Convergence and Future Networks

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Pre-convergence Networks and Policies

• Legacy single purpose networks—silos
• Conduit told you something about the content--defined boundaries
• Old Rules based upon distinct industry and regulatory structures
Converged Networks and Services
Multiple Networks with Multiple Services

Traditional “silos” of service

Voice
Copper

Video
Coaxial

TV/Radio
Spectrum

Future converged services

Voice, Video, Data…

TCP/IP
(the Internet Protocol)

Cable, DSL, 3G, WiFi…
What is the Next Generation Network?

A Multilayer Transformation

- **Next Generation CORE**
  Delivered by changing transmission and switching--converged network

- **Next Generation ACCESS**
  Higher bandwidth, greater symmetry, lower contention, supports higher peaks

- **Next Generation Service Platform**
  Controls, provisions, programs services

- **Together NGC, NGA and NGSP create the IP NGN Framework of the future.**
What is the Next Generation Network?  
A Multilayer Transformation

- NGN refers to networks using technologies, usually IP, that achieve convergence in order to carry voice, video and data over the same infrastructure rather than separate networks (core centric definition)

- This transformation will be evolutionary and support “mass customised” services

- The initial drivers may differ among operators
  - Existing network replacement cycle
  - OPEX reduction
  - New services/revenue creation
  - Faster time to market

Since Networks will Continue to Inter-Work and Evolve, “Next Generation” is a Journey, Not a Destination
What is the Next Generation Network?

Two Descriptions

**Fundamental Characteristics (from ITU 2004 Description):**
- All kinds of services over all kinds of media...
- Decoupling of services from networks...
- Interworking...
- Open interfaces...
- Generalized mobility...
- End-to-end quality of service

**Fundamental Characteristics (from ETSI Description):**
- Uncoupling of services and networks
- All kinds of services possible using service related APIs
- NGN will support both existing and "NGN aware" End Terminal Devices.
- Quality of Service
- Security mechanisms
IP NGN Architecture: Layers of Convergence

APPLICATION CONVERGENCE
Integration of New Innovative IP Services over Broadband

SERVICE CONVERGENCE
Service Continuity and Creation

NETWORK CONVERGENCE
Eliminate Layers in the Network
Network Layer Convergence: The Foundation

- VoD / HDTV Gaming
- Data Center
- Presence-Based Telephony
- Web Services
- Mobile Apps
- IP Contact Center
- Voice over Demand
- High Definition Television
- Gaming

Service Exchange

- Framework for User and Application-based Network Control
  (Data, Voice, Video, Mobility)

Network Convergence

- Customer Element
- Access / Aggregation
- Packet Svc Edge
- Multiservice Core

Transport

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Service Layer Convergence

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INTELLIGENT INFORMATION NETWORK

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Service Management for Convergence

IDENTITY MANAGEMENT
- User / Device ID
- Location / Presence
- Service Registration
- Audit / Logging
- Assured Authentication

POLICY MANAGEMENT
- Subscriber Policy
- Application Policy
- Per-Sub Service

MOBILITY MANAGEMENT
- Device Roaming
- Service Mobility
- User Mobility

DYNAMIC SESSION MANAGEMENT
- Session Initiation & Call Control
- Rich-Media Control
- Bandwidth & QoS per Session
- Accounting / Billing
Application Layer Convergence

- Framework for User and Application-based Network Control (Data, Voice, Video, Mobility)

- Service Exchange
  - Self-Service
  - Policy
  - Identity
  - Billing

- Customer Element
- Access / Aggregation
- Packet Svc Edge
- Multiservice Core

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Innovative Applications with Residential Broadband and Everything over IP (EoIP)

Integrated Networks, Content and Entertainment Systems
Consumer Equipment for the IP NGN
How Things Change When Everything is over IP (EoIP): Convergence and VoIP

PSTN

Internet over PSTN

Internet over Broadband (Voice over Internet)

Apps

TCP/IP

Voice

Transport

Apps

TCP/IP

Voice

Transport
Policy Challenges for Convergence and New Networks

Opportunities

Enables innovation and competition: service development, new forms of access, fixed mobile convergence

Investment

NGN network deployment requires significant investment

Investment requires stable + secure legal + regulatory environment

Policy

Balancing competition and investment

With competition, incentives for efficient and timely investment

Regulation should not discourage NGN investment