



17<sup>th</sup> GLIF Technical Working Group meeting  
25-26 January 2012  
Baton Rouge, LA, USA

The GLIF Technical Working Group held its winter meeting on 25-26 January 2012 at the Pennington Biomedical Research Center, Baton Rouge, United States. This was being held in conjunction with the Internet2/ESnet Joint Techs Workshop. 33 people attended the meeting in person (see the list of attendees enclosed), the secretary was Peter Szegedi (TERENA).

1. Welcome, apologies, and agenda

Lars Fischer (NORDUnet), the lone co-chair of GLIF Tech WG, welcomed the participants and gave a brief introduction to GLIF. He proposed to wait a few more months until the new co-chair will be ready to step up and be introduced to the position.

Lars reminded that the real technical work of GLIF is done under the task forces that are meant to be short term with natural evolution towards new activities. For instance, the GNI-API Task Force's efforts have moved to OGF-NSI or the Campus Networking Task Force's activity is migrating towards TERENA End-to-End workshops. The Distributed Topology Exchange Task Force strengthened its position with a detailed work plan and list of deliveries over the next 18 months. The task force is now co-chaired by Jeroen van der Ham (UvA) and Inder Monga (ESnet). The Defining GLIF Architecture Task Force is chaired by Jerry Sobieski (NORDUnet), the Performance Verification Architectures Task Force is co-chaired by Jerry and Steve Wolf (Internet2). In Rio de Janeiro two more potential task force activities have been discussed; the Defining GLIF Architecture Task Force and the NSI Implementation Task Force. These must be kicked off just now.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/250112-welcome.pdf>

2. Open Exchanges and Link Policies

Erik Jan Bos (NORDUnet) gave an update to the Open Exchange paper (aka Open Networks for Open Science). The paper was drafted by Bill St.Arnoud back in April 2011. In the meantime, two other papers have been published; the "Role of open exchanges in research networking" by SURFnet and "The case for Open Lightpath Exchanges" by NORDUnet. The three papers have three different views on the same topic. It is recommended to read all of them:

[http://www.glif.is/publications/papers/20110519BStA\\_Open\\_Exchanges.pdf](http://www.glif.is/publications/papers/20110519BStA_Open_Exchanges.pdf)

<http://www.glif.is/publications/papers/ole-surfnet.pdf>

<http://www.glif.is/publications/papers/ole-nordunet.pdf>

There was a question if the three papers are consistent. Erik-Jan (NORDUnet) said that all the three papers have very strong technical aspects and they touch on the distributed open lightpath exchange issue. The distributed version of open exchanges is a new angle, Internet2 has been working on this concept for a year now but it is still too early to talk about the results said Steve Wolff (Internet2). Jerry (NORDUnet) added that the key word that is popping up all the time is "non-blocking" although there are other criteria that we have to

meet with. For instance, the provisioning time of the bandwidth/capacity upgrade inside the distributed GOLE is a blocking condition. Roberto Sabatino (DANTE) said that GÉANT also initiated a distributed exchange point discussion within the European community. It is useful to have as many voices as possible. Bill St. Arnaud came up with the term “neutral policy” instead of “open policy”. Open does not mean free of charge. Policy neutral behaviour of the exchange means that there is no additional policy that exchange point adds to the link policy. Erik Jan proposed to take the discussion to the mailing list that may lead to new updates to the papers mentioned above.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/250112-tech-ole.pdf>

Lars Fischer (NORDUnet) talked about link policies and how to enforce them. In principle, GOLEs are policy neutral that means that there is no additional policy enforced by the exchange point. Lars explained this with the example of NORDUnet. NORDUnet has several IP peering points in the US because e.g., some US based cloud providers only peer with NORDUnet if there are PoPs physically located in the US. The links (bought from commercials) between these PoPs can be used to bridge between GOLEs but that won't be policy free (i.e. users have to pay for that). NORDUnet is not a global service provider so the policy would be against peering between third parties. NORDUnet announces their end-points but not the peering points.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/250112-link-policy.pdf>

However, it is a tendency that more and more inter-GOLE resources are in place. From the technical point of view it is great but from the policy description and enforcement point of view it is getting worse. For instance, the policy-aware path finding is a challenging goal for the future to be solved. Jerry commented that we have just started to discuss about policy so we should not jump ahead to the policy agent and policy-aware path finding issues yet. We need more clarifications before. In the future a task force might be needed to address these issues but it is too early at the moment.

### 3. News and updates

Marek Blazewicz (PSNC) talked about experiences in deploying the high-end visualization application in the transatlantic GLIF environment. He gave a brief introduction to PSNC institute and the PIONIER network. PSNC took part of the NSI plugfest in Rio de Janeiro. Remote rendering application was demonstrated using different communication patterns and protocols. It was done in almost real-time. The connection setup was done manually although it is expected that an automated provisioning system in the near future will save some time.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/250112-psnc.pdf>

JJ Jamison (Juniper Networks) talked about the recent activities in the Arabic countries concerning GLORIAD and GulfLight. GLORIAD connects countries in the northern hemisphere. It started as an early NSF fund to connect the US to Russia when there was no connectivity between them at all. Besides the funding, the collaborative partners have made the current GLORIAD happen.

JJ talked about the emerging NRENs in the Gulf. Saud Arabia and Oman already set up their NRENs while Bahrain and Kuwait are considering doing so. The Arab League also supports to set up an Arab States REN (ASREN) to aggregate demands and reach the critical mass in the region. Currently there are several separate links connecting the Gulf to Los Angeles, New York or Amsterdam. GulfLight might have the potential to aggregate traffic for GÉANT, Internet2, GLORIAD or Ubuntunet and gain cost efficiency. Dubai seems to be a reasonable location for an open exchange. Lars asked about the timeframe setting up GulfLight. JJ said that the most optimistic approach is to start something in the fall 2012. Gulf cable installations are happening as we speak.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/250112-gulf-light.pdf>

Artur Barczyk (CalTech) gave an update on LHC Open Network Environment. During 2011, LHCONe consisted of two implementations, the transatlantic Layer 2 domain and the European VPLS domain, each successful in its own scope. In addition, Internet2 deployed a VPLS based pilot in the US. The VRF implementations are on the way. Several technical meetings will follow.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/250112-lhcone.pdf>

At the end of the first day Peter Szegedi (TERENA) mentioned the plan to organise a “Lightpath Services Workshop for Campuses” in 2012. TERENA is in good position to engage with the NRENs and approach the campus and end-site network operators in order to promote and facilitate end to end networking. Peter will liaise with Internet2, CANARIE, AARnet, and the European NRENs to make this event happen.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/250112-e2ews.pdf>

#### 4. Task Force discussions

Jerry Sobieski (NORDUnet) gave a brief introduction to the Dynamic GOLE Service Task Force and summarised what has been accomplished so far. The GLIF Automated GOLE Pilot was initiated in 2010 to provide a global fabric of Open Lightpath Exchanges for the express purpose of maturing the dynamic provisioning software, demonstrating the value of GOLEs to emerging network service models, and to develop a set of BCP for these services.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/260112-automated-gole.pdf>

The task force is planning to upgrade its Automated GOLE Infrastructure introducing meshing and alternate paths in the topology. It was pointed out that the infrastructure is a cutting-edge experimental facility to try out new technologies and applications. This facility also demonstrates how the notion of GOLEs can function in a global network. GLIF participants will use the learning from this effort to deploy next-generation lightpath services in their production networks. There is a gap between demonstrate something and put it into production. NSI implementation task force is meant to discuss this, said Inder Monga (ESnet). Only bulletproof services can go production.

Jeroen van der Ham (UvA) reported that the Distributed Topology Exchange Task Force completed its first survey about topology and automated provisioning. Among the 17 replies most of the operators said that they use manual database and Visio diagram to represent topology. Most of them are willing to share full topology and availability information with GLIF.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/260112-jeroen-dtox.pdf>

As nobody likes to write XML therefore Inder Monga (ESnet), the new co-chair, encouraged the meeting participants to try and agree on a machine readable topology description format (NML) and start collecting the potential tools for its representation. It was agreed that the security and identity considerations must be built into the path-finding process.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/260112-inder-dtox.pdf>

The new ‘NSI Implementation Task Force’, also led by Inder, was kicked-off with the aim at facilitating the production deployment of OGF's NSI standard protocol implementations. There was an open call to form small teams that can bring the recommendations forward.

***ACTION 1:*** *GLIF Secretariat has been asked to create a new mailing list for the task force.*

John MacAuley (SURFnet) emphasised that implementation agreements, best practices and operational guidelines are needed to bridge the gap between the standard and its production deployment. The ASON logical architecture would be applicable here. Both data and signalling planes topology and discovery are needed. Signalling plane must be secure with proper authentication and authorization.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/260112-nsi-imp.pdf>

The ‘GLIF Performance Verification Task Force’, initiated by Jerry Sobieski (NORDUnet) and Steve Wolff (Internet2), is a green field approach on how to verify that the network service is engineered as it is required by the user. The performance verification architecture must be designed in a service independent way. Jerry encouraged people to start creating an inventory of the potential performance verification tools on the Wiki however the current set of tools should not restrict us in how to define the overall architecture.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/260112-glif-pv.pdf>

Joining the taskforce and producing the inventory would be great but the inventory itself should not restrict us on what we think about the architecture, commented Steve Wolff (Internet2).

***ACTION 2:*** *Encourage all to join the glif-pv mailing list and collect the tools on the Wiki.*

Erik-Jan Bos (NORDUnet) gave a brief historic overview of the GLIF and positioned the work of GLIF as the area between research and the production environment, in the areas of the network, middleware and applications. It is not trivial how to step from working technology prototypes to production services. The definition of “a GLIF reference

architecture” is the main objective of the newly formed ‘GLIF Architecture Task Force’ already proposed in Rio de Janeiro that will help to understand better the end-to-end e-science workflow.

Inder described the end-to-end approach to GLIF architecture. The Campus Networking Task Force lighted up that there are various issues from the campus perspective. It is very important to get to the user on campus. Anything that facilitates that is good, said Lars. All the Cloud providers as well as Skype have the same problems to include the network at the application level to reach out to the end-user. Let’s work on an end-to-end architecture for science. E2E applications such as Globus Online (huge file transfers that does not use the GLIF infrastructure yet) and HPDMnet can be used to demonstrate. The key challenge is to enable the application software stack to do the work.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/260112-glif-arch.pdf>

***ACTION 3:*** *Work on two documents; a problem statement document (architecture white paper) and the detailed charter for the GLIF Architecture Task Force to be presented at the next coming Annual LambdaGrid Workshop in Chicago.*

At the end of the day, Tomohiro Kudoh (AIST) showed a live demonstration of lightpath setup using an automatic scheduler.

#### 4. Closing, next meeting, AOB

Lars Fischer (NORDUnet) wrapped up the meeting and summarised the agreements.

Slides:

<http://www.glif.is/meetings/2012/winter/slides/260112-closing.pdf>

The next GLIF Tech WG meeting will be held during the 12th Annual LambdaGrid Workshop in Chicago, IL, USA on 11-12 October 2012.

#### **List of attendees (33)**

Don Robertson	AARNet
Tomohiro Kudoh	AIST
Artur Barczyk	Caltech
Thomas Tam	CANARIE
Sandeep Nimmagadda	CCT
Roberto Sabatino	DANTE
Richard Hughes-Jones	DANTE
Chin Guok	ESnet
JJ Jamison	GLORIAD/Juniper
Eric Boyd	Internet2
Dale M. Finkelson	Internet2
Stephen Wolff	Internet2
Buseung (Kwangjong) Cho	KISTI
Hyunhun Cho	KISTI

Inder Monga	Lawrence Berkeley National Lab
Erik-Jan Bos	NORDUnet
Lars Fischer	NORDUnet
Jerry Sobieski	NORDUnet
Schyler Batey	Pacific Wave
Marek Blazewicz	PSNC
Alex Moura	RNP
Fausto Vetter	RNP
Ronald van der Pol	SARA
John MacAuley	SURFnet
Bill St. Arnaud	SURFnet
Harold Teunissen	SURFnet
Hans Trompert	SURFnet
Gerben van Malenstein	SURFnet
Yves Poppe	TATA
Peter Szegedi	TERENA
Alan Verlo	UIC & StarLight
Tom Lehman	USC/ISI
Jeoren van der Ham	UvA