



Развитие компьютерной, образовательной и научной сети КТУ Манас

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Аннотация:

Статья посвящена обзору технологий интеграции и этапов развития технической инфраструктуры в Кыргызско-Турецком университете «Манас» за период 1995-2017гг. Университет основан в 1995 году, тогда еще с простой локальной Ethernet-сетью, 20 компьютерами, 20 академическим и административным персоналом, и около 90 студентами. А сейчас, это университет с несколькими дистанционными гигабайтными сетями и более чем 7000 пользователями. Обзорное исследование показывает рост информационно-коммуникационные технологии (ИКТ) в соотношении к росту числа пользователей. А также внедрение ИКТ в гигабитные сети в кампусном типе университета. Результаты данного исследования могут быть использованы в Кыргызско-Турецком университете «Манас», Министерством образования и другими университетами Кыргызстана.

Ключевые слова:

Сети, исследовательские образовательные сети (REN), высшие учебные заведения, исследовательские образовательные сети в странах Центральной Азии (CAREN), исследовательские образовательные сети в Кыргызстане (KREN)

Development of a Computer, Educational and Scientific Networks at KTU Manas.

Abstract:

This review article is about development stages of internet intersected with computer, educational and scientific networks at KTU Manas from 1997 to 2016. The university was founded in 1995, then with a simple local Ethernet-network, 20 computers, 20 academic and administrative staff, and about 90 students. And now, this is a university with several gigabyte distance networks and more than 7000 users. The survey study shows the growth of information and communication technologies (ICT) in relation to the increase in the number of users. As well as the introduction of ICT in gigabit networks in the campus type of university. The results of this study can be used in the Kyrgyz-Turkish University Manas, the Ministry of Education and other universities of Kyrgyzstan.

Keywords:

Networks, research educational networks (REN), higher education institutions, Central Asia Countries RENs (CAREN), Case of Kyrgyzstan REN (KREN)

1. INTRODUCTION

Education plays a main role in a country development. Success in education depends on its participants, interactions between them and access to educational sources. By the development of information communication technology (ICT) these interactions between participants became more effective and easy. Nowadays, first simple networks turn to smart networks which provides much more opportunities like open or easy and secure access to educational sources and tools.

Within the technological developments Information and Communication Technologies (ICT) become necessary tool in education, and universities invest more in technology, to integrate it into the learning process. By investing in technology, educational institutions are expecting that both instructors and students will benefit from it, by using it to increase the quality of education. However, there are a number of factors preventing use of technology in education, like lack of training, lack of time, lack of equipment (Beggs, 2000; Newhouse, 1999; Ertmer, 1999). According to ITU report (2013) the number of people using Internet by the end of 2013 is estimated to be over 2.7 billion (39% of the world's population). Out of this number 77% of the population is from developed countries, and only 31% from developing. Statistics reveal that there is a digital inequality in developed and developing countries in terms of ICT and internet penetration rate. Poor countries have a little or no access to the Internet, while in industrialized countries the number of people connected to the Internet is rapidly growing (UNESCO, 2005). In order to promote the development of Knowledge Societies, there is a need to overcome digital inequalities. One of the main solutions for it is educational networks, which offers many possibilities for its users

2. KTU MANAS PROFILE

KTMU founded in 1995 between Kyrgyz and Turkey Republics. In 1997 the university has opened with three faculties Engineering, Economics and Administrative Sciences, Letters. Now the university is a big campus with many buildings connected into one campus network, which connects 9 faculties, 2 graduate schools, 3 applied schools with a mount of 5500 students and 1500 academic and administrative staff [1].

Kyrgyz-Turkish Manas University has the following technological infrastructure: from 1997-2016, 995 personal computers, 150 notebooks, 250 printers and 100 projectors more then 200 Wi-Fi routers. Furthermore, 15 existing computer laboratories were improved, and 3 new smart laboratories were opened. All these equipment's are implemented in several campus building through optical and Ethernet networks. Internet is provided from two different independent from each other internet providers, one of them is private and second is educational network KRENA. (Manas University reports, 2016).

In this paper will be shown growth of ICT in example of the local university, in last 20 years. Also number of used network, computer and other office devices to number of users and infrastructure integrated into the process of instruction at KTMU. This review aimed to investigate to the current status of ICT use among the Kyrgyz Republic universities as well.

3. RELATED WORKS

The previous work on the infrastructure of the Manas University was done by Muhametjanova (2012). In the work, author determined the barriers and enablers of technology integration between 2006-2009. Method included students and instructors' perceive of Information and Communication Technologies (ICT) in education at the Kyrgyz-Turkish Manas University. The results show that there is still deficiency of laboratories, users' lack of knowledge and experience about technology, deficiency of hardware and software. Author claims that the cost of personal computer; problem with Internet connection are still perceived barriers for students.

However, in 2010 the emergence of new ISP providers in the IT market of the country finally could increase the internet speed. Also, in 2010 Kyrgyz-Turkish Manas University became member of Central Asia Countries RENs, CAREN which provided to university internet 15 MBps connection. Nowadays, technology infrastructure of the Kyrgyz-Turkish Manas University is one of the best among universities in Kyrgyzstan. According to the reports of 2013, the university was in top 5 universities in Kyrgyzstan since it was founded (RA expert reports, 2013).

4. MATERIALS AND METHOD

4.1. Purpose of the study

The purpose of this study is to investigate and reveal an ICT growth and implementation of technology integration into educational institution and show stages of changes of ICT infrastructures of the university by years. The study shows the range of numbers between users and computer devices to number of network infrastructure and internet speed. It should be noted that few universities in Kyrgyz have a campus type of university.

4.2. Materials

As a research materials for this paper, the information about Internet speed, number of computer equipment, network equipment and implementation scheme of the network, number of students and staff was taken. These data was collected using reports of IT department of the Kyrgyz Turkish Manas University (Report of KTU Manas, 2016). The growth of the number of computers and laboratories per years is given in the Table 1. As it can be seen, the number of computer laboratories has increases six times from 3 up to 18 in 20 years, from 1997 to 2016, while the number of students a bit more than 2 times, allowing more computerization of the educational process.

Table1 The number of computer laboratories

| | 1997-2005 | 2006-2010 | 2011-2016 |
|---|---------------------------|-----------|-----------|
| Computer Laboratories | 3 (20 computers per each) | 8 | 18 |
| Computers for researches and education | 494 | 740 | 995 |
| Students | 2450 | 3300 | 5500 |
| Academic and administrative staff | 650 | 1200 | 2050 |

According to the report of the IT department of the Kyrgyz Turkish Manas University, the growth of the internet speed in the past 20 years was as much as 16 times. In the Figure 1 below the internet speed from 1997 to 2017 is shown. In 1997, the speed of internet traffic was only 15 MBps, while with the development of fiber optic cables it grew to 235 MBps nowadays. It is obvious that internet traffic grows depend on development of information communication technologies. High speed of internet traffics eased the use of remote resources.

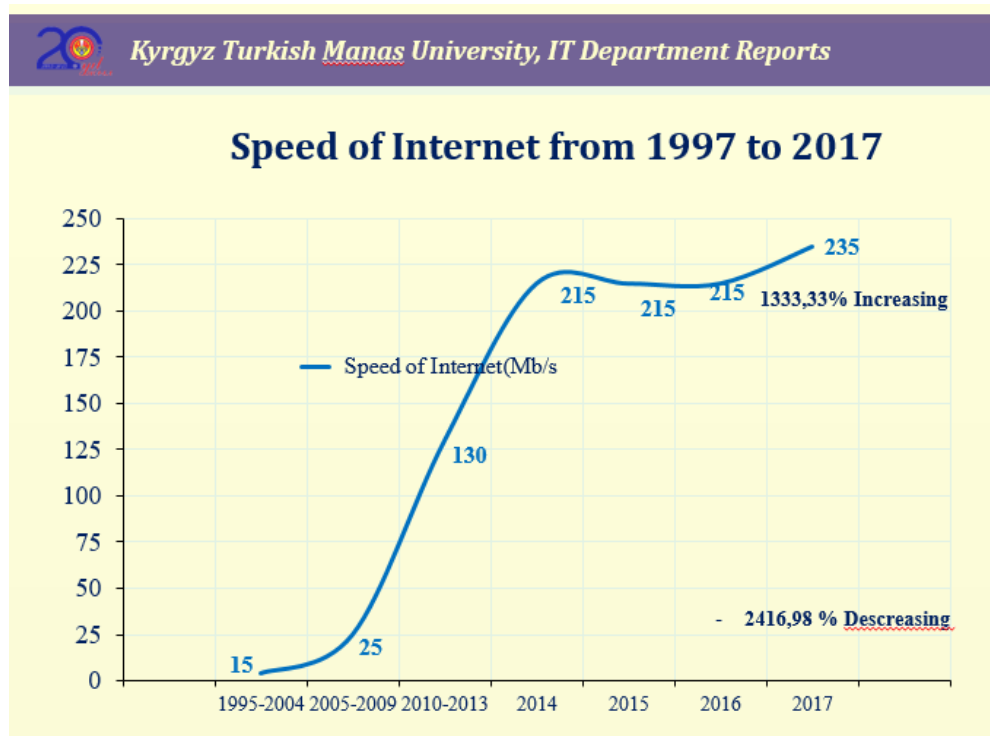


Figure 1 Internet connection and speed from 1997- 2017

Network architecture and implementation.

The university has a campus at the south-west of the Bishkek city and remoted main building (3 kilometers far). Thus, this is taken into account when building the network architecture. Implementation of the network architecture is given in in the Figure 2.

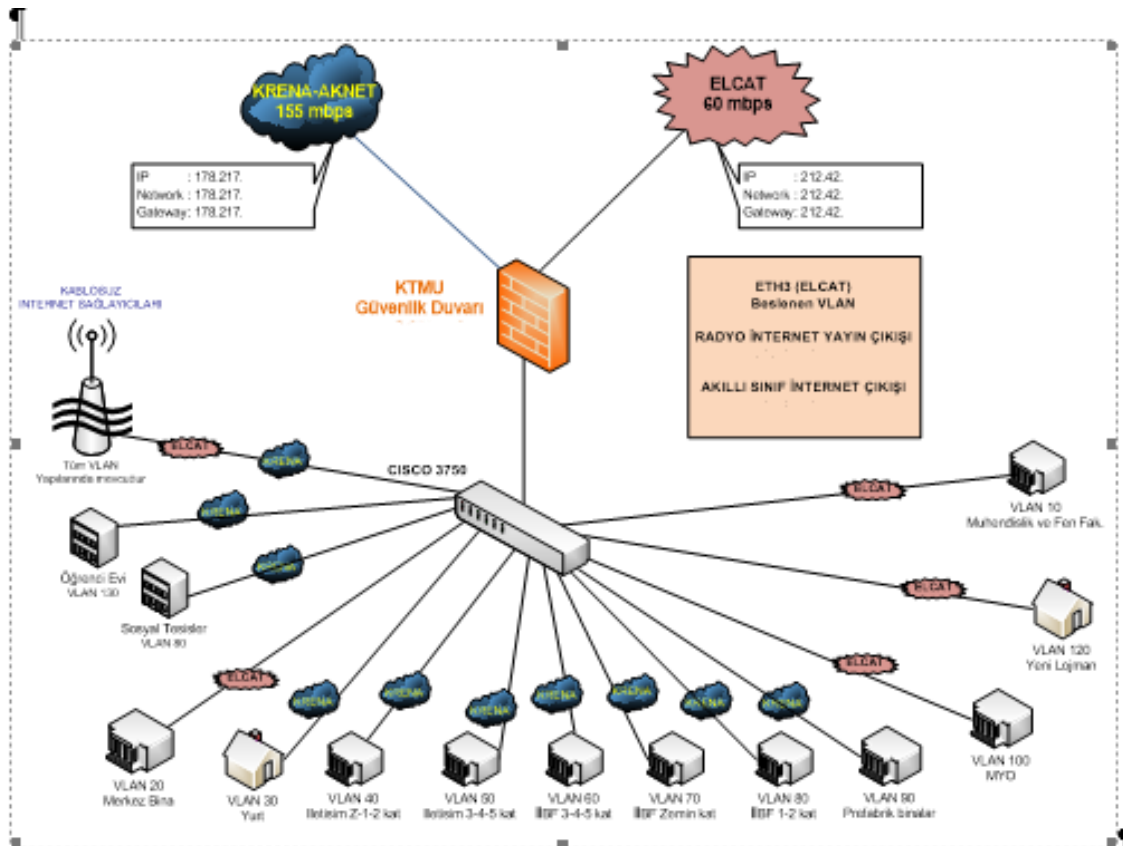


Figure 2. Network architecture and implementation

Campus LAN topology

The topology of the Local Area Network is shown in the Figure 3. As it can be seen from the figure, the Kyrgyz Turkish Manas University has an agreement with two internet providers of the country. The most of the internet traffic is supported by Central Asia Countries RENs (CAREN) – 155 mbps, and other 60 mbps is obtained from local ISP company.

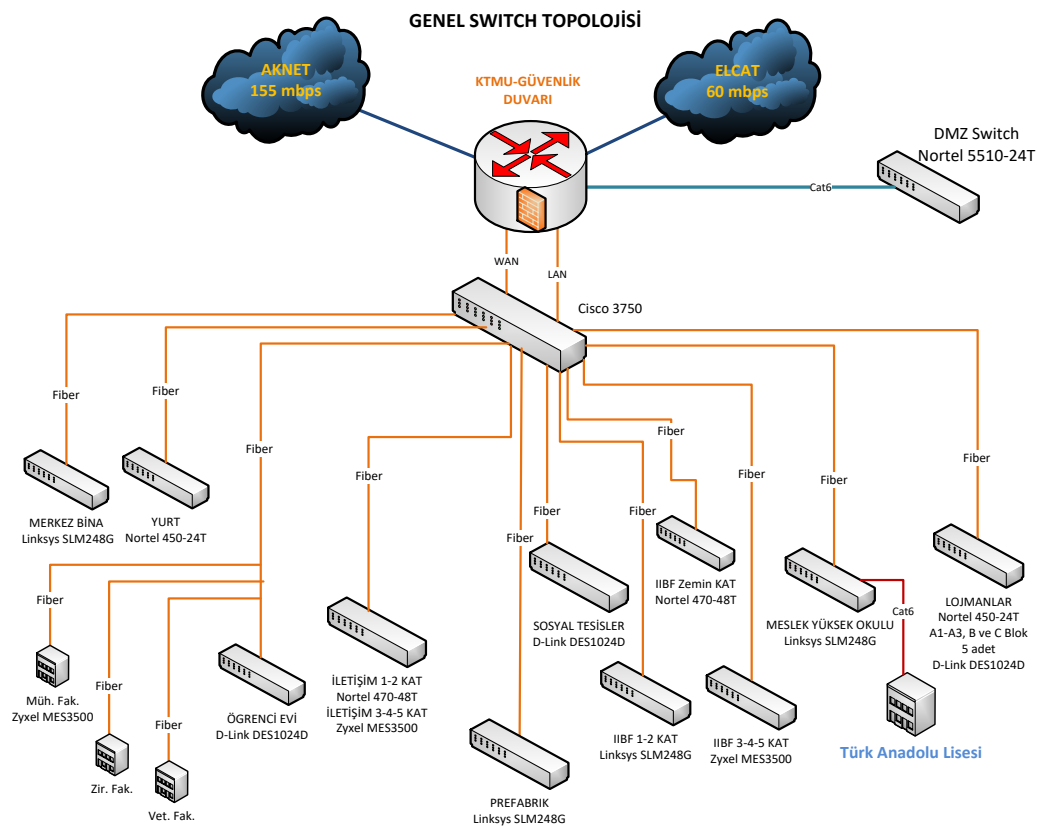


Figure 3. LAN topology

In the Figure 4, the number of hardware equipment by year is presented. As it can be seen from the figure, there is an increase of the number of personal computers and notebooks used by the academic and administrative staff at the university. Also, the supplementary equipment such as printers, routers and projectors are also given a high priority. It can be explained by the growth of the new building in the university, which requires the new equipment as well.

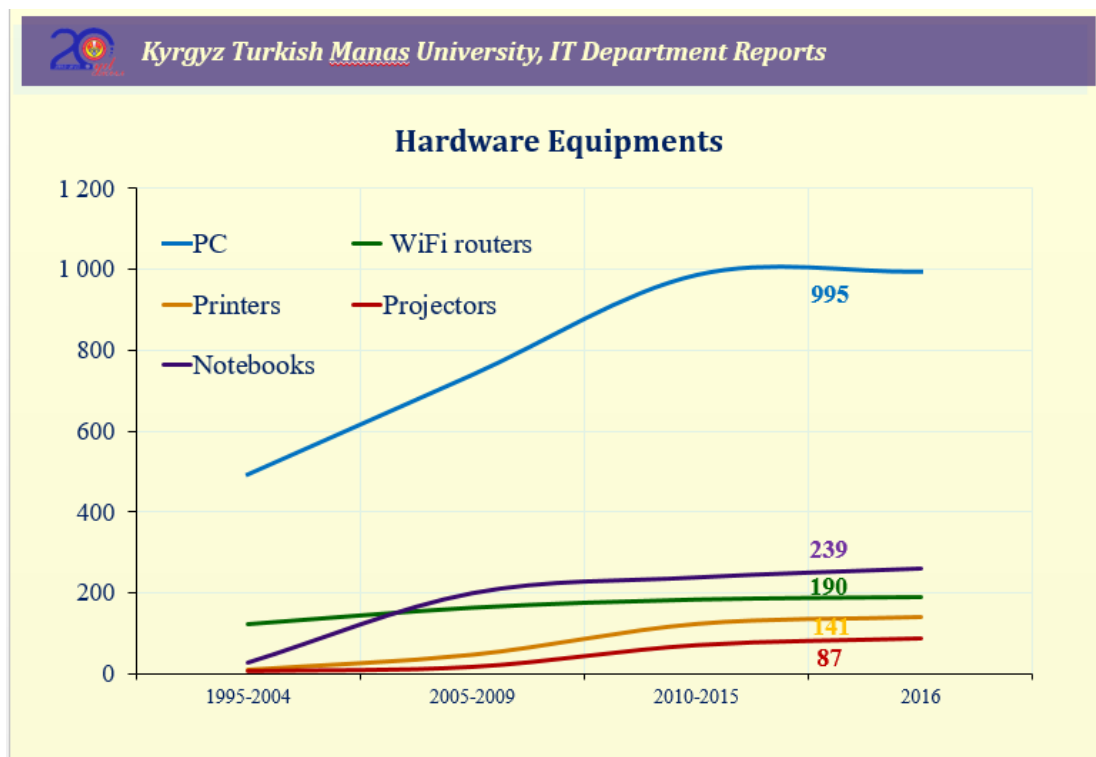


Figure 4. Hardware Equipments

- Access to educational sources of KTU Manas



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Figure 5. Educational and administrative portals of the Kyrgyz Turkish Mans University

5. RESULTS AND CONCLUSION

The paper presents the growth of the ICT usage at the Kyrgyz Turkish Manas University in the period of time from 1996 to 2016. The results of this study can be used by the Kyrgyz-Turkish Manas University, Ministry of Education, and other universities in Kyrgyzstan. Also, the results can contribute to the literature on the use of ICT in education in Central Asia regions.

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