Challenges and Collaborative Planning in R&E Networks

Report out from the TNC23 Planning and Development in R&E Networks side meeting
June 9, 2023

Setting the context

- In the 90’s R&E networks were seen as innovation drivers
  - We are driven by the science use cases and not for profit.
  - “Competition” were risk averse large telcos.
- Today hyper-scalers are driving network innovation
  - They have HUGE budgets for R&D
  - They own the end-to-end ecosystem, e.g., compute, storage, network
- Collectively the R&E community is similar to hyper-scalers, but with a significant technical difference… multi-domain interoperability
  - We understand the scientific community and use cases
  - Collectively we manage the end-to-end ecosystem
  - Our community is collaborative vs competitive

Area 1: Intercontinental Connectivity

- Information consolidation and sharing
  - Systems view of trans-oceanic connectivity as well as terrestrial footprints *[GNA]*
  - Logical connectivity view of experiments and large science collaborations, e.g., partnership resource map *[GNA]*
- Coordinated groups
  - Science engagement group to experiments approach to coordinate requirements, co-design, solutions, etc. *[Joint collaboration based on requirements of experiment, inform GNA of outcomes]*
  - Technical coordination group to explore efficiency, resiliency, etc, across the various trans-oceanic connectivity, and potentially joint operations. *[Joint collaboration based on requirements of experiment, inform GNA of outcomes]*
- Dedicate effort to work on the various coordinated tasks

Area 2: Packet Layer Renewal

- Information consolidation and sharing
  - List of networks and associated services, hardware, and protocols. *[GNA]*
  - Tender information, e.g., RFP, and potentially reasoning for selection. *[Bilateral (for sensitive information), public information can be shared with GNA]*
  - Technology and vendor roadmaps. *[Bilateral (for sensitive information), public information can be shared with GNA]*
  - Network element testing tools, methodology and results. *[Bilateral for testing collaborations and sensitive information, general/public results/information shared with GNA]*
  - Work towards a unified view of what we could be tendering in 5-7 years. *[General sharing with GNA, more focused (bilateral) discussions among like minded NRENs]*
- Service coordination
  - Building consistent end-to-end services. May require us to review our services and simplify if warranted. *[Bespoke services would require bilateral cooperation and shared with GNA, general services can be addressed in GNA]*

Area 3: Automation and Orchestration

- Information consolidation and sharing
  - System level architecture design documentation, e.g., block diagram. *[GNA]*
  - Workflow models and functions. *[GNA]*
  - Taking lessons learned from bi-lateral collaborations and sharing that in a larger forum. *[GNA]*
  - Socialize the NREN SLACK Automation channel. *[General SLACK]*
- Coordinated training and outreach activities. *[Bilateral activities for focused engagement, might hand over to GNA for general engagement (and if process is more matured)]*

Area 4: Big Science Requirements

- Information consolidation and sharing
  - Sharing requirements gathering reports among the NRENs. *[GNA]*
  - ESnet can share how requirements workshops are done. *[Multiple forums]*
  - A register that tracks the current connectivity asks (understanding that there may be big error bars). *[GNA]*
- External engagements
  - Create a unified “global” R&E network pitch that we can use for funding agencies, experiments, etc. *[GNA++]*

Takeaway

- **Consider** the potential of what the R&E community can do as a whole
- **Collaborate** and share your experience with the R&E community
- **Contribute** your expertise to drive the R&E ecosystem

Join the Global Network Architecture Group (GNA-G)!

- Talk to Ivana Golub <ivana.pezelj.golub@gmail.com> in person
- Contact GNA-G leadership <https://www.gna-g.net/contact-us/>

"Irrelevance only creeps up on you if you let it." — **Stewart Stafford**