

# ORGANIZATION OF THE VIRTUAL MOBILE PLATFORM, BASED ON EXISTING NETWORKS OF MOBILE AND FIXED TELECOMMUNICATION OPERATORS

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## ABSTRACT

The analyses of the operations of mobile and fixed service providers show the presence of excess reserve capacity which is the result of the technology from the channel to the packet and from radio relay to the fiber optic technology. At the same time the implementation of 3G and 4G equipment offers high bandwidth access at the latest mile. Based on the above mentioned it is possible to create a new concept: a virtual mobile environment based on the existing networks providing new services other than operators' common services, through the organization of the dynamic structure over the existing telecom network of operators.

**Keywords:** mobile operators, platform, (control center) management center, triple service

## INTRODUCTION

The considerable part of the modern telecom services require high bandwidth (carrying capacity, throughput) not only in the main transmission part, but also in last mile segment to make possibility of broadband Internet and multimedia triple service packages usage via the mentioned networks. The market analysis of fixed networks operators services shows a sharp increase in new service providing via fixed networks. In the market of mobile operators, the conversion from E1 channel technology to IP packet technology has significantly improved the quality of sound services and, if not completely, it reached more than satisfactory level. So surplus of the carrying capacity frequency generated in the channels won the third and fourth generation of mobile communication technologies.

Voice communication with the web service provided by cellular operators was a heavy blow to linear operators, but it also contributed to the development and implementation of linear operators by the use of technology with now widespread fiber optic cable to home (fiber to home).

Assuming that the mobile operator network development policy may not be able to get the full coverage throughout the state, then the study of other cellular network operators or linear density of resources, will make it possible to create a unique virtual platform. It will include all the linear operators and mobile network resources of the country. The platform will allow in the developing countries, using the existing network resources, to avoid new financial investment for the organization of administrative,

professional and corporate networks, on the other hand, will enable the operators of transport sector, the surplus carrying capacity. In this case the surplus consumption of the carrying capacity as a way of local information exchange does not require additional expenses such as the cost of the internet [1,5].

Referring to the transport networks the main upgrading is obvious, not only in the software, but also in the physical part of the network` radio-relay channels in the fundamental part of the transport network changed into fiber optic cables. Considering the history of the RA operators since mid 90s up to now, we can give the following schematic picture of the core network:



the basic transmission network, based on radio relay equipment



the basic transmission network, based on fiber optic equipment

Fig1. general scheme of the mobile operator transport network

In the result of technological change the carrying capacity of the main network has grown from 156 Mbit / s to 40 Gbit / s and this value will increase according to the standards of used optical cable and equipment and it is now possible to conclude that there is more than enough surplus of transport networks.

Consequently, excess consumption can be a new method of multimedia services and corporate packages for data transfer.

As to the coverage created by cell operators it should be noted that the organizations decide the policy of the development of coverage themselves. Consequently, from the regional and geographical view communication organizations have a balanced coverage of networks, but that does not mean complete broadband coverage in all the final points. So we can make a conclusion that combining mobile and networks of fixed broadband operators it is possible to get a large and virtual network that will enable them to consume the surplus of transport networks, providing corporate data exchange packages or other specialized networks. As an example we can mention the Telemedicine network. As the packages supported operators networks don't have static value and undergo dynamic changes, then for the surplus carrying capacity management the virtual network must transform into a manageable with management center (CP) platform. In this case, the CP problem will be:

- Create an object or a subscriber, of which will fully meet the descriptions of the operators' objects, using HLR and VLR systems;
- control the capacity of the platform, assessing network surplus of carrying capacity of the operators;
- support the communication between the customers and the frequency of dynamic change.

So CP will be the operator of specialized virtual mobile network, which will provide not specific service packages of mobile networks.

Again referring to the scheme (Figure 2) of the operators we should note the interconnecting center, which is unique. It allows you to simplify the task of installing the platform.

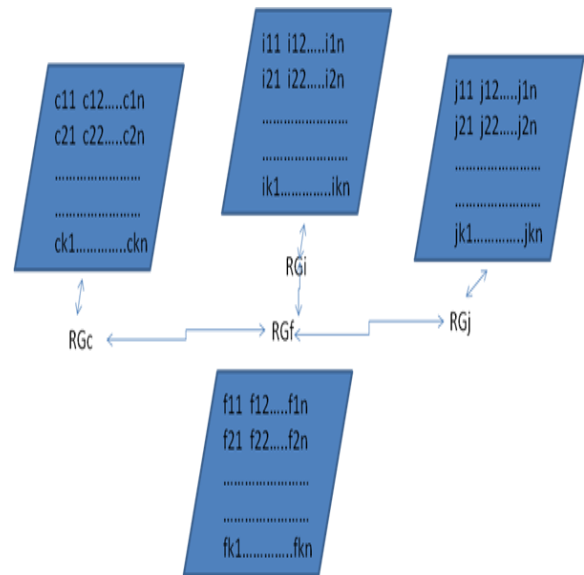


Figure 2 The scheme operators of RA

Where`

The elements **c**, **f**, **i**, **j** are the succession of mobile and fixed-line management center operators and endpoint (automatic telephone station or base station) communication channels between network nodes sequence:

**RG** – the nodes are operators output gateways.

**RGf** – the junction is also supported by internetwork interconnection.

The connection of the control center to the operators system, which connects two virtual network subscribers to RFG point can be described as follows: assuming that A is served by the node of the fixed operator, and B point can be connected by three cellular operators, if in that position at least 1 operator has a coverage. Considering that all the operators have a coverage in that part, then according to the scheme described in Figure 3, three-way method is possible.

Based on capacity of the transport network of each operator and the number of nodes constituting the channel, it is needed to determine sufficient capacity coefficient **K**, which will meet the maximum capacity providing mobile operators, if the number of the node, which form the channels offered by the operators is the same, then in the case of IP and MPLS routing will be the minimum number of nodes in the channel, if the nodes have an equal number, then the priority will be given to MPLS technology. Taking into account the fact that the platform is based on the use of transport networks based on the maximum excess value of coefficient **t** time interval, an update interval can be set, if necessary to change the channel.

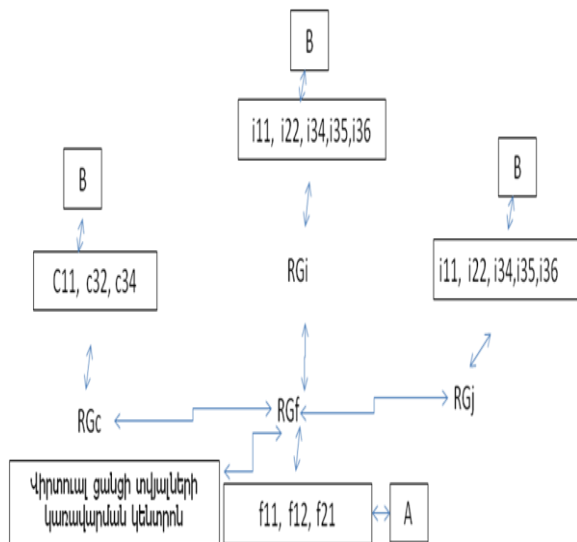


Fig .3. Connecting the points A and B on the basis of virtual platform

In this case dynamic transport channel between the two endpoints will be done due to the following formula:

$Mopt = t(f, c)$ , when the HLR (f, c) and VLR (f, c) remain the same.

where

the channels built from minimal elements are the sequence of F and C are communications

Mopt- preferred channel value selection

t - the time value of regular updates

HLR - maternal data of the subscriber.

VLR - Networking possession.

The perspective usage of the platform is evident in different areas; we should like to point out medicine or e-medicine, telemedicine sector. The platform will fully satisfy the needs of telemedicine, by providing broadband communications regardless of the users' location, providing along with the third level multiprotocol ability to work.

Generalizing the above mentioned it can be concluded that:

- It is necessary to build a unitary virtual platform based on the networks operators
- It will help to consume the surplus existing in the transport networks, and will ensure the further development
- The virtual platform will help to avoid the high financial costs, to build networks to provide coverage along the whole territory of the country
- Based on several network operators the platform has strong backup channel opportunity to reduce the network disability.

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