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"Convergence of Internet & Telephony"

Juha Ristimaki

NOKIA
The Three VoIP Scenarios

1. Native VoIP
2. PSTN/GSM and VoIP interworking
3. PSTN/GSM services over IP
Some Numbers

- IP telephony "invented" in 1995
- International VoIP revenue $20.5 billion in 2002, $54 billion cumulative (IDC)
- Up from only millions of dollars today, revenue for transnational IP voice telephony will reach $4.3 billion worldwide by 2002 (Probe Research '97)
- US telcos lose 3 percent of their yearly revenue to IP telephony by 2002 (Forrester '97)
- 6 million IP telephony users worldwide, 2 million in Europe by 2001 (Dataquest '96)
- By 2005, 34% of phone calls are over data networks (Probe Research)
The End User Perspective
Initial Drivers for VoIP Penetration

RESIDENTIAL
- Tariffs
- Busy line problem
- Web VoIP access

BUSINESS
- Teleworking
  - Integrated UI and services
  - CPE costs and management
- Office
  - Integrated UI and services
  - VPN costs and management
  - Electronic commerce

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The VoIP Drivers

- Cost and management
- Frequent updates and management
- Bypassing regulations
- Service delivery integration
- Scalability and redundancy
The Key Challenges in VoIP

- QoS
  - Currently by dimensioning or proprietary methods, standardisation on-going
- Reliability
  - Fault tolerant router platforms needed for high-reliability services. End users adapt to low-price unreliable services
- Usability
  - IP telephony usability of PC terminals must evolve
- Terminal penetration
  - Internet penetration growing fast, PC voice capability often insufficient
- Pricing, accounting, charging
  - Schemes currently in their infancy
- Interworking with legacy nwks
  - H.323 not yet 100% mature
- Regulation
  - Varies, but usually VoIP is unregulated
- Security
  - Basic methods available, standardisation on-going
- Reliability
  - Fault tolerant router platforms needed for high-reliability services. End users adapt to low-price unreliable services

Preconditions for native IP telephony business not yet fulfilled
VoIP - PSTN/SDN/GSM interworking business taken the first steps, though
H.323

- ITU-T recommendation for packet-based multimedia communication
- More than 120 companies, including Intel and Microsoft, back the standard
- H.323 standard defines the following functional units:
  - **H.323 Terminal** for end-user access:
    - voice support is mandatory, data and video support are optional
  - **Gateway** for bridging H.323 conferences to other networks
    - e.g. normal fixed or mobile voice terminal needs a gateway to access H.323
  - **Gatekeeper** has several functions, e.g., map aliases addresses to IP addresses, exercise call management functions and AAA
  - **Multipoint Control Unit (MCU)** supports conferences between three or more endpoints

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**H.323 Applications:**
- Internet Telephony and Videotelephony
- Desktop Videoconferencing
- Collaborative Computing
- Network Gaming
- Distance Learning
- Support and Help Desk Applications
- Interactive Shopping
H.323 Development

- Version 1 defines client to client communications
  - require IP address of recipient in order to send messages across network
- Version 2 defines the Gatekeeper:
  - Accounting
  - Authentication
  - Authorization
  - Inter-network communication has not been addressed
Current Deficiencies of H.323

- No standard account authentication access protocol
- No full featured H.323 Gatekeeper available today
- No agreement on how the Gatekeeper works
- No standard for Inter-Gatekeeper communication

True interoperability not there yet
Nokia and VoIP

Overview of The Activities

- Participation in
  - the main standardisation bodies and cooperation fora (IMTC VoIP, ITU-T SG16, ETSI TIPHON, IETF, ATMF RMOA, MIT ITC)

- Internal research and development
  - Testbeds
  - Demonstrators
  - Pilots
  - Protocol development
  - First major system product: GSM Intranet Office
  - GSM office service solution with full-scale H.323 system
  - Expanding R&D focused to VoIP system solutions optimised both for fixed and mobile networks
GSM Intranet Office

An office solution by Merging GSM and VoIP