ITU-T's Previous NGN-Related Work

Global Information Infrastructure (GII)

The Global Information Infrastructure (GII) project produced a number of Recommendations in the Y series. However, implementation issues were not covered.

Selected References

[1] ITU-T Rec. Y.100 (1998), General overview of the Global Information Infrastructure

[2] ITU-T Rec. Y.110 (1998), Global Information Infrastructure principles and framework architecture

[3] ITU-T Rec. Y.130 (2000), Information communication architecture

[4] ITU-T Rec. Y.140 (2000), Global Information Infrastructure (GII): Reference points for interconnection framework

[5] ITU-T Rec. Y.140.1 (2004), Guidelines for attributes and requirements for interconnection b etween public telecommunication network operators and service providers involved in provision of telecommunication services

Joint Rapporteur Group Activities on NGN

In order to give impetus to NGN work, ITU-T Study Group 13 established a Joint Rapporteur Group on NGN (JRG-NGN), which worked until the formation of the Focus Group on NGN (FGNGN). The objective was to prepare "foundation" draft Recommendations on NGN. Consideration was also given to terminology aspects of NGN. The main subjects studied by JRG-NGN were:

- General reference model of NGN
- Business model, service architecture and scenarios for NGN
- Functional requirements and architecture of NGN
- Identification requirements for NGN
- Mobility requirements and mobility management architecture
- QoS requirements and end-to-end QoS architecture of the NGN
- Reference service model for multiprotocol label switching (MPLS) based reliable and manageable IP networks
- Migration of networks (including Time Division Multiplexing – TDM – networks) to NGN
- Technical issues and layer models useful for regulatory considerations

Before work was handed over to the FGNGN, Recommendations Y.2001 and Y.2011 were completed.

How NGN Is Progressing Within ITU-T

On 7 May 2004, ITU-T established a new Focus Group (FGNGN) to address the urgent need for initial global standards for NGN.

The Focus Group is divided into seven Working Groups (WGs), each focusing on a core topic. The WGs are as follows:

WG 1	SR (Service Requirements)
WG 2	FAM (Functional Architecture and Mobility)
WG 3	QoS (Quality of Service)
WG 4	CSC (Control and Signalling Capability)
WG 5	SeC (Security Capability)
WG 6	Evo (Evolution)
WG 7	FPBN (Future Packet-based Bearer Networks)

Details of the FGNGN may be found at

www.itu.int/ITU-T/ngn/fgngn/

which contains a link to TSB Circular 236 which established the FGNGN, a press release, and details of the meetings of the FG.

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International Telecommunication Union

NGN

Next Generation Networks

ITU-T

Global Connectivity
Fixed or Mobile
Any Device
Anytime
Anywhere

ITU-T's Working Definition of NGN

A Next Generation Network (NGN) is a packet-based network able to provide services including 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 offers unrestricted access by users to different service providers. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.

NGN is characterized by the following fundamental aspects:

- Packet-based transfer
- Separation of control functions among bearer capabilities, call/session, and application/service
- Decoupling of service provision from the network, and provision of open interfaces
- Support for a wide range of services, applications and mechanisms based on service building blocks (including real-time/streaming/non-real-time services and multimedia)
- Broadband capabilities with end-to-end QoS and transparency
- Interworking with legacy networks via open interfaces
- Generalized mobility
- Unrestricted access by users to different service providers
- A variety of identification schemes which can be resolved to IP addresses for the purposes of routing in IP networks
- Unified service characteristics for the same service as perceived by the user
- Converged services between fixed/mobile
- Independence of service-related functions from underlying transport technologies
- Compliant with all regulatory requirements, for example concerning emergency communications and security/privacy, etc.

Why NGN?

The NGN concept has been introduced to take into consideration new realities in the telecommunication industry, characterized by factors such as: the need to converge and optimize operating networks and the extraordinary expansion of digital traffic (i.e. increasing demand for new multimedia services, increasing demand for general mobility, etc.).

Study Topics

A number of ITU-T standardization activities are related to the establishment of implementation guidelines and the development of standards (ITU-T Recommendations) for the realization of NGN. These activities seek to ensure that all of the elements needed to realize the network capabilities are addressed. This should include existing and new applications.

Evolution of Networks to NGN

Evolution to NGN should allow continuation of, and interoperability with, existing networks, while in parallel allowing the implementation of new capabilities. Since the realization and deployment of NGN will be an evolutionary process, it is necessary to describe a variety of approaches.

The vast amount of capital invested in the PSTN (Public Switched Telephone Network) means it will be one of the main work areas for evolution to NGN. Early outputs from ITU-T's Focus Group on Next Generation Networks (FGNGN) describe possible ways of evolving PSTN to NGN. They provide steps for evolution of transport, management, signalling and control parts of PSTN to NGN.

QoS (Quality of Service)

The basic criterion for QoS evolution is "subjective user satisfaction", e.g. speed, accuracy reliability, security, etc. This involves identification of parameters that can be directly observed and measured at the point at which the service is accessed by the users and network providers. Since each recognized operating agency has a different regulatory environment, service offering, geographic span, and network infrastructure, there must be flexibility within any global end-to-end architecture for NGN. These factors should be taken into account while agreeing on parameters for and levels of QoS for NGN.

Interoperability

Considering that NGN will involve a broad series of protocols (including various profiles) at both service and network levels, it is essential to ensure interoperability between different systems and networks.

Security

Security is as crucial to NGN as it is in today's network environment. The fact that the scope of the topic is so wide combined with the number of SDOs (Standards Development Organizations) already involved underlines the strategic importance of this subject. Within NGN, security issues interrelate with architecture, QoS, network management, mobility, charging and payment.

Security needs in NGN should evolve to:

- a comprehensive security architecture for NGN;
- preparation of NGN operational security policy and guidelines;
- adequate NGN security protocols and APIs (Application Programming Interface).

Generalized Mobility

NGN will give users and devices the ability to communicate and access services irrespective of change of location or technical environment. The degree of service availability may depend on several factors, including access network capabilities and service level agreements between the user's home network and the visited network, etc. It includes the ability to communicate from various locations using a variety of terminal equipment, with or without service continuity, while in transit or while changing access means.

Service Capabilities and Architecture

Work in this area will:

- address the telecommunication service capabilities that NGN should provide, maintaining separation between services and the networks they run on; and
- develop a suitable service architecture focused on the interfaces to support different business models and seamless communication in different environments.

Backwards compatibility with and the evolution from existing services and systems will also be studied here.