

Next Generation Networks (NGN) Management Concept

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Article Information

Received: November 11, 2022

Accepted: December 12, 2022

Published: January 13, 2023

Keywords: NGN, Networks.

ABSTRACT

NGN (Next Generation Network) - next generation networks. This term appeared later in the field of telecommunications and is interpreted differently in specialized literature. For example, specialists in the field of switching understand the new principles of switching when called NGN, specialists in primary networks - the transition to new networks of MPLS, OSPF, BGP and other transport technologies, specialists in access networks - broadband access systems, and so on. Based on the above, we believe that it is appropriate to understand NGN from the point of view of telecommunication networks as follows.

NGN networks are a technical solution that appeared at the stage of digital communication development, when data traffic became more important than voice traffic, and computers became more important than telephones.

According to this definition, the symbiosis of certain technological solutions gives rise to certain features of NGN:

- NGN technology appears as a result of the historical development of telecommunications, at a certain stage of society's informatization, that is, when data traffic "overcomes" traditional speech traffic;
- due to social changes in society and changes in the relative value of information, the concept of NGN is associated with a sharp qualitative change in the development of all technologies of communication systems,
- NGN technology covers all layers (levels) of modern communication systems, its new capabilities lead to a radical change in the relationship of its users to communication services.

In modern telecommunications, serious changes related to strong "internetization" of society are observed, which can be considered as a scientific and technical revolution in essence. Until now, it can be said that world telecommunications have experienced two scientific and technical revolutions

The first change has a direct technological significance and is related to the transition from analog transmission and switching principles to digital.

The second change in telecommunications was associated with the emergence of cellular

communication systems. The difference between this change and the previous one is that society has changed its focus on the world of communication. The idea that two people can connect with each other from anywhere and at any time became very attractive to everyone, which made social communication an intangible asset of society. As a result of this change, the "commoditization" of communication has led to an increase in the level of wireline services.

The third change is the transition to the global information society (IGS), which has already begun and is gaining momentum. This change is fundamentally different from the previous ones, it covers not only the whole society, but also changes its construction foundations, importance, directions, etc. That is, information resources become strategic resources similar to natural resources. For this, the population should have wide access to the information resources of society and world civilization. Such an opportunity can be created only by a new generation network, that is, NGN is directly related to the transition to the global information society and is its leading force.

The idea of NGN has begun to change all existing technologies, from data transmission to cellular communication systems. It is well understood that in NGN, data is more important than speech information, and packet switching and packet traffic are more important than channel switching and speech traffic.

Globally, voice traffic is stable, while data transmission, especially Internet traffic, is increasing dramatically. Therefore, the NGN concept can be recognized as a global strategy for the development of the telecommunications industry.

No single channel switching technology can fully meet the high demands for communication services. For example, existing subscriber telephone networks, despite the installation of advanced modems, cannot provide a sufficient increase in channel capacity. The current ADSL technologies temporarily meet the requirements, but sooner or later the network will need to be completely modernized. NGN technology can do this.

NGN should be viewed not only as a new technical concept or a new technology, but as an ideological doctrine based on the following strategic postulate:

The computer is more important to the future society than the telephone, and it makes sense to place it at the center of new communication technologies.

As a consequence of this, the following can be noted with the need for radical restructuring of communication networks:

- ✓ communication networks should be radically modernized for the normal operation of a computer-oriented network, not a phone.

Until now, the development of telecommunications is somewhat evolutionary: ISDN in the telephone network, transmission systems were transferred from PDH to SDH and then to ATM, and NGN offers new principles of construction at all levels. This means that it is preferable to rebuild the network with minimal use of working components.

The idea of NGN arose as a result of the redistribution of privileges between speech and data traffic, increasing over data traffic. The idea of NGN has led to an evolutionary change in the principles of communication systems.

Conventional transmission systems use electric and optical cables, as well as radio technical means (radio relay and satellite transmission systems) as a medium for transmitting signals.

A digital signal in a transmission channel has a logical structure that includes cycles (frames) and line codes.

In digital transmission systems, electrical signals of various structures are transmitted, and at the output, digital channels of the primary network are formed, which are compliant with standards

in terms of transmission speed, cyclic structure, and line code type.

Secondary network technologies can evolve as desired, but ultimately they must use the same primary network model channels as the PDH/SDH hierarchy.

By establishing the first priority for data traffic, NGN technology requires the abandonment of channel switching. The advantages of packet switching in data transmission were already known and proven. So, in the era of NGN, the principle of packet switching should prevail. Considering that traditional electrical communication systems are based on the principle of channel switching, there is no doubt that NGN will bring new principles to the structure of the communication system.

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