INASP and NRENs work together to strengthen campus IT networks

Interim reports indicate successful evolution of pilot project

INASP has been working with national research and education networks (NRENs) in Africa since 2013 to increase the knowledge and skills of campus engineers so they could improve and develop their institutions' networks. Here INASP reports on the first six months of the final phase of the project, when NRENs were given funding to implement their own programmes of work.

In 2013 INASP started a pilot project that aimed to provide advanced training to national research and education networks (NRENs) in three countries - Tanzania, Uganda and Zambia (see box: What are NRENs?). Although considerable improvements have been made to broadband infrastructure across Africa, academics and students using computers on university campuses often don't see the benefit. Networks may not be well designed or configured, or not well managed day to day. They may lack skilled IT staff and investment in people and hardware may be insufficient.

INASP's Peter Burnett with Pascal Hoba (right), Director,UbuntuNet Alliance, and Stein Mkandawire, CTO, ZAMREN (left) in Mozambique, November 2015.

The INASP pilot project aimed to tackle two of these problems – the reliability of campus networks and the skills of IT staff. The approach has been to increase the knowledge and skills of campus engineers so that they could improve and develop their institutions' networks. Between 2013 and 2015, INASP supported NREN staff to attend advanced training courses, and to run training sessions for groups of university engineers. These resulted in improvements to networks (for example, introducing wifi) and in relationships between IT staff and librarians responsible for making online information accessible.

Building on NREN strengths and capabilities

After the first two years of the pilot, INASP had developed a good working relationship with the NRENs and it was clear both what was needed and what was working (see box: What did the pilot achieve in the first two years?). It was therefore possible to move to a different way of working with the NRENs for the final year of the pilot, which also acknowledged their strategic priorities and autonomy.

INASP invited each NREN to submit a proposal for further funding to enable them to undertake an additional phase of work. Rather than support individual

workshops and activities as in the earlier stages of the pilot, INASP made a larger grant available of up to $25,000 (c£18,000) for a 12-month programme. In return, NRENs were expected to share lessons learned with INASP and with peer NRENs. Full reports on their activities will be available later in 2016, at which point a comprehensive learning document will be published. The NRENs are now six months into their grants and this update is intended to document how the final phase of the project is progressing to date.

Each NREN chose to provide further training to universities and undertake additional Direct Engineering Assistance (hands-on workshops with network engineers who work to renovate and improve their network infrastructure). The NRENs have also organized campus training workshops to build capacity in member institutions and their own staff have undertaken training to increase their knowledge and skills. Two of the NRENs took the opportunity to expand their human capacity in a bid to increase the level and reach of support they can offer to their member institutions.

Increasing staffing and supporting professional development

The Research and Education Network of Uganda (RENU) initially polled members of the Uganda Vice Chancellors' Forum to find out in what areas they needed RENU's continued support. One of the priority areas indicated by this survey was further training in network engineering for NREN and university staff. Using the INASP grant, RENU responded by recruiting a systems engineer and a network engineering intern and funded three IT staff from member institutions (Kambobo University, Uganda Christian University and Makerere University) to undergo further professional development, including attending a network monitoring and measurement workshop in Nigeria. Some of the staff are attending the 'training of trainers' programme in collaboration with UbuntuNet Alliance (see box: Sponsorship gives engineers opportunity to network at UbuntuNet) and the African Network Operators Group (AfNOG), so that they can cascade skills to engineers at other universities.

A RENU direct engineering assistance workshop for network engineers at Uganda Martyrs University in Nkozi in December 2015.

What are NRENs?

NRENs (National Research and Education Networks) are not-for-profit, specialized internet service providers (ISPs) that are dedicated to supporting the needs of the research and education communities within a country. They deliver services to institutions that have advanced research support and education requirements that are not generally satisfied by the offerings of private-sector ISPs. NRENs are often hosted within major universities, but are independent organizations. They are independent of specific suppliers, thus trusted by their community to deliver high-quality services at a reasonable price. The Boards of NRENs often comprise vice-chancellors of the major higher-education institutions in a country. NRENs are able to bring the benefits of collective buying power to universities by procuring networks and services on a national basis, thereby providing savings for individual institutions. There is a strong sense of ownership among those involved in NRENs, which is a major driver of their success.

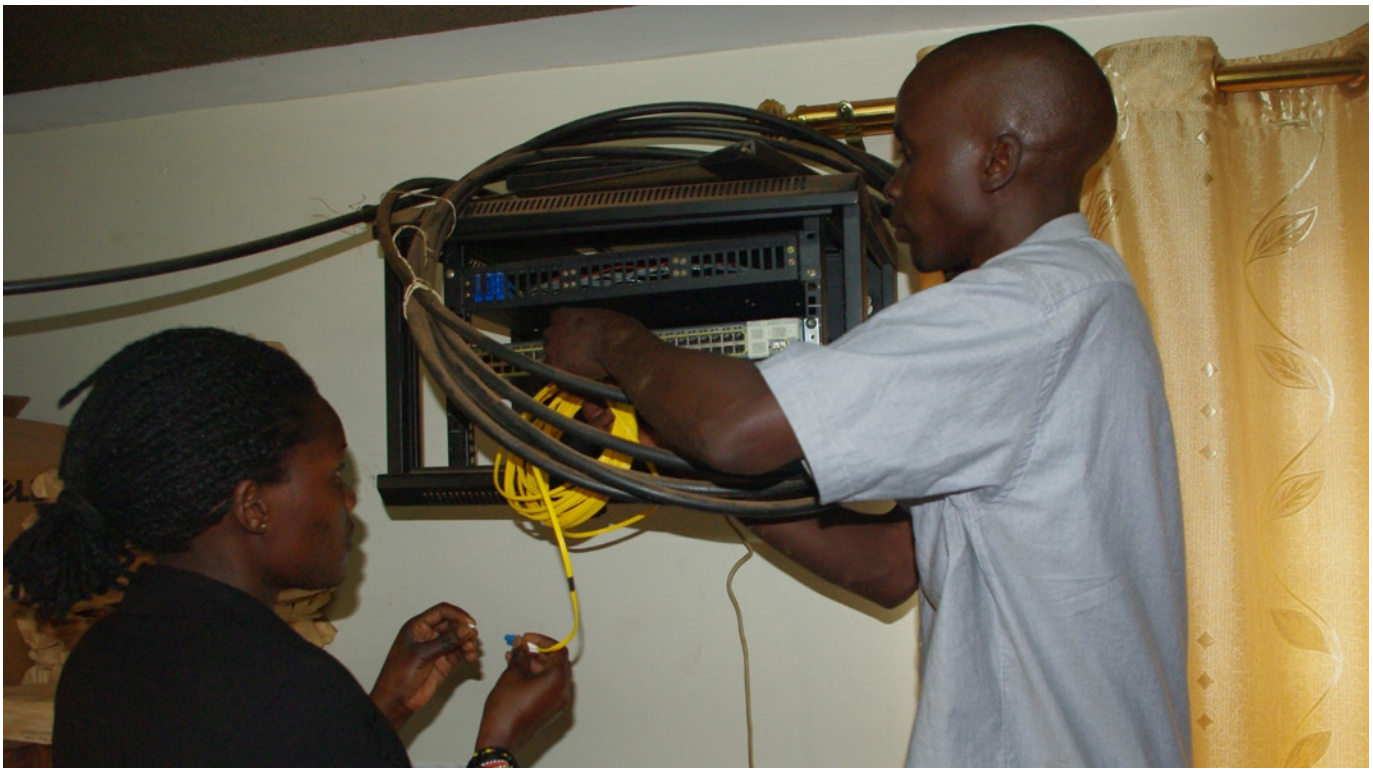
TERNET staff members at the 'Harmonization of Priorities' workshop with COTUL (Consortium of Tanzania Universities) in February 2016.

In September 2015, Tanzania Education and Research Network (TERNET) employed four new members of staff - a systems developer, two network engineers and a marketing intern - to complement its existing staff of two full-time engineers. Three of the new staff members were recruited internally from TERNET's internship programme. The new staff members have participated in training workshops including advanced routing and switching skills to build their technical skills and capacities as well as started to provide support to universities to strengthen their networks. TERNET plans to create add-on services for clients, as well as increase revenue, so that it can retain these engineers after the INASP support ends.

TERNET also discussed how to improve communication between NRENs in order to share information, and hosted a joint workshop with the Consortium of Tanzanian University Libraries on the integration of ICT and library services. The Tanzanian NREN's work with Dar es Salaam University College of Education to design and implement a new network and deploy network monitoring systems is helping to improve speed and accessibility. TERNET's new employees have explained how the technical knowledge they have gained and the ability to apply their skills has been beneficial to individual universities, but also indicated some of the challenges they have encountered. For example, on some occasions it has been difficult to access the information they need about the universities' network prior to a visit, and institutions' financial limitations

Sponsorship gives engineers opportunity to network at UbuntuNet Alliance

INASP supported six engineers from the National Research and Education Networks to attend the 8th Annual Conference of the UbuntuNet Alliance for Research and Education Networking, in Mozambique in November 2015. The UbuntuNet Alliance works in eastern and southern Africa to secure affordable access to broadband and efficient ICT structures for National Research and Education Networks (NRENs). In advance of the conference, INASP also supported sponsored delegates to attend a four-day 'Training the Trainer' workshop for NREN and campus IT engineers.



RENU provided hands-on training for network engineers at Ndejje University in Kampala, October 2015.

have prevented them from purchasing the hardware they need to improve the network.

NRENs and consortia collaborate to increase access to online publications

TERNET also agreed an extension to the INASP grant to work with the Consortium of Tanzania Universities (COTUL). The joint efforts of library consortia and NRENs - marrying the technical skills of the NREN and the content provided by libraries - have the potential to improve researchers' ability to access online academic publications.

TERNET organized a 'Harmonization of Priorities' workshop in February 2016, at which librarians, researchers, university IT staff, COTUL and TERNET came together to discuss how they could cooperate to better achieve their joint objectives. Each of these groups performs a distinct role in securing and maintaining access to research. A closer working relationship should enable them to more effectively serve their users' needs. The workshop allowed each group to explain its needs and priorities and to receive constructive help and support that will improve both communication and understanding. The Chair of TERNET reported that "the workshop was a very rewarding experience" and that areas of joint work are now being identified.

"Without the skills to deploy technology, maintain and improve it – and to think critically and creatively about its use – it won't suddenly transform the way teaching or research is done. Developing technology is about developing individuals to manage and mobilize it."

Jon Harle, Senior Programme Manager, INASP

RENU is organizing a similar consultative meeting with the Consortia of Uganda University Libraries (CUUL), following a promising first meeting in November 2015. It will be exciting to see what changes can come about with this cooperative approach to the challenges of access to electronic resources. RENU also organized a workshop for the heads of 14 HE institutions with the Virtual University of Uganda (VUU) to explore opportunities for networking in the future and to share the needs of their institutions beyond internet connectivity.

NREN feedback indicates satisfaction with new partnership

The feedback from the NRENs on this new way of working with INASP in the third year of the pilot has so far been positive, although they have also commented on barriers to full effectiveness of their work (see, for example, the feedback from TERNET, above). RENU comments that the new working relationship "has challenged us to plan longer-term and more holistically, evaluate where the need is greatest and impact is highest.... so it is good in terms of helping RENU to grow in its planning (and evaluation) capacity".

Similarly, TERNET comments that the long-term grant "gives more freedom and requires less reports... also, we can still communicate anytime if there is a need to do so". In response to its activities, RENU has noted a "strong improvement in the performance of heads of ICT and their network staff". RENU has decided to focus its Direct Engineering Assistance activities on up-country universities. It is at these universities, which have fewer skilled staff, that they feel the impact will be greatest. RENU also found that "the community of campus network engineers has a much more national character as a result of rural campus hosting training".

Early reports suggest that this method of identifying trusted partners that can devise and implement their own plans, and providing longer-term grants, is proving effective. The full Learning, Reflections and Innovation document at the end of the funding period will explore this in more depth and identify learning points for future work.

What did the pilot achieve in the first two years?

A Learning, Reflections and Innovation report on the first two years of the pilot was published in April 2015.[1] This review found that the project activities were making positive changes to the work of the NRENs and helping to improve the networks they support. The main findings were:

- The advanced trainings for NRENs and the Direct Engineering Assistance (DEA) provided had both stand-alone benefits and were complementary, with DEA reinforcing the learning that had taken place during training. The DEA took the form of hands-on workshops with network engineers from different institutions, with the aim of supporting them to renovate and improve their network infrastructure.
- The campus networks that the NRENs support were showing signs of improvement.
- There was some evidence of improved relationships between engineers and librarians (meaning more appropriate IT solutions to library needs), and also of improved regional collaboration.
- In terms of sustainability, the NRENs reported that they were able to provide DEA support relatively cheaply, and that they all have strategic plans to become self-sustaining, including providing fee-based IT consultancy services.
- Some NRENs also indicated membership growth, greater financial stability and improved status and reach resulting from an improvement in their reputations. RENU reported an increase in membership and that they are more valued by members: "The workshops and DEAs have caused a big increase in institutions' buy-in to NREN membership".

References

1. www.inasp.info/uploads/filer_public/2015/04/20/nren_lri_summary_web_04_15.pdf

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