masayuki	Sony Corporation	JP
Nomura	Toshiyuki	NEC	JP
Norimatsu	Takeshi	Matsushita Electric Industrial Co., Ltd.	JP
Ohm	Jens-Rainer	Heinrich Hertz Institute	DE
Ostermann	Joern	AT&T	US
Pandzic	Igor	University of Geneva	CH
Park	Sung-Hee	Samsung AIT	KR
Park	Soo Jun	ETRI	KR
Pawson	Dave	Oracle Corporation	US
Pefferkorn	Stephane	France Telecom	FR
Pereira	Fernando	Instituto Superior Tecnico	PT
Petajan	Eric	Lucent	US
Philippe	Pierrick	CNET France Telecom	FR
Pierangelo	Migliorati	University of Brescia	IT
Pockaj	Roberto	DIST	IT
Preteux	Francaise	INT	FR
Puri	Atul	AT&T	US
Purnhagen	Heiko	University of Hannover	DE
Quackenbush	Schuyler	AT&T	US
Rault	Jean-Bernaud	France Telecom CCETT	FR
Ray	Lee	Creative Technology Limited	US
Reader	Cliff	Reader LLC	US
Robertson	George	BBC	UK
Rossi	Lorenzo	University of Brescia	IT
Roth	Goran	Ericsson	SE
Rowe	Simon	Canon Research Centre Europe Ltd.	UK
Rump	Niels	FHG IIS-A	DE
Rynderman	Michel	Avid Technology, Inc.	US
Salembier	Philippe	Campus Nord	ES
Schirling	Peter	IBM	US
Schuster	Brigitte	Alcatel	FR
Senoo	Takanori	Matsushita Electric Industrial Co., LTD	JP
Seoung	Jun Oh	Kwangwoon University	KR
Shibata	Yoshiaki	Sony Corp. PSD Center	JP
Shin	Hyundoo	Samsung Electronics Co., Ltd.	KR

Shin	Jae Seob	Samsung	KR
Signes	Julien	France Telecom R&D	US
Sikora	Thomas	HHI	DE
Silva	Claudio	IBM Research	US
Singer	David	Apple Computer	US
Sodagar	Iraj	Sarnoff Corp.	US
Son	Se-Hoon	Samsung AIT	KR
Song	Mun Sup	Samsung	KR
Spiegel	Ehud	AutoMedia	IL
Spille	Jens	Deutsche Thomson Brandt GmbH	DE
Stepping	Michael	FTK Research Institute	DE
Stone	John	Sony Broadcast	UK
Stubbings	Clive	NDS	UK
Sull	Sanghoon	Korea University	KR
Sun	Huifang	Mitsubishi Electric, ITA	US
Suzuki	Yoshinori	Hitachi, LTD	JP
Swaminathan	Viswanathan	Sun Microsystems	US
Takahashi	Kuniaki	Sony Corporation	JP
Takamura	Seishi	NTT	JP
Takashima	Youichi	NTT Human Interface Labs	JP
Tanaka	Naoya	Matsushita Communication Ind.	JP
Taylor	Michael	Canon Research Europe	UK
Teichmann	Bodo	FHG IIS-A	DE
Thebault	Bertrand	CCETT CNET DIH	FR
Thom	David	Mitsubishi Electric America	US
Thomas	G A	BBC	UK
Toguri	Yasuhiro	Sony Corporation	JP
Vaananen	Riitta	Helsinki University of Technology	FI
Väänänen	Mauri	Nokia Research Center	FI
van der Meer	Jan	Philips Electronics	NL
Vasudevan	Vinod	Kent Ridge Digital Labs	SG
Vetter	Michael	TASC, Inc.	US
Villegas	Paulo	Telefonica I+D	ES
Vogt	Joerg-Stephan	GmbH	DE
Vollmer	Jens	Bosch	DE
Walker	Toby	Sony Japan	JP
Watanabe	Hiroshi	NTT	JP
Watanabe	Shuichi	Sharp Corporation	JP
Welter	Marco	SESI/ASTRA	LU
Westerink	Peter	IBM	US
Winder	Simon	Microsoft Exchange	US
Won	Sohn	ETRI	KR
Wu	Zhixiong	Oki Electric Industry Co., LTD	JP
Yagasaki	Yoichi	Sony Corporation	JP
Yamada	Yoshihisa	Mitsubishi Electric Corporation	JP
Yang	Chao-Kung	Hughes Electronics	US
Yong	Suk-Jin	KETI	KR
Zamora	Javier	XBIND	US
Zeug	Michael	Iterated Systems	US

Annex 2
Agenda

1. Opening
2. Roll call of participants
3. Approval of agenda
4. Allocation of contributions
5. Communications from Convenor
6. Report of previous meeting
7. Processing of NB Position Papers
8. MPEG Phase 2
 - 8.1 MPEG-2 parts
 - 8.2 Verification of MPEG-2
 - 8.3 Amendments
 - 8.4 Corrigenda
 - 8.5 Workplan
9. MPEG Phase 4
 - 9.1 Version 1
 - 9.1.1 Final Draft International Standard
 - 9.1.1.1 System
 - 9.1.1.2 Video
 - 9.1.1.3 Audio
 - 9.1.1.4 Reference software
 - 9.1.1.5 DMIF
 - 9.1.2 Verification Tests
 - 9.1.2.1 Systems
 - 9.1.2.2 Video
 - 9.1.2.3 Audio
 - 9.1.3 Quality of service
 - 9.1.4 Conformance Testing
 - 9.1.4.1 System
 - 9.1.4.2 Visual
 - 9.1.4.3 Audio
 - 9.1.4.4 DMIF
 - 9.2 Version 2
 - 9.2.1 Patent statements
 - 9.2.2 Requirements
 - 9.2.3 Tools
 - 9.2.3.1 DMIF
 - 9.2.3.2 Systems
 - 9.2.3.3 Natural Visual
 - 9.2.3.4 Synthetic Visual
 - 9.2.3.5 Natural Audio
 - 9.2.3.6 Synthetic Audio
 - 9.2.4 Verification Models
 - 9.2.4.1 System
 - 9.2.4.2 Video
 - 9.2.4.3 Audio
 - 9.2.4.4 SNHC
 - 9.2.5 Committee Draft

- 9.2.5.1 Systems
- 9.2.5.2 Video
- 9.2.5.3 Audio
- 9.2.5.4 Simulation software
- 9.2.5.5 DMIF
- 9.3 Workplan
- 10. MPEG Phase 7
 - 10.1 Requirements
 - 10.2 Call for proposals
 - 10.3 Experimentation Model
 - 10.4 Workplan
- 11. Overall WG11 workplan
- 12. Explorations
- 13. Liaison matters
- 14. Administrative matters
 - 14.1 Schedule of future MPEG meetings
 - 14.2 Promotion of MPEG
- 15. Organisation of this meeting
 - 15.1 Tasks for subgroups
 - 15.2 Finalisation of meeting allocation
- 16. Planning of future activities
- 17. Resolutions of this meeting
- 18. A.O.B
- 19. Closing

Annex 3

Documents submitted

No.	Source	Title
4173	Pete Schirling	Document Register for 46th Meeting in Roma. IT
4174	SC 29 Secretariat	Summary of Voting on ISO/IEC 13818-6/FPDAM 1
4175	SC 29 Secretariat	Summary of Voting on ISO/IEC 13818-2/FPDAM 5
4176	DAVIC via the SC 29 Secretariat	Liaison Statement from DAVIC on DAVIC Content, APIs, Metadata and Security Technical Committee
4177	Peter Westerink, Jeff Boston	Comments and suggestions for the MP4 file format VM 4.0
4178	Peter Westerink	Degradation Priority Atom
4179	Vahe Balabanian	DMIF October 1998 (Atlantic City) Meeting Report
4180	Mario L Alvisi	Collective name of PWI's: TICS handling and storage of secure digital images
4181	Martin J. Rowell & Mario L. Alvisi	Workshop and meeting held in Bologna on "TICS standards for handling and storing digital images"
4182	Stepping, Michael, Zamora, Javier, Kiderud, Joergen	DMIF Application Interface: Syntax definition
4183	Michelle Kim, Peter Westerink	Flexible Multimedia Object Time Stamps
4184	DAVIC	15th DAVIC Call for Proposal (SC 29 N 2831)
4185	Zvi Lifshitz	Agenda and Logistics for the December IM1 AHG Meeting
4186	DAVIC	Navigation tools for MPEG-2 Transport Streams and MPEG-4 streams
4187	Gauthier Lafruit, Toon Gijbels	Refined proposal for definition of "number of macroblocks per second"
4188	SC 29/WG 1	Liaison Statement from WG 1 to WG 11 (SC 29 N 2835)
4189	Tsutomu Ando	Advanced BIFS for 3D object protection
4190	Hiroshi Inoue, Toshiyuki Nakagawa	IPMP Implementation study
4191	Michael Stepping	DAI Syntax definition: Source files, C++, Java
4192	S. R. Quackenbush, D. J. Meares	Audio Subgroup- Task Group Mandates for 46th MPEG Meeting
4193	Jens Spille	Report of Ad Hoc Group on MPEG-4 Audio Conformance
4194	Chung-Sheng Li, Michelle Kim	Content Description Framework
4195	Niels Rump	IPMP Ad-hoc Report
4196	N. Nandhakumar, Dinkar Bhat	MPEG-7 Systems - Need for File Format Standardization
4197	Michel Rynderman	Comment on File Format
4198	Katsumi Tahara, Yoshihiro Murakami	Requirement and proposal for the profile structure on MPEG-4 studio profile
4199	T. Geary, S. Okubo, D. Skran, G. Thom	Liaison to ISO/IEC JTC1 WG11 SC29 MPEG-4 concerning support for MPEG-4 system and audio
4200	Jens-Rainer Ohm, Wolfram	Concepts and Architecture for MPEG-7 Experimentation

	Liebsch, Bela Makai, Karsten Mueller, Behnam Saberdest, Detlef Zier	Model
4201	Jens-Rainer Ohm	Report of AHG on Core Experiments in MPEG-4 Video
4202	Tolga K. Capin,, Srikanth Bandi,, Joaquim Esmerado,	EPFL Core Experiment Results on Body Animation
4203	Tolga K. Capin	Proposal for update to body animation specification
4204	Weiping Li	Fine Granularity Scalability Using Bit-Plane Coding of DCT Coefficients
4205	Dave Pawson	Description of seek algorithm for the mp4 file format
4206	Vahe Balabanian	Operation over Heterogeneous Networks
4207	Vahe Balabanian	Operating with non-DMIF terminals
4208	Toshiro Kawahara, Sanae Hotani	Proposed Revision to EP Tool part of MPEG-4 Audio Version 2 WD
4209	Ralf Funken	Additions to the CELP Audio part of the Conformance Working Draft
4210	Jean-Claude Dufourd	Report of AHG on Systems Conformance
4211	Jean-Claude Dufourd, Souhila Boughoufalah	BIFS conformance test coverage check list
4212	Jane Hunter	A Comparison of Schemas for Dublin Core-based Video Metadata Representation
4213	Jens Vollmer	Format of Log Files for Bitstream Exchange
4214	Yoichi Yagasaki	Ad hoc Group Report of Requirement Study for High Quality Application (N2455)
4215	Shigeru Fukunaga, Hideaki Kimata, Eishi Morimatsu	New Profile for Real-Time Communication (MPEG-4 Visual Version 2)
4216	JNB	Late Comments on ISO/IEC FCD 14496-5 (SC 29 N 2867)
4217	Niels Rump for the IPMP Ad-hoc Group	IPMP Answers to the MP4 "Matrix" questionnaire
4218	Eishi Morimatsu	Syntax Refinement of Dynamic Resolution Conversion Tool for Version 2 Visual WD
4219	Eric Scheirer	Some bitstreams for V1 Structured Audio conformance testing
4220	Graham Thomas	Ideas on composition conformance testing
4221	Philippe Salembier	Description of MPEG-7 Content Set
4222	Jean-Bernard Rault, Marc Emerit, Olivier Warusfel, Jean-Marc Jot	Audio Rendering of Virtual Room Acoustic and Perceptual Description of the Auditory Scene
4223	Jean-Marc Jot, Lee Ray, Luke Dahl	Extensions of Audio BIFS: Interfaces and Models Integrating Geometrical and Perceptual Paradygms for the Environmental Spatialization of Audio
4224	Young-Kwon Lim, Jung- Chul Lee, Youngjik Lee	The Back Channel information of the MPEG-4 Audio TTSI
4225	Jung-Chul Lee, Young- Kwon Lim, Youngjik Lee	The Conformance Bitstreams of the MPEG-4 Audio TTSI

4226	Dave Pawson	Proposal for mp4 atom versioning
4227	Dave Pawson	Source code for mp4 parser
4228	Juergen Herre, Adam Lindsay	Report of the Ad-hoc Group on Audio Activities in MPEG-7
4229	David Singer, Peter Hoddie	File format analysis and recommendations
4230	Munchurl Kim, Jun Geun Jeon, Jinsuk Kwak, Myoung Ho Lee and, Chieteuk Ahn	A user-assisted video object segmentation based on rigid and non-rigid body tracking with a Graphical User Interface
4231	T.K. Tan	Report of the Adhoc group on Software Integration and Verification in MPEG-4 Video
4232	Munchurl Kim, Jun Geun Jeon, Jinsuk Kwak, Myoung Ho Lee and, Chieteuk Ahn	User's guide Version 1.1 for a user-assisted video object segmentation tool
4233	V V Vinod, Mark Buxton	Report of AHG on MPEG-7 XM development
4234	V V Vinod, Mark Buxton	MPEG-7 XM Version 0.01
4235	Hiroiyuki Imaizumi, Shinichi Sakaida, Wentao Zheng, Osamu Mizuno, Yoshiaki Shishikui, Yasuaki Kanatsugu	Results of experiment on 4:4:4 chrominance format video encoding for MPEG-4 studio profile
4236	The National Body of Japan	Study of ISO/IEC 13818-4/PDAM3
4237	Hai Tao, Homer Chen	Semantics of BAP DCT Coding
4238	problem study group (http://www.mpeg.org/video-amendment)	PDAM for 13818-2.2: display informative text and source discription extension
4239	Alexis M. Tourapis, Oscar C. Au, Ming-Lei Liou	The Second Status Report of Core Experiment on Fast Block-Matching Motion Estimation Using Circular Zonal Search
4240	Osamu Sunohara, Yoichi Yagasaki	Requirements for the structure and functionality of MPEG4 studio profile
4241	Osamu Sunohara, Yoichi Yagasaki	The experiment results of 4:4:4 / 10bit format video coding for MPEG4 studio profile
4242	Takefumi Nagumo, Yoichi Yagasaki	application and coding efficiency of object based spatial scalability
4243	Kuniaki Takahashi, Takefumi Nagumo, Yoichi Yagasaki	Proposal for Spatial Scalability upsampling filter download syntax
4244	Norio Ito	A Result of bitstream exchange: error resilience for still texture
4245	Tomoko Aono, Norio Ito, Hiroiyuki Katata	Results of the verification test for temporal scalability
4246	Shuichi Watanabe	Three levels of descriptors for the coded visual contents
4247	Akira Inoue, Masayuki Nishiguchi	Decoder Conformance Testing Procedure for HVXC
4248	Marco Mattavelli	Report of the ad-hoc group on decoder QoS.
4249	Masahiro Iwadare,	MPEG-4/Audio Codepoint for ITU-T H.324

	Toshiyuki Nomura	
4250	Marco Mattavelli	Proposition for MPEG-4 version-2 Complexity Estimation Syntax
4251	Euee S. Jang, SungJin Kim, Munsup Song, Mahnjin Han, S. Y. Jung, Y. S. Seo	Results of CE M5 Error Resilient 3D Mesh Coding
4252	S. Y. Jung, SungJin Kim, Munsup Song, Mahnjin Han, E. S. Jang, Y. S. Seo	Results of CE M7 Color Prediction for 3D Mesh Coding
4253	Paul Christ, Christine Guillemot, Stefan Wesner	Proposed Amendments to DMIF Application Interface (DAI) and to DMIF Network Interface (DNI)
4254	Jan van der Meer	AHG report on Carriage of MPEG-4 over MPEG-2
4255	Gauthier Lafruit, Roberto Pockaj, Jan Bormans	Complexity Analysis of Facial Animation Software for CGD
4256	Gauthier Lafruit, Jan Bormans	Complexity Analysis of 3D mesh software
4257	Euee S. Jang, WD Editors	Version 2 Visual WD 5.1
4258	Tom Huybrechts, Andy Scherpenberg, Gauthier Lafruit	Demo for CGD parameter estimation in 3D rendering
4259	Yoshinori Matsui	An MPEG-4 Stream Encapsulation Method by MPEG-2
4260	Jan van der Meer	MPEG-4 over MPEG-2 Issues
4261	Web3D Consortium	Statement from Web3D Consortium to WG 11 (SC 29 N 2871)
4262	Jin Soo Choi, Myoung Ho Lee, Chieteuk Ahn	Reference software implementation status of 3D model coding
4263	Jean-Claude Dufourd	Upgrade of MDS (BIFS editing tool) for FDIS
4264	Paul Christ, Chrisitne Guillemot, Stefan Wesner	Application Signaling based on URLs in Scene Descriptions
4265	Yoshinori Suzuki, Seishi Takamura, Yuichiro Nakaya	Proposal of Acquisition Visual Object Type and Profile for MPEG-4 Visual Version 2
4266	Yoshinori Suzuki, Seishi Takamura, Yuichiro Nakaya	Revision of specifications for Global Motion Compensation
4267	Sven Bauer, Andre Kaup et al	Request for a new Visual Object and a new Visual Profile in Version 2: Main-Plus Object and Main-Plus Profile
4268	Eric Scheirer	All the things which have to be conformance-tested in Structured Audio V.1
4269	Hari Kalva, Alexandros Eleftheriadis	Using Command Descriptors
4270	Hari Kalva, Lai-Tee Cheok, Aizaz Akhtar, Javier Zamora, and Alexandros Eleftheriadis	Implementation/Demonstration of Command Descriptor Framework
4271	D.Curet	Some points of MPEG4 system conformance
4272	D.Curet	MPEG4 on MPEG2 cases and signalling
4273	Ralf Funken	Scalability in MPEG-4 Audio

4274	Bernhard Grill, Heiko Purnhagen	Report of the AhG on MPEG-4 Audio FDIS and Reference Software FDIS editing
4275	Peter Kauff, Guido Heising, Klaas Sch??r	Complexity Comparison of Texture Coding Tools for Boundary Blocks
4276	Björn Bunte, Ulrich Benzler	Evaluation of OBMC performance for bitrates between 128 and 1150 kbit/s
4277	Francoise Preteux, Titus Zaharia, Sorin Curila, Mircea Curila	Geometry Coding of 3D Meshes: Results of Core Experiment M2
4278	Francoise Preteux,, Marius Preda, Titus Zaharia	Preliminary Results on Hand BAT Interpolation
4279	Jean-Claude Dufourd	Request for an intermediate 2D Systems profile
4280	I. Moccagatta, H. Chen	MPEG-4 Verification Test - MPEG-4 fb @ low bit rate pre-screening results
4281	Anthony Vetro, Huifang Sun	Video verification tests: object-based results
4282	Anthony Vetro, Huifang Sun	Verification of FGS using bit-plane coding
4283	Francoise Preteux, Marius Preda, Titus Zaharia	Results of Core Experiment on BAP Coding
4284	Goran Roth	Results on Unequal Error Protection for MPEG-4 Video
4285	Jens Vollmer	Open Issues in Section on "Networks with ITU-T H.223 Transport" in DMIF V.2 WD 4.0
4286	David Thom,Heiko Purnhagen	Audio Web Page activity
4287	Adriana Dumitras, Faouzi Kossentini, Ali Jerbi	Proposed changes to the MPEG-7 Requirements document
4288	Ganesh Rajan	MPEG-4 Object Descriptor Framework: Some Conformance Issues
4289	I. Moccagatta, H. Chen	Proposal for modification of the Still Texture Error Resilience syntax following FDIS changes
4290	Frank Nack	MPEG-7 Requirements Documnet V. 7a
4291	Frank Nack, Ed Hartley	Report of the Ad Hoc Group on MPEG-7 Requirements
4292	Martin Dietz, Toshio Miki	Report of the ad-hoc group on MPEG-4 audio error resilience for version 2
4293	T. Ebrahimi, P. Doenges	Report of Ad hoc group on 3D model coding
4294	Madhukar Budagavi, Wendi Rabiner, Raj Talluri	Performance of unequal error protection (UEP) of MPEG-4 video and proposed extensions to DMIF for supporting UEP
4295	T. Ebrahimi, C. Horne, E. Jang, Y. Nakaya	Report of Ad hoc group on Video VM and Visual FDIS/WD
4296	Michelle Y. Kim, Peter Westerink	Demonstration of a visual MPEG-4 authoring and playback tool
4297	Zvi Lifshitz	IM1 Software Platform AHG Report
4298	Zvi Lifshitz	Editorial Comments on Systems FDIS
4299	Mahesh Subramanyan	Clarification of URL/URN/URI for usage in MP4 file format

4300	Zvi Lifshitz	MPEG-4 Player Core Code Release 1.5
4301	Zvi Lifshitz	BIFS/OD Encoder Software Release 1.5
4302	Michael Frater, Michael Wollborn, Vittorio Baroncini, Teruhiko Suzuki	Report of AHG on video verification test
4303	Viswanathan Swaminathan, Yihan Fang	Implementation Status and Demo of Sun/Columbia of MPEG-J
4304	Gerard Fernando	Report of MPEG-J AHG
4305	Riitta Vaananen, Jyri Huopaniemi	Current status and demonstrations of Advanced AudioBIFS
4306	Juergen Herre, Eric Allamanche, Ralf Geiger, Thomas Sporer	Information on MPEG-4 Low Delay Audio Coding
4307	Juergen Herre, Eric Allamanche, Ralf Geiger, Thomas Sporer	Update on MPEG-4 Low Delay Audio Coding
4308	Jan Bormans	Report of the Computational Graceful Degradation AhG
4309	Eric Petajan, Tolga Capin	FBA adhoc Report
4310	Eric Petajan, Chandrajit Bajaj	Proposal for Adding Object Mirroring and Instancing to 3D Model Coding
4311	Fan Ling, Xuemin Chen	Report on Fine Granularity Using Bitplane Coding
4312	Frank Bossen	Description of core experiments on 3D model coding
4313	Frank Bossen	Results of core experiments on 3D model coding
4314	Frank Bossen	Comments on WD for 3D model coding
4315	R. L. Schmidt, A. Puri, B. G. Haskell	Advanced BIFs Node for Keying
4316	Sadiye Guler., Michael Rizkalla., Michael F. Vetter	An Object Behavior Based Indexing Framework For Video
4317	Gauthier Lafruit	Assessment of mesh coding complexity
4318	Tihao Chiang, Huifang Sun	Report of Ad Hoc Group on Encoder Optimization
4319	Hung-Ju Lee, Tihao Chiang	Results for MPEG-4 video verification test using rate control
4320	Hung-Ju Lee, Tihao Chiang	Verification of results on CE-Q4a: Core Experiment on Fast Block-Matching Motion Estimation
4321	Iraj Sodagar, Hung-Ju Lee, Paul Hatrack, Shipeng Li, Bing-Bing Chai	Software integration and bitstream exchange of Visual Texture Coding
4322	Shipeng Li, Iraj Sodagar, Hung-Ju Lee	Status report of scalable shaping coding for visual texture coding
4323	Bing-Bing Chai, Iraj Sodagar, Paul Hatrack	Report on progress in Error Resilient Still Texture using a Packet Approach
4324	Michael Vetter	Report of the AHG on MPEG-7 Evaluation Logistics
4325	Michael Vetter	Summary of MPEG-7 Proposal Pre-registrations
4326	Michael Vetter, Stephen Long	Status of Metadata Standards at SMPTE

4327	Se-Hoon Son, Dae-Sung Cho, Sung-Gul Ryoo, Jae-Seob Shin, Takefumi Nagumo, Yoichi Yagasaki	Status report on the Reference S/W Integration for Object based Spatial scalability
4328	Michael Vetter, Stephen Long	The K-L-V Protocol for Metadata and Data Encoding
4329	Javier Zamora, Jean Francois Huard	Message Flow for DMIF Multicast
4330	Javier Zamora, Jean Francois Huard	DAI Extension for QoS Monitoring and Negotiation
4331	Yingwei Chen, Mihaela van der Schaar, Brigitte Schuster, Jie Liang, Edouard Francois	Fine Granular Video Scalability by Combining Video Object and Visual Texture Coding
4332	Regis J. Crinon	Proposal for a DSM-CC Amendment 2
4333	Gabriel Taubin, Andre Gueziec, Claudio Silva	SNHC 3D Mesh Coding Reference Software
4334	Gabriel Taubin, Andre Gueziec, Claudio Silva	SNHC 3D Mesh Coding Syntax Improvements
4335	Regis J. Crinon	General Considerations for MPEG-4 over MPEG-2 Transport
4336	Gabriel Taubin, Andre Gueziec, Claudio Silva	SNHC 3D Mesh Coding Error Resiliency by Partitioning
4337	Gabriel Taubin, Andre Gueziec, Claudio Silva	Hierarchical Encoding of 3D Meshes with Associated Properties
4338	Y.B.Thomas Kim, S.H. Park, S.W. Kim	Subjective test results on BSAC at 40kbps/stereo and 56kbps/stereo
4339	Y.B.Thomas Kim, S.H. Park	Detailed description of BSAC
4340	Y.B.Thomas Kim, S.H.Park	System issues on audio fine granule scalability (BSAC)
4341	Carsten HERPEL	Report of AHG on MPEG-4 on the Internet
4342	Yingwei Chen;, Weiping Li	Request for Further Actions on Fine Granular Video Scalability
4343	Jeong-Hwan Ahn, Yo-Sung Ho	Adaptive Coding of Multiple Components on 3D Model Coding
4344	Aaron E. Walsh	Implementing IPMP for use with VRML textures, sounds and objects
4345	Ehud Spiegel	Spline-based shape coding for support of high quality video object segmentation
4346	Joern Ostermann	Integration of face animation and TTS in IM1 3D
4347	Olivier Avaro	Liaison Statement from AIC on AIC Requirements and Architecture
4348	Olivier Avaro, Rob Glidden	Report of the Ad Hoc Group on MPEG-4 Version 2 Systems Profiles and Levels
4349	Alvar Bray, Andrea Barbieri, Paul Garrett, Ron Laborde	PactPlayer version 1.06 source code

4350	Alvar Bray, Andrea Barbieri, Paul Garrett, Ron Laborde	PactPlayer version 1.06 Test code
4351	Alvar Bray, Andrea Barbieri, Paul Garrett, Ron Laborde	PactPlayer version 1.06 Release Notes
4352	Alvar Bray, Andrea Barbieri, Paul Garrett, Ron Laborde	PactPlayer version 1.06 Technical Intro
4353	P.Kauff., G. Heising	Additions to MPEG-4 Version 2 Visual WD Draft Rev 5.1 to Incorporate the SA-DCT Tool

*Annex 1***Requirements Group Report****Source: Rob Koenen, Chairman***The Requirements Chairman is grateful to Mike Zeug for keeping notes during the meeting***MPEG-2****422 Profile @ High Level**

The FPDAM was progressed to FDAM (N2547). No comments or negative votes were received.

MPEG-4 Version 1

It was decided in a joint meeting with Systems to make clear in the FDIS that all BIFS nodes related facial animation are included in the Complete Graphics Profile.

MPEG-4 Version 2 and beyond**Tools**

A document was created (N2607) with a list of tools under consideration for Version 2, checked against the requirements and against available software. From the requirements point of view, it is clear that (almost) all of the tools address existing requirements. A few tools do not address currently existing requirements:

- DMIF: interoperation with non-MPEG-4 terminals
- System: application texture BIFS node

For these tools, we need to either designate the requirement at the next meeting, or stop the work. One tool is still under discussion: Chroma Key. Proponents of this technique should bring Requirements to next meeting, together with evidence. Other parties are invited to show how other tools, already accepted in the MPEG4 tool set, can also meet these requirements.

Profiles

The Profiling policy for Version 2 was further clarified (See policy documents: N2200, N2565). To this end, a document was created which holds 'Profiles under consideration' (N2566). We will be stricter with adding Profiles for V.2; in particular, the following criteria apply:

- Profiles should be really new;
- There should be concrete and real deployment plans.

The document with profiles under consideration contains:

1. for Audio and Visual: necessary Object types (including new ones)
2. For Profiles: functionalities, comparing with existing (V.1) Profiles,
3. References with evidence to support claims made in point 2. above. The best evidence is in subjective tests (which is a regular Audio practice!)
4. Intended application areas
5. Level information for the Profiles
6. List of company name with deployment plans (not included yet). This is essentially a list of supporting companies. MPEG does not require of companies to give detailed deployment plans, but a certain commitment to deploy the profile *is* required.

A choice is made when there is a complete overview of the potential new profiles. This process will start at FCD stage.

High Quality Requirements

Requirements for high quality (Studio) applications were reviewed. A small change was made to the Requirements Document (N2562): the maximum object size was enlarged to 4k x 4k. Also, a requirement for lossless transcoding from MPEG-2 422 Profile into MPEG-4 was added. Proponents indicated that they can wait until after version 2; their proposed schedule is starting a PDAM in July 1999. It has now become a matter of the Video Group to provide the technology. After that has happened, the Requirements Group will again discuss the issue with the goal of defining the adequate Profiles. Input for that effort is available in the form of contributions to the Roma meeting.

Fine Grain Scalability

The requirements Group heard a presentation on the applications of Fine Grain Scalability. This presentation satisfied Dublin resolution 3.1.5, and the Requirements group is convinced that fine grain scalability is a very useful tool. The group encouraged the presenters to make their presentation available as an input to the Seoul meeting.

MPEG-7

Miroslaw Bober, Chris Chorley, Seungyup Paek, Mike Vetter, Judy Garette, Lois Toomey, Lorraine Wheeler, Neil Day, Philippe Salembier were thanked for their efforts in collecting and distributing test material, and receiving all pre-registrations.

Test Material

Many people (but not all yet) had received the MPEG-7 content set. 10 more copies remain available at Conversion Media. When these are sold out, the content can be obtained from MPEG members who are in the possession of the test set. The procedure is outlined in N2570. Seungyup Paek remains the primary contact.

Requirements

Some discussions took place on the Requirements Document. The conclusion was that while it needs a big clean-up, the content is in a fairly good state. Necessary changes are editorial. Using draft revision 7a (M4290), M4287 and the material generated at the Roma meeting, improve MPEG-7 Requirements, addressing the following issues:

- Editorial
 - more explanation in pictures
 - better wording to make requirements clearer in some places
 - typographical improvements:
 - make clear distinction between Requirements, Notes, Examples
 - Usage of 'must', 'will' → shall
 - logical ordering of requirements
- Adding UML diagram and removing figure 2 (agreed)
- Consistency within document
 - Definition of DDL vs. requirements (definition of new Ds)
 - Terminology
 - apply existing definitions consistently
 - supply new definitions for words that may be misinterpreted
- Consistency with other documents
 - 'Framework' vs. C&O
 - terminology in FAQ
- More examples
 - e.g. mention 'namespace' under 'unique identification'
- Definition of 'feature'

During the meeting, two separate proposed revisions were produced. These are taken into account in the AHG. The general feeling was that the definitions should not be altered, but merely cleaned up. This means that the group did not want to introduce new terminology.

Because the Call for Proposals is still in effect, changes are postponed until after the evaluation, and no new version was issued.

File Format

The issue of a file format was discussed. The group felt that there should be a stored representation of MPEG-7 descriptions, with requirements that closely resemble those for the MPEG-4 Intermedia Format. The group also said that the format should not be the universal format that holds both descriptions and any type of content that may exist.

DDL

DDL Requirements were discussed following contribution m4212. Jane Hunter agreed to see if the requirements as they are now in the Requirements Document are adequate. As a general remark, it is far better to have Requirements that are explicit and maybe say things twice, than Requirements that *maybe* say everything, but need a lot of explanation to arrive at that conclusion.

Binary representations

The need for a binary representation of the DDL was discussed. There are no requirements to drive this today – we would need to see requirements and applications. The group concluded that it may be useful to have a non-human readable efficient representation of the DDL. In any case, the DDL should be easily parsed. It was agreed that we Ds and DSs can have binary representations (Ds sometimes exclusively).

Coding (parts of) the DDL depends on the solution (for the DDL) chosen. Coding DDL does not mean coding the language itself, but rather coding of the DSs generated from the DDL. In any case, if requirements for this are not made explicit, it will not happen.

Applications

MPEG-7 Applications were not addressed at this meeting

Pre-registrations to the Call for Proposals

A list of pre-registrations was made available (N2567). All pre-registrations have received a unique 'p-number'. Minor corrections are still expected; all proposers have been asked to correct their data in the list. The number of pre-registrations (657) and the number of different proponents (over 70), taken together with the fact that they come from different industrial segments and academia distributed around the world give an indication that MPEG-7 addresses real and existing needs.

One pre-registration was received on the opening day of the plenary. Another appeared to have been sent after the deadline, but before the opening day of the plenary. In the light of accepting the first late pre-registration, the second was also accepted.

During the meeting, an inquiry was sent out to obtain some more information on the Descriptor pre-registrations, with the sole purpose of making the distribution of proposals over evaluating groups easier. Giving this further information was not mandatory.

IBM (Pete Schirling and Jörg-Stephan Vogt) have kindly offered to take care of the ftp site for uploading proposals. Proposers will be asked to submit their proposals to the MPEG meeting in Seoul as an input document.

Evaluation Procedures

Much time was spent on detailing the evaluation process in Lancaster and on the time schedule

leading up to these evaluations. The result is found in N2572, which holds the MPEG-7 Work Plan. It lists task and responsibilities, with names where they are known. Evaluation will take place in Teams, each with their team leaders and some with deputy team leaders. Systems tools and non-normative tools will not be evaluated, but an overview of the proposals will be made.

Proponents that attend the meeting have been asked to also act as evaluator. When evaluators have an interest in the proposal (either direct or indirect) they are asked to declare so, and this will be recorded. It is possible in principle to act as an observer. Observers will not at any stage be allowed to take part in the discussions, because there should be a clear distinction between evaluators with their clear responsibility, and observers who have no evaluation task.

It was decided to allow proposers to combine different proposals (corresponding to different pre-registrations) in a single submission (i.e., a single document). The document should not only contain the individual proposals —with all required information for each of them—, but also a note on how the proposals interrelate and where to find which proposal in the document (by pre-registration number)

XM Development

Version 0.01 of the XM - the architecture - was discussed and accepted. The good news is that it will most likely be possible to have one single framework for all parts of the standard, wherever developed (i.e., in whichever MPEG subgroup). User interfaces and media interfaces are now included in the XM Architecture (XMA). It is envisaged to support multiple platforms, but that will mean that platform-dependent modules need to be provided by parties that are interested in certain platforms. Right now, there are commitments for Intel/Windows and Linux platforms.

An ftp site for the XM has kindly been made available by KRDL from Singapore.

Complexity

Complexity was discussed in a joint meeting with ISG. Complexity issues exist in:

- parsing of the DDL and DSs
- the calculation of descriptors (even though strictly out of the normative parts of the standard this is still important — compare to MPEG-2 and MPEG-4 encoding; issues that were definitely considered in making technology choices)
- matching algorithms more or less implied by descriptors (also outside the normative realm, but also important)

Contributions

A few technical contributions were received; some in a joint meeting with Video. It was very interesting to learn about the work of SMPTE (contribution by Mike Vetter, m4328), an important body in the specification of Metadata. The Requirements group's chair expressed the desire to use important pieces of work done elsewhere rather than doing things all over again. The presented schemes have been submitted in response to the Call for Proposals.

*Annex 5***Delivery group report****Source: Vahe Balabanian, Chair**

The following are the results of the meeting grouped under the headings of DMIFV1, DMIF V2 and DSM-CC.

DMIF V1

1. DMIF V1 Conformance
 - The text of ISO/IEC 14496 part 6 DMIF has been updated with test environments for Broadcast and File Storage. In addition Abstract Test Suites were added. The DMIF conformance CD text is integrated within the MPEG-4 Conformance CD N2550
2. DMIF V1 FDIS W2506
 - The document was withheld until the Systems Working Group resolved whether or not to include the Systems FCD Annex E in DMIF. Since the decision was made by Systems to postpone Annex E to V2, The DMIF FDIS has been released to the SC29 secretariat at the end of this meeting.
3. DMIF URL
 - The DMIF WG reviewed the procedure for the URL registration and resolved to prepare an application for DMIF URL registration for review in March 99.

DMIF V2

- 1) DMIF V2 WD 5.0 was approved N2606
- 2) DAI Syntax
 - The documents M4191, M4182 were reviewed and it was decided to add the DAI syntaxes for C++, JAVA and IDL to the V2
- 3) DAI
 - The document M4330 was reviewed and it was decided to add the QoS performance monitoring to V2
 - The document M4253 was reviewed jointly with Systems but in the absence of the authors no clarification could be obtained and no changes resulted to V2.
- 4) Multicast DMIF
 - The document M4364 was reviewed and was decided to add the information flow for Multicast DMIF to the V2 with qualifying text The V1 DAI is unchanged.
- 5) Mobile Networks
 - The liaison document M4199 was reviewed and was decided to respond with N2635. Some members will attend ITU-T SG16 Q11/14 to contribute to the editing of H.245 for MPEG-4 code points.
 - The document M4294 was reviewed extensively and the author was advised to participate in the ITU-T SG16 Q11 meeting in Monterey on Feb 1999 in order to assure its technical operation over H.223 with the H.223 experts.
 - The document M4285 was reviewed and was decided to correct the present text in V2 to correspond to the Systems document. The issue of identification of the uniqueness of ES_Id in two-way communication was not resolved however a possible alternatives using a session unique CAT was proposed.
- 6) Heterogeneous Operation
 - The document M4206 was reviewed and was decided to add DNI parameters for DMIF-to-DMIF operation through gateways to V2
 - The document M4207 was reviewed and was decided to add a parameter for DMIF-to-non-DMIF operation using gateways with qualifying text to V2.

It is noted that the definition of gateways is beyond the scope of DMIF e.g., access to

directories, discovery of other gateways and access to network servers.

DSM-CC

1. DoC for FDAM1

All comments are incorporated in the disposition of comments document N2545

2. DAM1

Text is ready for release to SC29 see document N2546

3. PDAM2

The document M4332 was reviewed and was decided to create a proposed text in N2608 for review by the MPEG-4 on MPEG-2 AHG.

4. The document M4176 was reviewed from DAVIC for the request to incorporate a DSM-CC URL and was decided to respond with liaison N2638.

Documents Reviewed:

Doc #	Title
M4176	Liaison Statement from Digital Audio-Visual Council (DAVIC) to SC 29 on DAVIC Content, APIs, Metadata and Security Technical Committee [DAVIC/Lo006]
M4182	DMIF Application Interface: syntax Definition
M4191	DAI Syntax Definitions: source files, C++, Java
M4254	AHG report on Carriage of MPEG-4 over MPEG-2
M4330	DAI Extension for QoS Monitoring & Negotiation
M4364	Message flow for DMIF Multicast
M4206	Operation over Heterogeneous Networks
M4207	Operating with non-DMIF Terminals
M4285	Open Issues on H.223
M4253	Proposed amendments to DAI & DNI
M4294	Performance of UEP of MPEG-4 Video and proposed extensions to DMIF supporting UEP
M4199	ITU-T SG16/Q11 liaison response
M4174	Summary of Voting on ISO/IEC 13818-6/FPDAM1
M4332	Proposal for a DSM-CC Amendment 2

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Antonio Carvalho	QMW	UK	44-171-975-5530	44-181-981-0259	a.carvalho@ekc.qmw.ac.uk
Madhukar Budagavi	Texas Ins.	USA	1-972-997-6168	1-972-997-5786	madhukar@ti.com
Javier Zamora	Xbind Inc.	USA	1-212-809-3303	1-212-809-3305	javier@xbind.com

Next Meeting:

MPEG 47 Mar 15-19/99 Seoul KR

Next Target Dates to meet:

DMIF V1 conformance FCD–July 1999
DMIF V2 CD -- March 1999

Annex 6

Systems group report

Source: Olivier Avaro, Chairman

Overview

The main results of the MPEG meeting in Rome from a Systems perspective are:

1. Delivery of the Final Draft International Standard of Version 1 Systems (FDIS of 14496-1) and roadmap for the delivery of Systems Version 1 Part 5 FDIS in March 99.
2. Delivery of Systems Version 1 Conformance CD.

The delivery of Systems Version 2 CD has been differed to March 99.

Detailed Report

Version 1 Part 1 Specification

The following contributions have been reviewed:

	V1 FDIS Revision of the editing		MPEG-4 V1 Gen.
4298	Editorial Comments on Systems FDIS	Zvi Lifshitz	MPEG-4 V1 Gen.
Xxxx	AHG Report on Specification Editing	Alexandros Eleftheriadis	MPEG-4 V1 Gen.

The Version 1 Part 1 is finalized in term of technical comments. Additional editorial comments on the document delivered on the 15th of November have been reviewed.

The main decisions were the following:

- Informative Annex on FlexMux is moved in version 2 WD;
- Informative Annex on 4/2 is considered as input on the version 2 4/2 activity;
- FBA nodes in the profile structure have been restored.

The size of the modifications requested by the national bodies in Atlantic City made it hard for the editing team to deliver the specification in Rome. The final specification should be delivered by the 15th of January.

Version 1 Part 4 Conformance

The following contributions on conformance have been reviewed:

	V1 Conformance		MPEG-4 V1 Conf.
4210	Report of AHG on Systems Conformance	Jean-Claude Dufourd	MPEG-4 V1 Conf.
4211	BIFS conformance test coverage check list	Jean-Claude Dufourd, Souhila Boughoufalah	MPEG-4 V1 Conf.
4213	Format of Log Files for Bitstream Exchange	Jens Vollmer	MPEG-4 V1 Conf.
4220	Ideas on composition conformance testing	Graham Thomas	MPEG-4 V1 Conf.
4271	Some points of MPEG-4 system conformance	D.Curet	MPEG-4 V1 Conf.
4288	MPEG-4 Object Descriptor Framework: Some Conformance Issues	Ganesh Rajan	MPEG-4 V1 Conf.

These contributions basically served as the starting point to create the Systems Conformance CD, one of the main achievement in Rome. Input on the conformance CD through NB comments are solicited for Seoul. The following decisions and results should be noted:

- Because composition is not define in Version 1, there will not be any conformance on composition.
- With the revision of the conformance specification, bit stream exchange should be the main activity of the conformance activity in Systems.

- The mp4 file format has been chosen in Systems as well as in other MPEG sub-groups as the format for exchanging bitstreams.
- In addition to bitstream exchange, the Systems sub-group plans to exchange scene dumps in order to check the temporal behavior of the BIFS scenes at the client side.

BIFS

The following contributions have been reviewed:

	V2 BIFS		MPEG-4 V2 BIFS
4189	Advanced BIFS for 3D object protection	Tsutomu Ando	MPEG-4 V2 BIFS
4203	Proposal for update to body animation specification	Tolga K. Capin	MPEG-4 V2 BIFS
4222	Audio Rendering of Virtual Room Acoustic and Perceptual Description of the Auditory Scene	Jean-Bernard Rault, Marc Emerit, Olivier Warusfel, Jean-Marc Jot	MPEG-4 V2 BIFS
4223	Extensions of Audio BIFS: Interfaces and Models Integrating Geometrical and Perceptual Paradigms for the Environmental Spatialization of Audio	Jean-Marc Jot, Lee Ray, Luke Dahl	MPEG-4 V2 BIFS
4262	PROTO and ExternProto	Julien Signès	MPEG-4 V2 BIFS
4263	Integration of mesh	Julien Signès	MPEG-4 V2 BIFS
4309	FBA adhoc Report	Eric Petajan, Tolga Capin	MPEG-4 V2 BIFS
4310	Proposal for Adding Object Mirroring and Instancing to 3D Model Coding	Eric Petajan, Chandrajit Bajaj	MPEG-4 V2 BIFS
4315	Advanced BIFs Node for Keying	R. L. Schmidt, A. Puri, B. G. Haskell	MPEG-4 V2 BIFS
Xxxx	AHG Report on Advanced BIFS	Julien Signes	MPEG-4 V2 BIFS
Xxxx	Integration of application texture in BIFS		MPEG-4 V2 BIFS
4344	Implementing IPMP for use with VRML textures, sounds and objects	Aaron E. Walsh <aaron@mantiscorp.com>	MPEG-4 V2 BIFS/IPMP

These contributions mostly served to improve the Systems Version 2 BIFS specification, which can be considered overall in good shape. The following points should be noted:

- Node for Keying: this Version 2 node created controversial discussions. First in term of procedure: there were no explicit requirements on the functionality provided by this node. Second in term of architecture: such functionality can be seen as shape coding, which should be treated in Video and not in Systems. Third in term of quality: it was not clear how good the node performs. Point 1 has not been resolved. Requirements have been proposed late in the meeting, making it difficult to address properly the issue. This will be done at the very beginning of the Seoul meeting. Point 2 can be considered as resolved, since the information in this node really is an interface to any video-coding algorithms. Its place is then at the Systems level, either as a node or as decoder configuration parameters. The choice of a node is more flexible since the technique can then be applied to textures composite using BIFS. Concerning point 3, the quality of the node should be demonstrated in Seoul.
- The AIC Initiative identified the requirement to integrate HTML pages in a BIFS scene and felt that the ApplicationTexture node, previously defined in VRML is a potential solution to this requirement. The node is not yet completely specified and tested. More contributions on it are solicited for Seoul.

Elementary Streams Management

IPMP

In addition to several contributions on cross IPMP/BIFS-ESM issues, the following IPMP specific contributions and issues have been addressed:

	V2 IPMP		MPEG-4 IPMP
4195	IPMP Ad-hoc Report	Niels Rump (for the IPMP	MPEG-4 IPMP

		Ad-hoc Group)	
Xxxx	Management of Intellectual Property		MPEG-4 IPMP

The issue on the management of intellectual property using the IPMP architecture has been addressed in an output document from the Systems sub-group and created controversial reactions in the plenary report. Basically, it was not clear if the IPMP architecture properly supports the management of intellectual property rights, including patents. The MPEG-4 Systems sub-group is confident that such management is doable, should investigate this further, document and demonstrate how this can be done and is ready to answer any technical argument that challenges the current assumptions.

MPEG-4 on MPEG-2 and IP

The following contributions have been reviewed and served to produce the first documents on the transport of MPEG-4 over IP and MPEG-2.

	V2 4 on 2/IP and MP4		MPEG-4 V2
4254	AHG report on Carriage of MPEG-4 over MPEG-2	Jan van der Meer	MPEG-4 V2 ESM/4on2
4259	An MPEG-4 Stream Encapsulation Method by MPEG-2	Yoshinori Matsui	MPEG-4 V2 ESM/4on2
4260	MPEG-4 over MPEG-2 Issues	Jan van der Meer	MPEG-4 V2 ESM/4on2
4272	MPEG4 on MPEG2 cases and signaling	D.Curet	MPEG-4 V2 ESM/4on2
4335	General Considerations for MPEG-4 over MPEG-2 Transport	Regis J. Crinon	MPEG-4 V2 ESM/4on2
4341	Report of AHG on MPEG-4 on the Internet	Carsten Herpel	MPEG-4 V2 ESM/4onIP

Only the transport of MPEG-4 over MPEG-2 has been explicitly addressed. It results on the production of an amendment to MPEG-2 Systems. Further documents (ex: MPEG-4 profiling, transport of MPEG-4 over IP) should be produced in Seoul. Contributions are solicited in these domains as well as NB comments to improve the Amendment on the transport of MPEG-4 over MPEG-2 Systems.

Joint issues on ESM and BIFS

The following contributions on joint issues between ESM and BIFS have been reviewed. They mostly concern notion of time in BIFS and client-server interactivity.

	V2 ESM/BIFS		MPEG-4 V2 ESM/BIFS
4183	Flexible Multimedia Object Time Stamps	Michelle Kim, Peter Westerink	MPEG-4 V2 ESM/BIFS
4264	Application Signaling based on URLs in Scene Descriptions	Paul Christ et al.	MPEG-4 V2 ESM/BIFS
4269	Using Command Descriptors	Hari Kalva, Alexandros Eleftheriadis	MPEG-4 V2 ESM/BIFS
Xxxx	Access to time in BIFS		MPEG-4 V2 ESM/BIFS

The most controversial issue is the one regarding client-server interactivity. The difficulties come from the fact that on one hand, many solutions already exist on specific networks, and on the other hand, MPEG-4 wants to keep its transport agnostic capabilities. The architecture of the only completely documented solution does not have unanimous support. A compromise should be found before Seoul, or an alternative architecture proposed.

Extensions of the timing model have also been proposed to deal more efficiently with IP-like network. Further detailed contributions and implementations are solicited for Seoul.

MPEG-J

	V2 MPEG-J		MPEG-4 V2 MPEG-J
4304	Report of MPEG-J AHG	Gerard Fernando	MPEG-4 V2 MPEG-J

4304	Report of MPEG-J AHG	Gerard Fernando	MPEG-4 V2 MPEG-J
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The technical work in MPEG-J continued to progress. The major issue in this activity was related to management of the Java technology developed in MPEG-4 regarding the policy of Sun. In particular, the answer provided by Sun to the resolution from MPEG in Atlantic City (regarding the profiling of Java technology) was not satisfactory (cf. related resolutions). The requirements stated in Atlantic City have been stated again more precisely: *“MPEG-J will need certain combinations of Java classes and these will be referred normatively by MPEG-4 version 2. MPEG requires a position statement from the owner of the IP on Java that these specific configurations of Java classes with respect to profiles to be defined will be possible”*. A response from Sun is expected by the 22th of January. In case the response is not satisfactory, a call for proposal will be issued by the convenor.

MP4

The following contributions have been reviewed and served to improve the current specifications on mp4.

	V2 MP4		MPEG-4 V2 ESM
4177	Comments and suggestions for the MP4 file format VM 4.0	Peter Westerink, Jeff Boston	MPEG-4 V2 ESM/MP4
4178	Degradation Priority Atom	Peter Westerink	MPEG-4 V2 ESM/MP4
4197	Comment on File Format	Michel Rynderman	MPEG-4 V2 ESM/MP4
4205	Description of seek algorithm for the mp4 file format	Dave Pawson	MPEG-4 V2 ESM/MP4
4217	IPMP Answers to the MP4 "Matrix" questionnaire	Niels Rump for the IPMP Ad-hoc Group	MPEG-4 V2 ESM/MP4
4226	Proposal for mp4 atom versioning	Dave Pawson	MPEG-4 V2 ESM/MP4
4229	File format analysis and recommendations	David Singer, Peter Hoddie	MPEG-4 V2 ESM/MP4
4299	Clarification of URL/URN/URI for usage in MP4 file format	Mahesh Subramanyan	MPEG-4 V2 ESM/MP4
Xxxx	AHG Report on File Format	Dave Pawson	MPEG-4 V2 ESM/MP4
4196	MPEG-7 Systems – Need for File Format Standardization	N. Nandhakumar, Dinkar Bhat	MPEG-7

The mp4 specification can be considered as mature and the file format has been chosen has the only format for exchanging bitstreams within MPEG-4. The MPEG-4 Systems sub-group will provide support for the use of mp4 for the bitstream exchange activities.

Im1

The following contributions have been reviewed.

	Im1 V1/V2 – Part 5		MPEG-4 Im1
	IPMP Demonstration		MPEG-4 Im1
4185	Agenda and Logistics for the December IM1 AHG Meeting	Zvi Lifshitz	MPEG-4 Im1
4190	IPMP Implementation study	Hiroshi Inoue, Toshiyuki Nakagawa	MPEG-4 Im1
4227	Source code for mp4 parser	Dave Pawson	MPEG-4 Im1
4263	Upgrade of MDS (BIFS editing tool) for FDIS	Jean-Claude Dufourd	MPEG-4 Im1
4270	Implementation/Demonstration of Command Descriptor Framework	Hari Kalva, Lai-Tee Cheok, Aizaz Akhtar, Javier Zamora, and Alexandros Eleftheriadis	MPEG-4 Im1
4296	Demonstration of a visual MPEG-4 authoring and playback tool	Michelle Y. Kim, Peter Westerink	MPEG-4 Im1
4297	IM1 Software Platform AHG Report	Zvi Lifshitz	MPEG-4 Im1
4300	MPEG-4 Player Core Code Release 1.5	Zvi Lifshitz	MPEG-4 Im1

4301	BIFS/OD Encoder Software Release 1.5	Zvi Lifshitz	MPEG-4 Im1
4303	Implementation Status and Demo of Sun/Columbia of MPEG-J	Viswanathan Swaminathan, Yihan Fang	MPEG-4 Im1
4305	Current status and demonstrations of Advanced AudioBIFS	Riitta Vaananen, Jyri Huopaniemi	MPEG-4 Im1
4346	Integration of face animation and TTS in IM1 3D	Joern Ostermann	MPEG-4 Im1
4349	PactPlayer version 1.06 source code	Alvar Bray, Andrea Barbieri, Paul Garrett, Ron Laborde	MPEG-4 Im1
4350	PactPlayer version 1.06 Test code	Alvar Bray, Andrea Barbieri, Paul Garrett, Ron Laborde	MPEG-4 Im1
4351	PactPlayer version 1.06 Release Notes	Alvar Bray, Andrea Barbieri, Paul Garrett, Ron Laborde	MPEG-4 Im1
4352	PactPlayer version 1.06 Technical Intro	Alvar Bray, Andrea Barbieri, Paul Garrett, Ron Laborde	MPEG-4 Im1
Xxxx	Advanced Audio BIFS Demo.		MPEG-4 Im1
Xxxx	Im1 "Tour de France"	ENST/CSELT	MPEG-4 Im1

These contributions cover the following Im1 activity:

- Contribution of Systems to MPEG-4 V1 Part 5. The software is due for the next Seoul meeting. Despite the important progress brought by the contributions above, the remaining effort is important. The work plan defined in Atlantic City has been adjusted.
- Contribution of Systems to MPEG-4 V2 Part 5. The software is due for the next Seoul meeting when Version 2 will go to CD. The software CD is not yet completed and contributions for Seoul are expected.
- Demonstrations: There were no new big demonstrations of Im1 in Rome, such demonstration is planned for Seoul. But some pieces of Version 2 were demonstrated (Advanced Audio BIFS, MPEG-J...) as well as progresses in the verification of the IPMP functionality.
- In addition to the release of the authoring tool from ENST, IBM demonstrated an MPEG-4 authoring tools that produces mp4 file.

Version 2 Tools and Profiles

The following contributions have been reviewed:

	V2 Tools and Profiles		MPEG-4 V2 Req.
4198	Requirement and proposal for the profile structure on MPEG-4 studio profile	Katsumi Tahara, Yoshihiro Murakami	MPEG-4 V2 Req.
4279	Request for an intermediate 2D Systems profile	Jean-Claude Dufourd	MPEG-4 V2 Req.
4348	Report of the Ad Hoc Group on MPEG-4 Version 2 Systems Profiles and Levels	Olivier Avaro (Deutsche Telekom - Berkomp), Rob Glidden (Quadramix)	MPEG-4 V2 Req.
4348	Report of the Ad Hoc Group on MPEG-4 Version 2 Systems Profiles and Levels	Olivier Avaro (Deutsche Telekom - Berkomp), Rob Glidden (Quadramix)	MPEG-4 V2 Req.
xxxx	New profiles in MPEG-4 to support MPEG-2		MPEG-4 V2 Req.
xxxx	MPEG-4 Systems Version 2 Tools		MPEG-4 V2 Req.
Xxxx	AHG on Profile		MPEG-4 V2 Req.

The main result of these activity is the identification of the Systems Version 2 tools, the verification that they follow the MPEG versioning policy and that well-defined requirements exist for the functionality they provide. Not many progresses were made on the definition of profiles and levels. This is a little bit worrying since the current version 1 section on profile and levels is clearly not sufficient to define meaningful conformance points (ex: there is no bounded complexity for 3D scenes). Contributions are solicited for the next meeting in Seoul.

Liaison

The following contributions have been reviewed and answered by the Liaison sub-group.

N°	Title	Source	Activity
	Liaison		Liaison
4184	15th DAVIC Call for Proposal (SC 29 N 2831)	DAVIC via the SC 29 Secretariat	Liaison
4186	Navigation tools for MPEG-2 Transport Streams and MPEG-4 streams	DAVIC	Liaison
4261	Statement from Web3D Consortium to WG 11 (SC 29 N 2871)	Web3D Consortium via the SC 29 Secretariat	Liaison
4347	Liaison Statement from AIC on AIC Requirements and Architecture	Olivier Avaro	Liaison

From a Systems perspective, the following should be noted:

- An active participation from the MPEG-4 community in the clients forum (ex: Davic, ATSC, AIC) is needed to inform these client bodies on MPEG-4 as well as to adapt and interface the MPEG-4 technology to these operational environments.
- The collaboration with W3D should progress and go further than just liaison exchange. We need closure technically (ex: Proto/ExternProto...) as well as politically (ex: Intellectual Property on MPEG-4 technology).
- The AIC Initiative defines compelling applications and specifications based on MPEG-4/VRML/HTML standards. This group has a big potential in term of enabling real business with these technologies. Input from the MPEG-4 perspective is needed to refine the AIC Specification, to define an implementation framework and to set-up real scale trials.

MPEG-7

The following contributions have been reviewed:

	MPEG-7 (+Req.)		MPEG-7
4200	Concepts and Architecture for MPEG-7 Experimentation Model	Jens-Rainer Ohm et al.	MPEG-7

Not much time was spent on MPEG-7 and Systems matters. More contributions are solicited for Seoul, to the lights of the results from the MPEG-7 Call for Proposal (ex: MPEG-7 architecture, MPEG-7 streaming and synchronization, MPEG-7 file format...).

Annex 7
Video group report

Source: Thomas Sikora, Chairman

The video group addressed in its meeting issues related to MPEG-4 (Version 1 and Version 2), MPEG-7 and MPEG-2. The major effort in the group was dedicated towards progression of Version 1 of the MPEG-4 Visual standard to IS.

MPEG-2

Interlace Video on Progressive Displays

At the meeting the display of interlace video on progressive displays was discussed. The problem arises in existing decoders which are not in the position to identify the source format in the bitstream. A possible amendment was discussed for MPEG-2 Video and an AdHoc was established to discuss the issue.

MPEG-4 (Version 1)

FDIS

The video group evaluated comments issued on the FDIS draft of MPEG-4 and discussed possible revisions. Based on the outcome of the discussions and taking into account a number of minor technical problems found in the FDIS the final FDIS document was issued. As a major item the video group identified shortcomings in the definition of complexity bounds for video decoders. The FDIS document was revised accordingly.

Software Integration and Verification

A schedule for continuing software integration and verification was developed. A detailed plan for testing combination of tools was issue. The schedule targets to complete the bitstream verification by 1st February '99.

Verification Tests

The results of the "Error Resilience" verification tests were reviewed. Previously for a bitrate of 128 kbit/s one test sequence showed unexpected artifacts. The new test results showed a drastic improvement and demonstrated the excellent performance of the MPEG-4 standard in error prone environments.

Next the results of the "Temporal Scalability" verification tests were reviewed. Under all test conditions the temporal scalability extension of MPEG-4 clearly outperformed the simulcast case. In almost all cases the temporal scalability tool approached the single layer result and in some conditions even outperformed the single layer scheme.

Further verification tests are under preparation for content-based coding targeted for March 1999.

At the March 1999 meeting results for the frame-based coding efficiency results will be pre-screened – the tests are targeted for July 1999. Also for July 1999 the extended Temporal Scalability tests are targeted.

Conformance

Good progress was made for the specification of conformance of MPEG-4 video coding systems.

The discussions in the video group identified that MPEG-4 video conformance could be defined in a similar way as specified for MPEG-2. The official software will introduce a new way of measuring conformance against a benchmark. Conformance points for MPEG-4 video were identified and bitstreams defined. A MPEG-4 CD was released.

MPEG-4 (Version 2)

Tools to be supported

The tools to be supported by Version 2 are:

- GMC
- ¼ pel MC
- BBM
- SADCT

Additional tools agreed to be supported by version 2 are listed below. These tools provide new functionalities compared to version 1:

- Newpred (Error Resilience)
- Object Spatial Scalability (Scalability)
- Multiple Alpha Channel Coding (Various)
- Error Resilience for Still Texture Coding (Error Resilience)
- Scalable Arbitrary Shape for Texture Coding (Scalability)
- Wavelet Tiling (Still Texture)

A decision was taken that the new tools will only be supported in profiles in version 2 if their performance is clearly demonstrated in formal subjective tests.

Output documents

A new version of the Working Draft for Version 2 was released. An new version of the verification model was released.

Software integration and bitstream verification

A schedule for software implementation and bitstream verification was developed. The integration of version 2 tools will proceed after the completion of version 1 software in February 1999.

MPEG-4 (Further)

Normative composition

The video group identified the need to specify normative composition of video objects. An AdHoc group was established to discuss possible solutions for version 2.

Advanced Layered Coding

No major activity took place regarding advanced layered coding. However, a new set of test conditions were specified to allow a final comparison between the two proposals in March 1999 and to conclude the activity.

Fine Granularity Scalability

Various partners expressed the desire to explore the MPEG-4 video system for internet video applications using fine granularity scalability approaches. To understand the application context in more detail the requirements were issued accordingly. It was agreed that a fine granularity scalability system should be compatible to MPEG-4 Version 1 at the base layer. It should also be investigated whether it is already possible to provide this functionality with existing MPEG-4 technology already. First results showed promising performance. More experimentation will be

required to understand the trade-of between the number of levels and the overhead associated with the proposals.

Studio Applications

The need to provide MPEG-4 solutions for very high quality applications was expressed by a number of MPEG member companies. This would request the MPEG-4 video coding system to be extended to 4:2:2 and 4:4:4 formats with possible extension of the toolkit (scalability).

It was decided to identify the needs and technical issue both in the requirements group as well as in the video group. Further experimentation will be required to clarify the performance of MPEG-4 video at very high bit rates.

MPEG-7

The activities of the MPEG-7 group were reviewed and discussed in the video group. Further two input documents related to MPEG-7 image database query systems were presented and discussed.



Annex 8

Audio group report

**Source: S. Quackenbush,
D. Meares,**

**Chairman Audio Subgroup
Secretary Audio Subgroup**

Opening of the meeting

The MPEG/Audio Subgroup meeting was held during the 46th meeting of WG11 in Rome, Italy, 7th to 11th December 1998. The list of participants is given in Annex A-1. The members welcomed Schuyler Quackenbush in his new role of Audio Group Chairman. In turn, the Chairman welcomed the delegates to the meeting and outlined the work for the five days.

Administrative matters

Approval of agenda

The agenda as presented in Annex AII was discussed, edited and approved.

Atlantic City meeting report

The Audio Subgroup portion of the Atlantic City meeting report, October 1998, had been previously distributed by email and was approved.

Allocation of contributions

All contributions were listed (see Annex A-VI) and allocated to the agenda and were discussed in either the Task Groups or in Audio plenary. The secretary brought several relevant documents from Test, Systems, and Requirements to the attention of the group.

Communications from the Chair

The Chairman summarised the detailed allocations and questions raised at the Chairman's meeting held on the evening before the main meeting started. The majority of these, by design, were already in the agenda.

- The emphasis for the early part of the week has to be MPEG-4 v1 conformance.
- This is followed closely by Reference Software for MPEG-4 v1, particularly the interface to Systems.
- Third on the list has to be MPEG-7, with due acceptance that most members of the group are compression experts.
- David Meares has noted that he needs to step down as secretary to the Audio Subgroup. Mr. Quackenbush thanked David for all his hard work with Peter Schreiner on looking after the direction of the Audio group over the last few years. It will be necessary to identify other volunteers to take over some of the tasks that are needed to support the Chair.
- The Chair of Requirements has asked that audio experts make themselves available to the MPEG-7 deliberations particularly for the Lancaster University meeting in February 1999.

Joint meetings

Joint meetings with Requirements and Systems were established and are reported below.

Received National Body Comments Liaison matters

Mr. Iwadare introduced m4199 and m4249 relating to the addition of an MPEG-4 codepoint in the ITU-T H.32x terminal architecture. ITU-T is asking for additional tests before this can be done. MPEG do not have the resources for this and Mr. Brandenburg observed that there is also a difference in approach between MPEG and ITU-T. The Group decided to respond positively by indicating the full extent of the information that is available to ITU-T on MPEG-4 Audio. Mr. Brandenburg prepared and presented the liaison statement, which was approved.

M4216 from Japan adds detail to their 'No' vote on MPEG-4 pt 5, requesting alignment of the reference software to the pt 3 text, including the MPEG-4 Audio Transport Stream (MATS). It was agreed that the problem was being resolved by use, in future, of the MPEG-4 file format: Mr. Moriya was volunteered to lead this work.

M4236 from Japan asks for ADTS bitstreams in the Conformance Pt of 13818. The bitstreams have been provided and correct decoding has been checked by Nippon Steel. A DoC was prepared. Mr. Ray discussed the need for a liaison statement to the MMA asking them for permission to include some or all of their DLS2 specification as an annex to the MPEG-4 conformance document, and to request that they make their members aware of the MPEG-4 Conformance specification for SASBIF. This would greatly assist MPEG-4 developers in their proof of SASBF functionality. A liaison statement was prepared accordingly and was approved.

Task group activities

To accomplish the large number of tasks to be performed by the Audio Subgroup, 12 task groups were formed as indicated in Annex A-V. The results of each of the task groups were presented to and discussed by the entire Audio Subgroup, including iterations as necessary. The conclusions of the task groups are presented elsewhere in this report and are included in the output documents.

Amendment to MPEG-2 Conformance, 13818-4 AMD3 (FPDAM Mar 99)

This was dealt with under National Body papers above. The study on the DoC and the draft text are presented in documents WG11/N2548 and N2549.

MPEG-4 Audio FDIS status

Three issues were raised on the FDIS, relating to DRC, CELP wideband and CELP narrowband. A mechanism has been found to apply DRC to all parts of MPEG-4 Audio in a way that is transparent to Systems. The proposal relating to changes to wideband CELP was judged to be too late and untested and so was dropped. CELP narrowband speech profile is restricted to a sampling rate of either 8 or 16 kHz, whilst scalable profile is restricted to sampling rates in the vicinity of 8 kHz.

With these decisions, only purely editorial matters remain and will be completed by 18th December. For completeness, however, the proposed changes were reviewed and approved. The final status of the FDIS is given in document WG11/N2573.

However, as a very serious matter, it was noted once again the significant difficulties that were experienced in editing large documents on MS Word. The combination of cross references and version control cause Word to scramble previously entered data in an unpredictable way. This is reaching the point where members are refusing to take on editing tasks because of the difficulties. Mr. Herre also observed that ISO should freeze standards in a postscript format to avoid future incompatibilities. The preferred option is to use Latex for the future preparation of major texts, such as MPEG-7. The Audio Group raised this as an output resolution.

MPEG-4 Conformance CD (CD Dec. 98)

Mr. Quackenbush held a full Plenary meeting of all the members who had volunteered to assist in editing the Conformance document, during which the requirements for the week and the style of documentation were decided. Mr. Spille raised the issue of the style of the Conformance document

so as to realign the individual editors. The proposals were discussed at length and agreements on style were agreed.

Mr. Funken presented m4209 on additions to CELP details to enable bitstream syntax and decoder operations to be verified. The document describes the required additions, procedures for testing CELP conformance and offers sample bitstreams for both MPE and RPE modes. Some elements were identified to complete the Conformance requirements. These were added during the week. Mr. Scheirer submitted m4219, which was noted, in his absence, as offering some of the necessary bitstreams for checking the conformance of SA elements. The bitstream described are available from a web site together with the expected pcm output. Linked to this is document m4268, describing how the bitstreams exercise the various aspects of SA. Some elements of SA are not yet exercised by Mr. Scheirer's bitstreams and thus additions are needed. The Task Group picked up this work.

Mr. Meares presented m4220, from the BBC on composition conformance testing. Most of the document is concerned with video matters, but A/V synch is included. The document offers a source A/V sequence with precisely timed audio and video elements. This can be used to check the overall system timing, including the compositor and displays. The group acknowledged the value of the sequence and discussed the timing tolerance. It was agreed that for higher quality applications the recommended tolerance should be -20/+40 ms ('-' indicating audio leading).

M4225 on conformance testing of TTSI was presented was presented by Mr. Lim. It suggests specific bitstreams for TTSI.

Mr. Inoue presented document m4247 on HVXC conformance testing. HVXC uses random number generators for various elements and thus conformance testing by direct comparison cannot be used. Procedures are recommended to overcome these difficulties by either forcing the decoder into more deterministic modes of operation or by statistical modes of assessment. However, some decoders may not be able to respond to forced deterministic modes and so alternative approaches based on additional bitstreams (if necessary) and a statistical approach is needed. Mr. Quackenbush asked that Mr. Inoue prepare text for the conformance document, with 'place holders' for those parts of the text that cannot be defined

Mr. Spille identified the necessary links and conformance points between Systems and Audio. All audio decoders are part of the MPEG-4 System. The following interfaces have to be provide to test the audio decoders:

- DecoderSpecificInfo: The decoder specific information constitutes an opaque container with information for a specific media decoder.
- Audio Access Units:
- Audio Composition Units:
- AudioSource Fields Information:
- (Private Test Info):

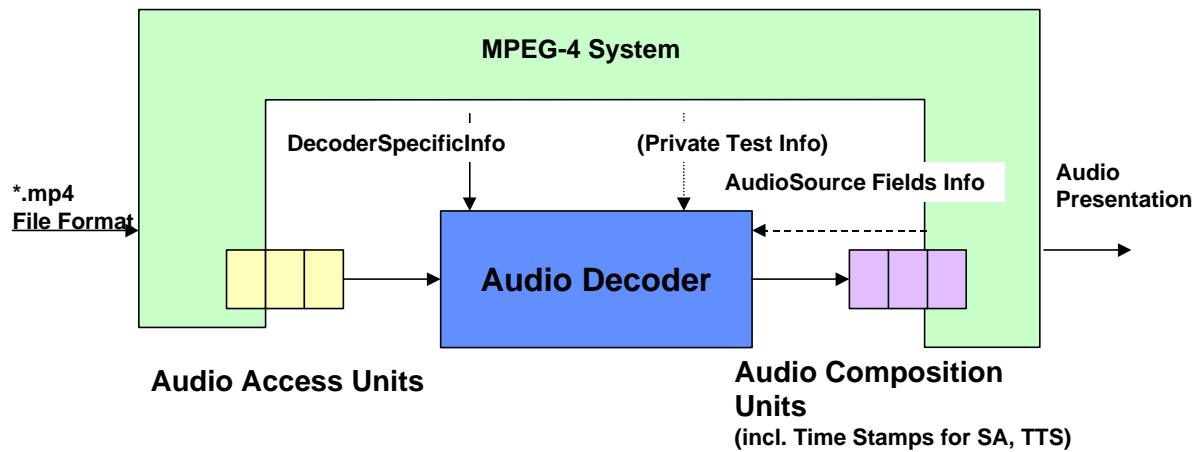


Figure 1 – Audio Conformance Points

One of the problems identified by the Group relating to Conformance is the file format for test bitstreams. These have been submitted in various formats but it was accepted that ultimately they would be converted to MPEG-4 file format.

During the week, the task of defining audio composition was transferred from Systems to Audio, and it is now necessary for Audio to work on it. There was noted to be confusion between Audio and the other Groups as to whether or not there would be profiles and levels for composition. This had been in an output document from Audio at the last meeting but it still seems to be contentious. One proposal is to use the complexity for the audio decoder profile to define the composition complexity. In discussion with Systems, it was noted that document WG11/N2519 from Systems in Atlantic City, offers a template listing complexity restrictions. This was updated to add the necessary Audio details, from document WG11/N2484, and is presented in document WG11/N2590.

The conformance CD is given in document WG11/N2550

MPEG-4 Reference Software FDIS (Mar99)

Mr. Purnhagen led the reference software task group and reported back to the Group as the week progressed. Many members contributed to the process of preparing the required elements and Mr. Purnhagen amalgamated the contributions.

Concern was voiced over the extent to which the software use should be explained in "README" files or in source code comments, as it is unreasonable to expect that non-experts should be tutored into understanding the code. It was agreed that explanations should be aimed at helping MPEG members themselves: beyond that additional guidance is optional. Comments, however, should include guidance on how the software should be tested.

It was observed that the MPEG-4 file format was not yet available and so encoder/decoder software interfaces should be edited in the meantime to M4TRIF. Subsequent conversion to MPEG-4 file format would then be facilitated. Mr. Lim volunteered to assist in resolving issues relating to file formats.

The group debated at length whether or not audio composition was part of Systems responsibility or Audio responsibility. Real-time composition is currently in a mess. Mr. Quackenbush noted that being practical, if Audio don't sort things out then it wouldn't be done. Mr. Coleman, however, noted that there was no way at the moment that the reference software could be used to check the issue of A/V synchronisation.

The workplan for the audio part of the reference software is given in document WG11/N2574

MPEG-4 Audio/Systems Issues

Mr. Jot introduced briefly his contribution on additional BIFS for perceptual description of the auditory scene. This requires the addition of PerceptualScene and PeceptualSound as AudioBIFS

nodes. Mr. Avaro asked whether this was a worthwhile improvement on the proposals from Helsinki University, which are based on a spatial model. The Audio Group feels firmly that the proposal is a worthwhile improvement and that the two elements can co-exist. This however, requires an output document and additions to the Amds to parts 3 and 5.

In a joint meeting with Systems, Mr. Teichman raised the issue of MATS (MPEG-4 Audio Transport Stream). This has been moved from the normative part of the standard to the Informative part. The burden of MATS on the Systems layer was discussed.

The current position relating to Audio/Systems issues is given in document WG11/N2575.

MPEG-4 over MPEG-2 ??

IM1 Audio Plug-ins

Mr. Teichman observed that Samsung had uploaded an audio plug-in but that it had not yet been tested, as the scene description with the right BIFS node was not available. It was also noted that the software had changed since the plug-in had been uploaded so it may need modification. Mr. S-W Kim and Mr. Signes volunteered to sort this out.

MPEG-4 Profiles and levels

Mr. Koenen asked that MPEG-4 version 2 profiles and levels should be debated and contributed at the time of FCD. Discussion in anticipation at Seoul is encouraged.

MPEG-4 version 2: technical issues

MPEG-4 version 2 – Error resilience

Four documents were discussed in task group and were summarised for the Audio group by Mr. Dietz. The recommendations were to write informative annexes, to update the ep tool description, to check integration with Systems, to discuss use of block codes and to start verification tests. The error resilience workplan is given in document WG11/N2579.

IPR and Watermarking

Nothing to discuss at this meeting.

Low delay

Mr. Herre presented m4306 and 4307 giving further details on the low delay encoder (~20 ms delay). The performance had been demonstrated by a test report to the Atlantic City meeting, but small additional improvements are presented in m4306. As a variation on the very low 20 ms delay, Mr. Herre also reported a slightly relaxed 40 ms mode running at a lower sampling rate. This gives worthwhile improvement vis a vis AAC at a similar bit rate and sampling rate. The penalty is a small increase in the size of the scalefactor band tables. The Group approved the proposal for inclusion into the standards document.

Environmental spatialisation

Ms. Vaananen and Mr. Huopaniemi introduced the topic of audio BIFS relating to 3D sound spatialisation. M4305 describes the demonstrations of advanced audio BIFS. The implementation (450 MHz Pentium II running the Telenor IM1 player) achieves sound source modelling, air absorption and environmental modelling.

1. Sound source in free space, move around source with directionality (first order IIR filter)
2. Moving sound source, exaggerated Doppler shift
3. Source moving to a wall, auralisation of reflections of different delay
4. Two sound sources in linked rooms, modelling sound propagation in spaces, transmission through spaces and through walls. Two different room acoustics of small space to large space (tube station)
5. Concert Hall simulation

Additionally, Mr. Jot demonstrated the IRCAM/France Telekom proposal given in m4222 and 4223. This covers the perceptual approach to spatial auralisation and provides other ways of processing sound rather than moving sources and listeners in modelled rooms. It represents

distance, room effects, audio only and perception beyond the source space. It is described as a generic reverberation response model, comprising early sparse reflections, diffuse concentrated reflections and later classical reverberation as temporally separate entities. Useful visual interface linking high level user controls, such as presence warmth liveness (9 controls in total) to the lower level perceptual parameters and spatial model. Relative to the v1 BIFS, additional BIFS elements need to be added to both PerceptualScene and PerceptualSound. The proposal is to add normative elements (of node definition and semantics, and rules for graceful degradation) and informative elements (of algorithm implementation). Additionally, the elements for implementation in IM1 are available for integration.

In discussion in Audio, it was noted that the two approaches of spatial modelling and perceptual modelling could co-exist in IM1. The proposal was also presented to Systems who accepted the additional tool and functionality and worked to unify the nodes. This will be presented in output document WG11/N2578.

Back channel

Mr. Kim presented m4340 showing how a back channel could be used to optimise the use of fine grain scalability operation. The back channel can be used to request the server to send more or less enhancement layers to the receiver. The document also outlines how interleaving can be used to reduce the amount of overhead data but it brings with it the problem of increased delay, input buffer size constraints and editability.

Mr. Lim presented m4224 on the use of back channel for TTSL. This allows the signalling of forwards/backwards controls to the server. The necessary syntax is also given and will be incorporated into the WD.

An AHG was established to ensure that the issue of back channel was not overlooked. This will pull in effort from other groups.

BSAC, HILN

Mr. Kim presented m4338 giving test results of BSAC at 40 kbps/stereo as an update of the results presented at the last meeting. Samsung had located faults in the previous embodiment, see m4339, and better results were now being reported. Item 20 was seen still to be a problem for BSAC at 40 kbps but overall there is an improvement and Samsung will do further work on this tool. With that, BSAC was accepted into MPEG-4 v2.

Mr. Park presented m4339 describing what changes were being proposed to BSAC. One query was raised relating to mono/stereo scalability. This will be tested prior to Seoul. Otherwise, the proposed changes were accepted and will be incorporated. A description of the BSAC tools set is given in document WG11/N2583.

No new work was reported to this meeting on HILN, which led Mr. Meares to ask for a schedule outlining when the necessary improvements would be made available. Mr. Purnhagen advised the group that a core experiment would be announced at the next meeting.

Other version 2 matters

At the request of Requirements, the following table of justifications for the version 2 tools was compiled.

Technology	Requirements paragraph	Name
Error resilience	#4.4.8 Robustness to information errors and loss	Dietz
Low delay	#4.4.9 delay modes	Herre
Environmental spatialisation	#4.1.3 auralisation effects	Ray
Back channel	#4.1.5 user interaction	Kim
BSAC (fine step scalability)	#4.4.4 fine grain scalability	Kim
HILN	#4.4.6 and 4.4.7 time change and pitch change	Purnhagen

Table 1 MPEG-4 Version 2 Audio Technology and the associated requirement it addresses

IM1 (Telenor implementation) has been accepted by Systems as being definitive for their v2 core experiments. All future core experiments should therefore be based on that player.

Mr. Ray presented the summary of his task group's findings as presented in document WG11/N2576.

Mr. Brandenburg's task group gathered information on MPEG-4 v2 core experiment progress and proposals, and these are presented in document WG11/N2580.

Audio 14496-3 /Amd 1 (PDAM Mar 99)

Mr. Kim co-ordinated the contributions to the Amd 1 text. The compilation of these subparts is presented in document WG11/N2577.

Conformance 14496-4/Amd 1 (WD Mar 99)

Time did not permit the preparation of a WD on v2 conformance at this meeting.

Reference Software 14496-5 /Amd 1 WD (Oct 98)

The group reviewed the status of version 2 reference software. The BSAC and HILN code needs to be marked as version 2 items only. New tables are needed for the low delay encoder needed 15th Jan. New tables and syntax re needed for BSAC to be added Jan 15th 99. The error resilience tool needs an update needed 15th Jan. The difficult items are spatialisation and back channel as these may be handled within Systems. It is also important to note which version of IM1 should be used for core experiments.

The workplan for the reference software v2 is presented in document WG11/N2582

Review of MPEG-4 version 2 Overview

There was insufficient time to review this at the Rome meeting.

MPEG-7 Audio (15938 WD Dec 99)

In a joint meeting with Requirements, Audio was brought up to date on the issues of the MPEG-7 Audio, the experimentation model (XM) and the current approach to evaluations. Mr. Herre talked about the Audio Task Group and the work it hopes to achieve during the week. Mr. Koenen presented the proposals as they currently exist relating to the evaluation of the proposals for MPEG-7. The Descriptors need further input to aid the evaluations and this will be requested. There will be 11 groups at Lancaster covering audio and video, Descriptors, DDs and DDLs. For Lancaster to work, the proposers need to also take on the role of evaluators under a group leader. Each group will be asked to judge a group of proposals all under one generic cluster and make reports at the end of the week giving plus and minus points relating to each proposal which will be passed on to Seoul. The requirement is that there will be specific recommendations into the Seoul opening Plenary on which tools will be included in the XM. This will then need endorsing in Seoul. Beyond Seoul, there will be a series of core experiments by which alternative proposals can be introduced into the XM.

Mr. Quackenbush queried the evaluation procedure, as Audio has a long history of approval and subjective testing. Mr. Lindsay responded that document N2463 covers the mechanisms, which will be adopted for the assessment of proposals.

Mr. Buxton introduced the XM, as described in m4200. This includes both non-normative elements (extractor, search engine and application) and normative elements (encoder, interface and decoder). The architecture and development details for the XM contributions are given in m4234. Ms Eklund observed that different styles of software could slow down the process of developing the XM and offered to help specify the format of software templates. Under the guidance of Mr. Herre, the Audio group reviewed and approved the document describing MPEG-7 XM development as given

in document WG11/N2571.

Mr. Herre raised the issue of limited audio material being available for the MPEG-7 tests. The material available now is only either highly critical for coders or general audio. What is needed now is specific material to which metadata can usefully be added. However, Mr. Meares reminded the group of the very precisely worded copyright release statement that is needed for all MPEG-7 test material. Mr. Dietz will check with Deutsche Welle whether the test material used for MPEG-4 can be made available. Mr. Ray will also check on the availability of SA material. Mr. Meares reported that he is endeavouring to get BBC Information and Archives involved in MPEG-7 and if he is successful there is a good chance that test material would be made available. Mr. Lindsay volunteered to provide an FTP site at Riverland for additional audio test material.

Mr. Lindsay outlined the preparations for evaluation of the MPEG-7 audio descriptors at Lancaster. There are about 250 audio proposals to be assessed in three parallel sessions each proposal getting about 15 minutes for presentation. At present there is a shortage of audio evaluators and volunteers are being requested.

Mr. Herre noted that there is a need for the Audio Group to review the Requirements document. At present the document is difficult to read and the audio requirements are not an accurate reflection of what is needed. The document should be reviewed in the ad-hoc group to the next meeting. Similarly, additional input is needed on the applications document, N2462. Messrs Herre and Lindsay outlined the characteristics that may be used to describe audio content, see document m4228, and the process by which this is being refined.

MPEG Audio FAQ/Web Page

Additional FAQs for MPEG-7, e.g. guidance on typical descriptors, were discussed and will be added to the web page. Mr. Sang-Wook Kim, Samsung, volunteered to take over the task of maintaining the audio web page at its current location. The Group thanked Mr. Purnhagen for having done the task up to now and Mr. Kim for taking over the task.

Mr. Thom asked whether the AAC Conformance bitstreams would be made public on the web page. Mr. Meares observed that there had been a resolution to this effect at the last meeting and so this will now be done. Also, details relating to the Philips bitstreams were resolved. Mr. Iwadare noted that each bitstream requires a copyright release form for the bitstream, and, in some cases, the contained audio item.

Mr. Thom prepared the output document, which records the workplan for the remaining tasks, see document WG11/N2584.

Discussion of unallocated Contributions

All contributions had been assigned to specific agenda items.

Meeting deliverables

Press statement

Mr. Meares prepared the Audio part of the press statement, which was approved.

Dispositions of Comments

The DoC matters are referred to above.

Responses to NB comments

Responses to the National Body comments were prepared and were approved.

Liaison statements

As reported above, these were prepared and approved.

Recommendations for final plenary

Messrs Meares and Thom prepared a list of recommendations for approval at the final MPEG plenary meeting.

Establishment of new Ad-hoc Groups

The following ad-hoc groups were established:

	Mandate	Meeting
AHG on MPEG-4 Audio Conformance (Spille, Dietz)	2585	no
AHG on audio part of MPEG-4 FDIS & Reference Software editing (Grill, Purnhagen)	2586	Weekend before Seoul
AHG on MPEG-4 Audio V2 editing and software progression (Grill, Kim, Purnhagen)	2587	Weekend before Seoul
AHG on MPEG-7 audio matters (Herre/Lindsay)	2588	no
AHG on MPEG-4 V2 core experiments (Brandenburg, Dietz)	2589	Weekend before Seoul
AHG on MPEG-4 Conformance (Joint) (J. Deford)	2618	Yes
AHG on MPEG-4 back channel (Y. Lim)	2591	no

Approval of output documents

All output documents were presented to Audio plenary and were approved.

Future activities

Schedule of future meetings

The dates of the next MPEG meeting in Korea were confirmed. Dates for the ad-hoc group meetings had been previously discussed. All of the ad-hoc group meetings will occur on the Saturday or Sunday immediately preceding the MPEG meeting.

Agenda for next meeting

Mr. Meares presented the agenda for the MPEG Audio Subgroup meeting in March 1999 in Seoul, Korea, to the meeting. This was briefly discussed and approved (Annex III).

A.O.B.

Mr. Quackenbush encouraged members to take the opportunity of the editing period for the Conformance document to review the text and to pass comments back to the editor, Mr. Spille. He also requested members to consider how they could help cover the secretarial support at the next meeting.

Closing of the meeting

Mr. Quackenbush thanked the Audio Group members for their hard work during the week and looked forward to seeing them all again in Seoul. He also expressed thanks to Mr. Meares for all the hard work and guidance for the Group during his period of tenure as secretary to the group.



20 12:25 hrs

Annex A-I: Meeting Participants List

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Annex A-II: Agenda for the Rome Audio Subgroup Meeting

1. Opening of the meeting
2. Administrative matters
 - 2.1. Approval of agenda
 - 2.2. Atlantic City meeting report
 - 2.3. Allocation of contributions
 - 2.4. Communications from the Chair
 - 2.5. Joint meetings
 - 2.6. Received National Body Comments and Liaison matters 4199, 4216, 4236, 4249,
3. Task group activities 4192,
 - 3.1. MPEG-2 Conformance, 13818-4 /Amd 3 (FPDAM Mar 99) 4236,
 - 3.2. MPEG-4 Audio FDIS editing status 4274,
 - 3.3. MPEG-4 Conformance 14496-4 (CD Dec. 98) 4193, 4209, 4219, (4220, Systems), 4225, 4247, 4268,
 - 3.4. MPEG-4 Reference Software 14496-5 (FDIS Mar 99) 4216, 4274,
 - 3.5. MPEG-4 Audio/Systems Issues 4199, 4340, (4177, 4183, 4254, 4259, 4260, 4341, System),
 - 3.5.1. IM1 Audio plug-in (4348, Systems)
 - 3.6. MPEG-4 Profiles and levels (4348, Systems)
 - 3.7. MPEG-4 Audio 14496-3 /Amd 1: Technical Issues
 - 3.7.1. Error resilience 4208, 4292, 4355, 4358,
 - 3.7.2. IPR and Watermarking
 - 3.7.3. Low delay 4306, 4307,
 - 3.7.4. Environmental spatialisation 4222, 4223, 4305,
 - 3.7.5. Back channel 4224,

- 3.7.6. BSAC, HILN 4338, 4339, 4340,
- 3.7.7. Other (4198, 4215, 4240, Requirements), 4214, (4249, Liaison),
- 3.8. MPEG-4 Audio 14496-3 /Amd 1:Editing Group (PDAM Dec 98)
- 3.9. MPEG-4 Conformance 14496-4 /Amd 1 (WD Dec 98)
- 3.10. MPEG-4 Reference Software 14496-5 /Amd 1 (PDAM Dec 98)
- 3.11. Review of MPEG-4 version 2 Overview
- 3.12. MPEG-7 Audio 15938-3 (WD Dec 99) 4200, 4228, (4221, 4287, 4290, 4291, 4233, 4234, 4324, 4325, Requirements), (4196, Systems), 4286,
- 3.13. MPEG Audio FAQ/Web Page
- 3.14. MPEG Audio - Preparation of press statement
- 4. Discussion of unallocated Contributions
- 5. Meeting deliverables
 - 5.1. Press statement
 - 5.2. Dispositions of Comments
 - 5.3. Responses to NB comments
 - 5.4. Liaison statements
 - 5.5. Recommendations for final plenary
 - 5.6. Establishment of new Ad-hoc Groups
 - 5.7. Approval of output documents
- 6. Future activities
 - 6.1. Schedule of future meetings
 - 6.2. Agenda for next meeting
- 7. A.O.B.
- 8. Closing of the meeting

Annex A-III: Agenda for the Seoul Audio Meeting

- 1. Opening of the meeting
- 2. Administrative matters
 - 2.1. Approval of agenda
 - 2.2. Rome meeting report
 - 2.3. Allocation of contributions
 - 2.4. Communications from the Chair
 - 2.5. Joint meetings
 - 2.6. Received National Body Comments and Liaison matters
- 3. Task group activities
 - 3.1. MPEG-2 Conformance, 13818-4 /Amd 3 (FPDAM Mar 99)
 - 3.2. MPEG-4 Audio 14496-3 FDIS editing status
 - 3.3. MPEG-4 Conformance 14496-4 (FCD Jul. 99)
 - 3.3.1. Audio
 - 3.3.2. Composition
 - 3.4. MPEG-4 Reference Software 14496-5 (FDIS Mar 99)
 - 3.4.1. Audio coder System interface
 - 3.4.2. Composition
 - 3.5. MPEG-4 Audio/Systems Issues

- 3.5.1. IM1 Audio plug-in
- 3.5.2. Other
- 3.6. MPEG-4 Profiles and levels
 - 3.6.1. Composition
 - 3.6.2. Version 2 Audio
- 3.7. MPEG-4 Audio 14496-3 /Amd 1: Technical Issues
 - 3.7.1. Back channel
 - 3.7.2. BSAC
 - 3.7.3. Environmental spatialisation
 - 3.7.4. Error resilience
 - 3.7.5. HILN
 - 3.7.6. Low delay
 - 3.7.7. Other
- 3.8. MPEG-4 Audio 14496-3 /Amd 1:Editing Group (PDAM Mar 99)
- 3.9. MPEG-4 Reference Software 14496-5 /Amd 1 (PDAM Mar 99)
- 3.10. MPEG-4 Conformance 14496-4 /Amd 1 (WD Mar 99)
 - 3.10.1. Audio coding
 - 3.10.2. Composition
- 3.11. Review of MPEG-4 version 2 Overview
- 3.12. MPEG-7 Audio 15938-3 (WD Dec 99)
- 3.13. MPEG Audio FAQ/Web Page
- 3.14. MPEG Audio - Preparation of press statement
- 4. Discussion of unallocated Contributions
- 5. Meeting deliverables
 - 5.1. Press statement
 - 5.2. Dispositions of Comments
 - 5.3. Responses to NB comments
 - 5.4. Liaison statements
 - 5.5. Recommendations for final plenary
 - 5.6. Establishment of new Ad-hoc Groups
 - 5.7. Approval of output documents
- 6. Future activities
 - 6.1. Schedule of future meetings
 - 6.2. Agenda for next meeting
- 7. A.O.B.
- 8. Closing of the meeting

Annex A-V: Audio Task Groups and Mandates

In order to make the necessary progress during the Rome meeting, the following task groups are proposed together with the mandates as listed. The intention is that the Task Groups are charged with working on the topics listed with the aim and delegated authority of making decisions and recommendations.

MPEG-2 Conformance, 13818-4, Amd 3 (Quackenbush)

Noting that this amendment is to progress to FPDAM at the March 99 meeting:

- To review the progress toward providing a test bitstream for checking MC_CRC and the checking of that bitstream.
- To collect and address any National Body comments on this amendment.
- To establish a publicly accessible server for all Audio Conformance bitstreams.
- To progress the amendment text to add bitstreams and their descriptions to 13818-4
- To prepare a 'study on NB comments' and a 'study on the PDAM' as output documents

MPEG-4 Conformance, 14496-4, (Spille)

Noting that the conformance documentation (for MPEG-4 version 1) is to progress to CD at this meeting:

- To continue development of a conformance model for MPEG-4 Audio
- To consider and propose appropriate test procedures and performance criteria as may be required by the various tools in MPEG-4 Audio
- To work with members of the other subgroups, as required, in order to develop a unified approach to Conformance testing
- To edit the conformance document so that it is suitable for progression to CD.

MPEG-4 Reference Software, 14496-5, FDIS preparation (Purnhagen)

Noting that the reference software (for MPEG-4 version 1) is to progress to FDIS at the March 99 meeting:

- To study all input comments on the MPEG-4 Reference Software FCD
- To review, thoroughly, all proposed changes to ensure consistency, particularly between software modules
- Working with the other Subgroups, to compare and align the reference software to the text parts of MPEG-4 14496 parts -1, -2 and 3
- To ensure that audio reference software have correct interface with systems software (e.g. access units, configuration data, composition units)
- To report the status of the reference software (i.e. what is complete, what is incomplete, what is tested, what is not tested).
- To produce a workplan to implement audio composition functions.
- To prepare a 'study on the FCD' as an output document

MPEG-4 Audio/Systems Issues (Teichmann)

- To study and resolve, jointly with Systems, issues of timing and synchronisation in presentation of multimedia and multiple audio streams.
- To complete any outstanding issues relating to audio BIFS.
- To consider the options for the provision of an IM1 Audio plug-in
- To report the current status of these issues.
- To work with the reference software task group to produce a workplan and locate resources for the correct implementation of audio/systems issues in the audio reference software
- MATS

MPEG-4 Profiles and levels (Brandenburg)

- To assist Requirements in preparing a first draft of the annex to the applications document, N2547, identifying the Audio MPEG-4 profiling details.
- To review editorial aspects (including SA) of the audio profiles and levels as specified at the Atlantic City meeting
- To consider any relevant input documents on the subject
- If necessary and unavoidable, to propose changes to the Profiles document
- To consider the needs of the industry in relation to workable allocations of profiles and toolsets to applications

MPEG-4 Audio, 14496-3, AMD1: technical issues (Ray)

- To consider input documents relating to error resilience, IPR and watermarking, low delay profiles, environmental spatialisation, back channel and other matters as may be submitted.
- To consider any test results as may be reported to this meeting
- To recommend tools to be adopted into AMD 1.
- To contribute to the text of 14496-3 AMD1 as appropriate.

MPEG-4 Audio, 14496-3, AMD1: editing group (Grill)

Noting that the amendment to MPEG-4 Audio is to progress to PDAM at this meeting:

- To review the content of the relevant Atlantic City output documents, e.g. Working Draft N2428, error resilience N2429
- To consider relevant input documents to the Rome meeting and the considerations of the Task Group on MPEG-4 AMD 1 Technical Issues
- To continue integration of proven tools into the MPEG-4 VM
- To prepare the text of the PDAM.
- To propose a work plan for the completion of this activity

MPEG-4 Conformance Extension, 14496-4, Amd 1 (Brandenburg)

Noting that the conformance extension documentation (for MPEG-4 version 2) is to progress to WD at this meeting:

- To continue development of a conformance model for MPEG-4 Audio to cover the extensions required for the amendment
- To consider and propose appropriate test procedures and performance criteria as may be required by the various tools in MPEG-4 Audio
- To work with members of the other subgroups, as required, in order to develop a unified approach to Conformance testing
- To draft the necessary conformance extension documentation as a WD

MPEG-4 Reference Software Extension, 14496-5, Amd 1 (Purnhagen)

Noting that the reference software (for MPEG-4 version 2) is to progress to PDAM at the March 99 meeting:

- To study all input comments on the MPEG-4 Reference Software FCD
- To review, thoroughly, all proposed changes to ensure consistency, particularly between software modules
- Working with the other Subgroups, to compare and align the reference software to the text parts of MPEG-4 14496 parts -1, -2 and 3
- To prepare a 'study on the FCD' as an output document

MPEG-7 (Herre, Lindsay)

Noting that the first WD of this standard is required at the Dec 99 meeting:

- To discuss the input documents on MPEG-7 as they affect Audio
- To identify missing and additional sources and types of audio material needed for the evaluation of MPEG-7 proposals
- To discuss the appropriateness and sufficiency of evaluation methods for the testing of MPEG-7 proposals, N2463, and to propose additional methods if needed.
- To report on the areas in which Audio is expected to contribute to MPEG-7, and also to report on the areas in which additional input from Audio may be needed.
- To prepare a first draft of an applications document for MPEG-7
- To consider Audio FAQs and propose suitable answers

MPEG Audio FAQ/Web Page (Thom)

- To consider new FAQs and propose answers to them
- To add MPEG-7 FAQs
- To review the web pages and propose updated pages
- To list tasks which will remain unfinished at the end of this meeting and to obtain undertakings to complete them.

MPEG Audio - Preparation of press statement (Meares)

- To consider the state of development of the work delegated to the Audio Subgroup
- To prepare a press statement describing the highlights as of this meeting

Annex A-VI: Input/Output Documentation**Contributed documents**

The following documents were contributed to the Audio Subgroup and were considered during this meeting:

Number	Author	Title
4173	Pete Schirling	Document Register for 46th Meeting in Roma. IT
4192	S. R. Quackenbush, D. J. Meares	Audio Subgroup- Task Group Mandates for 46th MPEG Meeting
4193	Jens Spille	Report of Ad Hoc Group on MPEG-4 Audio Conformance
4200	Jens-Rainer Ohm, Wolfram Liebsch, Bela Makai, Karsten Mueller, Behnam Saberdest, Detlef Zier	Concepts and Architecture for MPEG-7 Experimentation Model
4208	Toshiro Kawahara, Sanae Hotani	Proposed Revision to EP Tool part of MPEG-4 Audio Version 2 WD
4209	Ralf Funken	Additions to the CELP Audio part of the Conformance Working Draft
4214	Yoichi Yagasaki	Ad hoc Group Report of Requirement Study for High Quality Application (N2455)
4216	JNB via SC 29 Secretariat	Late Comments on ISO/IEC FCD 14496-5 (SC 29 N 2867)
4219	Eric Scheirer	Some bitstreams for V1 Structured Audio conformance testing
4222	Jean-Bernard Rault, Marc Emerit, Olivier Warusfel, Jean-Marc Jot	Audio Rendering of Virtual Room Acoustic and Perceptual Description of the Auditory Scene
4223	Jean-Marc Jot, Lee Ray, Luke Dahl	Extensions of Audio BIFS: Interfaces and Models Integrating Geometrical and Perceptual Paradigms for the Environmental Spatialization of Audio
4224	Young-Kwon Lim, Jung-Chul Lee, Youngjik Lee	The Back Channel information of the MPEG-4 Audio TTSI

4225	Jung-Chul Lee, Young-Kwon Lim, Youngjik Lee	The Conformance Bitstreams of the MPEG-4 Audio TTSI
4228	Juergen Herre, Adam Lindsay	Report of the Ad-hoc Group on Audio Activities in MPEG-7
4236	The National Body of Japan	Study of ISO/IEC 13818-4/PDAM3
4247	Akira Inoue, Masayuki Nishiguchi	Decoder Conformance Testing Procedure for HVXC
4249	Masahiro Iwadare, Toshiyuki Nomura	MPEG-4/Audio Codepoint for ITU-T H.324
4268	Eric Scheirer	All the things which have to be conformance-tested in Structured Audio V.1
4273	Ralf Funken	Scalability in MPEG-4 Audio
4274	Bernhard Grill, Heiko Purnhagen	Report of the AhG on MPEG-4 Audio FDIS and Reference Software FDIS editing
4286	David Thom, Heiko Purnhagen	Audio Web Page activity
4292	Martin Dietz, Toshio Miki	Report of the ad-hoc group on MPEG-4 audio error resilience for version 2
4306	Juergen Herre, Eric Allamanche, Ralf Geiger, Thomas Sporer	Information on MPEG-4 Low Delay Audio Coding
4307	Juergen Herre, Eric Allamanche, Ralf Geiger, Thomas Sporer	Update on MPEG-4 Low Delay Audio Coding
4338	Y.B.Thomas Kim, S.H. Park, S.W. Kim	Subjective test results on BSAC at 40kbps/stereo and 56kbps/stereo
4339	Y.B.Thomas Kim, S.H. Park	Detailed description of BSAC
4340	Y.B.Thomas Kim, S.H.Park	System issues on audio fine granule scalability (BSAC)

Output Documents

The following output documents were produced in whole or part by the Audio Subgroup. Those shown in *Italics* were approved for public release.

Number	Title
2548	Study on DoC on ISO/IEC 13818-4/PDAM3
2549	Study on Text of ISO/IEC 13818-4/PDAM3
2573	Status of MPEG-4 Audio FDIS 14496-3
2550	ISO/IEC 14496-4 CD Conformance Testing of the MPEG-4
2574	Workplan for the audio part of ISO/IEC 14496-5 MPEG-4 Reference software
2575	Information on MPEG-4 Audio systems issues
2576	Report on the technical issues of MPEG-4 Audio, version 2
2577	WD of ISO/IEC 14496-3 Amd 1: MPEG-4 Audio, Version 2
2578	Extension of advanced audio BIFS: a perceptual paradigm for environmental spatialisation of audio
2579	Error resilience workplan
2580	Status of MPEG-4 Audio Version 2 core experiments
2581	WD for ISO/IEC 14496-4 Amd 1: MPEG-4 Audio, Version 2 Conformance
2582	Study on ISO/IEC 14496-3 PDAM 1: MPEG-4 Audio, Version 2 Reference Software
2583	Fine grain scalable Audio tool implementation ways with MPEG-4 System
2571	MPEG-7 XM development
2584	MPEG Audio web page work plan & FAQs
2590	Template for composition profiles and levels definition

Annex 9
SNHC group report

Source: Peter Doenges, Chairman

SNHC Meeting Summary

For Version 1 MPEG-4, the main SNHC objectives for the Roma meeting were to insure that FDIS edits from the Atlantic City meeting were implemented correctly, while making Conformance improvements for Part 4 CD and repairing Face Animation profiling problems created inadvertently in Atlantic City. Version 1 functionalities of interest to SNHC remain Face Animation (FA), 2D Animated Mesh (2DAM), Still Texture coding, and various 2D/3D graphics, scene composition, structure update, and animation nodes in Systems BIFS plus specialized BIFS nodes for face body animation and 2D mesh animation.

For Version 2, the main objectives were to solidify testing and complexity analysis for final technology selections in the WD to be promoted to the Version 2 Visual CD. The main functionalities for Version 2 are body animation, 3D mesh, and CGD (all backward compatible with Version 1). These include body integration with face when desired, 3D mesh compression (3DMC) including hierarchical and progressive forms as well as error resilience, and Computational Graceful Degradation as header information that describes media complexity and the projected surface sphere for decoding and rendering load estimations.

An outline of more detailed meeting objectives and work is given below:

Version 1

1. Part 2 FDIS editing complete (FA, 2DMC, SNHC in BIFS)
 - a. Incorporate NB items for N2502a from Atlantic City
1. Part 4 Conformance
 - a. Development of SNHC Visual Conformance CD beyond N2445
 - b. Finish test bitstream definition and subsequent development, exchange, verification
1. Part 5 Reference Software
 - a. Update reference software to match FDIS (for Mike Colman)
 - b. Schedule driven by 3/99 Part 5 FDIS, review latest FA, 2DMC input
1. IM1 software integration status
 - a. FDIS currency, any revision to work plan & contributions
1. Review & update SNHC software plan
 - a. Version 1 & 2 deliverables of encoder, decoder, test data, tools
1. Still Texture Coding
 - a. End-to-end test, BIFS support for wavelet progressive/MIP texture

Version 2

1. Review of contributions, CEs, WD, bitstream exchange re: CD promotion requirements
2. Completion of open technology items, promote M1-M5 from Visual WD to Visual CD
 - a. 3D Model Coding
 - i. M1: Topological/connectivity compression - complete
 - ii. M2: Prediction for geometry compression
 - (1) Parallelogram vs. polygon vertex prediction, model-adaptive hybrid
 - iii. M3: Hierarchical connectivity compression - complete
 - iv. M4: Coding of properties (color, normal, texture u,v) - complete
 - v. M5: Partitioning of data for error resilience & incremental rendering
 - (1) Incremental rendering, error resilience/masking vs. efficiency loss
 - (2) Approaches/layers on baseline WD

- (a) M1 Topological Surgery (base mesh connectivity) with start codes
 - (b) Component-based data partitioning
 - (c) Unification of looping with the TS approach
 - (3) Resolve proposal for adding object mirroring, instancing to 3DMC
- vi. M6: 2D/3D mesh unification
 - (1) Integrating connectivity of 3DMC into intra-plane 2DAM
- vii. M7: Color quantization
 - (1) Exploiting limits of human visual color differentiation to improve efficiency of color compression & assessment of impact on M4
- b. Face Animation
 - i. FA1: Face Model Mesh Calibration - FDP/VRML, texture
- c. Body Animation
 - i. BA2: BAP Compression (DCT)
 - ii. BA6: BAP Quantization Step Sizes
 - iii. BA8: BAT Table Interpolation
- 1. BA work items
 - a. Resolve and implement actions from VRMLC/Web3D H-Anim meeting
 - i. Harmonization of BAP, joint nomenclature with H-Anim
 - ii. Use of well-defined PROTOs: Systems PROTO vs. new nodes
 - iii. H-Anim model files integrated into IM1 with VRML parsing
 - iv. Proposed default joint centers for Visual Specification Annex
 - b. Specification changes: min/max, DCT, BAT issues, defaults, etc.
 - i. Status of bitstream exchanges, WD status, small changes vs. CD deadline
- 1. Clarification by Systems on use of PROTOs in Version 2 to support body animation
- 2. IM1 implementations
 - a. Body node and integrated FBA decoder, demo models/bitstreams
 - b. 3D Model Coding decoders integrated, demo models/bitstreams
- 1. Part 5 Reference Software
 - a. Update reference software to match CD (for Mike Colman)
- 1. ISG CGD for SNHC
 - a. Review new complexity analyses on FA and 3DMC, CGD demo
 - b. Evaluate WD to CD promotion, any further verification testing
- 1. Profiling, applications (if Requirements ready - maybe late week)
 - a. FA Calibration/Predictable profiles and related level issues
 - b. 3DMC & BA - applications, how used, what profile & level points

Most of these objectives were achieved. Version 1 work was completed including Conformance improvements needed for CD. Outstanding items are now the Part 4 Conformance bitstream generation and Part 5 software updates before the Seoul meeting, March 1999. Elements of the software plan for Version 1 and 2 were updated by agreement among members, but no output document was created.

The Version 2 CD was delayed by WG11 to the Seoul meeting in March to give priority to Version 1 Conformance work. Most of the planned SNHC Version 2 work toward CD was completed but targeted at WD again. Vertex prediction and error resilience decisions in 3D Model Coding were not resolved. These must see timely attention before the special 3DMC Ad Hoc Group meeting at EPFL, Lausanne, in early February. There were valuable updates to specification text on Body Animation and 3DMC, as well as an advisory on hierarchical encoding of 3D meshes with associated properties (M3). Proposals were made on multi-object vertex prediction (M2) and color coding (M7) to improve coding efficiency beyond the M2/M4 baseline in the WD. However, there were not sufficient results with cross checks from contributing partners to meet the WD/CD schedule in 3DMC M6 and M7 core experiments. Without needed progress, these will be dropped with no adverse consequences to the core 3DMC (M1-M5).

SNHC Contributions & Related Review

The following contributions concerning SNHC were presented or discussed during the meeting:

Face & Body Animation - FBA

No.	Available Date	Group Section	Title Source
4202	19981201	MPEG-4	EPFL Core Experiment Results on Body Animation (BAT only)
	98/11	SNHC	Tolga K. Capin., Srikanth Bandi., Joaquim Esmerado,
4203	19981201	MPEG-4	Proposal for update to body animation specification
	98/11	SNHC	Tolga K. Capin
4237	19981201	MPEG-4	Semantics of BAP DCT Coding
	98/11	SNHC	Hai Tao, Homer Chen
4278	NO	MPEG-4	Preliminary Results on Hand BAT Interpolation
	98/11	SNHC	Francoise Preteux., Marius Preda., Titus Zaharia,
4283	NO	MPEG-4	Results of Core Experiment on BAP Coding (DCT coding)
	98/11	SNHC	Francoise Preteux., Marius Preda., Titus Zaharia
4309	19981201	MPEG-4	FBA Ad Hoc Report
	98/11	SNHC	Eric Petajan, Tolga Capin

3D Model Coding - 3DMC

No.	Available Date	Group Section	Title Source
4251	19981201	MPEG-4	Results of CE M5 Error Resilient 3D Mesh Coding
	98/11	SNHC	Euee S. Jang, SungJin Kim, Munsup Song, Mahnjin Han, S. Y. Jung, Y. S. Seo
4252	19981201	MPEG-4	Results of CE M7 Color Prediction for 3D Mesh Coding
	98/11	SNHC	S. Y. Jung, SungJin Kim, Munsup Song, Mahnjin Han, E. S. Jang, Y. S. Seo
4262	19981201	MPEG-4	Reference software implementation status of 3D model coding
	98/11	SNHC	Jin Soo Choi, Myoung Ho Lee, Chieteuk Ahn
4277	19981201	MPEG-4	Geometry Coding of 3D Meshes: Results of Core Experiment M2
	98/11	SNHC	Francoise Preteux, Titus Zaharia, Sorin Curila, Mircea Curila
4293	Yes	MPEG-4	Report of Ad hoc group on 3D model coding
	98/11	SNHC	T. Ebrahimi, P. Doenges
4310	19981201	MPEG-4	Proposal for Adding Object Mirroring and Instancing to 3D Model Coding
	98/11	SNHC	Eric Petajan, Chandrajit Bajaj
4312	Yes	MPEG-4	Description of core experiments on 3D model coding
	98/11	SNHC	Frank Bossen (editor)
4313	Yes	MPEG-4	Results of core experiments on 3D model coding
	98/11	SNHC	Frank Bossen
4314	Yes	MPEG-4	Comments on WD for 3D model coding
	98/11	SNHC	Frank Bossen
4333	19981201	MPEG-4	SNHC 3D Mesh Coding Reference Software
	98/11	SNHC	Gabriel Taubin, Andre Gueziec, Claudio Silva
4334	19981201	MPEG-4	SNHC 3D Mesh Coding Syntax Improvements
	98/11	SNHC	Gabriel Taubin, Andre Gueziec, Claudio Silva
4336	19981201	MPEG-4	SNHC 3D Mesh Coding Error Resiliency by Partitioning
	98/11	SNHC	Gabriel Taubin, Andre Gueziec, Claudio Silva
4337	19981130	MPEG-4	Hierarchical Encoding of 3D Meshes with Associated Properties
	98/11	SNHC	Gabriel Taubin, Andre Gueziec, Claudio Silva
4343	19981201	MPEG-4	Adaptive Coding of Multiple Components on 3D Model Coding
	98/11	SNHC	Jeong-Hwan Ahn, Yo-Sung Ho

Implementation Studies Group - ISG

No.	Available Date	Group Section	Title Source
4255	19981201	MPEG-4	Complexity Analysis of Facial Animation Software for CGD
	98/11	Implementation	Gauthier Lafruit, Roberto Pockaj, Jan Bormans

4256	19981201	MPEG-4	Complexity Analysis of 3D mesh software
	98/11	Implementation	Gauthier Lafruit, Jan Bormans
4258	19981201	MPEG-4	Demo for CGD parameter estimation in 3D rendering
	98/11	Implementation	Tom Huybrechts, Andy Scherpenberg, Gauthier Lafruit
4308	19981201	MPEG-4	Report of the Computational Graceful Degradation AHG
	98/11	Implementation	Jan Bormans
4317	NO	MPEG-4	Assessment of mesh coding complexity
	98/11	Implementation	Gauthier Lafruit

Video

No.	Available Date	Group Section	Title Source
4244	19981201	MPEG-4	A Result of bitstream exchange: error resilience for still texture
	98/11	Video	Norio Ito
4289	19981201	MPEG-4	Proposal for modification of the Still Texture Error Resilience syntax following FDIS changes
	98/11	Video	L. Moccagatta, H. Chen
4295	NO	MPEG-4	Report of Ad hoc group on Video VM and Visual FDIS/WD
	98/11	Video	T. Ebrahimi, C. Horne, E. Jang, Y. Nakaya
4321	19981201	MPEG-4	Software integration and bitstream exchange of Visual Texture Coding
	98/11	Video	Iraj Sodagar, Hung-Ju Lee, Paul Hatrack, Shipeng Li, Bing-Bing Chai
4322	19981201	MPEG-4	Status report of scalable shaping coding for visual texture coding
	98/11	Video	Shipeng Li, Iraj Sodagar, Hung-Ju Lee
4323	19981201	MPEG-4	Report on progress in Error Resilient Still Texture using a Packet Approach
	98/11	Video	Bing-Bing Chai, Iraj Sodagar, Paul Hatrack

Systems

No.	Available Date	Group Section	Title Source
4297	19981201	MPEG-4	IM1 Software Platform AHG Report
	98/11	Systems	Zvi Lifshitz

Output Document Editors

Editors or coordinators responsible for SNHC elements of output documents were assigned:

Document	Editor
Final FDIS edit verification	Igor Pand i
Face Animation	Eric Petajan
2D Animated Mesh	Peter van Beek (remote)
Cross Check of Systems BIFS	Igor Pand i ... Julien Signes
Cross Check of Still Texture	Eric Petajan ... Iraj Sodagar
SNHC Conformance CD (via Video) V1	Pete Doenges, Eric Petajan, Igor Pand i , Roberto Pockaj, Joern Ostermann, Peter van Beek (remote) ... Minhua Zhou?
SNHC FBA Profile/Level Corrections V1	Eric Petajan, Joern Ostermann ... Julien Signes, Rob Koenen
SNHC 3DMC, BA to Visual CD V2	Frank Bossen, Claudio Silva, Tolga Capin ... Euee S. Jang
ISG for SNHC CGD WD to CD V2	Gauthier Lafruit, Marco Mattavelli, Jan Bormans, SNHC
SNHC 3DMC, PROTO in Systems V2	Frank Bossen, Claudio Silva, Tolga Capin , Euee S. Jang
SNHC Ref. Software List & Work Plan	(no output document)
SNHC Core Experiments	Frank Bossen, Tolga Capin
Press Release	P. Doenges

Editing Schedule for Meeting

Documents	Mon	Tue	Wed	Thu	Fri
Final FDIS edit verification			Preliminary		Approval
Face Animation					

Documents	Mon	Tue	Wed	Thu	Fri
2D Animated Mesh					
Cross Check of Systems BIFS					
Cross Check of Still Texture					
SNHC Conformance CD (Visual) V1		Draft	Preliminary	Final to Jean-Claud Dufourd	Approval
SNHC Profile/Level Contributions V1				Preliminary	Approval
SNHC 3DMC, BA to Visual WD V2				Preliminary	Approval
ISG for SNHC CGD WD to WD V2				Preliminary	Approval
SNHC Ref. Software List & Work Plan				Preliminary	Approval
SNHC Core Experiments				Preliminary	Approval
Press Release				To Rob K.	Approval

AHG Meetings and Reports

The following AHG meetings were held on Saturday/Sunday before the WG11 meeting or the work progress was discussed to gauge the impact on the main meeting plan:

Doc.	Group	Title	Authors
4309	SNHC	Report of Ad Hog Group on Face and Body Animation	Eric Petajan, Tolga Capin
4293	SNHC	Report of the Ad Hoc Group on 3D Model Coding	Touradj Ebrahimi, Pete Doenges
4308	ISG	Report of the Ad-Hoc Group on Computational Graceful Degradation	Jan Bormans, Marco Mattavelli

FBA was busy with their joint meeting with VRMLC/Web3D H-Anim on November 17, 1998, at Lucent Bell Labs, Murray Hill, New Jersey, and its follow-up. There were useful contributions presented at the Sunday AHG meeting of FBA in Roma including laptop demonstrations on body animation using BAT to animate body shape deformations (arms, legs, fingers) with joint angle movement. There were extensive results on DCT coding of BAPs vs. predictive BAP coding with quantization vs. bitrate and distortion vs. bitrate. These results verified the utility of each scheme for broadcast and interactive applications.

3D Model Coding experienced steady if slow progress leading into two extensive days of AHG meetings on Saturday and Sunday before the WG11 meeting in Roma. The first day was dedicated to development of experimental conditions for error resilience testing of 3DMC with corrupting bitstreams. This effort built on related work in the Video subgroup. Michael Frater joined the meetings to help devise details of experiment design with the intent to distribute error bitstreams to M5 proponents (two surviving at this point) for testing during the Roma meeting. Sunday was for contributions on M2, M3, M5, and M7.

Useful contributions were presented on M2 parallelogram vs. polygon prediction of 3D vertex geometry (including a hybrid scheme that adapts the prediction rule to the prevalent triangle vs. polygon structure of given 3D models), M5 mesh error resilience partitioning, M7 better properties prediction, plus other small suggested changes in 3DMC syntax and semantics. An important contribution on M3 hierarchical *encoding* of 3D meshes with associated properties was made to help developers, as well as an M2 scheme for adaptive geometry coding of multiple 3D model components. Most of the 3DMC WD technologies for baseline M1-M5 (base mesh topology, vertex geometry, hierarchical topology, properties, and error resilience with progressive rendering) were in solid shape with bitstream exchanges and reference software contributions from the prime proponents and 2nd implementers.

For 3D Model Coding however, M2 remains unresolved on the final prediction choice with consistent M1 integration. M5 data partitioning in the WD has not been studied in depth with error bitstreams. Overall software maturity in M5 can use more work. Well-tuned encoders and decoders for the M5 change for component-based model partitioning have not been compared to the M5 WD partitioning with the same error bitstreams. The M5 schemes are undergoing steady encoder improvements that benefit the otherwise degraded efficiency of 3D data partitioned into small independent pieces. Other functionalities for compression efficiency like coding for 3D symmetry and non-manifold 3D meshes

remain open.

Joint Meetings

The following joint meetings and other SNHC working sessions were held (in this location):

Meeting with	Monday	Tuesday	Wednesday	Thursday	Friday
	9am-1:30pm WG11 Plenary		9-11am WG11 Plenary		2-10pm WG11 Plenary
SNHC	4-4:30pm SNHC Plenary - meeting agenda, work plan, docs & deadlines	Conformance	Conformance	Conformance	9-11:30am SNHC Plenary V1/V2 doc approval, AHGs, V1/V2 work plan, Ref. Software list to MC, resolutions • Output Doc submissions!
	4:30-5pm SNHC - Conformance output doc & bitstream plan	4-5pm SNHC Plenary - 3DMC V2 CE results, Conformance results	4-5pm SNHC - Plenary FDIS, Conformance, Ref. Software review	4-6pm SNHC - Plenary document review	
Systems	3-4pm Systems with all - V1 Conformance			10-10:30am Requirements, SNHC, Systems - V1 FA profile repair	
	5-6pm SNHC, Systems BIFS, Requirements - Face Profiling in FDIS V1			1:30-2:30pm SNHC & Systems - V2 PROTO use with BA/H-Anim • SNHC, RS, Systems - V1 Still Multi-Res. Texture & BIFS Integration - broadly, IM1 & Reference SW • SNHC, Systems - Integration 3DMC with BIFS	
Software Delivery	Mike Colman: List/sources of V2 CD Reference Software + V1 FDIS Software				
				3-3:30pm SNHC , 3DMC, DMIF, ISG - data partitioning in reduced QoS	
ISG				9-10am SNHC 3DMC, ISG - M2 complexity to resolve choice • SNHC, ISG - ISG FA/3DMC complexity, CGD	

Meeting with	Monday	Tuesday	Wednesday	Thursday	Friday
				demo	
Requirements				2:30-3:00pm Requirements, SNHC - V2 Tools & SW • (also see Systems)	
Video					
Audio					

Meeting Work & Results

V1 - FDIS Edits & NB Comments

FA and 2DAM edits in the FDIS Visual and Systems parts were verified as accurate from the Atlantic City meeting. SNHC recommended release of the FDIS in final form as planned by the Video and Systems subgroups. No new NB comments pertained.

V1 - Face Animation Complexity

Other work in face animation was mostly concerned with understanding the current status of Systems profiling, the prognosis for achieving well-structured calibration and predictable profiling in Version 2, the repair of some inadvertent profiling problems for Simple Face, and verifying complexity analysis.

In a joint meeting with ISG and SNHC, results of complexity analysis of face animation were discussed:

Doc.	Group	Title	Authors
4255	ISG	Complexity Analysis of Facial Animation Software for CGD	Gauthier Lafruit, Roberto Pockaj, Jan Bormans

This work by ISG used the DIST (U. of Genoa) Face Animation Engine (thanks!) software and renderer for profiling. Instrumentation of the software was shown in a laptop demo by ISG including how much time was being spent in the FAP decoding, animation, and rendering stages. The high-level prediction of rendering load using CGD parameters in the context of a face model was also presented. The results of all this work included the confirmation that the high-level prediction model for rendering load comes quite close to reality for many viewing situations, and confirmation that the face animation decoding stage represents a relatively small share of the total terminal complexity including 3D rendering.

V1 - Conformance in Face Animation, 2D Animated Mesh

A joint meeting was held early in the week on Conformance with Systems (Jean-Claud Dufourd) et al to agree on the general structure of conformance writing and integration, including Part 4 breakout of sub-documents on specific topics such as SNHC. The SNHC updates to FA and 2DAM were generated and reviewed within SNHC in the first portion of the week, then integrated with Systems on Thursday late.

The FA working group refined the conformance bitstream requirements for FA, and the 2DAM sections were updated with bitstream types and content. Specific individuals were assigned to give this the needed push during the week. Appreciation is extended to them for making the necessary progress: Joern Ostermann, Eric Petajan, Roberto Pockaj, Igor Pand i in FA (Visual and Systems coordination) and Peter van Beek on 2DAM (working remotely who made needed contributions by e-mail). The result of this work is that functional and performance tests for conformance are sufficiently defined, and bitstream definitions, exercised conditions, and data sources are specified. Bitstream collection, development, and verification must follow the Roma meeting. SNHC recommended approval of the Conformance CD.

Much discussion occurred about potential quantitative BIFS testing in the context of conformance. For now, the approach must avoid the open-ended issues of normative composition and the difficulties of testing with geometry or rendering engines whose precise behavior and output image quality are not controlled by the MPEG-4 specification. An approach occurred to several people in Systems and SNHC.

The approach uses unambiguous text-format dumps of the scene graph for BIFS nodes with either default nodes or specific model properties depending on the elements under test. BIFS dumps would provide quantitative, repeatable indications that well-formed nodes are being produced by BIFS decoders or by specialized decoders like FA Face Definition Parameters or 2DAM face lists in mesh initialization.

Mike Colman indicated that such a software package for scene graph dumping might be made available to MPEG-4. Systems conformance has been adjusted to make this possible, including described points of instrumentation of the Systems buffer model to gather the needed data. This area received much attention, and the conformance document deserves careful review in this area as well. This approach to BIFS instrumentation opens the possibility in Version 2, for example, to use specific face models (whatever their rendered qualities) to push a complete Predictable FA download and animation sequence through the testing pipeline at prescribed conformance points of FA update rates and model complexity.

V1 - Face Animation Profiling

There were extensive, labored discussions about the needs of members to achieve both "lean" face animation when the application needs a Simple FA decoder plus a few parts of BIFS, as well as full 3D graphics capability needed to animate downloaded custom faces with Text-to-Speech (TTS) in 3D virtual environments. This recurring discussion was prompted by the changes to Systems BIFS profiling that were introduced in the Atlantic City FDIS work. This was subsequently resolved with Systems in part by falling back on FCD profiling originally developed in Tokyo (spring 1998).

A joint meeting was held with Systems and Requirements to review the difficulties that developed in BIFS profiling as a result of editing in the Atlantic City meeting. SNHC felt that the results were not in line with NB support, and appeared to structure FA profiling in such a way that both simple and more complicated FA configurations in lower- and higher-complexity terminals could not be independently achieved without undue overhead in some cases. The solution eventually agreed was to put the face node back into the complete Graphics Profile and to simplify in the corresponding way the BIFS profiles for Face, 2D Mesh, and Hybrid. This resulted in more desirable tool combinations for building simple and complex FA decoders, and was more in line with NB support at the time of FCD.

Mesh-level calibration of proprietary face models has not had adequate attention so far with at least two partners conducting verification work. At the Roma meeting, EPFL and Lucent have committed to undertake conclusive mesh calibration studies with comparable results. At least one scheme for this has been developed by EPFL and is expected to see commercial realization soon. SNHC looks forward to necessary results in this area to solidify any further Version 2 profiling with Requirements.

V1 - Integration of Still Texture & V2 3D Mesh Coding with 2D/3D BIFS

A joint meeting was held with Systems and SNHC about the integration of Still Texture and 2D/3D Mesh Coding with Systems BIFS:

Doc.	Group	Title	Authors
2479	Systems	AHG on Integration of Still Texture and 2D/3D Mesh Coding	Euee S. Jang, Julien Signes

For Version 1, the issue on the table for several meetings has been verifying that BIFS can successfully link Still Texture (not supported in the baseline VRML specification) to 2D/3D models. Verification should be accomplished for texture properties of a 2D or 3D model in the BIFS scene graph that link to a Still Texture elementary stream, and for end-to-end functionality using Still Texture for progressive image coding or for downloading one or several resolution layers needed in 3D rendering.

Systems confirmed that BIFS image texture can be linked to the wavelet elementary stream type, and BIFS scene graph walking by a suitable terminal should provide enough information to instantiate the wavelet texture onto the 2D or 3D model correctly. The implementation details about how the wavelet texture is managed after decoding, for progressive image display or for downloading to texture memory of a 3D rendering pipeline, are hidden from BIFS and become the duty of application developers. Thus,

for example, the conversion of a wavelet image download into multi-level MIP map texture for OGL is not normative, although an informative advisory about a method to do this would be useful. It was agreed that, subject to verification of the Still Texture linkage in BIFS, the FDIS can stand as specified.

Near the end of the meeting, a combination of Sarnoff, Lucent, and AT&T Research agreed to implement a single-layer wavelet-based 3D texturing system around BIFS and to prepare a demonstration of the rendering of 3D models with decoded wavelet texture applied. This is an important step and thanks!

V1 - Software Integration & V1/V2 Reference Software

Mike Colman held joint meetings with SNHC, Systems, Audio, and Video to arrive at an approach to software integration. It has been noted that bitstream decoding until now by the functional subgroups has been largely implemented by direct connection of test bitstreams to decoders without the Systems multiplex layer with access units that package potentially multiple inbound bitstreams. This has been done to some extent in IM1 integration efforts to date, but a file-based approach for Reference Software and Conformance bitstreams was needed.

Based on the availability of tools that perform the access unit coding and file formatting, SNHC agreed to convert Reference Software and Conformance bitstreams to the MP4 File Format. This will be synchronized and completed with Mike Colman before the Seoul meeting. Mike was given a preview of the depth of software available for Version 2 BA and 3DMC. SNHC agreed to make small changes to Reference Software for Version 1 that track FDIS final language before the Part 5 Reference Software FDIS at Seoul in March. Version 2 Visual WD software for SNHC BA and 3DMC is already in pretty good shape. Small changes in Version 2 Reference Software (including Version 1 dependencies) are expected and will be accomplished by the Seoul Version 2 Visual and Systems CD.

V2 - 3DMC Integration with BIFS

A joint meeting was held with Systems and SNHC to discuss candidate approaches to 3DMC integration with BIFS. The functionalities of specific concern are Systems BIFS support for such modes as:

- Downloading a base mesh (M1-M2-M4) with proper initialization of vertices, face list, properties
- Hierarchical topology (M3) downloads to update/animate transitioning vertices, face lists, properties
- Downloading incremental 3D model pieces (M5) partitioned for error resilience, progressive display

Custom node types (like FA and 2DAM coding) with a BIFS update (structure changing) feature, the use of existing multiple LOD nodes at lower efficiency, and PROTOs to accomplish specialized model updates were discussed as contributing possibilities. Other issues to resolve may include buffer management to sustain 2D/3D rendering from the scene graph while updates from 3DMC decoding are trickling into the scene graph, and custom animation scripting (not normative) to transition models (M3).

No clear agreement was reached beyond confidence that solutions should emerge. This must receive adequate attention on the Advanced BIFS reflector before Visual and Systems CD in Seoul. Both groups should consider verifying implementation of each mode described above in a Systems BIFS context, beyond the private demonstrator animations shown by EPFL-IBM and Samsung in Atlantic City.

V2 - PROTO Support in BIFS for Body Animation & H-Anim

A joint meeting was held with Systems and SNHC to verify V2 PROTO support in Systems. PROTO is needed to conform Body Animation with the Web3D H-Anim approach to customizing motion interpolators for body joint rotations. The necessary BIFS functionality will be provided. There is some chance that Julien or Zvi will implement PROTO in the next few months. However, BA people should take this challenge directly if necessitated by limited Systems resources before the Seoul V2 Systems CD.

V2 - Visual Working Draft

SNHC input contribution documents drove the editing of the Visual Working Draft or WD (originally planned to be Committee Draft or CD). The specification elements for Body Animation, 3D Model Coding and Computational Graceful Degradation with supporting bitstream exchanges were included:

- BA: Full body & hand Body Animation Parameters (BAP - predictive & DCT types), Body Definition Parameters (BDP), Body Animation Transform table (BAT)
- 3DMC: Connectivity, geometry, properties, hierarchical, error resilience partitioning
- CGD: Model complexity parameters, projected surface sphere for 3D rendering

SNHC recommended approval of the Visual WD with edits after the meeting.

V2 - Tools Linked to Requirements

A joint meeting was held with Requirements and SNHC to identify the current clauses in the MPEG-4 Requirements document linked to Version 2 SNHC functionality, and to give overviews of the status of Version 2 SNHC work. Satisfactory connections to Requirements were shown and software identified.

V2 - Body Animation Progress

Section 5 gave a summary of the Body Animation work to date with important input contributions to the Roma meeting. Thanks go to EPFL, U. Penn, Philips, INT, AT&T, Rockwell, and U. of Illinois for ongoing work, and to others in Face Animation who have worked to leverage FA tools into BA tools.

Most of the issues with H-Anim have been satisfactorily resolved. The nomenclature linkage of Body Animation nodes/joints to H-Anim is understood to be non-normative, so MPEG must be watchful for changes in H-Anim work as the Web3D Next-Generation specifications and annexes solidify. A BAT bitstream exchange was to be accomplished not long after the Roma meeting, and this is a condition for CD inclusion of BAT. Verification work on BAP decoding and quantization step size continues.

V2 - 3D Model Coding Progress

Again, see Section 5 for a summary of the 3D Model Coding work preceding the WG11 meeting. Several valuable contributions in M2, M3, M5, and M7 were made. The main two items of attention were completing M2 testing of polygon vs. parallelogram vertex prediction, and subjecting the two error resilience approaches (WD baseline - Topological Surgery with changes including start codes, and the M5 component-based partitioning) under equal test conditions for error resilience vs. efficiency.

Useful results in M2 were shown on vertex prediction schemes and the hybrid scheme that adapts to the prevalent topology of the 3D mesh. Also presented was a useful M2 modification proposal for adaptively predicting the root vertex of each connected component of the 3D model, while otherwise trying to code a succession of disconnected components within an overall compressed 3D mesh. This will need further cross checks to be considered. Unfortunately, after much effort by INT, the 3DMC working group still did not achieve a fully consistent test of the polygon vs. parallelogram rule for M2 vertex prediction. The work did not conclude with each method driven consistently by identical coded 3D models whose structure exactly reflects the vertex sequence of the spanning tree that is produced by the WD M1 method.

INT has offered graciously to go beyond the contributions of the method originators to work with EPFL and IBM to accomplish the needed comparative tests on an equal footing before Seoul! All effort should be applied to accomplish a useful step by the Lausanne meeting in early February. The hybrid method has increased complexity, but may be merited to adapt most efficiently to a wider variety of 3D content. The work of ISG on 3DMC complexity analysis was foiled by the non-availability of software in the M2 area preceding Roma for software profiling. ISG resources are tight before Seoul, and yet progress must be made in time for Visual CD then. INT has offered graciously (again!) to accept guidance from ISG on how to integrate profiling software and methodology with the M2 methods (and possibly the hybrid of both), to reach conclusions on complexity for the needed M2 decisions, while adhering to ISG standards. This is stressful for all the people concerned, and we need the method originators to support the activity!

The main effort made during the WG11 meeting on M5 was to complete and debug the Samsung contribution on component-based partitioning, to tune the EPFL-IBM encoder, and to look at the relative efficiency of both methods to determine that error resilience testing is even justified. Basically, if the overhead of generating independent coded partitionings of 3D models including padding to fit packet

sizes for typical sizes of packets and 3D models exceeds the threshold of 100%, then it is reasoned that bitstreams might just as well be sent multiple times in multiplex for error resilience. Later in the WG11 meeting, the WD baseline encoder for data partitioning and error resilience pushed below the 100% threshold, sometimes achieving very worthy efficiencies. The component-based encoder still needed work. The upshot of this refinement work was by meeting end that error resilience testing was simply premature, and must await stable encoder/decoder software that breaks the 100% barrier by good margin.

Considerable time was spent one day with Michael Frater on 3D Model Coding experiment design for error resilience. The issues developed and documented included the nature of error detection, error localization prospects (not good), overhead factors and tradeoffs associated with 3D model data partitioning, the relationship of techniques used here to video data partitioning and what packet sizes and error rates had been considered, what kind of transmission channels (packet sizes, packet loss or bit errors, etc.) are likely to be used, how to simulate those channels with appropriate corrupting error bitstreams, how to subject each M5 method fairly "on short notice" to error streams, what encoder parameters should be exercised, including models with large and small connected components, what error rates, what to do about the separation of the vertex graph in component-based partitioning into a separate channel, and finally what basis of comparison to use in test analysis (subjective, % decoded triangles). There are many details here retained by Michael Frater, and are not repeated here (no output document generated). All effort should be applied to linking with Michael for error tests by the Lausanne meeting.

As mentioned before, a key Ad Hoc Group meeting is planned for 4-5 February 1999 at EPFL in Lausanne. With all the results that have been achieved in 3D Model Coding so far, there are remaining concerns about whether MPEG-4 Version 2 will attract the widest useful variety of 3D content types from the VRML and other communities. Based on contribution proposals and other discussion at the Roma meeting, participants have committed to follow-up development and testing in the following areas, toward the result of attracting more prevalent types of 3D content with superior compression efficiency:

- Stitching to accommodate non-manifold 3D content
(automatic without current encoder detection & partitioning into manifolds)
- Content-adaptable vertex prediction for triangles & polygons
(for efficient handling of triangular and n-sided polygonal meshes)
- Time stamping of 3D models for animated 3D icons, "flip books"
(agreed to be handled with Systems time coding)
- Object mirroring not now supported by VRML/BIFS
(for efficiency with symmetric faces and other such 3D models)
- Instancing within 3D Model Coding for multiple components

These items add to the top priorities for Lausanne:

- Error resilience: data partitioning in reduced QoS environments
- Complexity of vertex prediction for selection of one method or hybrid

Lausanne affords an opportunity to bring these items to concrete maturity as small deltas to the current specification and software work. There must be adequate progress in terms of testing, cross checks and bitstream exchanges, final text, etc. before Seoul (preferably at Lausanne) to consider these. This refinement for improved functionality and efficiency is still subject to WG11 approval as usual.

V2 - 3D Data Partitioning in Reduced QoS Environments

A joint meeting was held with DMIF, SNHC and ISG to consider advice about likely constraints on data partitioning of 3D models in reduced Quality of Service (QoS) environments. This discussion tried to focus on error rates/distributions and channel types considered by video and channel experts in the DMIF subgroup, especially Internet/Web, DTV, AICI, ADSL, ATM, and video cellular telephony. Some useful parameters were gleaned from this discussion. While the discussion was not conclusive about certain details of error resilience experiment design for 3D Model Coding, SNHC has likely over-constrained the low end of component sizes for 3D model data partitioning. The current experiment design calls for the

use of a binary progression of partitioning sizes: 45B, 90B, 180B, 360B, 720B, and 1440B. The DMIF discussion pointed towards component sizes of greater likelihood around 250B, 1500B, even 9000B. M5 testing should consider revising the experiment conditions accordingly, unless there is a compelling case made to the contrary. The smaller packet sizes (e.g. 45B) jeopardize effective encoding of 3D models for error resilience (i.e. due to excessive overhead) based on the current methods under evaluation.

V2 - 3DMC Complexity, CGD demo

A joint meeting was held with ISG and SNHC to examine results in the profiling and analysis of 3DMC complexity, along with a CGD demonstration intended to verify computational resource demands and the estimation of rendering load with 3D models:

Doc.	Group	Title	Authors
4256	ISG	Complexity Analysis of 3D mesh software	Gauthier Lafruit, Jan Bormans
4258	ISG	Demo for CGD parameter estimation in 3D rendering	Tom Huybrechts, Andy Scherpenberg, Gauthier Lafruit

In summary about the results, ISG showed that the computational "big spenders" included arithmetic decoding and vertex prediction within the 3D model decoding tool suite. ISG was not, as mentioned earlier, supplied with adequate software to fully analyze the vertex prediction alternatives under M2. However the triangle-based parallelogram prediction scheme was available (lower complexity than polygonal prediction). The computational intensity of vertex prediction was sufficiently high for ISG to recommend that choices of complexity taken in the future should be as stingy or low as possible. Thus the final assessment of polygonal and hybrid vertex prediction schemes must take this into account.

ISG verified that the predominant use of the CGD parameter, #vertices, appears sufficient to make predictions of decoder complexity with a range of 3D models. This can be complemented with the projected surface sphere and other CGD parameters to estimate 3D rendering load. Predictions frequently fell within 10% and sometimes very close to reality, with the prediction model properly calibrated for the processor, geometry, and rendering metrics of the target platform (e.g. for the laptop with software OGL observed under test in this demonstration). Predicted vs. actual rendering times were often close for 3D models in timed animation sequences with 3D renderings, where the real-time instrumentation of the PC laptop was compared with the predictions based solely upon CGD bitstream parameters. People in the ISG group and at IMEC are to be congratulated for valuable work and contributions in this area!

The question remains in Version 2 as to whether CGD-based profiling of SNHC content normalized to complexity metrics could make a useful contribution in assuring certain qualities of final 3D renderings, if normative composition with rendering can not be achieved (persistently unlikely so far). The capability for terminals to make (non-normative) platform-specific predictions of decoding and rendering load also offers a "handle" for adapting content complexity of 3D models when they are coded with LOD nodes or hierarchical/progressive model variants (e.g. M3 and M5 coding).

V2 - Business Backup to Profiling Version 2 Tools

Participants are reminded that Requirements expects the assertion of business commitments to use tools in Version 2 profiling to make progress in the profiling work now due with the near-in completion of CD.

Roma Output Documents with SNHC Contributions

SNHC recommended approval of the following output documents including SNHC contributions:

Doc. No.	Title
N2553	MPEG-4 Version 2 Visual Working Draft Version 6.0
N2550	Conformance CD Documents for MPEG-4 Version 1

Core Experiments for Seoul, Korea

The following Core Experiments were formulated for Seoul:

Doc. No.	Title
N2630	Core Experiments in Face & Body Animation
N2631	Core Experiments in 3D Model Coding

Face Body Animation

N2630

- _ FA1 Mesh-level calibration of face shape
- _ BA2 Body Animation Parameter coding verification
- _ BA6 Body Animation Parameter quantization step size verification
- _ BAT Body Animation Transform bitstream exchanges

3D Model Coding

N2631

- _ M2: Integrated M1/M2 tests of parallelogram, polygonal
- _ M5: Encoder tune-ups, error resilience testing for M5 decisions
- _ M8: Stitching for non-manifold 3D models, mirroring to exploit symmetry for efficiency

Ad Hoc Groups for Seoul, Korea

The following AHGs were established by SNHC to coordinate core experiments and documents:

Doc. No.	Title
N2627	AHG on Face Body Animation
N2628	AHG on 3D Model Coding
N2629	AHG on Integration of Still Texture & 2D/3D Meshes

Face Body Animation

N2627

- _ Continued body animation specification work for Version 2
- _ On-going IM1 integration with software and bitstream contributions
- _ Additional FBA data sets and evaluation of FBA system as specified in FDIS
- _ Core Experiment (CE), other mini-experiments & verification work

3D Model Coding

N2628

- _ Conducting required CE, complexity work, mini-experiments
- _ Collecting specific data on packet, noise considerations for better experiment conditions in error resilience (M. Frater)
- _ Special AHG meeting at EPFL, Lausanne, 4-5 Feb 1999

Integration of Still Texture & 2D/3D Meshes

N2629

- _ Verification of integration of still texture & 2D/3D mesh coding within BIFS from system perspective
- _ Development of content that stresses the system in support of verification
- _ Recommended guidelines for content developers
- _ Development of conformance document for the integration of SNHC tools
- _ IM1-based verification of still texture in 3D by Lucent, AT&T, Sarnoff
- _ Closure on conceptual node design for 3DMC+BIFS, IM1 to follow later

plus these AHGs sponsored by other MPEG-4 subgroups with related objectives and need for assistance:

Doc. No.	Title
N2558	AHG on Editing the Documents of the MPEG-4 Visual FDIS, the MPEG-4 Video Verification Model, the MPEG-4 Visual Working Draft and MPEG-4 Video Conformance
N2591	AHG on MPEG-4 Backchannel
N2594	AHG on Computational Graceful Degradation
N2618	AHG on MPEG-4 Systems Conformance
N2619	AHG on Advanced BIFS

N2623	AHG on IM1
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Roma Participants

Many thanks are given to the following individuals who participated in the working groups and SNHC meetings in Roma. Also please see the attendance corrections for the Atlantic City meetings in the second table below with my apologies for this oversight - every bit of contribution counts - THANKS!

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29 December 1998

Annex 10
Test group report

Source: Vittorio Baroncini, Chairman

Introduction

At the 46th meeting of WG11, in Rome, the results of two verification tests were presented and discussed. The work-plan for the other verification tests was updated. Finally MPEG-4 Version 2 formal test has been foreseen to be necessary between the 47th and the 48th meetings.

MPEG-4 video verification test

Pre-screening meeting

The Sunday before the beginning of the 46th meeting a pre-screening meeting was held, with the aim of properly analyse the outcomes of the work done during the previous weeks.

In spite of the many problems had during the preparation of the materials necessary to prepare the verifications tests this meeting showed good results and a huge amount of work in the preparation of the tapes for the forthcoming tests.

In detail the result of the error robustness verification test was retained valid and satisfactory , as well as the results obtained in the verification test of the Temporal Scalability in Simple Scalable Profile. The tapes produced for the other tests was accurately analysed and lead to a number of technical consideration very useful during the 46th meeting.

Error robustness

During the meeting the results of the formal verification tests of the Error Robustness functionality were presented to the Test and Video Group.

A careful analysis of the result lead to a report (contained in doc. N2604) that has been made public as formal MPEG output document.

In detail the results lead to the conclusion that the technology contained in the Error Robustness functionality is well suited to afford the cases in which multimedia services have to cope with environment affected by transmission errors.

Furthermore the test methodology, used to carry out these test, prove to be able to correctly evaluate the presence of errors and their visual impact (if and when any occurs).

Scalability

The results of the formal verification tests of the Temporal Scalability functionality in the Simple Scalable Profile were presented to the Test and Video Group.

The test result are described in a report (contained in doc. N2605) that has been made public as formal MPEG output document.

The formal verification tests showed that in all the given conditions, the Temporal Scalability in Simple Scalable Profile exhibits the same overall quality provided by Single layer coding in Simple Profile. In some test results Temporal Scalability in Simple Scalable Profile provides better quality than Single layer coding in Simple Profile.

Furthermore it is evident that the Temporal Scalability in Simple Scalable Profile provides better quality than the Simulcast coding in Simple Profile.

Temporal scalability in Core Profile

The results of the test sequences were provided at the Rome meeting, however it is still necessary to perform some modification related to the use of B-VOP and P-VOP.

The video group decided that the result of the test will be presented at the 48th meeting (Canada). A pre-screening of the sequences produced for the test will be done in a meeting before the 47th meeting (Korea).

Details about coding parameter settings and test methods are given in document W.2601.

Content-Based Coding

After viewing the results of the Rome pre-screening, the Video and the Test group has agreed to change the test condition and schedule as follows.

The “MPEG-1 vs MPEG-4 frame-based” and the “MPEG-4 object-based vs MPEG-4 frame-based” tests will be performed separately and with different time schedules; this decision is due to the different functionality and applications addressed. Further since now on, the “MPEG-1 vs MPEG-4 *frame-based*” test will be referred to as the “Coding Efficiency” test, and the “MPEG-4 *object-based vs MPEG-4 frame-based*” will be referred to as the “Content-based Coding” test.

At the Rome meeting the sequences selected during the pre-screening meeting were accepted and the test conditions were decided.

Finally, the test methods to be used in the two tests (i.e. high and low bitrates) were agreed.

The results of the “Content-based Coding” test will be presented in Seoul.

Details about coding parameter settings and test material preparation are given in doc.W2602.

Coding Efficiency

Some changes to the test conditions settled in Atlantic City have been decided, related to the use (for the low bit rate test) of the bit rates 64, 128, 256 kbps , to the replacement of the sequence “News” with the sequence “Carphone” to the add of the 384kbps bit rate in the high bit rate test (same test conditions as the 512kbps case) and to the add of the sequence “TableTennis”.

A new pre-screening has been planned, and it will perform in Seoul.

Details about above items are given in the document W.2603.

List of output documents

Title	Number
Revised test conditions and test plan for video verification test on Temporal Scalability in Core Profile	2601
Revised test conditions and test plan for video verification test Content-Based Coding	2602
Revised test conditions and test plan for video verification test on Coding Efficiency	2603
Report Of The Formal Verification Tests On MPEG-4 Video Error Resilience	2604
Report Of The Formal Verification Tests On MPEG-4 Temporal Scalability in Simple scalable Profile	2605

Ad hoc groups

Ad hoc group	Number	Mtg
Ad-hoc group on MPEG-4 Video Verification tests (Moccagatta)	2560	yes

Annex 11

Implementation Study group report

Source: Marco Mattavelli, Chairman

Generalities

The work of the Implementation Studies Group (ISG) during the meeting in Roma has addressed seven main topics:

- 1) The specification of a Video Complexity Verifier model for the definition of measures apt to limit the maximum number of macro-blocks per second in video levels,
- 2) The further developments of Computational Graceful Degradation for the rendering of SNHC video,
- 3) The update of the video CGD syntax for version 2,
- 4) The analysis of MPEG-4 systems components, in particular the first results of the study of IPMP interface synchronisation problems,
- 5) The evaluation of the complexity of SNHC polygon prediction techniques,
- 6) The complexity issues of defining a flexible picture size in the MPEG-4 studio profile,
- 7) The analysis of MPEG-7 complexity problems.

1. The specification of a Video Complexity Verifier model for the definition of measures apt to limit the maximum number of macro-blocks per second in video levels.

The Video Complexity Verifier model (VCV) proposed by the ISG has been presented to video group. It is based on the documents M4187 “Refined proposal for definition of “number of macro-blocks per second””, and M4354 “Proposal for Video Verifier Model”. It has made clear that VCV and the complexity formula are two separate issues. The task group of video in charge of the level definitions presented two alternative proposals that resulted similar to the one proposed by ISG at the Atlantic City meeting, and also similar in terms of the drawbacks. The VCV buffer model instead has been acknowledged to provide an elegant solution to the MB/sec definition in a variable picture size and picture rate environment.

Syntax changes to enable an adaptive decoder latency lower than the level default have not been accepted, but this constraint does not seem to constitute a serious draw-back.

A discussion aiming at harmonizing the VCV and VBV model definitions in a single model was held. No agreement was reached on the real need of using a single model instead of satisfying separately the two independent models. A proposition to add the VCV model latency to DTS and PTS instead of subtracting it to the DTS giving to the model the physical meaning of a finite decoding time delay has been accepted.

Another discussion was about the need of a Video Memory Verifier model (VMV) to precisely define the maximum memory requirements for each level. The VMV model was accepted as well since it is considered necessary for a correct definition of level parameters.

The ISG approved some recommendations for the use of complexity weights and SPRITE macro-blocks in the VCV and VMV for version 2. These recommendations can be found in document N2593.

2. The further developments of Computational Graceful Degradation for the rendering of SNHC video.

A real-time demo showing that complexity prediction is feasible with the selected SNHC CGD parameters has been presented at the meeting. The technology is described in document M4258, “Demo for CGD parameter estimation in 3D rendering”.

Syntax of CGD for SNHC version 2 has been finalized in the version 2 WD.

FAP updates and mesh updates are negligible for complexity prediction and no transmission of extra CGD parameters is needed.

Document M4255 “Complexity Analysis of Facial Animation Software for CGD Implementation” reports other experimental results confirming the validity of the developed CGD SNHC syntax for version 2.

3. The update of the video CGD syntax for version 2.

Document M4250 “Proposition for MPEG-4 version 2 complexity estimation syntax” proposes the update of video CGD syntax for version 2. The update consist in simply taking into account the new version 2 video tools: shape adaptive DCT, boundary block merging and quarter pel prediction. The update and the according syntax have been approved by the ISG (see document N2592) and will be proposed to video during Seoul meeting.

4. The analysis of MPEG-4 systems components, in particular the first results of the study of IPMP interface synchronisation problems.

Some results of preliminary studies of IPMP implementation have been presented in contribution M4190 “IPMP Implementation study”. The main focus is to simulate the possible synchronization problems of a Systems implementation based on a multi-thread platform having as master thread the IPMP SFC. The approach is promising since it seems able to master the delay and synchronization problem caused by non-normative IPMP applications. For the moment Systems timing model is only simulated and no conclusions can be drawn at this stage of the work.

The ambitious goal of this activity remain to verify which architectures implementing Systems timing and synchronization specifications can be compatible with IPMP non-normative applications introducing delays and stand-by situations.

5. The evaluation of the complexity of SNHC polygon prediction techniques.

Two prediction schemes have been proposed by SNHC, but only one software version has been received and analyzed. Results of the complexity analysis are available in document M4256 “Complexity Analysis of 3D mesh software”. No conclusion can be drawn about the complexity of the second scheme. The first scheme is compatible with the existing version 2 CGD syntax and no syntax modifications or updates are necessary.

6. The complexity issues of defining a flexible picture size in the MPEG-4 studio profile

The requirements of an MPEG-4 studio profile have been presented in M4198 “Requirement and proposal for the profile structure on MPEG-4 studio profile”. Some parameters of the profile could have a strong impact on the implementation complexity. They are:

20.1.1.1.1.1.1.1 - The maximum values of: Frame vertical size, Frame horizontal size, Frame rate (Maximum and Minimum value),

- Aspect ratio,

- 10-12 bits dynamic for DCT specifications.

The requirements for these parameters need to be better specified in order to analyze the actual complexity impact. This discussion will be held during next meeting in Seoul.

7. The analysis of MPEG-7 complexity problems.

MPEG-7 complexity issues have been discussed with he requirement group. ISG raised the need of precisely define complexity problems in the evaluation and in the XM construction phase. The group agreed that strategies and tools to evaluate complexity of modules in the XM are a very

important issue that need to be considered. Conversely the use of precise criteria in the proposal evaluation phase has been considered as less relevant issues that should be solved in the second phase with the actual implementation in the XM.

Annex 12

Liaison group report

Source: Barry Haskell, Chairman

The Liaison group considered the following Rome input documents

	Source	Title	Number (if any)
1	SC29 WG1	JPEG2000 test images	M4188
2	SC9	ISAN	
3	W3C	Synchronized Multimedia Group	
4	TICS	Traffic control imaging	M4180
5	TICS	“ “ “	M4181
6		email on EPO	
7		email on eRENA	
8		email on COMIQS	
9	AIC Initiative	Information on requirements & architectures	M4347
10	SMPTE	Metadata standard	M4326
11		email on NEMISIS	
12	ITU SG16	MPEG4 on ITU standards	M4199
13	W3D (VRML)	Cooperation	M4261
14	DAVIC	Navigation tools for MPEG-2 Transport Streams and MPEG-4 streams	M4186
15	DAVIC	DSM CC URL	M4176
16	DAVIC	CFP	M4184
17	ITU-T SG16	Revised MPEG-2 parts 1& 2	M4356

List of current liaison representatives

IETF	Vahe Balabanian
ITU-T SG16 Q11	Yoshihiro Kikuchi
CEN	Francoise Preteux
Web3D (VRML)	Julien Signes
ITU-R WP10C	Karlheinz Brandenburg
AES	Karlheinz Brandenburg
ISO / TC 46 / SC 9	Albert Simmonds
AGICOA	
SMPTE	Bruce Penny

The following output liaison documents were produced:

N2632	Request to MMA for permission to use some of their text in audio conformance
N2633	Liaison to AIC with attachments: MPEG4-on-MPEG2, MPEG4-on-IP
N2634	Liaison to SMPTE
N2635	Liaison to ITU-T SG16/Questions 11 to 14 Regarding MPEG4 Systems on H.32X
N2636	Liaison to Web3D on VRML NG

N2637	Liaison to DAVIC on Multimedia Navigation Tools
N2638	Liaison to DAVIC on MPEG2 DSM CC URL
N2639	Liaison to ITU-T SG16/Q12 on Common Text Recommendations
N2640	Liaison to ITU-T SG16/Questions 11 to 14 Regarding MPEG4 Audio on H.32X