Next Generation Networks architecture by ITU-T

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1. The beginnings
2. The definition
3. Fundamental characteristics of NGN
4. NGN architecture
Outline

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Outline

1. The beginnings
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The motivation towards NGN

- the Internet was designed for simple connectivity of best-effort traffic
- explosion of data traffic
- strong demand for new multimedia services
- increasing demand for mobility
The genesis

- ITU-T Workshop on IP Networking and Mediacom in Geneva, April 2001

- no common understanding of what an NGN is!

- So why did ITU-T take lead, when there was no consensus?
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The genesis

- several institutions began to work on NGN
- overlaps?

- Focus group on NGN (FGNGN) was created under ITU responsibility
  - European Telecommunications Standards Institute (ETSI)
  - Alliance of Telecommunications Industry Solutions (ATIS)
  - China Communications Standards Association (CCSA)
  - Telecommunication Technology Association (TTA)
  - Telecommunication Technology Committee (TTC)
  - 9th Global Standard Collaboration (GSC)
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Related documents

- ITU-T Recommendation **Y.2121**, “Requirements for the support of flow-state-aware transport technology in NGN”
Areas of key importance in NGN
Identified by ITU-T Recommendation Y.2001, Section 8

- General framework and architectural principles
- Architecture models for the NGN
- End-to-end QoS
- Service platforms
- Network management
- Security
- Generalized mobility
- Network control architecture and protocols
- Service capabilities and service architecture
- Interoperability of services and network in NGN
- Numbering, naming and addressing
- Disaster and relief communication capabilities
Keywords

ITU-T Rec. Y.2001
- decoupling between transport and service
- generalized mobility
- GII (Global Information Infrastructure)
- NGN
- overview
Next Generation Networks (NGN)

A packet-based network able to provide telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. It enables unfettered access for users to networks and to competing service providers and/or services of their choice. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.
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Objectives of ITU-T NGN

Economic aspects

- promote fair competition
- encourage private investment
- define a framework for architecture and capabilities to be able to meet various regulatory requirements
- provide open access to networks
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Objectives of ITU-T NGN

Social aspects

- ensuring universal provision and access to services
- promoting equality of opportunity to the citizen
- promoting diversity of content, including cultural and linguistic diversity
- recognizing the necessity of worldwide cooperation with particular attention to less developed countries
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3. **Fundamental characteristics of NGN**
4. NGN architecture
Fundamental characteristics of NGN

The list

- packet-based transfer
- decoupling of service provision from transport
- support for a wide range of services
  - real time, streaming, non-real time and multimedia
- broadband capabilities with end-to-end QoS
- generalized mobility
- interworking with legacy networks via open interfaces
- unrestricted access by users to different service providers
- converged services between fixed/mobile
- independence of service-related functions from underlying transport technologies
- support of multiple last-mile technologies
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Fundamental characteristics of NGN
Decoupling of service provision from transport, Y.2011

- NGN transport
- CO-CS, CO-PS and CLPS layer technologies
- NGN services
  - e.g., voice telephony services (audio, fax, etc.)
  - e.g., Data services (WWW, e-mail, etc.)
  - e.g., Video services (TV, movie, etc.)
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Flow-state-aware (FSA) transport technology

- 4 classes of service (service contexts)
  - ARS, GRS, MRS, VRS
- flow-based differentiation
- stateful aggregations
- in-band and out-of-band signaling
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Generalized mobility

The ability for the user or other mobile entities to communicate and access services *irrespective of changes of location or technical environment*. The degree of service availability may depend on several factors including Access Network capabilities, service level agreements between the user’s home network and the visited network (if applicable), etc. Mobility includes the ability of telecommunication with or without service continuity.
Fundamental characteristics of NGN

Generalized mobility, Y.2012
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Fundamental characteristic summary
C. Lee and D. Knight, “Realization of the Next-Generation Network”
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NGN architecture overview

“NGN Architecture: Generic Principles, Functional Architecture, and Implementation”


Thank you for your attention!