# Voice-over-IP Standards and Interoperability Update IETF

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## Context: Convergence as Mantra

- is IP the ATM of today?
  - ATM was the answer, what was your question?
  - note that ATM is no longer *the* answer
- is convergence a mantra or a direction?
  - test - who is touting convergence?
    - e.g. Lucent prez - "convergence of all networks"
  - and are their companies actually doing it?

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## Convergence as Reality

- mixed world
  - hard to justify tearing out existing circuit-switched nets
    - known operations, significant amortization xx
  - no reason to recreate it if starting new
- very mixed view on economics of convergence
  - 50/50 vote for cost effectiveness of IP telephony replacing
  - Lucent prez at N+I: 70% - 80% reduction in cost of IP net over existing teleco nets
    - 100 - 250 x capacity at same cost by 2005

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## Convergence and Architecture

- one big issue in telco/Internet convergence are the architectural assumptions in each camp
- Internet:
  - stupid network
  - smart edges
  - applications on 3rd party servers or in end nodes
- teleco network
  - smart network (Intelligent Network - IN)
  - dumb edges
  - applications in service provider network

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# IETF Transport Area

- Audio/Video Transport (avt)
- Endpoint Congestion Management (ecm)
- IP Performance Metrics (ippm)
- Integrated Services (intserv)
- Integrated Services over Specific Link Layers (issll)
- IP Telephony (iptel)
- Media Gateway Control (megaco)
- Multiparty Multimedia Session Control (mmusic)
- Multicast Address Allocation (malloc)
- Network Address Translator (nat)
- Network File System (nfs)
- ONC Remote Procedure Call (oncrpc)
- Performance Implications of Link Characteristics (pilc)
- PSTN and Internet Internetworking (pint)
- Resource Reservation Setup Protocol (rsvp)
- Signaling Transport (sigtran)
- Session Initiation Protocol (sip)
- Service in the PSTN/IN Requesting InTernet Service (spirits)
- TCP Implementation (tcpimpl)
- TCP Over Satellite (tcpsat)
- tElephone NUmber Mapping (enum)
- Transport Area Working Group (tsvwg)

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# Audio Visual Transport - avt

- Real Time Protocol (RTP) - RFC 1899
  - transport multimeda over IP networks
  - used by H.323 & SIP
  - includes feedback protocol (RTCP)

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## IP Telephony - iptel

- PSTN/Internet gateway discovery protocol
  - find the "right" gateway to the PSTN
  - basically a routing problem
- call processing script language
  - how to tell a switch what you want done with incoming calls

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## Media Gateway Control - megaco

- working with ITU SG16
- protocol between a media gateway controllers and media gateways
- decompose a phone switch

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## Multiparty Multimedia Session Control - mmusic

- Session Description Protocol (SDP)
- Session Announcement Protocol (SAP)
- Real Time Stream Protocol (RTSP)
- Simple Conference Control Protocol (SCCP)

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## PSTN and Internet Interworking - pint

- Internet server (e.g. web server) to PSTN commands
  - click 2 call - place call between number A and number B
  - click 2 fax - send this data to phone number A as a FAX
  - access to voice - call number A and play this voice data

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## Signaling Transport - sigtran

- protocol to carry IN signaling protocols over IP networks
  e.g. SS7, Q.931 ...

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## Session Initiation Protocol - sip

- broken out from mmusic
- extensions to SIP protocol
- advance SIP on standards track
- SIP seen as competitor to H.323

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## Service in the PSTN/IN Requesting InTernet Service - spirits

- protocol to let Internet-based servers rect to information from the PSTN
  - e.g. Internet Call Waiting (ICW)

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## tElephone NUmber Mapping - enum

- for Internet-based hosts
- map from phone number to URL
  - can get different URLs based on application
  - voice vs. FAX
- could be URL pointing to actual host or gateway

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## Questions Asked

- what are the timeframes for standards?
- what is the ITU's future role in IP relm?
- what are the trends in VoIP standards?
- key players in VoIP standards?

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## Timeframes

- *"Likely timeframes for the development and adoption of new VoIP standards?"*
- SIP is at Proposed Std (published March 1999)
- additions underway (e.g. for cable modem use) due 1st half of 2000
- pint, megaco, sigtran, iptel/gdp - 1st half of 2000
- iptel/script, spirits/ enum - 2nd half of 2000

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## ITU Role

- *"Future role of the ITU as a standards authority in the IP realm"*
- IETF & working together on some things (e.g. megaco) but sometimes have different architectural view
  - IETF more peer to peer Internet
  - ITU more service provider
- future depends on what Internet concept prevails
- ITU process is now faster than the IETF

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## Trends

- *"Current status and trends in VoIP standards"*
- if SIP is any guide, trend is to Internet model
  - traditional phone world generally supports H.323
  - ISPs, new phone companies, Cisco support SIP
    - cable seems to be going to SIP
- traditional telephone world still there - megaco
- $$ story is still open

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## Players

- *"Key players in the critical area of VoIP standards"*
- IETF, ITU & ETSI are the major standards groups
- Cisco, Nortel, Lucent, Telcordia, etc major companies
- Worldcom (MCI) major carrier -
  Level 3 & Quest coming along

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## Regulations

- I'm here from the government and I'm here to help
- telco world has a surfeit of regulations
- expect the Internet to attract same
- not going to make things easier

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## How to become an IETFer

- the IETF does not exist: just an activity
- no "members"
- to take part
  - 1/ join a mailing list (open access - no fee)
    read archive before posting brilliant idea
  - 2/ attend a meeting (open access - meeting fee)
    next meeting in DC week of Nov 8th
- web page - www.ietf.org
- open access to all documents



## Have fun

thank you