

## **Direct Engineering Assistance (DEA)**

### **Overview**

Direct Engineering Assistance activities provide a valuable complementary component to NSRC technical training programs, with the objective of physically improving operational network infrastructure and the skills of the people operating the respective network. DEA field activities consist of addressing specific requests for network design and operations to solve identified problems at a campus network, within the infrastructure of a country's national research and education network (NREN), its Network Operations Center (NOC), or another related component of the network. Other focus areas of DEA programs include assistance with the design and creation of an operational Internet Exchange Point (IXP), or improving operations of a ccTLD registry for a specific country, such as the implementation of DNSSEC.

During a DEA engagement, the NSRC group physically assists local engineers identify and fix problems, or install new equipment to improve their networks, which NSRC sometimes provides via donation -- when possible, and as needed. During DEA field activities, NSRC also assists with strategic planning about how to maintain and grow the networks and NREN communities or shared infrastructure, such as an IXP. NSRC typically produces a detailed strategic planning report for the beneficiary organization to: summarize work performed and network upgrades achieved during the on-site DEA, help guide the technical staff on implementation plans for subsequent network improvements, and assist the managers or decision makers of their respective institutions to plan and budget for the network improvement activities. Each DEA activity is different, as the work is customized to address the precise needs of the group requesting assistance.

### **NSRC Direct Engineering Assistance Guide**

A Direct Engineering Assistance (DEA) field activity provides technical help to an organization to assist them in solving one or more problems that they are facing in the management and growth of their network. It will typically involve NSRC-sponsored engineers working side-by-side on location with local engineers to identify and implement region-appropriate solutions. The NSRC model is for local hands to develop local expertise for their network environment, which means the responsible staff will implement the recommended changes themselves, working shoulder-to-shoulder with NSRC staff. Frequently these activities will involve design and architectural changes to a campus network so that it can make more effective use of the upstream connectivity provided by its national or regional research and education networks. If needed and requested, the NSRC will sometimes donate network hardware to achieve specific objectives of the network development activity.

A DEA program has a life cycle that typically follows this pattern:

1. An organization realizes that their network or some specific system is not operating in an optimal fashion and will ask the NSRC for assistance.

2. NSRC engineers will work directly with the local engineers to gather information about the problem and explore solutions.
3. Once a solution is identified and agreed upon by all parties, the on-site activity can be scheduled, equipment shipped (if any is provided), and local logistics are sorted out.
4. NSRC engineers arrive and work side-by-side with the local engineers on their physical networks. Frequently, the DEA will be scheduled in conjunction with an NSRC technical training course in the region so the local engineers may obtain relevant training just prior to the DEA activity.
5. Often the DEA will be large enough in scope that the NSRC involvement will simply provide a pattern or a template that will be started during the field engagement with NSRC staff and the local engineers will be expected to complete the activity over some additional period of time.
6. The NSRC engineers will provide a report outlining the specified objectives of the DEA, a detailed summary of the work that was actually performed during the field mission, and future recommendations for the organization to continue to improve their network and information technology (IT) infrastructure.

To begin a DEA activity, the requesting organization should: 1) clearly formulate and document their specific objectives; 2) provide relevant network diagrams; 3) prepare a detailed description of the problems and challenges they seek to address; and 4) send them to [nsrc@nsrc.org](mailto:nsrc@nsrc.org) with a request for assistance.