

## **GNA-Tech and GLIF: a proposed merger**

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### **1. Introduction**

Since their inception, the Global Network Architecture Technical Working Group (GNA-Tech) and Global Lambda Integrated Facility (GLIF) have been collaboration forums for lower layer networking issues on a global scale, with a focus on Research & Education (R&E) Networking.

During two meetings in September 2018, co-located with the NORDUnet Conference 2018 in Helsingør, Denmark, a proposal was presented to merge the GNA-Tech activities and the GLIF activities. The rationale behind this merger is that having two global lower layer focused groups in the R&E space is inefficient. Issues include:

- duplication of efforts,
- experiencing an increasingly crowded calendar,
- having travel budgets under stress,
- and being mindful of environmental issues of air travel.

The meetings at the NORDUnet conference generated discussion that focused around a few central themes:

- the goals of the new organizational set-up,
- the status and role of the GNA Policy & Strategy WG,
- the position of researchers and vendors in GNA,
- confusion about governance vs. policy vs. strategy vs. funding for activities.

This document proposes the potential working areas for the merged framework. It takes into consideration discussions at both the GNA Technical WG meeting on 17 September 2018 and the GLIF meeting on 21 September. These discussions were guided by a slide deck prepared by the current co-chairs of GLIF and the current co-chairs of the GNA Technical WG. This slide deck is available at:

<https://www.glif.is/meetings/2018/plenary/wilde-glif+gna.pdf>

The overall aim for the framework is to:

- coordinate the building of the global network interconnect for R&E (on topics including but not limited to architecture and joint procurement),
- coordinate the running of the global network interconnect for R&E (on topics including but not limited to federated operations and useful instrumentation),
- sharing best current practices, exploring future directions, learning from and inspiring each other,

- R&E networking community engagement.

## **2. Way Forward**

The themes mentioned above are important to take into consideration. Having a clear understanding of these issues and creating consensus on the way forward are important for a successful harmonization of the GNA-Tech and GLIF efforts, and to come to a global acceptance of the concept of having one powerful, active and well-functioning forum for lower layer issues for Global R&E Networking.

### **2.1 Status and role of the GNA Policy & Strategy WG**

The GNA Policy & Strategy WG was created by the Global R&E Network CEO Forum in July 2017, initially as a closed group. The group's initial charter was to begin developing policies regarding the equitable use of, and access to, the Global R&E Network to support the work of the GNA Tech WG. When this group was created, it was agreed to open up the group after the first deliverables had been produced, including a Terms of Reference document. This remains the intention, but to date the deliverables have not yet been completed.

The proposed way forward is for this WG to continue as above, and to create a new Technical Policy area in the proposed merged GNA+GLIF framework (see below).

### **2.2 Position of researchers and vendors in GNA-Tech**

GLIF, from the start, aimed to support researchers with a need for global connectivity. Sharing capacity on a best effort basis was a change to previous practices at that point in time. GLIF also welcomed vendors to meetings. During the first years of GLIF, both groups were present and active, however after a few years most stopped participating, with a few notable exceptions.

Conversely, GNA-Tech started to coordinate R&E Network organizations efforts in a more scalable way, with an architecture consisting of GXPs (Global R&E Exchange Points) and link elements, and has grown towards blueprinting structural collaboration and cost-sharing. GNA-Tech was started by active R&E Network organizations and active members of the GXP community. It has never actively tried to attract (network) researchers or vendors.

Nothing prohibits (network) researchers and vendors from participating in the work of the GNA-Tech, and in fact their input on how the Global R&E Networks could best support their work would result in an improved outcome all round.

### **2.3 Governance vs. policy vs. strategy**

The GLIF Governance WG has provided a mechanism for the community to have voice in organizing the administration and budget of the GLIF. It however has been relatively inactive for a couple of years, with conversation typically limited to the annual budget review, i.e. the income from sponsors including approval of the funding of the GLIF Secretariat role and whether or not to create material like a new map, a new logo, and web site.

The GNA-Tech has no formal governance structure, since funding is provided by participants' organizations, and the primary aims have been technical of nature. This has led to efficient operation, however there is a perception from some that GNA-Tech is "closed" or under the control of the Global R&E Network CEO Forum. While the CEO Forum kicked off the GNA-Tech, since a number of years there is no direct tie between the GNA-Tech and the CEO Forum, other than through the fact that some, but not all, of the active contributors work for organizations that participate in the CEO Forum.

A merged entity should include a simple governance structure providing a voice for all willing and able participants, while adding a minimum of administrative overhead.

#### **Funding for activities**

It is proposed that the work within the merged GNA-Tech/GLIF entity working areas is funded by the participating organizations. This implies that cost for time, travel and accommodation for chairs and co-chairs are borne by the organizations that make them available for this role. Chairs and co-chairs will need to ensure that their organization makes them available for doing this work, based on the philosophy that if we all contribute a little, we all gain a lot. Additional tasks such as running and maintaining a website, organizing meetings, managing communication, etc., is resourced by participants.

### **2.4 Summary**

Everyone with an interest in global R&E Networking is welcome to participate in the merged GNA-Tech/GLIF entity. This is intended to be a group that addresses lower layer issues for the architecture, operation and innovation of global R&E networks and their use by the research and education community. It is intended to be a forum to discuss ideas, share knowledge and experience, and develop solutions to problems that arise in the experience of the users of the global R&E network.

### **3. Mode of Operation**

GNA-Tech is about bringing together Network Architects of NRENs, GXP Operators, and power users of these facilities, to discuss and align technologies, system integration thinking, time lines, and budgets on how to build the Global Interconnect environment for Research and

Education, often referred to as the “Global REN” or “GREN”. GLIF adds to this the researchers and applications, as well as providing an opportunity to demonstrate future networking technologies.

A harmonized GNA-Tech/GLIF will consist of a number of working areas, each with one or more Working-Groups within them. It is important to be clear that this set of working areas is a framework. There is no guarantee that at any given time there will be active Working-Groups in all of these areas. There are currently active groups working and some others in process of being formed. Whether there is an active group in any of these areas will depend on there being a perceived problem that needs to be addressed and a set of people who are interested in pursuing solutions to that problem. There is no intent here to create a group of standing work areas that are expected to take on a life of their own. In setting up a Working-Group, the following questions should be answered:

- What is the problem to be solved and how does it manifest in actual practice?
- What are ways in which R&E Networks, GXP Operators, network and application researchers and other participants can address this problem?

*From here on in this document, for the sake of simplicity, the “merged GNA-Tech/GLIF entity” is referred to as “GNA”.*

There is one Working Group which will oversee the structure and work flow of the working areas:

- **GNA Oversight Working Group:** Its primary function is to manage and facilitate the working areas and Working Groups. This will be based on the open participatory model of the GLIF Governance WG. Activities include:
  - o Create new Working Groups, finding new WG leaders as necessary,
  - o Identifying and either reinvigorating or winding up WGs which have become inactive,
  - o Ensure there is a maintained website, shared working space, meetings and active communication channels.
  - o Ensure that participants are funding any activities equitably

The continuous and basic rule for this group is: *“What is the problem a Working Group is trying to or needing to solve”?* To safeguard that mission and guard against scope creep each proposed group will have a charter with an automatic expiry date, which can be extended by the Oversight Working Group. Extensions will in principle be granted if there is a new proposed or amended charter that is acceptable. There will be a lightweight process for creating a new group or winding down an existing group. The initial co-chairs of the GNA Oversight working group are proposed to be David Wilde (AARNet), Dale Finkelson (Internet2) and Erik-Jan Bos (NORDUnet). A mechanism for changing the members of this group will be developed.

The GNA Oversight group has an Executive Liaison in the person of Jim Ghadbane (President & CEO, CANARIE).

#### 4. Working Areas for GNA

The list below is the proposed list of initial working areas for the Global Network Architecture.

- **GNA Architecture.** The area of work for this group includes:
  - Keeping the GNA Reference Architecture documents up to date,
  - Developing transit definitions and the relationship to the Commons.
  - Refining the definition of and the mode of operations of a GXP.
  - Determining direction for resource sharing group. Creating Network Services documents, if and when needed.
  - Sharing knowledge on collaboration topics such as:
    - participating in subsea cable builds,
    - assist in the development of collaborations like ANA or APR.

Current situation: The existing GNA-Tech WG covers areas as mentioned above. Current co-chairs of this group are Dale Finkelson (Internet2) and Erik-Jan Bos (NORDUnet), and are proposed to retain this role for the new work area.

- **GNA Tools.** The area of work for this group includes:
  - Defining an architecture for virtualization for global adoption with the R&E Networking community, considering the lessons learned in creating AutoBahn, GTS, NSI, OpenNSA, and the GNA-Tech white paper on Virtualization.
  - Operationalizing AutoGOLE (or similar technologies).
  - Network resource mapping, including defining a data exchange format, data base rules for storing such data, and possible visualization tools.
  - Developing possible fruitful models for software collaboration and a software tools inventory.
  - Specifying a limited set of potential best practice collaboration models for software sharing and software development. Considering existing best practices and being flexible to consider NRENs that might not have software development resources, defining options on contribution possibilities.
  - Create an inventory of software applications and tools developed and/or maintained by NRENs, in order to share the software, or collaborate on development. Initially focused on software used for network operation, however in future this may expand to include other software; products and services
  - Identify a tool to maintain this inventory, in the form of a website with pointers and update methodology: evaluate an existing CANARIE portal for this purpose.

Potential co-chairs for a group in this area are: Josva Kleist (NORDUnet) & Warrick Mitchell (AARNet). (Warrick has confirmed his availability to take on this position.)

- **GNA Research Support.** The area of work for this group includes:

- Working with users from data intensive projects, networking researchers, and network application researchers on current and future developments relating to data transport and researcher needs across Global R&E networks.
- Defining the network aspects of research workflows.
- Coordination of the instances of the “GRP” Global Research Platform (eg. the Pacific Research Platform) towards a Global R&E Network Research Platform.
- Global Caching service description and best current practices development.

Current situation: This area has to start yet.

Potential co-chairs are yet to be identified.

- **GNA Operations.** The area of work for this group includes:

- Starting the platform for R&E Network operations coordination.
- Introducing and adopting best current practices around routing, such as MANRS, in the R&E Networking realm.
- Further developing the Federated Operations model and extending it to GNA participants.
- Global database of NOC contact info.

Current situation: This area has to start yet.

Potential co-chairs are yet to be identified.

- **GNA Technical Policy.**

**Background:** Some meetings were held already on this topic, e.g. collocated with the Hong Kong APAN meeting, generating some useful topics for discussion. This group will be acting as the focal point for collaboration topics that are not technical or architectural in nature, but need further discussion on a technical policy level. Groups in the area will flag policy issues, and will either come up with proposals for solutions, or flag it to higher management for resolution. This is not intended as a means to dictate or devise policy but to be a resource when policy issues arise and to proactively look at policy issues, and to advice upper layer management at R&E Networks and GXP Operators.

The area of work for this group includes:

- Identifying and proposing solutions to technical policy issues between GXP Operators and participating R&E Networks at a GXP.
- Developing a technical policy for transit, and coming up with a best current practice for routing between R&E Networks that, due to geographical dispersity, are unable to peer.

The basic question this group should address is: *“What are the existing or proposed policy considerations that affect our ability to create and manage an effective global R&E Networking environment of collaborating organizations, for exchanging traffic on the participating networks”?*

Current situation: This area has to start yet.

Potential co-chairs are yet to be identified.

- **GNA Futures**

This group aims at organizing the ability to set up demonstrations at some of the major meetings every year, showcasing the ability of the R&E Networks, GXPs and Research Installations that use the infrastructure. Among other things demonstrations of tools or techniques used in prototypes like ANA and APR so other organizations can see how they work and how useful they might be.

Current situation: This area is envisaged to be a continuation of the successful demos at GLIF meetings.

Potential co-chairs are yet to be identified.

## **Appendix A. Template for Terms of Reference for a Working-Group in the GNA Framework**

Elements should include:

- Name of the WG
- Lifespan of the WG
- ToR authors
- Goal of the WG
- Elevator Pitch for the WG
- Deliverables
- Timeline
- Collaboration method
- Communication method
- Initial members
- Initial co-chairs

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