To: ARIN FinCom
From: 2019 Grant Selection Committee
Subject: ARIN Community Grant Program Recommendations

In its first year, the ARIN Community Grant Program received 23 applications. The members of the Grant Selection Committee (the "Committee"), noted below, each reviewed every application, scored them independently and then discussed the 16 projects with at least some initial support from the members of the Committee on a series of conference calls. The other 7 applications did not obtain favorable support from any of the members of the Committee after initial review and scoring.

The Committee recommends funding 4 worthy projects that adhere to the ARIN Grant Program eligibility guidelines by aligning with ARIN's mission and benefitting the Internet community within the ARIN service region. The total funding requested is $44,500, out of a Board approved allowance of $60,000. Please see a summary of the 4 projects below containing applicant comments as well as the Committee's comments.

1. DNS Open-Source Tools Enhancement & Maintenance
Suggested funding amount: $7,500 (fully fund)

DNS-OARC
Indianapolis, IN, USA
Susan Graves
Membership Coordinator

Internet operations and infrastructure critically depend upon the DNS. While there are many vendor solutions available for implementing DNS service, the gathering, measurement, testing and debugging of DNS traffic, protocol features and vulnerabilities are no less critical a part of this. Part of DNS-OARC's public benefit mission is to develop publicly available tools and service that support these capabilities, and these are widely used by the DNS and operator communities. Our open-source tools including; dsc (dns stats collector), dnsjit (captures and replays DNS), dnscap (network capture utility), dnsperf (performance testing), and drool (replays DNS), (and others). These need constant maintenance and improvements. The use of these open-source tools is free, and as a 501(c3) nonprofit, OARC seeks to fund development and hardware costs to support this public benefit work.   Many of these tools have been developed in-house over time by OARC and its contributors. Others have been developed externally, and either donated to OARC by the original owner, or in some cases OARC has taken custodianship for the community of DNS tools which have become 'orphaned' from their original developers.

By improving the gathering, measurement, testing and debugging of DNS traffic, protocol features and vulnerabilities, the DNS and Internet becomes more efficient, better understood, and more secure. OARC puts on 2 two-day technical workshops per year (going to 3 in 2020)

where approximately 400 organizations attend annually to share knowledge, best practice, studies, technical advancements, training on DNS topics.

We support the North American Internet community with our tools and services including workshops. Our open DNS-Operations mailing list where participants help each other solve internet questions daily has about 2000 subscribers. There are critical dependencies between the operations of Internet numbering and naming resources (e.g. in-addr.arpa), and OARC's tools will be of value to many ARIN Members and service users. About 40% of our paying members are located in the US and Canada. You can see a list of our approx. ~100 members on the right side of our Home page: https://www.dns-oarc.net.

Budget information:
5200 for Developer time: Our only Developer and a possible contractor developer-funding allowing- to develop code, review, document and test code.
1000 for hours of training and overseeing optional developer work.
800 for travel to report at industry events.
400 for admin expenses, contracting, legal, billing, payroll, Quickbooks entries, internal audit.
100 for Independent auditor's additional time.

Committee comments:
This project focuses on various methods to improve the monitoring and troubleshooting of DNS and is related to Internet technical improvements. It creates technology improvements applicable to all Internet users and community members by an established organization with organizational support and technical knowledge to complete the project. The project addresses a specific problem and will have a meaningful impact. From the materials provided, it appears to be a worthy candidate for funding.

2. IPv6 Training for Enterprises
Suggested funding amount: $20,000 (partially fund, requested $25,000)

Industry Network Technology Council
Fairfax, VA, USA
Nalini Elkins
Chief Technical Officer

Enterprise IPv6 adoption has lagged. One of the issues is that enterprise technicians don't know how IPv6 works. The technicians want to get trained yet the management does not feel that they do not want to pay for such training because they do not see a business need for adoption.

This creates an unfortunate cycle where misinformation about the complexity of the IPv6 protocol and unreasonable fears about security and manageability combine with the perceived lack of urgent business needs to prevent adoption of IPv6.   We have a multi-pronged strategy. We can provide technical training on many of the core features of IPv6. We plan a series of webinars this year**.** We presented one such webinar last year which was attended by over 120

people from over 70 separate enterprises including outsourcing companies, "brick-and-mortar" Fortune 500 type enterprises, small independent software companies and others.   We also plan to work with NIST to create papers and a lab where enterprises can learn about IPv6. NIST plans a lab which will be a test bed where if there are product support issues with IPv6, we can help to fix them. They are looking to us for collaboration.

Goal: To train between 200 - 500 enterprise senior technicians from a minimum of 100 separate enterprise organizations on IPv6. To create an awareness among enterprise C-level executives of the business need to adopt IPv6. To assist NIST in creating paper and a lab where enterprises can learn about IPv6.

This project would fit into both Internet technical improvements and also informational outreach.

Enterprises in the United States disproportionately impact the ARIN service region as well as the world. People using the Internet are not just doing google searches - they are accessing their bank, their insurance company, and government sites. Enterprises are the fundamental backbone of the economy. In particular, the large Fortune 500 level enterprises that we are targeting need to make moves to become current on technology. IPv6 is critical.   It is like improving the plumbing for the house - a thankless and costly task, but if it is not done, then you will pay a potentially large cost when an old pipe breaks.

Budget information:
Consulting (Lee and Nalini): $20,000
Travel (to NIST workshops): $5,000

Committee comments:
This project aims to help disseminate strategies for IPv6 adoption across industry. Training enterprise personnel on IPv6 deployment will have a direct impact on the growth of IPv6 deployment, helping solve the deployment lag in a particular section of the Internet user community. The targets are specific and obtainable, and the deliverables include a webinar and whitepaper. The enterprise focus is novel enough and focused on a critical need for the global Internet community that it seems distinctly useful. The individuals involved appear uniquely driven to get this message out to the community.

3. CrypTech Open Source Cryptography Project
Suggested funding amount: $10,000 (partially fund, requested $30,000 but noted that $10,000 would be helpful)

CrypTech/Stitching NLnet
Amsterdam, The Netherlands
Phil Roberts
Managing Director, Technology, Diamond Key Security

Working since 2014, the CrypTech project has developed an open-source hardware cryptographic engine design to meet the needs of high assurance Internet infrastructure systems that use cryptography. Our open-source hardware designs are aimed to be of general use to the broad Internet community, covering needs such as securing email, web, DNSSEC, PKIs, etc. The project has produced a design and hardware boards that have been used in various experiments and test, and now an external product. We are proud to say that the current design has been the subject of a positive external security evaluation (https://cryptech.is/2018/10/external-security-audit-commpleted). The CrypTech core team are now beginning the process of designing next generation designs and ARIN community funding can help enable this process.

The explicit aim of CrypTech is to build an open source crypto engine that could be used specifically in DNSsec signing operations and in RPKI certificate authorities.

The project is open source and could be used by anyone in the world. Specifically, it could be used by TLD operators, or regional internet registries (including ARIN) in their DNSsec or RPKI operations.

Budget information:
The major expenditures of CrypTech are paying professional developers for code development. Annually there is an in-person meeting for the developers and the core team. Some of the money covers that also, but almost all of it is for code development.

While we are asking for $30,000, we can do useful work with a grant of as little as $10,000. We know that your overall budget for grants in 2019 is $60,000.

As far as financial controls, the philosophy in CrypTech is that skilled and experienced developers need to be paid fair rates for the efforts. We therefore pay market rates for the wide variety of skills required for cryptographic hardware and software development. CrypTech developers are contracted to work the hours estimated for identified tasks, where those tasks have been agreed via consensus of the team, and that will continue to be the process we follow. The CrypTech board approves invoices from the developers based on the agreed tasks.

Committee comments:
This project appears highly aligned with the requirements of the ARIN Community Grant Program in creating benefits for the ARIN region and beyond by implementing open source technical solutions for the cryptographic features the community is adopting. From a technical perspective, it seems generally beneficial and is a competent, well-organized effort that offers a useful user experience improvement. Though generalized around cryptography, this project has applicability around the functions being adopted by the Internet community, meets the program guidelines and, develops open source tools. The application can be deployed worldwide and with RPKI and DNSSEC, it appears the more people who implement them the better they work.

4. Global NOG Alliance Admin Tool
Suggested funding amount: $7,000 (partially fund, requested $7,500)

Global NOG Alliance
Apeldoorn, The Netherlands
Sander Steffann
Treasurer

The Global NOG Alliance (GNA) is a non-profit foundation which has been set up to help Network Operator Groups and technical communities all around the world. We help NOGs by providing logistical support for their events and membership administration, thereby freeing up NOG organizers to focus on their core functions of growing and improving knowledge and expertise in their communities.

Our initial services to NOGs include providing technical support and hosting their websites, mailing lists, mailboxes, call-for-papers and event management tools. Now, while there are many open source tools capable of providing piecemeal solutions, there is nothing readily available that does exactly what NOGs need to free them from their administrative burdens. Our project therefore is to integrate existing open source solutions into a cohesive, easy-to-use system providing single-sign-on access to a wide range of useful event planning and membership administration tools. As open source advocates, we would also contribute to existing open source projects to improve their value for NOGs. Where existing tools do not exist or where integration between tools is not yet available we are looking to develop those parts, and of course release them as open source.

The Global NOG Alliance is primarily about informational outreach. This project in particular will help NOGs develop a stronger offering for their members by lightening some of the administrative burden, which in turn will help network operators keep informed about current and future developments like IPv6, DNSSEC, RPKI and others.

We support network operators everywhere, including the ARIN service region and the Caribbean. We are happy to offer our assistance, and the software package that will result from this project, to any existing or newly-formed NOGs and technical communities in the ARIN region. We are already working behind the scenes with the technical community in Barbados, for example.   With improved knowledge and experience throughout the internet communities we also work for a more stable internet with relevant best practices on security and reliability deployed around the world.

Budget information:
All funding will be used for the good of the NOG community, as per the operating principles of the Global NOG Alliance.

Software development, maintenance and integration - $5000
Hosting and infrastructure - $2000

Miscellaneous - $500

No single person has access to the funds. All access to the funds must be approved by a majority of the board. The foundation operates according to the Dutch rules set for charities and will provide full transparency on activities, funding and expenses.

Committee comments:
This project will unite the knowledge bases of multiple NOGs globally, which could be very helpful to our less served areas such as the Caribbean. It creates administrative benefits that will have a direct meaningful impact to a wide-reaching community. The technology is not the source of innovation, however, the concept takes an innovative approach. There should be greater improved network resiliency by creating a NOG membership management system for use by various countries and territories within the region. This project includes a clear description of undertaking, benefits, and funding requirements, and it seems like a good project for the engineering community which relies on ARIN services. We have a significant amount of useful information from the global technical community; therefore, this projects seeks to benefit the community by sharing and making available that body of information.

2019 Grant Selection Committee Members:
Susan Hamlin
Peter Harrison
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