ITU-T Study Group 16 Multimedia Services, Systems and Terminals

Telecommunication Standardization Bureau

Simão Campos, Counsellor

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ITU-T Study Group 16

(www.itu.int/ITU-T/studygroups/com16)

Responsible for studies relating to:

o multimedia service definition and multimedia systems, including the associated terminals, conferencing protocols, modems and signal processing.
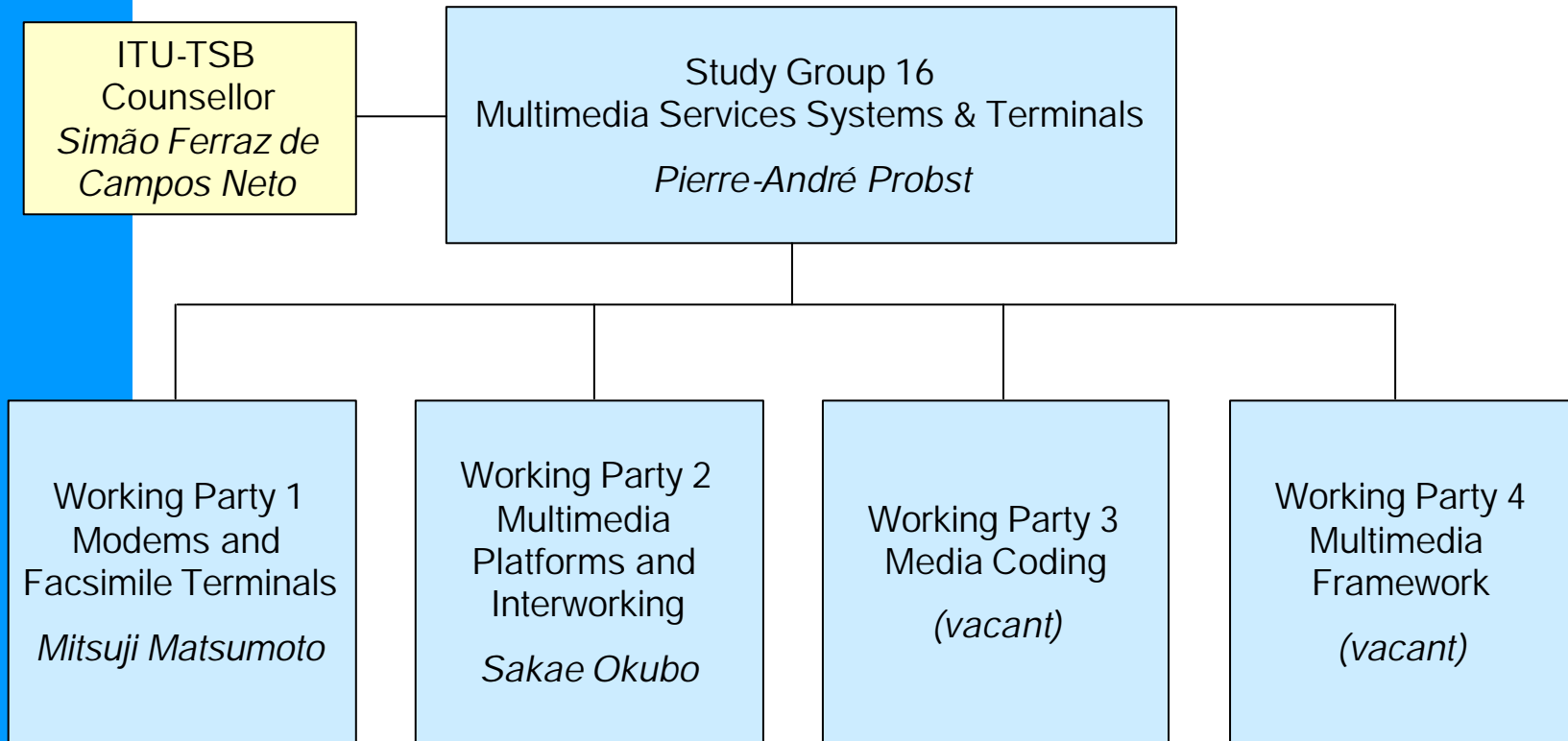
Lead Study Group on

o Multimedia Services, Systems and Terminals

o e-business and e-commerce

ITU-T Study Group 16 Structure

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ITU-TSB Counsellor *Simão Ferraz de Campos Neto*	Study Group 16 Multimedia Services Systems & Terminals *Pierre-André Probst*

- Working Party 1 Modems and Facsimile Terminals *Mitsuji Matsumoto*
- Working Party 2 Multimedia Platforms and Interworking *Sakae Okubo*
- Working Party 3 Media Coding *(vacant)*
- Working Party 4 Multimedia Framework *(vacant)*

ITU-T Study Group 16 WPs (1)

Working Party 1/16 - Modems and facsimile terminals

H/16	Accessibility to Multimedia Systems and Services
11/16	Voiceband Modems: Specification and Performance Evaluation
12/16	DCE-DCE protocols for the PSTN and ISDN
13/16	DTE-DCE Interfaces and Protocols
14/16	Facsimile terminals

Working Party 2/16 - Multimedia platform and interworking

D/16	Interoperability of Multimedia Systems and Services
F/16	QoS and End-to-End Performance in Multimedia Systems
G/16	Security of Multimedia Systems and Services
K/16	Mobility for Multimedia Systems and Services
1/16	Multimedia Systems, Terminals and Data Conferencing
2/16	Multimedia over Packet Networks using H.323 Systems
3/16	Infrastructure and Interoperability for Multimedia over Packet Network Systems
4/16	Video and data conferencing using Internet supported services
5/16	Control of NAT and firewall traversal for multimedia systems

New!

ITU-T Study Group 16 WPs (2)

Working Party 3/16 – Media coding

E/16   Media coding

6/16   Advanced video coding

7/16   Wideband coding

8/16   Encoding of speech signals at bit rates around 4 kbit/s

9/16   Variable bit rate coding of speech signals

10/16   Software tools for signal processing standardization activities and maintenance of existing voice coding standards

15/16   Distributed Speech Recognition (DSR) and Distributed Speaker Verification (DSV)

Working Party 4/16 – Multimedia framework

A/16   MediaCom

B/16   Multimedia Architecture

C/16   Multimedia applications and services

I/16   Telecommunications for Disaster Relief

J/16   Multimedia framework for E-Health applications **New!**

MM Service Descriptions

Integration of media components from the user's point-of-view

Service definition and requirements are available in the F-series. F.700 contains the umbrella definitions:

o Definition of several MM tasks:
  - *Conferencing* (multipoint, bi-directional, real-time)
  - *Conversation* (point-to-point, bi-directional, real-time)
  - *Distribution* (point-to-multipoint, unidirectional)
  - *Sending* (point-to-point distribution, Tx controlled, UD; info pushing)
  - *Receiving* (point-to-point distribution, Rx controlled, UD; info retrieval)
  - *Collecting* (multipoint-to-point distrib., UD, Rx controlled; info polling)
o Media components: audio, video, text, graphics, data and still-pictures
o Quality level for media components: {-1, 0, 1, 2, 3, 4}

MM Service Descriptions (2)

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F.70x: network-independent definitions

F.702 (F.MCV)-Multimedia conference services

F.703 (F.MCS)-MM conversational services

Network-specific definitions

F.731- N-ISDN MM conference services

F.732- B-ISDN MM conference services

Future work

Review of general multimedia architecture

Support of PSTN-based and packet based SMS

"E-everything"

MediaCom
An ITU-T Study Group 16 Project

MediaCom Context

Created in 2000 in recognition of:

o the rapid growth in digital, wireless, and IP networks;

o the convergence of technologies e.g. broadcasting, communications, information technology, etc.;

o that multimedia topics are addressed in many SDOs;

o the growth in multimedia services and applications;

o the need to study performance, interworking, interfaces etc. for user satisfaction.
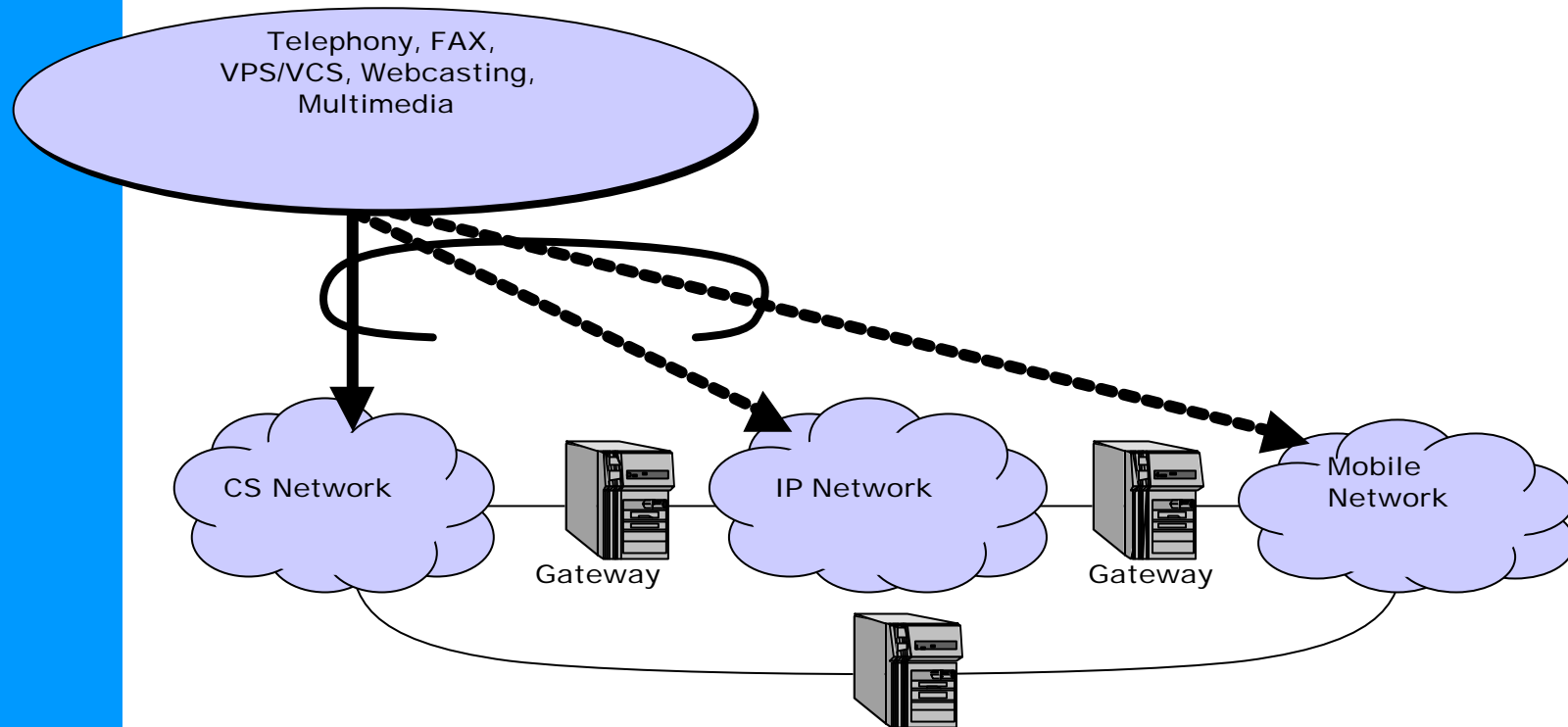
MediaCom: Objectives

The objective of the MediaCom Project in SG 16 is to create a **framework** for the harmonized and **coordinated** development of multimedia communication **standardization** for use across all ITU-T and ITU-R Study Groups, and in close cooperation with other regional and international SDOs and industry forums.

MediaCom: Goal

One of the main goals of the MediaCom Project is to **reduce** need for *higher layer* Gateway functionality

Telephony, FAX, VPS/VCS, Webcasting, Multimedia

CS Network

Gateway

IP Network

Gateway

Mobile Network

MediaCom Interactions

Seeking to work with:

- o Other ITU-T Study Groups
- o NGN project
- o ITU-R Study groups
- o IETF
- o ISO/IEC
- o Regional bodies, e.g. ETSI
- o Industry & other bodies as required

Recent workshops

- o Home Networking *** June 2004 * (Geneva)**
- o All-stars Network Access *** June 2004 * (Tokyo)**
- o Standardization in Telecommunications for motor vehicles, November 2003
- o Accessibility I+II July, October 2003
- o Workshop on Next Generation Networks, July 2003
- o Workshop on Standardization in E-Health, May 2003
- o Workshop on Telecommunications for Disaster Relief, February 2003

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MediaCom Work Strategy

o Ten Framework Study Areas (FSA)
[→ *"Horizontal Questions"*]

- (A/16) **Project MediaCom**
- (B/16) *MM Architecture*
- (C/16) *MM Applications and Services*
- (E/16) *Media Coding*
- (F/16) *QoS & E-to-E performance in MM Systems*
- (G/16) *Security of MM Systems and Services*
- (H/16) *Accessibility (total comm. concept)*
- (I/16) *Telecommunications for disaster relief*
- (J/16) MM framework for e-health applications
- (K/16) Mobility (ex Q5/15)

o MediaCom **Steering Committee**

o Aligned '**Questions'** in Study Group 16

o **Database** of multimedia related standards

o Thematic **workshops**: Telecom/Broadcasting Convergence;
Home Networking; E-health

Working Party 1
Modems and Facsimile Terminals

Status of SG 16 activities: Modems and Facsimile

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o **Accessibility (Q H/16):**

- Text telephony (Rec V.18): extension to include text telephony for mobile users

- Text telephony over IP
  (V.151 = V.ToIP)

o **PCM Modems (Q 11/16):**

- Rec V.150.1 (ex V.MoIP): procedures for the end-to-end connection of V-series DCEs over IP-networks

- Voiceband data transport in IP networks
  (V.152 = V.VBD)

Working Party 2
Multimedia Terminals and Systems

Status of SG 16 activities: WP2 (1)

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o Interoperability of MM systems and services (Q D/16):

- H.323 and SIP interoperability
  → work to continue under Q.2/16

o QoS and E-to-E performance in MM-Systems (Q F/16):

- QoS Architecture (H.360, ex H.qos.arch)
- MM QoS service classification (H.mmclass)
- Call processing performance in MM systems (H.mmcp)
- Controlling service priority (H.priority)

o Security of MM systems and services (Q G/16):

- Hybrid security profile to Rec H.235 on Security and Encryption
- Mobile security (Rec H.510)

Status of SG 16 activities: WP2 (2)

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o MM-Systems, terminals and data conferencing (Q 1/16):

- Revision to Recs T.120, H.222.0, H.320, H.324

o MM over packet based networks (H.323 systems) (Q 2/16):

- *H.323: Most widely used protocol for Voice over IP !!!*
- Further development of H.323 (QoS, Internet protocols, modem relay)
- Further development to H.460 (use of generic extensive framework)

o Infrastructure and interoperability for MM over packet based networks (Q 3/16):

- Media gateway decomposition Rec. H.248.1: new functionality added via "packages"

Status of SG 16 activities: WP2 (3)

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o Video and data conf. using IP-supported services (Q 4/16):

- Integration of video and data, interoperability
- Directory services for videoconferencing (H.350 series)

New!

o NAT Control and Firewall Traversal (New Q 5/16):

- User-friendly approaches for traversing MM & videoconferencing through NATs and firewalls

o Mobility (Q K/16) [*formerly: Q.5/16*]:

- Mobility protocols and procedures for H.323 systems
- Terminal mobility
- H.5xx series

Working Party 3
Media Coding

Status of SG 16 activities - Media coding

o **Media coding (Q E/16):**

- Media coding involves four aspects: Audio, Video, Still-image & possibly other media coding (eg character coding)
- Umbrella question for Media Coding coordination
- Completion of JPEG-2000 series eg T.800, T.801, T.803, T.804

o **Advanced video coding (Q 6/16):**

- New generation of video coding standards for all applications (Joint Video Team SG16/MPEG)
  - ITU-T H.264 | MPEG4 Part 10 (*Advanced Video Coding*)
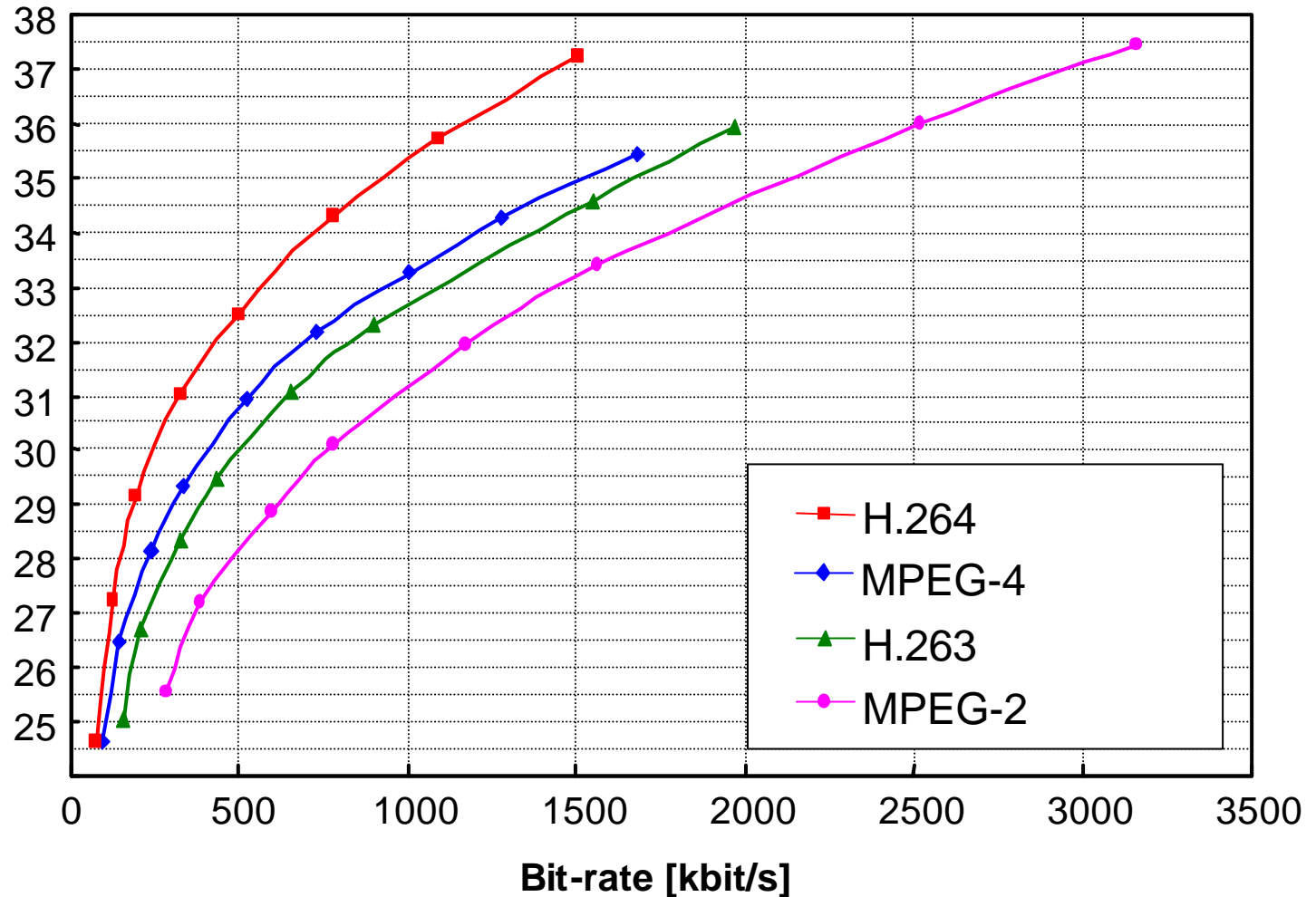 - Conformance testing, reference software and "professional" extension under development

Status of SG 16 activities: H.264 Performance

Tempete CIF 30Hz

Status of SG 16 activities WP3 - audio coding

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o Variable bit rate coding of speech signals (Q 9/16):

- Performance requirements under discussion
- Two approaches: classical VBR and embedded VBR
- Applications: 3G, VoIP, PSTN, PCME, DCME,...

o Software tools (Q 10/16):

- Maintenance of existing narrowband & wideband speech coding standards
- Extension of the ITU-T SW tool library (G.191)

Working Party 4
Multimedia framework

Status of SG 16 activities: MM Framework (1)

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o Telecommunications for Disaster Relief (Q.I/16):

- Support for emergency communications in disaster recovery operations between authorized users
- TDR trends:
    - PSTN → *IP*
    - *Voice → Multimedia*
    - *National → Global*
- Workshop in Geneva, 17-19 February 2003 (see http://itu.int/ITU-T/worksem/ets) >>
- **PCP-TDR:** Creation of a Partnership Coordination Panel for TDR with SDOs, Intergovernmental organizations and NGOs

Status of SG 16 activities: MM Framework (2)

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o Multimedia framework for e-health applications (Q J/16)

- E-health Workshop: decision to create a Question on an e-health standardization framework in SG16 (Question J)
- Question approved January 2004
- Study items:
  - Users' requirements
  - Multimedia framework (overall concept)
  - Roadmap
  - Generic Architecture
  - Specific system characteristics
- Develop corresponding Recommendations within the mandate of SG16

Status of SG 16 activities: MM Framework (3)

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o Multimedia architecture (Q B/16)

- Triple play & home networking
- Triple play over VDSL: H.610, H.611 (ATM-based)
- Study items:
  - IP-based triple play over VDSL; updates to ATM-based specs
  - Develop overall MM framework concept
  - Roadmap & Generic Architecture
  - Documentation of architectural assumptions made by previous work on multimedia standardization (H- and T-series Recommendations): early 2005.
  - End to end Open Services Architectural Framework (including home network environment) - H.saarch: mid 2005.
  - Identification of inconsistencies between the MM architectural frameworks in other SGs and other bodies: late 2005.

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Conclusion

Conclusions – MediaCom

o **Coordination** and **harmonisation** for development of standards supporting **converging** services, IT/Telecommunications & Broadcasting is under way and urgently needed

o SG16's **MediaCom Project** is the *umbrella* for this activity in the field of services and applications

o In SG 16, work is progressing in services, emergency telecoms, telematic terminals, modems, MM Terminals (including IP telephony), e-health and media coding

o Exploring new **innovative ways to work** and increase the value to the membership

o The **workshops** represent an excellent opportunity to better understand the MM work and to coordinate the work among the different players.

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Thank You!

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Simão Ferraz de Campos Neto joined the ITU-TSB in 2002 and is the Counsellor for ITU-T Study Group 16, where standardization work takes place on multimedia services, protocols, systems, terminals and media coding. He was the Coordinator in TSB of the 2003 ITU-T Informal Forum Summit, and has also organized several workshops (IP and Multimedia in Satellites, Telecommunications for Disaster Relief and recently on Standardization in E-health).

Prior to joining ITU in 2002, Mr Campos worked as a scientist in COMSAT Laboratories performing standards representation and quality assessment for digital voice coding systems. Mr Campos authored several academic papers and portion papers, as well as serving in the review committee of several IEEE-sponsored conferences. He was the editor of the TSB Security Manual.

Mr Campos is a Senior Member of the IEEE and received an MSc from the State University of Campinas, Brazil, on Telecommunications in 1993 and a BSc in Electronic Engineering from the same university in 1986.

Supplemental Slides: VoIP

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VoIP – the Services

VoIP Services: Old Stuff

o Just like Plain Old Telephone Service: setting up a call from A to B

o Plus handy additional services such as

- 3-way calling
- Caller ID with name
- Call hunt
- Call waiting
- Call forwarding
- Call transfer
- Toll free number:
  - Vonage: $.4.99/month + 100 incoming minutes, then 4.9c/min
- Repeat dialing etc.

VoIP Services: New Stuff

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o Free area code selection:
  - Live in New York, but California area code

o Virtual phone number:
  - Link secondary # to primary # ($4.99/month)
  - Ex: You live in NY (718), mom in Florida (561);
    you get secondary # with area code 561;
    Mom calls you & doesn't pay long-distance

o Global portability: phone rings everywhere in the world if plugged in a broadband link.

[from Vonage website]

VoIP Services: New Stuff

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o VoIP applications will run on a plethora of devices:

- PDA, game console, laptop, MP3 player,...

o Microsoft's Xbox Live! has integrated voice application

o Instant, wireless voice communications:

- Vocera communication badge: wearable device around the neck
- In use now in e.g. hospitals
- Natural spoken commands: "Conference Mr Alder and Mr Rauh"

VoIP Services: Even Newer Stuff

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o Integration of VoIP with computing systems, e.g.:

- Internet call to a doctor's office
- Doctor's system instantly displays:
  - your medical records (medication, visits)
  - Available appointment times
  - ...
- Doctor's system sends text message as reminder the day before the appointment
- etc.

VoIP – the market

Market Segments for VoIP

o "Invisible" VoIP:

- Corporate environment: replace separate voice and data networks with single converged network

- Operators use VoIP inside their networks at lower cost

Market Segments for VoIP, cont'd.

o "Visible" VoIP: Broadband Voice

- Consumer market: ordinary telephone + "adapter box" + Broadband connection

- Pioneered by startups, e.g. Vonage, Net2phone

- AT&T, BT, Qwest etc. are following (numerous press announcements Dec 2003)

- Broadband Voice – the future of fixed-line telephony?

Players in VoIP Market

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o VoIP innovations will come from a numerous sources:

- Start-ups (if of low barriers to entry)

- Local carriers will move to VoIP to compete outside their regions

- Long-distance carriers will move to VoIP to avoid access charges

- Cable companies to offer VoIP using cable lines

VoIP – the standards

ITU-T's H.323 – 1st VoIP-Standard ...

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o V.1: 1996, focus on enterprise voice, video, and data collaboration

- Took less than a year

o V.2: 1998, focus on "Internet Telephony"

o V.3: 1999, incremental improvements

o V.4: 2000, major enhancements focused on the requirements of service providers

o V.5: 2003, stability

o Chairman of ITU-T's Multimedia Services Study Group:

- Pierre-Andre Probst, Swisscom

H.323 ... Mature Standard

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o H.323 is proven and deployed technology

o H.323 provides a strong, *proven* foundation for new multimedia products and services

o H.323 has arguably largest market share:
  - (several) billion minutes/month [anecdotal evidence]

o H.323 provides excellent interworking between IP networks and the PSTN

Competition: Session Initiation Protocol (SIP)

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o IETF Standard (RFC 3261)

o Ever-increasing complexity:

- Corrections, additions, changes
- RFC 3261 is largest IETF document ever produced

o Support for SIP is growing:

- Many carriers are examining to deploy SIP in the next 12-18 months
- But they have been saying this for several years now

H.323 and SIP Interworking

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o How to harmonize H.323 and SIP networks?

- Basic call interworking (work in progress)

- Feature interworking (everybody wants it, but nobody wants to do the work)

VoIP and Quality of Service

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o What about Quality of Service?

- Jitter, delay, packet loss

o 2 camps of opinion:

- End-to-end Quality of Service architecture needed

- Internet's best-effort service is not bad enough to warrant those investments:

  - Customers value cheap service