KazRENA – Research & Education Network

Research & education services during pandemic

KazRENA. Development history

- **KazRENA – Kazakhstan Research & Education Networking Association – was registered on August 3, 2001 as a union of legal entities in the form of an association (non-for-profit organization)**

- **Development of KazRENA was initiated by NATO Virtual Silk Highway Project (2003-2010)**

- **Supporting research and education by providing high-speed and low-cost Internet access within the NATO Science for Peace and Security Program**

International research and educational integration

- The task of national research & education networks (NRENs) is to unite universities and research institutes in a single academic network for integration with each other and for interaction with worldwide research centers, leading world universities, as well as international research and education networks of a global level.

- Main international partner-networks are Internet-2 (USA), GEANT (Europe), TEIN4 (Asia-Pacific region), RUNNet (Russia), CAREN (Central Asia)

Advantages of NREN over commodity Internet

- The main advantage is easy integration of universities and research centers with each other.

- Access to data storages and knowledge bases of the world research and education system is transparent for universities and research institutes.

- These tasks are realized by solving technical issues of telecommunication connection and automatic authentication.

- After that, the "information highway" between universities and research centers has already been laid.

- At the same time, the access level and exchange modes are determined by the universities and institutions themselves.

- Commercial networks and providers are banned from accessing research networks

Digital environment of research & education in new conditions

- **In connection with the dynamic development of digital technologies and new conditions during pandemic, a deep modernization of the existing research and education network and its saturation with new digital services are taking place.**

Interaction with research & education organizations

- **eduGAIN is an international liaison service that brings together research and education identity federations of GÉANT network**

- **Universities and research organizations of Kazakhstan use a large number of e-resources and e-services – bibliographic and abstract databases, e-learning systems, digital repositories, their own and subscribed e-libraries, and etc.**

- **The service integrates authorization systems and thus enables secure access to the resources of the global academic community.**

- **The storage and processing of users' personal data is carried out in full accordance with the requirements of the current legislation and the user is authorized exclusively on the servers of his organization**

- **GÉANT is a European multi-gigabit network that consolidates more than 10 thousand research and education organizations from over 40 countries, and the number of users exceeds 50 million. The bandwidth of the core network reaches 500 Gbps, providing interaction with more than 100 NRENs around the world, including KazRENA.**

- **KazRENA integrates the Kazakhstan research and development sector into the global innovation system, including joint activities for the implementation of research and technical projects**

New research & education services

- **Information security system in academic field (academic CERT / CSIRT)**

- **Remote work with research equipment and virtual labs.**

- **Development of virtual digital laboratories and stands with remote access.**

- **Transition to extensive use of physical and mathematical modeling as well as simulation modeling in research experiments.**

- **Distributed computing, e-repositories and e-libraries**

Digital education

- eduroam is an international roaming service for users in research & education.

- Content Delivery Network (CDN) technology

- Providing support and development of modern methods and technologies of distance learning

- Trainee control (proctoring automation)

- Automatic remote control of students and fixing violations using cameras and other technical means

- The scheduling and control room management system in conjunction with the university/campus access control system allowed accumulating large amounts of data and conduct research, analysis, and forecasting of the university infrastructure load

- Individualization of education by "digital footprint" through electronic journals and diaries, social networks, electronic libraries

Computing networks

- Construction of GRID systems based on KazRENA network for distributed computing and research

- Integration into the international system of computing resources and computing experiments

- Rent of supercomputers, services for the load of computing resources, distributed and GRID computing

Cybersecurity issues

- **Holding a Cybersecurity Month in February 2021, similar to the annual event by CISA (USA)**

- **KazRENA and its specialists have the necessary rights and competencies to work with the Cisco Academy**

- **Organization of the International Cybersecurity Training Center**

- **Development of the Cybersecurity Training Center in Kazakhstan and in the Central Asia region as a whole. An important problem is the lack of qualified cybersecurity specialists in enterprises.**

- **The work of the Center is expected to involve a wide audience, primarily students and teachers of universities and colleges.**

- **Participation of businesses will be important, including utilities with critically vulnerable infrastructure, as well as small and medium enterprises.**

Center for modern digital technologies

- **The Center for Modern Digital Technologies is being developed jointly with universities**

- **This is an innovative educational platform for the demonstration and training of students and teachers in modern information technologies**

- **It is necessary to involve regional universities in the system of international academic integration, participation in international research, technical, and educational cooperation and consortia through the organizational, technical and communication capabilities of KazRENA**

- **The center's functions are to supplement the existing education process at universities with practical examples and tools for practice-oriented activities.**

ISIC/ITIC Cards

- KazRENA is a licensed authority of ISIC – International Student Identity Card in Kazakhstan and issues ISIC/ITIC cards for students and university teachers

- ISIC/ITIC cards can be integrated into systems of building access, library and corridor printing

- Loyalty program and provision of discounts on goods and services in the country and abroad

IPv6

- KazRENA provides its members with access to the world network via a new IPv6 protocol with a free pool of up to 10,000 IP-addresses

- Annual training and professional improvement of teachers and university staff in information technology is conducted on the basis of our own Cisco Academy and other specialized organizations, both in full-time and part-time forms

Campus management systems

- **Turnstiles and security systems in universities and dorms**

- **Own fiber-optic communication**

- **Corridor printing**

Contacts

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