

Development Concept for Multi-Service Public Communication Networks in the Russian Federation

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Table of contents

• Working group members	3
• Communications Ministry's goals in 2012-2018	4
• Objectives of the Framework	5
• Restrictions imposed by the existing regulations on the interaction between operators	6
• Multi-service communications networks	7
• Market participants	11
• Services and quality in the multi-service communications network	15
• Connection points and interface requirements	20
• Connection rules	21
• Subscriber identification using number, address and name	23
• Telegraph service in multi-service networks	24
• Technical regulation	25
• Law Enforcement Support Functions	27
• Local procurement	28
• Framework implementation plan	29

Working group members

Group Leader:

Eldar A. Razroyev, Candidate of Economics, advisor to Russia's Minister for Communications and Media

Developers:

Viktor S. Aleshin, Doctor of Engineering, Provost for Research, Research Director, Moscow Technical University of Communications and Informatics (state educational institution of higher vocational education)

Vladimir A. Grigoryev, Doctor of Engineering, Chair of Wireless Communications, State University of Information Technology, Mechanics and Optics (research university)

Igor O. Guryanov, Candidate of Engineering, Deputy Director, Research and Development Center for the Analysis of EMC, Research Institute of Radio (federal state unitary enterprise)

Anton A. Zarubin, Candidate of Engineering, Provost for IT, Bonch-Bruyevich St. Petersburg State University of Telecommunications

Vitaly B. Kreindelin, Doctor of Engineering, Deputy Director, Department for Public Services in Communications, Federal Communications Agency

Oksana P. Navarnova, Deputy Director, Development Department, Central Scientific Research Institute of Construction (federal state unitary enterprise)

Mikhail L. Khazov, Director, Metrology and Communications Network Support Systems Unit, Department for Radio Frequencies and Communications Network Regulation, Russian Ministry for Communications and Media

Vartan M. Khachaturov, Deputy Director, Department for Infrastructural Projects, Russian Ministry for Communications and Media

Communications Ministry's goals in communications in 2012-2018

- ❑ To make **high-quality communications** available to residents of Russia
- ❑ **Internet** should be **safe** for children, **free** for adults
- ❑ Each year **5 million** households get the possibility to connect to the Internet via a **100 Mbit/s** terrestrial link, more than **20 million** users get the possibility to access the Internet via **4G** mobile link
- ❑ Mobile services and Internet should be available **in all modes** of public transit
- ❑ Telephone number never has to be changed
- ❑ All **incoming calls** should be **free** in Russia, all **outgoing** should be based on **local rates**

Objectives of the Framework

- ❑ **Promote** the development of communication networks throughout the Russian Federation, including remote regions, to overcome the **digital inequality**
- ❑ **Reduce rates**, **expand** range and **accessibility** of services available to users by cutting costs
- ❑ **Simplify** the use of modern and advanced telecommunications technology in the territory of the Russian Federation in compliance with the requirements for the quality of services, **liberalize** operators' activity in the field of building multi-service communication networks
- ❑ **Harmonize** the regulatory framework, bring the policy of technical regulation into conformity with the relative development level of the communication technology and with the task of ensuring the integrity, stability and security of unified telecommunications network of the Russian Federation in the current context

Restrictions imposed by the existing regulations on the interaction between operators

- ❑ Traffic between network nodes located in different regions of Russia is routed only through **network elements of a higher level**
- ❑ Responsibilities of zonal operators in the construction and **maintenance of interconnection points**
- ❑ **Cross-subsidies** to zonal destinations at the expense of local and long-distance communications
- ❑ **Non-optimal pricing**: asymmetric regulation, significant pricing difference for termination at different levels, different rates for termination and initiation, regulation of retail rates
- ❑ Requirements to networks are **classified by types** of communication services

Prerequisites and key principles of building a multi-service communications network in Russia

- ❑ **Convergence of information and communication technology** facilitates the integration of information flow, which reduces the differences between the categories of telecommunication networks. Dividing networks by purpose (telephone, telegraph, data, etc.) is irrelevant
- ❑ The approach of establishing requirements to communications networks, developed in relation to the specifics of communications networks built based on circuit switching does not meet the current challenges of **implementing new technologies**
- ❑ The evolution of communications networks requires the creation of multi-service public communications networks as a separate network type, with a view to **moving to the networks of the future without prejudice to existing networks** and preserving their properties that can be used by the state

Definition of a multi-service communications network

Multi-service telecommunications network is the telecommunications network, which uses the **packet switching technology** as the basic data transmission technology and has following properties:

- ☐ services provided through the network **do not depend on the technology** used in the transmission of electronic messages
- ☐ diverse services **can be provided at the same time** using a single terminal connection to the telecommunications network
- ☐ is possible to maintain the contractual **quality standards** of different services simultaneously and **independently**
- ☐ telecommunications network provides **access to different service providers**

Target features of the multi-service communications network (1)

- ❑ Universal (single type) single level structure of the backhaul network
- ❑ Communication nodes are not bound to the services rendered: same communication nodes can be used to offer different services, the possibility of joint use of equipment by different operators
- ❑ Distributed functional and physical architecture: horizontal separation of delivery and management functions, services and applications
- ❑ Technological neutrality: independence of services from technology, both fixed and mobile; requirements to network functionality without a tie-in to physical nodes and equipment
- ❑ Open interfaces

Target features of the multi-service communications network (2)

- ☐ Global user mobility: both terminal and personal
- ☐ Widespread provision of a fixed set of communication services
- ☐ Internetwork communication: subscribers of one operator have access to the services offered by other operators
- ☐ Service quality control: ensuring the required quality standard depending on the service type
- ☐ Security compliance: access to emergency services, positioning, security, reliability

Market participants:

Telecom operators (TO)

Organization of subscriber access to the network, traffic transmission (including, where appropriate, interregional), communication services linked to the network infrastructure

- ☐ **Single license** with the ability to provide services to users of any type
- ☐ Connection in at least **two** geographically separated points to the networks of federal telecom operators, in all regions of the Russian Federation in the licensed territory
- ☐ Ban on self-dependent transmission of cross-border traffic
- ☐ Transmission of any traffic via any route within the Russian Federation in the licensed territory
- ☐ Free emergency calls from any terminal, with the definition of the subscriber's location, including when in the roaming

Market participants:

Federal telecom operators (FTO) (1)

FTO are subject to all requirements to TO; additionally, FTO are responsible for the transmission of cross-border traffic and connection of TO in points of presence

- ☐ Requirements to high throughput, stability of operation, integrity
- ☐ At least **four** adjacent backhaul hubs located in different federal districts (two to the west and two to the east of the **45th meridian east longitude**) with double backup capacity each
- ☐ **Own infrastructure**, including physical links to each region of the Russian Federation
- ☐ At least **two** own cross-border transmission stations, one of in the European, the other in the Asian part of the Russian Federation
- ☐ At least one connection point in the administrative center of each constituent entity of the Russian Federation, as well as additional points in cities with more than **100** thousand inhabitants

Market participants:

Federal telecom operators (FTO) (2)

- ☐ Transparent and nondiscriminatory pricing and regulated connection terms
- ☐ Connection to all FTO in at least two locations to the west and two locations to the east of the 45th meridian east longitude, in different federal districts
- ☐ Existing telephone networks should be connected to the multi-service communications network through the appropriate gateways at the FTO connection points
- ☐ Existing data networks should be connected to the multi-service communications network at the FTO connection points

Interaction between multi-service and existing communications networks

- ❑ Multi-service public communications network is built using the superimposition strategy:
 - Existing networks (one network - one dominant service) continue to operate in accordance with the current regulations
 - Multi-service networks built in accordance with the new regulations exist in parallel with traditional networks
 - Existing public communications networks (zonal, long distance / international level) are connected to the multi-service networks through a limited number of connection points, including those for long distance telephony
 - Multi-service networks are allocated non-geographic telephone numbering codes
- ❑ **Carrier decides whether to convert existing networks into multi-service networks**
- ❑ Conversion of an existing network into multi-service is performed if the requirements to multi-service networks are met
- ❑ Multi-service network operator is required to allow transit traffic from/to existing networks. The same requirement applies to existing networks
- ❑ Connectivity requirement applies to the whole public network

Services in the multi-service communications network

Types of services:

- ❑ **basic communication services** means transmission of messages in the multi-service telecommunications network between senders and recipients via the communications network linking them. Senders and recipients of telecom messages are terminals directly connected to the telecommunications network and using open interfaces
- ❑ **information and communication services** are services that can be implemented using equipment that is not part of the multi-service network infrastructure, access to these services is through the telecom operator's access network

Licensing of basic services in multi-service networks (1)

Single license covers all basic services in the multi-service network:

- ☐ issued immediately after the adoption of the appropriate regulations
- ☐ includes the license to provide all basic telecommunication services (not necessarily all of them) of TO's choice. TO must publicly declare exactly which basic telecommunications services it provides
- ☐ **FTOs are subject to additional licensing terms**, in accordance with the earlier requirements to the connectivity of networks; FTO is required to provide the entire set of basic services
- ☐ in terms licensing conditions (**differ by the mode of access to the network**), wired, mobile and satellite terminals are distinguished

Licensing of basic services in multi-service networks (2)

Single license covers all basic services in the multi-service network:

- ☐ **allows the use of radio relay and satellite transmission systems** by all telecom operators without special clauses in the license in accordance with the established rules of use of radio electronic devices
- ☐ operator has the obligation to provide access to services offered by other TOs and PUs. User has the right to drop some of the services, but the operator cannot limit the user in this choice. Conditions of access to services are the subject-matter of the contract and of the competition

Quality of basic services in the multi-service communications network (1)

- ❑ Quality indicators and measurement methods are determined by the regulator
- ❑ Values of quality of service indicators are agreed in subscription contracts
- ❑ Methods of quality assurance:
 - establishment by the regulator of communications services quality standards, development of methods to determine uniquely interpreted values, methods to compare the obtained values
 - establishing minimum values of quality indicators (in licensing terms and regulatory documents)
 - using measurement data and usage statistics obtained from the operators
 - providing subscribers with the opportunity to conduct independent testing of quality of communications services (subscription contracts should include both standards and testing methods)
 - claims related to the quality of communications services and reliability of data are processed by the Federal Supervision Agency for Information Technology and Communications

Quality of basic services in the multi-service communications network (2)

- ❑ Following is necessary to ensure quality control in communications services:
 - build an automated system allowing based on measurements and statistical information to evaluate the quality of communication services and collect evidence for the resolution of disputes between subscribers and telecom operators and publish telecom operator ratings
 - implement requirements to active equipment used in public communications networks for the purpose of automatic collection of statistics reflecting quality of communication services
- ❑ Data used for quality control:
 - measurements taken using methods approved by the regulator
 - calculations based on statistical information provided by operators
 - analysis of measurements made by users

Connection points and interface requirements

- ❑ Technological possibility of using universal **connection points regardless of the type of services** for the exchange of any traffic
- ❑ Minimum mandatory **list of open interfaces** and protocols that must be supported by connection points
- ❑ **Coordination of transmitted traffic** of each type (voice, data, media, signaling) **and of service quality parameters** in the organization of connection points

Connection rules (1)

- ❑ **Federal telecom operators (FTO)** get connected to each other by the prescribed deadline **on equal terms**, regardless of time of establishment and place of connection, and participate in costs on equal basis
- ❑ **Telecom operators (TO)** get connected to FTO networks in connection points offered by the latter and pay all costs of providing the channel to the connection point. TO must have at least **two** points of connection to one or more FTOs in every region of Russia where licensed activity is carried out. FTO is required to provide such an opportunity by the prescribed deadline with no additional conditions attached
- ❑ **FTO is responsible for network synchronization and UTC (SU) time signal propagation**, with the GLONASS satellite navigation system used for backup purposes

Connection rules (2)

- ❑ Interaction between different TO networks is either through FTO or other TO networks or at direct connection. Any TO **may connect to any other TO** within prescribed time on regulated symmetric terms, including maximum connection time without nonrecurring charge
- ❑ FTOs and TOs are prohibited to impose a connection charge. Only **monthly** fee is paid for the connection provided and hosting of equipment
- ❑ Only **symmetric billing** is allowed both for the service delivery time and amount of traffic, speed and required level of quality

Subscriber identification using number, address and name

- ❑ **Identifiers are assigned to subscribers and are subject to reliable registration**
- ❑ **Following identifiers** can be used:
 - phone number in the format specified in ITU-T Recommendation E.164
 - URI identifier, including the universal resource locator URL
 - IP-address
- ❑ **Addressing and routing** in TO networks must support the following:
 - defined quality parameters when using in the network terminal devices connected using different technologies
 - interaction within communications networks built using packet-switching technology between user devices connected over IP to networks of different operators
 - availability of services from a variety of access points (nomadicity)
 - number portability

Telegraph service in multi-service networks

- ❑ Providing document transmission services over the multi-service network
- ❑ Connection to the Unified System of Interagency Electronic Interaction
- ❑ Keeping all types and categories of messages in the telegraph service
- ❑ Keeping basic consumer properties of telegrams:
 - documentary nature, legal significance
 - availability of the service to all residents throughout Russia
 - guaranteed delivery by regulatory deadlines to any address
 - support for priority delivery, encryption, categorizing
 - feedback on the results of delivery
- ❑ Provision of services based on same rules throughout the Russian Federation, support to new service features
- ❑ Connection to existing public telegraph network
- ❑ Existing telegraph networks continue to operate in accordance with current regulations

Technical regulation (1)

- ❑ Technical regulation is based on the principles of technological neutrality, refocusing of control from technical parameters to criteria of quality, **minimization of checks**
- ❑ Regulator develops building and connection rules for FTO networks
- ❑ List of technical resources subject to mandatory certification (applies to equipment operated in multi-service networks) is allowed to include only the following:
 - emitting radio-electronic means of communication
 - backbone network equipment with synchronization functions
 - switching and routing equipment with law enforcement support functions

Technical regulation (2)

- ☐ **Notification procedure** for commissioning with the mandatory provision to supervising authorities of data on technical characteristics of communications networks and equipment
- ☐ Using **direct links references** to national, intergovernmental and international standards recognized by the Russian Federation
- ☐ **Abandoning project expert review** and using the notification procedure, in-service control
- ☐ Requirement **to keep technical documentation** and present it upon request to the Federal Supervision Agency for Information Technology and Communications
- ☐ Multi-service network services can be provided only if the **quality of services is controlled** and detailed procedures and quality control methods are applied

Law Enforcement Support Functions

- ❑ Keeping the basic principles of law enforcement activities: **continuity, completeness and reliability**
- ❑ Open interfaces and protocols of cooperation with competent authorities, use of international standards (including ETSI), competitive hardware market
- ❑ **Law enforcement support with respect to services:** it must be possible to scan traffic at connection points

Local manufacture

- ❑ Local manufacture preferences **through public procurement and accelerated depreciation**
- ❑ Requirement to manufacturers - availability of resident rights to the source code
- ❑ Admission to the public network of **open software and hardware** through the declaration procedure
- ❑ **Program for expanding the share of local manufacture** in equipment supplied to the Russian market (separate requirements to mechanical services, electronic assembly and software development)

Framework implementation plan

Open discussion and pilot operation of all innovations in the pilot area

- ❑ **August 2013** - approval of the Framework
- ❑ **December 2013** - pilot operation of all the innovations in the pilot area

Drafting and adoption of regulatory documents, issuance of licenses

- ❑ **March 2014** - drafting of regulatory documents based on the findings of the pilot operation of the framework in the pilot area
- ❑ **July 2014** - adoption of the new regulatory documents, new licenses start to be issued (validity of previous licenses is limited to their expiry dates)

Transition period

- ❑ Allocation of telephone numbering resources to segments of the multi-service network
- ❑ Gradual transition of existing operators from TDM to the future multi-service network model