ASREN

Arab States Research and Education Network

المنظمـة العربيـة لشـبكات البحـث والتعليـم

Egyptian National Research and Education Network
Egyptian Universities Network
Readiness Assessment Report

Africa Connect 2

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Forward

It gives me pleasure to introduce this readiness report on the Egyptian e-Infrastructures, as we move into an era of change towards investing to advance the pan-Arab research and education high-speed communication networks as part of the funding schemes provided by the European Commission in the context of EUMEDCONNECT3 and AfricaConnect2 projects. These networks provide powerful means for team collaboration, sharing of resources, and exchange of real-time simulation and data transfer at the national, regional and global levels. With the support of the European Commission and Talal Abu-Ghazaleh Organization, ASREN has been developing means to connect all Arab research and education institutions in a unified network that provides scientists, academics, students, and researchers with state-of-the-art connectivity. An open exchange point is now established in London to peer with research and education networks at the global level and will be linked to regional open exchange points to emerge in Fujairah – United Arab Emirates and Al Maadi - Egypt.

ASREN will continue to join efforts with its European counterparts to bring new technology means and services to the Arab research and education communities and to provide enhanced educational environments equipped with better tools, connectivity, and services.

Dr. Talal Abu-Ghazaleh
Chairman of ASREN

Summary: This report is intended to provide a background information on the Egyptian Universities Network. It also provides a list of projects that will be established by the Reform Strategy to enhance Higher Education System and a number of units at the Supreme Council of Universities SCU to manage and provide the electronic and knowledge services, as well as the potential for Egyptian international cooperation.

I.   INTRODUCTION

Egyptian Universities Network (EUN) is acting as the National Research and Education Network since its establishment at 1987. In 1987 the Supreme Council of Universities as a coordination authority for the Public Universities in Egypt had a unit for the international relations; this was the Foreign Relations Coordination Unit which had several projects with other countries. One of these projects was University Linkage Project (USAID fund) aimed to connect Egyptian Universities to the American Universities (BITNET) in a data network and its outcome was the formation of the EUN which links Cairo University and some other universities to the world via a leased line connection to Montpellier in France with a speed of 9.6Kbps. In 1989 EUN connected the Egyptian academic community to the international community through the European Academic and Research Network (EARN). In 1993 EUN was connected to the Internet with bandwidth 64 Kbps to become the main and the first gateway to the Internet in Egypt. As of today and due to the rapid increase in the usage of the Internet, the bandwidth has been gradually increased to become more than 2 Gbps. This in addition to the connection to other international networks such as GEANT, Internet2 and GLORIAD.

II.   EGYPTIAN UNIVERSITIES NETWORK

EUN was founded in 1987 under the umbrella of Supreme Council of Universities to serve the higher education community at large. Currently, EUN links all Egyptian universities through two main ISPs at a speed that ranges between 34 Mbps and 1 Gbps/university. It has a 2 Gbps international link to the Internet and 1 Gbps to Internet2 going to GLORIAD. A link is provided between EUN and ENSTINET, the research network in Egypt, which serves the universities with 155 Mbps. The entire network serves 23 public universities and 14 research centre plus Al-Azhar University which was built around 1000 years ago, and they have Bibliotheca Alexandrina as a member in this network, they also have about 120 small links to campuses that are outside the main universities buildings. Each university has a link between 34 Mbps and 155 Mbps according to its capacity. EUN provides value added services by contributing to some European projects such as EUMEDGRID-Support for a grid-computing infrastructure. The available infrastructure at EUN is a 68-Core CPU running gLite middleware for grid computing.

EUN hosts and manages higher education development projects, including e-learning, training, digital library and management information system for the Supreme Council of Universities. EUN also operates an advanced Video Conferencing system to facilitate communication between all the Egyptian Universities. It also provides electronic mail services to all universities. EUN manages and operates the .eg Top Level Domain infrastructure and services. It provides service protocol supporting communications using IPv6 to generate a wide range of IP addresses to all universities in Egypt.

EUN was connected during the first two phases of EUMEDCONNECT for seven years, and is currently connected to "GLORIAD", the global ring network for advanced applications and development, through the Egyptian National Scientific and Technical Information Network (ENSTINET). ENSTINET is also in the process of linking a 622 Mbps international link to GÉANT for research and education connectivity with Europe and the EUMEDCONNECT project.

III. REFORM TO ENHANCE HIGHER EDUCATION SYSTEM

The Government of Egypt prepared a Higher Education Reform Strategy discussed during a national conference on Higher Education held in February 2000. The conference declaration which identified 25 reform initiatives was endorsed and yield to start a loan of about $50 Million from the World Bank to establish the necessary projects of the Reform Strategy; some of these projects are:

- Quality Assurance and Accreditation Project (QAAP)

- Higher Education Enhancement Project Fund (HEEPF)

- Information and Communication Technology Project (ICTP)

- Faculty-Leadership Development Project (FLDP)

- Egyptian Technical Colleges Project (ETCP)

The ICTP in particular have 5 components:

- Network Infrastructure

- Management Information Systems/Decision Support Systems

- E-Learning

- Digital Library

- ICT Training

The cooperation between EUN and the ICTP and the Ministry of Information and Communication Technology MCIT resulted some of the remarkable and valuable following outcomes: Unified Network for Egyptian Universities, Institutes and Scientific Research Centers.

Within the scope of the protocol signed between Ministry of Communications and Information Technology (MCIT) and the Ministry of High Education and Scientific Research for developing and upgrading the Egyptian universities and research centers network, MCIT has published an RFP (Number 3 of year 2005) for building up the Edge Layer of this nationwide network using dark fiber. At that time the main building blocks of this edge network covering 16 universities and 9 research centers in which the Egyptian Universities Network (EUN) as well as the Egyptian National Scientific and Technical Information Network (ENSTINET) will be in charge of managing, controlling and operating the edge routers of the universities and research centers respectively, whereas each university and research center will be in charge of managing its own internal network. In addition to the 9 research centers that belong to the Ministry of High Education and Scientific Research, the National Telecommunication Institute (NTI) will be also part of this network infrastructure.

Egyptian Universities Network (EUN) in cooperation with the Information and Communication Technology Project (ICTP) is planning to implement a Video Conference and Streaming Solution for the Egyptian Universities Network and the 17 governmental Universities. After the successful implementation of the EUN Infrastructure network which connects all the Universities together and to the Internet through a high bandwidth and robust network.After commissioning the first successful phase of the EUN strategic videoconference network ; there is a need for upgrading the existing network to fulfill the latest technology and increase the network capacity.

IV.   ELECTRONIC AND KNOWLEDGE SERVICES CENTER

EUN as a role model to develop and manage ICT services in the Egyptian Universities, many centralized projects have been established to help enhance the information technology of the higher education process, which resulted in establishing number of units at the Supreme Council of Universities SCU to manage and provide the electronic and knowledge services. These units include EUN, Digital Library Unit (DLU) - Central Unit of Information Technology Training (CUIT) - National E-Learning Center (NELC) - Management Information System (MIS). Accordingly, the Electronic and Knowledge Services Center (EKSC) was established in 2011 to provide comprehensive, stable and developed e-services to the higher education society, in addition to, providing the needed information, statistic data and reports to support the higher education system, and to integrate with the related national institutions, as well as, concentrating on the cooperation with similar international institutions.

A. Digital Library Unit and Consortia

Within the framework of the Information & Communication Technology Project (ICTP) in the higher education, the Egyptian Universities Libraries Consortium (EULC) has been established in 2006, to be supervised by the Digital Library Unit (DLU), one of the Electronic and Knowledge Service Center (EKSC) units, at the Supreme Council of Universities. The unit aims to raise the efficiency of the libraries and information services at the Egyptian universities, through using the web 2 generation applications which help in providing interactive information. Moreover, it aims to encourage the collaboration between the higher education information institutions, which will lead to reducing the costs, the best utilization of the available resources and maximizing the outputs of these resources to benefit the beneficiaries. Thus, the DLU established the Egyptian Universities Libraries Consortium (EULC), which is the largest cooperative project for the information institutions, not only in Egypt but also in the Arab world. Consequently, more than 35 institutions participate in that consortium, including Governmental universities, some Private universities and Research and services institutions.

All the DLU services and resources are available through the computers connected to the Egyptian Universities Network (EUN).

 "The Egyptian university libraries consortium as a cooperative program aims at grouping homogenous and diverse academic and research libraries together in order to achieve the optimum saving in expenses and resources sharing by facilitating accessing the required information resources which fulfil the Egyptian scholars and students educational and research needs through providing preeminent infrastructure, collections, and services that shapes the creation of knowledge and facilitating learning and research.

The unit executes the following projects:

- The Egyptian Universities Digital Library

- The Egyptian Universities library automation (union catalog)

- The Egyptian University Digital repository

- Unified Automated System to manage the universities' libraries

B. National E-Learning Center

The national e-learning center was established in 2005, to be one of the essential projects financed by the Information & Communication Technology Project (ICTP) in the higher education. Then, in 2009 it became part of the Electronic and Knowledge Services Center (EKSC), at the Supreme Council of Universities (SCU). The center aims to enhance the education process in Egypt by promoting the usage of e-learning to be basic criteria in the Egyptian universities. That's in order to be able to compete on the national and international levels. Thus, the center aims to enhance the targeted learning outputs, within the higher education institutions, in Egypt, through the effective usage of information and communication technology applications in supporting the teaching and learning strategies.

The NELC governs 22 other centers to produce the e-courses within the governmental universities and its branches. The center provides technical support and consultations in instructional designing, developing, training and marketing e-courses. Its outcomes reaches now about 600 courses, which serves about 175,000 student.

C. ICT Training Unit

Using information and communication technology in enhancing the education process and developing the performance of the administrative, financial, and educational sectors are so critical and valuable issues in the educational process within the universities and educational institutions. The Information and Communication Technology Project (ICTP) is interested in developing the employees and faculties' staff and their assistants, thus it established Faculty and Leadership Development Project (FLDP), which encourage them to use information technology each in his specialization. Accordingly, the Central Unit of Information Technology Training, funded by the ICTP, was established in 2005 to put forward a training system for applying the information technology in higher education institutions and supervising this system in order to achieve the desired goals.

One of its biggest achievements now is the cooperation with international companies such as Cisco, EMC2 and IBM through official MoUs to develop student's skills to cope with the latest technologies provided by the respective companies like Cloud Computing, Big Data, etc. this is not only a traditional technical training but also it is aimed to embed these technical courses in the official curriculum on the faculties of Engineering and also faculties of computers and informatics.

D. Management Information Systems Unit

The Management Information System (MIS) aims to:

- Providing the council's members with the information needed to execute their tasks.

- Providing decision makers with accurate and complete information to support them in taking the right decision.

- Building an integrated management information system to be related to the universities management information system, to support the SCU in performing its tasks.

- Improving the working sessions, accuracy, and ability and monitoring the activities.

- Improving the decision support system process at the SCU through analytic tools and decision support system models.

- Building an information portal on the internet to provide the SCU services to the beneficiaries.

E. Universities Portals

This projects aims at providing all information about the university in an informative and interesting layout that suits each university by using the latest Web technology. This helps improving the Egyptian Universities web ranking.

V.   INTERNATIONAL COOPERATION

EU has been funding the establishment of the EUMEDCONNECT research network since 2004. The network has maintained a dedicated high-speed network to the Mediterranean research and education communities serving over 2 million researchers, academics and students in seven southern Mediterranean countries, namely Algeria, Egypt, Jordan, Morocco, Palestine, Syria and Tunisia. With its direct links to its pan-European counterpart GÉANT, the network facilitates the participation of the Mediterranean community in world-class research and education initiatives. The network has points of presence (PoPs) in Sicily, at Catania and Nicosia, Cyprus, and recently established in London linking to the GÉANT network with capacities that ranged from 45 to 622 Mbps.

The EUMEDGRID was initiated in 2006 as an e-Science development project targeting communities in different domains, including physics, hydrology, bioinformatics, engineering, and archaeology. It aimed at fostering e-Science and promoting e-Infrastructures in the Mediterranean region. Several grid sites have been established to support research communities in accessing grid computing facilities and resources, now there exists 36 Sites in 11 countries.

The grid e-Infrastructure has provided support to many scientific domains and applications in physics, fluid dynamics, social science and humanities, engineering, computing science and mathematics, and bioinformatics. General and reference applications and tools in different scientific domains have been deployed to provide scientists with portfolio of popular applications and tools including: ROOT, GCC 4.3, Octave, BLAST, Fluent, OpenFOAM, and Rosetta.

The EUMEDGRID e-Infrastructure supports the execution of parallel applications within the OpenMP and MPICH2 standards for Message Passing Interfaces, thus allowing the inclusion of HPC Clusters within the infrastructure. It has also contributed to consolidating best practices and standards for enabling transparent e-infrastructure provisioning to scientists worldwide across different regional initiatives and permanent infrastructures, such as the EU flagship initiative, EGI.

EUN was among the Arab Mediterranean NRENs connected to the GEANT network under the EUMEDCONENCT project Since April 2005 till March 2011. Also EUN was joined EUMedGrid project (2006 till 2008) and EUMedGrid-Support project (2010-2011). The Arab States Research and Education Network (ASREN) are established in December 2010 and EUN is of the main founder of ASREN.