CREATION OF THE PROTECTED TELECOMMUNICATIONS INFRASTRUCTURE

SMARTS

CREATION OF THE PROTECTED TELECOMMUNICATIONS INFRASTRUCTURE

CURRENT TRENDS AND THREATS

- «Digitalization» of human activity.
- Total personification.
- Development of biometrics access systems.
- Introduction of unmanned vehicles and Internet of Things.

On the other side there is growth of:
- **amount of cybercrimes;**
- **crimes related to personal data;**
- **attacks on critical infrastructures.**

THIS MEANS:
REQUIREMENTS FOR SAFETY OF STORAGE AND DATA PROCESSING SYSTEMS INFRASTRUCTURES ARE GROWING, THE APPLICATION OF NEW SOLUTIONS FOR MANAGEMENT OF SECURE STORAGE AND TRANSFER OF DATA IS REQUIRED.

The development of the Internet of Things, the 5G standard and the emergence of unmanned vehicles will inevitably lead to an increase of traffic in the operators' networks substantially; therefore, it is necessary to create a core network throughout the country which in the future can be easily scaled with minimal costs.

CONCEPT

Creation of road telecommunication networks.

Creation of a system for managing geographically distributed data centers.

Quantum cryptography for protecting communication lines.

PROTECTED TELECOMMUNICATIONS INFRASTRUCTURE

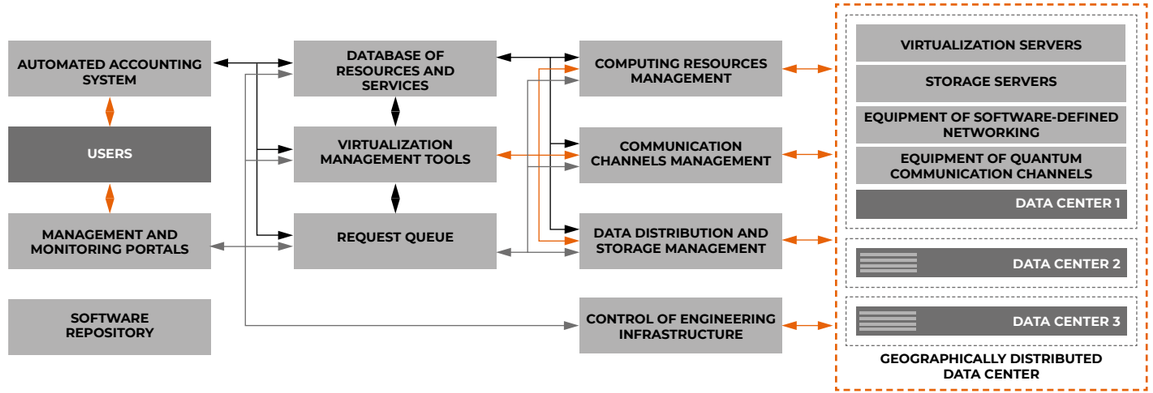
The project includes three stages: laying of the fiber-optic communication lines along the roads, developing of a software and hardware complex for protecting communication lines by encryption using quantum key distribution technology and unification of the data centers using this technology in a single, geographically distributed infrastructure.

«CREATION OF A SYSTEM FOR MANAGING GEOGRAPHICALLY DISTRIBUTED DATA CENTERS» PROJECT

SMARTS, together with ITMO University, with the support of the Government of Russia, are implementing the project **«Creation of a system for managing geographically distributed data centers, ...»** (Ministry of Education and Science of the Russian Federation, agreement 03.G25.31.0229 dated 03.03.17).

Project goal:
Creation of an integrated management system for scalable geographically distributed data processing and storage centers, the communication channels of which are protected by quantum technologies.

POSSIBILITIES OF THE CONTROL SYSTEM



- Management of virtual and quantum channels between data centers.
- Geographical distribution of data storage and computing power.
- Management of the engineering infrastructure of the data center.
- An integrated set of management tools.
- Portals for administrators and users.
- A web portal for receiving analytical information.
- Portal for configuring services.
- A billing portal for evaluating the actual services provided.

THE SYSTEM FEATURES

- New approaches to managing large amounts of data and providing cloud services based on Openstack *(a set of free software for creating infrastructure cloud services and storages)*;

- virtual software-configured storage system for a distributed infrastructure with a memory of more than 1 exabyte (10 ^ 18 bytes);

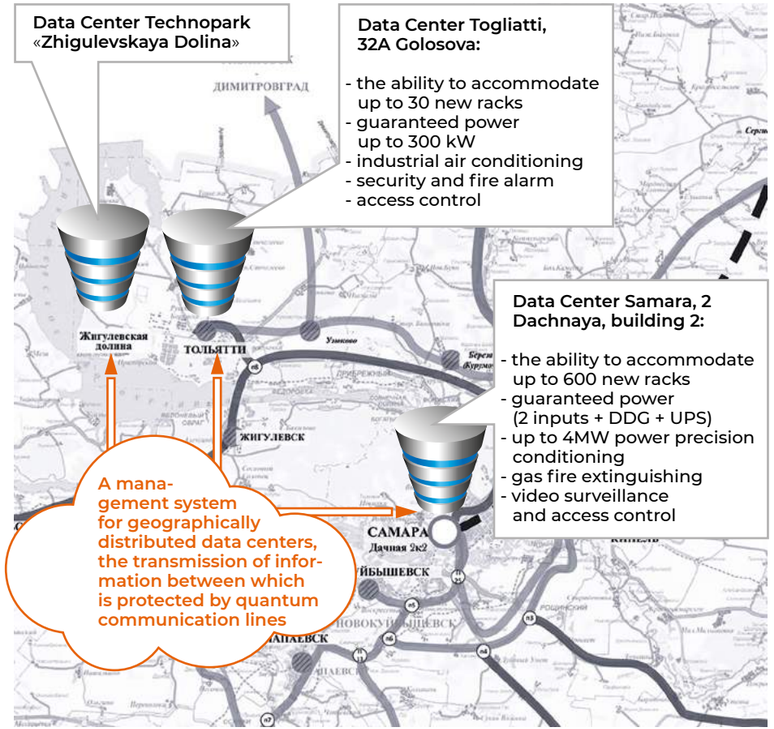
- means of optimizing the computing power of distributed data centers;

- technology of quantum communications at side frequencies;

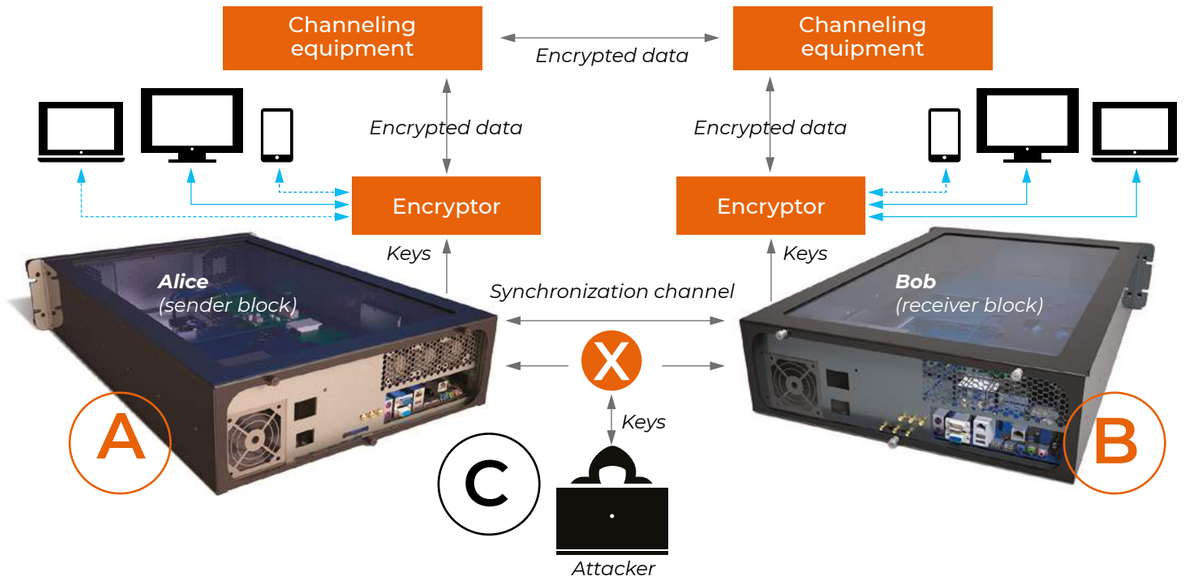
- the ability to organize a trusted execution environment based on geographically distributed infrastructure.

PILOT PROJECT SCHEME

Under the project a pilot zone of 3 data centers is created in the Samara region, connected by communication lines using quantum protection of data transfer. The system under development is a domestic platform that allows you to distribute the load between different data centers using the «cloud principle» of data processing and storage.
This approach allows for load balancing and unprecedented data security by using of quantum communications.



QUANTUM CRYPTOGRAPHY FOR PROTECTION OF TELECOMMUNICATIONS LINES



ADVANTAGES OF THE TECHNOLOGY

- The highest level of data transmission security.
- Ability to change encryption keys over 10 times per second.
- Unlimited in time security.
- Secure distribution of cryptographic keys using traditional communication lines.
- Guaranteed intrusion detection. (it is impossible to «listen» or hack due to physical laws)

The system works on the principle of quantum distribution of a cryptographic key on a sub-carrier frequency of simulated radiation, which has several advantages:

- the transmission range is higher than that of commercial analogues, the stability of the circuit does not depend on the range;
- the circuit is resistant to external influences on the fiber (heating, bending, vibration);
- compatibility with standard fibers Corning SMF-28e and others, no need to lay new lines;
- the possibility of increasing the number of users and speed due to frequency multi-plexing in one fiber;
- the system is designed and manufactured in Russia.

RUSSIAN QUANTUM ENCRYPTION SYSTEM

ITMO experimental quantum cryptography set with SSPD detector.

TO INCREASE SECURITY OF DATA TRANSFER, IT IS PROPOSED TO INTRODUCE THE RUSSIAN QUANTUM GENERATION AND ENCRYPTION KEYS DISTRIBUTION SYSTEM.

Leadership competencies in this area, based on strong quantum mathematics and a research base, ready-made samples of quantum cryptography, are demonstrated by ITMO University and Quanttelecom LLC, a member of SMARTS Group of Companies.
Small-scale production of quantum crypto-gateways was organized based on «Quanttelecom» LLC with the aim of constructing a quantum key distribution system compatible with telecommunication standard communication lines.

THE EFFECT OF INTRODUCING SMARTS PROJECTS

SMARTS' projects may become the basis for building a digital economy, make it possible to implement global projects:

- Digitalization in the field of security, medicine, distance education;

- creation of a unified secure infrastructure for the «smart city» system;

- creating the necessary conditions for the introduction of fifth-generation 5G communication services, introduction of the «Internet of Things» and drones.

ABOUT THE COMPANY

SMARTS COMPANY IS REGISTERED IN MAY 1991. UP TO 2015, IT WAS A MOBILE NETWORK OPERATOR IN 16 REGIONS OF THE RUSSIAN FEDERATION.

Currently, SMARTS JSC implements the following projects:
Creation of highway telecommunication networks,
Creation of a system for managing of geographically distributed data centers, including virtualization of resources and using of quantum technologies for protecting communication lines.

Proceeds	2017	2 532	mln rubles
EBITDA	2017	1 387	mln rubles
Balance sheet total	2015	5 993 797	thsd roubles
	2016	7 381 292	thsd roubles
	2017	7 809 889	thsd roubles

2 Dachnaya str., build. 2
443013, Samara city
+7 (846) 231 17 77
smarts@smarts.ru