SERVICES IN NGN – NEXT GENERATION NETWORKS

Alžbeta KANÁLIKOVÁ

Faculty of Management and Informatics, University of Žilina,
Slovak Republic

e-mail: Alzbeta.Kanalikova@fria.fri.utc.sk

Abstract

Nowadays is performing mutual convergence of existing networks into one network, called Next Generation Network. From the point of view of network services for the end user the essential property of the network is to deliver the information content in any format, through any device, anytime, anywhere and in desired volume. NGN network offers except basic existing services also large amounts of new network services. The implementation of new network services is not easy, it is important to determine properly the category, to know the network possibilities, its functions, properties and so on. Nowadays there is an effort to create new network services according to the needs of customer, user, for whom the greater is the value of service, the better and in larger scope satisfies his requirements in terms of information processing. In the process of increasing the value of service it is suitable to use effective methods of value management, value analysis, which search for harmonizing requirements with network's possibilities. Along with increasing network service's value decrease the costs of network service by means of elimination of inefficiency, increase service provider's prosperity and user's satisfaction.

1 NGN – NEXT GENERATION NETWORK

Technological progress, performing convergence of network properties and existing service functions gave rise to NGN (Next generation network). NGN network is the network of new generation, whose philosophical basis consists of unification of data, telephone and mobile networks including their services into one network concept The concept of such network is not simple and is permanently development. It will bring wide range of possibilities to introduce new and existing technologies in field of information transmission and processing, but also many possibilities especially in the branch of network services [5].

2 CATEGORIES IN NGN SERVICES

By means of building of new NGN architecture rise many opportunities and possibilities for development of required and especially new network services. New network services rise on the basis of new network possibilities, resp. implementation of

new technologies, and on the basis of users' requirements, but also by means of existing services extension and quality improvement. Some services in NGN are services, which rise as combination of existing network services and are the basis for new services creation. Categorization of new NGN services is still rising and developing. As in telecommunication services, it will depend for example on criterion, on common properties of elements of categorized objects, on functions of services, on used technologies, on different views on services etc. NGN services can be categorized into three wider areas [2]:

- **Communication services** as voice calls, instant messages, virtual private networks (VPN) and audio conferences
- **Information services (Content services)**
- **Transaction services** as e-tailing / e-commerce and financial transactions etc.

In accordance with document [3] the final product of each network is always the service providing. The information being transmitted and its utilization have nowadays a great value, and this value is continually increasing. From point of view of the value of information being transmitted it is possible to split network services into two basic groups:

Network associated services, which are provided on the basis of possibilities offered by new technologies, independently of users' needs.

Services provided through network are services that are connected with the value of information being transmitted. For them is important the cooperation between the department of installed technology, and the department, where the technology is to be implemented.

Resulting service rises on the basis of relationship, combination of these two types of network services. Following figure shows this interrelationship [4]:

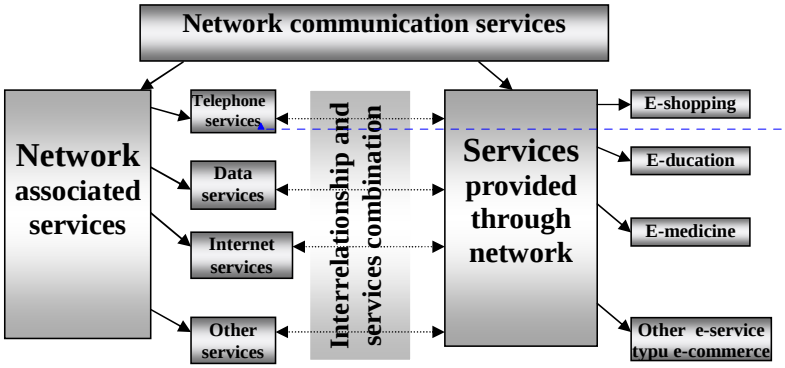

Figure 1 Mutual relationship among networks

Formátované

In accordance with [1] NGN networks will be probably able to perform a plenty of types of network services, which include technologies and services:

1. **Specialized resource services** (for example provision and management of transcoders, multimedia and multipoint conferencing bridges, media conversion units, voice recognition units etc.)
2. **Processing and storage services** (for example provision and management of information storage for messaging, file servers, terminal servers, OS platforms etc.)
2. **Middleware services** (for example naming, brokering, security, licensing, transactions, etc.)
3. **Application specific services** (for example business applications, e-Commerce applications, supply-chain management applications, interactive video games, etc.)
4. **Content provision services** that provide or broker information content (e.g., electronic training, information push services, etc.)
5. **Interworking services** for interactions with other types of applications, services, networks, protocols, or formats (e.g., EDI translation)
6. **Service management** to maintain, to operate, and to manage communications /computing networks and services.

In line with [1] there is an expectation, that between the most important existing and new network services, which will be providing in NGN background, will rank:

1. **Voice telephony** NGNs will likely need to support various existing voice telephony services (e.g., Call Waiting, Call Forwarding, 3-Way Calling, various AIN features, various Centrex features, and various CLASS features). Note, however, that NGNs are not trying to duplicate each and every traditional voice telephony service currently offered.
2. **Voice gateway** enables end user situated anywhere to access anytime information, news, weather information, share prices, transactions etc.
3. **Data services** enable in the real-time establishment of connectivity between endpoints, along with various value-added features (e.g., bandwidth-on-demand, connection reliability / resilient Switched Virtual Connections [SVCs], and bandwidth management / call admission control).
4. **Multimedia services** allow multiple parties to interact using voice, video, and/or data. This allows customers to converse with each other while displaying visual information. It also allows for collaborative computing and groupware.
5. **Virtual private networks (VPN's) -** Voice VPNs improve the interlocation networking capabilities of businesses by allowing large, geographically dispersed organizations to combine their existing private networks with

portions of the PSTN, thus providing subscribers with uniform dialing capabilities. Data VPNs provide added security and networking features that allow customers to use a shared IP network as a VPN.

6. **Public network computing (PNC)** provides basic computer services for business and private users. For example public networks providers would provide general processing and storage services (web sites, file storage / maintenance and backup, or computer application execution)
7. **Unified messages** enable delivering of voice message, e-mail, fax-mail and websites through common interface.
8. **Information brokering** involves advertising, finding and providing information by means of connecting users and service providers.
9. **E-commerce services** include transactions, payment information verifications, providing protection and trading possibilities, home banking and home shopping business-to-business service, storage management applications and knowledge management applications. To this category belong also e-learning, interactive teaching through electronic communication network, e-government etc.
10. **Call center services** enable users to get to call center operator by means of clicking on website. The call is directed to corresponding operator, that is located everywhere.
11. **Interactive gaming** offers consumers a way to meet online and establish interactive gaming sessions (e.g., video games).
12. **Distributed Virtual Reality** concerns with technologically made presentations of real world, or the reality will be mediated using the way of virtual session
13. **Home Manager** is a service, that is able to monitor home security-, energy system, home entertainment system and other home applications
14. **Emerging systems** for instance home central accounting department, selection of various service quality, setting up network bands, new services in e-commerce, micro payments, universal access to various networks, member's personal profile creations etc.

Basic destination of NGN network services is to enable user to deliver information content in any format, through each device, anytime, wherever and in desired size.

3 NGN SERVICES FUNCTIONS

Traditional network service providers offered to market basic information transmission between users with various possibilities of add value. Nowadays this service direction changes, because economy world becomes dependent on informations, as the essential sources. In NGN will be services oriented more towards improved broadband services, and emphasized information services. End users will significantly influence network by means of sophisticated Control Point Equipment (CPE) managing units, and will be able to choose from wide range of quality of service

(QoS) and of bandwidth. The bases of NGN services development are following general characteristics and service functions, needed for NGN environment [1]:

1. **Ubiquitous multimedia communication in real-time**, which is similar to personal communication. It includes highspeed transmission for each transfer and each medium, anytime, anywhere and in demanded data size.
2. **More personal intelligence distributed in all parts of the network.** User can create his personal profile, for instance, overpayment information and personal preferences, learning from previous models, and to perform specific functions in benefit of him. For example, "intelligent agent" informs about specific events, or searching, sorting and filtering of specific content.
3. **More network intelligence distributed by means of network.** It will be allowed to know about the access possibilities, the control of network services, content and resources. There may be provided some special functions of network providers, or of the network itself. For example "management agent" monitors network resources, collects user data, searches for the failures, or mediates new services and contents from other users.
4. **More simplicity for the user.** This function protects the user from seriousness of information collection, processing, editing and transmission. It allows simple access and the use of network services and contents, including user interface, which enables real interaction between the user and the network.
5. **Personalization of end user services and management services** allows user to manage his personal profile, independently, to supply network services, to monitor using and accounting, to adjust his user interface, presentations and working approaches, and to create and provide new applications.
6. **Intelligent information management** helps the users to manage information in that manner that provides possibility of searching, sorting, filtering the content and managing messages and data on each medium.
7. **Selection of information transmission quality –** is based on the difference in information transmission quality (QOS), where the user will be allowed to select the quality of transmission of his information.
8. **Selection of the way of information access** – each user will be allowed to determine the way of accessing his information, through which services etc.

4 CONCEPT OF NGN NETWORK SERVICES IMPLEMENTATION

Nowadays there is an effort to create network services in accordance with requirements of the customer, the user. In principle, there is an assumption, that the requirements on classic basic services will remain, but those service provider will prosper, who will add the value to these services, that means, who will provide more sophisticated services, who enables information access anywhere, who will mostly offer services, which will allow user to process or to gain desired information etc. The new network NGN provides the user with these possibilities (new technologies, new

services, multimedia services, highspeed access). As mentioned before, these days changes the approach towards user, customer, and his interests become the priority. This implies during the implementation of a new or the change of an existing service it is even more important to harmonize network (NGN) possibilities, its technologies, and functions with customer's requirements. Such harmonizing of customer's requirements and functions and possibilities of the network requires knowing well customer's requirements and network functions. It is necessary to search for concrete expression of this mutual relationship. In search process we can use methods and methodic from management, especially from value management, which come from value analysis. Through this method and its methodic we can express mutual relationship of customer's requirements and possibilities of the product, which is in this method expressed by an function of the object, that is in our case the network service. If is this method applied particularly on network services, we would search for most optimal expression of concrete network service functions, which would incarnate requirements of customer (end user) and are in accordance with network possibilities (for instance by setting network parameters, service parameters etc.). Along with satisfying requirements of the customer, the user of service, increases the value of the service for the customer, and in accordance with network possibilities also increases the total value of network service. Searching for greater value (or value add) of the service allows the provider of new network services to eliminate non-effective solutions and implementations, services, and thereby also to reduce costs of particular service. This implies the use of value management methods and value analysis should not become negligible, but they should start to be applied in methodology of implementation of particular network services [6].

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Referee: doc. Ing. Mária Rostašová, PhD.
Faculty of Operation and Economics of Transport and Communications
University of Žilina