



MoRENet

Mozambique Research and Education Network

The Ministry of Science and Technology in Mozambique

KTH - Royal Institute of Technology in Stockholm

UEM- Universidade Eduardo Mondlane in Maputo

CSD - Communication System Design 2006

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Why a Research and Education Network?

Today most of the highly developed countries have their own NRENs – Nationwide Research and Education Networks. The immediate raised question is “*why it is so important for a country to have a Research and Education Network?*” Just as a reminder, the entire Internet started as a research project that was further developed by universities in USA. Most of a society’s knowledge development goes through universities. The level of knowledge and progress of the universities often reflects on how well the country’s community is developed. The key to an open and democratic society is knowledge, which is mainly spread through universities and other education institutes.

As much as it is important for rich and well developed countries to have good communication between universities to maintain and develop knowledge in medicine, technology and social studies it is maybe even more important to give countries and communities under rapidly development the chance to conquer simple obstacles like spreading and sharing knowledge and information. All universities need connectivity to fulfill their main tasks, education, research and community interaction, Mozambique’s universities is not an exception.

At the moment, several African countries already have ongoing projects aimed at implementing nationwide research and educational networks. Tenet (Tanzania), Kenet (Kenya) and MNREN (Malawi) are just three examples. The Ubuntunet collaboration aims to connect the different countries NRENs so that the connectivity for the universities will be transborder wide, increasing the information exchange even more. This is a great opportunity that will give east Africa advantages to bind knowledge profitable for the societies well being.

An academic and research network will contribute not only to the public sector of the society but also to the private sector. As an example, a wide area network like a research and education network will provide a framework for both researchers and students to gain skills on the operation of networks and its equipments, creating opportunities for the development and/or improvement of new networking tools. This will benefit both the society and



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companies. The latter will save a great amount of financial resources by hiring already local well trained people.

Collaboration between the NREN and companies owning the fibre could take the form of services exchange, in which companies provide the fibre to the NREN and the universities in return provide the companies personnel with education and technical support in network administration and also allow the companies to use the network for tests on network equipment.

The NREN will help the public sector by providing a communication infrastructure needed for public administration, education and healthcare. Communication between universities and research centers working on the same subject is often crucial for the work to proceed efficiently. With fast and reliable communication a researcher will be given a great tool to communicate and spread valuable information so that the work isn't redundant on special topics. This is especially important in subjects related to healthcare and medicine there researching to find information and cure against deceases like HIV and Malaria is urgent. A common journal and documentation database would facilitate the work considerably.

Today many universities that are relatively close communicate with each other connecting to different ISPs that are not connected via direct links to each other. The most common scenario is that the communication goes via satellite from Europe or America and back to the not so far away University. The path the data takes from one University to another is not cost efficient and time delays are evident. Transmission via satellite cost much and is very unnecessary. A NREN will be a great solution to this problem. Institutions joining together in a cluster will have a better position to get better prices when negotiating with ISPs and software providers. Having a shared network and the ability of together negotiate with providers will make it possible to reduce the cost for each institution wanting to realize a high bandwidth network.

The establishment of a NREN, gives the universities the opportunity to setup a number of services that will be of help in the daily work. The examples listed below, describe some potential services for a NREN:



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VoIP – Voice over IP

VoIP is a powerful communication tool that will bring research centres closer together. VoIP will make a great impact on the way research is conducted in Mozambique. Communication among institutes enhances collaboration and reduces redundant work.

E-meeting point

This service will make “meetings” possible with people at different places, via electronic meetings, video conferences. The benefits for this are that institutions will save money and time. The need for travels for short meetings is eliminated.

Catalogue service

The NREN can provide a catalogue of National WebPages such as for companies, newspapers, television channels, politicians, society, culture and education etc.

FTP-file archive

Ftp-file archive service will enable institutions to centrally store and retrieve data on a wide variety of topics, from medical journals to papers on data networks and internetworking.

Telefax service

With this service an institution could write an ordinary mail but instead of sending it as a mail it can be sent to a server that forwards it as a fax. To do this a modified mail address is used instead of the ordinary e-mail address. One example: If Erik Lönnbark’s email address is erilon82@MoRENet.mz, and a Fax is to be sent to this person by using this service, his telefaxnumber is added to the mail address, that becomes ErikLönnbark@F090166762.fax.MoRENet.mz. As a result, the “mail” will be sent as a fax, to a fax machine through the network.

Caching servers

Caching servers are especially useful if the network hasn’t got a high bandwidth. The servers can cache the most used WebPages, which reduces the possibilities of bottlenecks on the network. This mechanism will also make the browsing process much faster.



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DNS servers

The NREN can be responsible for the domain name servers. If the Universities have this role it's easier to have a good control.

Other Research Projects

The NREN should be available as a tool for researchers that want to use the network for different projects and testing.