



GLIF Technical Working Group meeting  
24-25 February 2011  
Hong Kong, China

## **1. Welcome and announcements**

Erik-Jan Bos (SURFnet) welcomed everyone to the meeting, and outlined the aims and resources of GLIF. He also provided an overview of the task forces' activities that operated under auspices of the Technical Working Group (GLIF Tech WG).

<http://www.glif.is/meetings/2011/winter/slides/110224-Intro-EJB.pdf>

Thanks were also extended to APAN Programme Committee, especially to Jacqueline Brown and Kevin Meynell, for managing to host the meeting in conjunction with the APRICOT-APAN 2011 Conference.

Erik-Jan announced that he is leaving SURFnet and renouncing himself as co-chair of the GLIF Technical Working Group. (More about this can be found in Section 11 "Administrative issues")

## **2. Approval of minutes**

There were no comments on the minutes of the last meeting, and were therefore taken to be approved.

## **3. Campus Networking Task Force and End-to-End Service Architecture issues**

Ronald van der Pol (SARA) presented the actual status of the Campus Networking Task Force. A few weeks before the meeting, the task force issued a questionnaire about how GLIF should support campuses and other end-sites. The preliminary result of the survey were presented and briefly analysed by Ronald.

<http://www.glif.is/meetings/2011/winter/slides/110224-campus-RVDP.pdf>

The survey is still available on-line. Please, participate:

<http://mam.uninett.no/limesurvey/index.php?sid=68545&lang=en>

It was concluded that people answering the questionnaire are interested in collecting/producing best practice documents about terminating lightpaths at campuses. The task force deals only with networking issues and the end-systems are not part of it at the moment but the scope can be broadened based on the users' feedback. As a very first practical step, documentations available on experimental setups for various GLIF demonstrations in the past can be collected. Erik-Jan mentioned that some experiences are available at KISTI, as well as SURFnet had a seven-domain lighthpath demonstration to Rio de Janeiro, Brazil with end-systems included. The intention is to collect all the documentations available in one place – most likely in a dedicated GLIF Wiki space. Gigi noted that key pieces of information can be extracted from that Wiki page and used by other task force activates e.g., the Resource Allocation Task Force.

***ACTION 1 on Ronald (SARA) to start collecting and organising information on the GLIF Wiki about technical and non-technical experiences with GLIF demonstrations done in the past.***

It was also mentioned that campus issues are global; the problem space may well be larger than GLIF. More campus people from both Europe and overseas must be attracted by this activity. If the task force wants to organise separate meetings or workshops for the global community those campus network administrators/engineers who usually do not attend GLIF should also be addressed. Remote participation possibility is a key factor in that respect.

Peter Szegedi (TERENA) gave an overview on the TERENA End-to-End Provisioning Workshop series and its potential follow-up activity. TERENA organised three workshops in 2008, 2009 and 2010 respectively. The workshops covered both the technical and non-technical aspects of end-to-end lightpath provisioning, last mile solution, service architecture, application design and use cases, campus policy and other business model related issues.

<http://www.glif.is/meetings/2011/winter/slides/110224-E2E-PS.pdf>

TERENA stopped organising more workshops on these broad topics for a while and puts efforts into having dedicated small group discussions with all the potential communities in form of BoFs attached to major events during 2011 such as the TERENA Networking Conference and the NORDUnet Conference in Europe or the Internet2 Member and Joint Tech meetings in the US. Since similar discussions have been going on in various domains, it is expected that an open and global forum (such as GLIF) can easily accommodate such a long term discussion group that is highly multi-domain in nature. TERENA is willing to bring many of these – currently separate – discussions together and build one solid (global) community around the end-to-end campus issues that may possibly fit under GLIF. Any decision will be taken based on the community feedback given via the aforementioned BoFs planned for 2011.

Jerry Sobieski (NORDUnet) talked about the specific “service architecture verification” aspects of the end-to-end issues. An architectural proposal for defining, engineering, and verifying performance guaranteed services was presented and discussed.

<http://www.glif.is/meetings/2011/winter/slides/110224-E2E-JS.pdf>

It was concluded that independent verification of service delivery is critical to future application requirements. New protocols and new models of integrating the path verification function into the user virtual environment must be designed and developed. We need a comprehensive approach that considers how end-to-end performance verification processes are intrinsically linked to and parallel with the delivery of performance guaranteed services. Such a formalized architecture will be much more effective approach to performance verification and fault localization.

There was a question on what GLIF’s contribution can be since we have closed the perfSONAR Task Force – that can be considered as a kind of ping verification tool but does not address all the issues. Eventually, we need a transaction framework and a consistent way of handling connection requests. Appropriate authorisation process should also be in place. Policy questions – i.e. how policy can be validated on circuits passing through certain domains – are the most difficult aspects of this scenario especially when conditions/situations are changing on-the-fly.

In conclusion it was agreed that the main issue is that the end-to-end service doesn’t provide what the user expected. That is why end-to-end service architecture verification is important

for both provider and end user parties. Further discussion about the creation of a potential new task force under GLIF Tech WG covering these issues will happen at the next coming Annual Global LambdaGrid Workshop in Rio de Janeiro.

#### **4. New GOLE Governance Task Force proposal**

Bill St. Arnaud (SURFnet) gave a remote presentation about a possible Governance Framework for Open LightPath Exchanges (GOLEs) and Connecting Networks. As number of GOLEs increases and demand for lightpaths increases the need to have some broad frameworks and policies becomes important. Governance framework will help minimize questions on AUP policies, escalation procedures, who to contact, etc.

<http://www.glif.is/meetings/2011/winter/slides/110224-Gov-BSA.pdf>

Given the recent developments a number of organizations involved with e-Infrastructure, optical networking and GLIF have agreed that it would be useful to create a platform for discussing “governance” issues with respect to GOLEs. In this case governance does not imply any type of central control or management, but to work with the GLIF technical community, users and funding agencies to set in place common agreements, definitions, funding models and policies as to what define a GOLE and how resources designated for common usage should be allocated. It was emphasised that the proposed activity will not be used to oversee GOLE operations, but rather for preparing high level guidelines for the GOLE community. The participants recommended that the task force should be re-named in order to avoid any father confusion.

Bill, who has recently been retained under contract by SURFnet as a consultant, is prepared to take the leadership of this task force. A kick-off discussion will be organised during the Internet2 Spring Member meeting on the week of April 18-20th. The aim of that meeting is to be well prepared for the potential decision on the new task force creation – most likely under the Governance and Growth Working Group of GLIF – at the next coming Annual Global LambdaGrid Workshop in Rio de Janeiro.

All GLIF participants are encouraged to participate in discussions to further define scope and mode of operation of this task force for which a new mailing list has been created by the GLIF secretariat. The latest proposal for the name of the mailing list is:

*GLIF Architecture Task Force* <[architecture@glif.is](mailto:architecture@glif.is)>

***ACTION 2 on Peter (TERENA) to create the <architecture@glif.is> mailing list for the proposed GLIF Architecture (known as “Governance”) Task Force discussions.***

Follow up meetings will be possible at the TERENA Networking Conference in Prague, Czech Republic in May, and the NORDUnet/CCIRN meeting in Reykjavik, Iceland in June.

#### **5. GLIF Demonstrations - Automated-GOLE Pilot project activities**

Jerry Sobieski (NORDUnet) held a demonstration on the Automated GOLE Pilot project activities. The next generation PerfSONAR PinGER application over Fenius control plane was demonstrated live. The topology specification and distribution function within the Automated GOLE environment is targeted to be demonstrated at the Supercomputing 2011 event.

<http://www.glif.is/meetings/2011/winter/slides/110225-demo-JS.pdf>

The details of the demonstration are clearly described in this document:  
<http://www.glif.is/meetings/2011/winter/poster/AutoGOLE-handout-20110217-v5.pdf>

More than 50 people attended the demonstration of which at least 10 people were coming from the APRICOT/APAN community so it was considered as a big success!

## **6. GNI-API Task Force discussion and NSI implementation roadmap**

John MacAuley and Gerben van Malenstein (SURFnet) gave a status update on OpenDRAC. The last load was received from Ciena at the end of December 2010. It was realised that the working code cannot easily be put into production as is. It had to be verified that the code is actually ready for implementation in a production environment. OpenDRAC can even run on a laptop. OpenDRAC now runs on NetherLight, CzechLight and CERNLight (i.e. NetherLight instances manage CERN and CESNET domains too); additional key features will be completed in 2011. The implementation at KISTI is ongoing. The plans for 2011 include the building of an NSI interface as well as a CLI and Java App (automation tool to help users).

<http://www.glif.is/meetings/2011/winter/slides/110225-OpenDRAC-JMGvM.pdf>

Inder Monga (ESnet) updated the meeting participants on the accomplishments of the OGF NSI-WG over the last several months. The state machines were presented as well as a few concepts such as Service Termination Point and error handling. The concept behind the “release” message was discussed. There was a slight misunderstanding if “releasing resources” means that they are gone, but it is not the case. If the connection is released the reservation still remains in place (i.e. it can be provisioned/reconfigured again) until the whole reservation is cancelled. It was suggested to use “release” – “unreleased” message pairs for better understanding (although it is bad English).

The next step agreed is to demonstrate only the “setup” and “cancel” messages implemented on top of the Automated GOLE test bed in Rio de Janeiro. As NSI implementations become available, the Automated GOLE pilot project will repeat the experiments using early NSI implementations. The Dynamic GOLE Services Task Force will continue as an application oriented group, demonstrating services and applications based on Dynamic GOLE’s.

A new NSI Reference Implementation Task Force was suggested. There was a discussion about the objective and scope of that new task force and the possible overlap with the already existing Dynamic GOLE Services Task Force activity and with the OGF NSI-WG group. It was noted that the design and standardisation related discussions are different from the implementation ones. The proposed new NSI Reference Implementation Task Force would be the common place for people worried about the code and its implementation, while demonstrations and applications would remain in the Dynamic GOLE Services Task Force. The creation of the new task force will be discussed in Rio de Janeiro.

Evangelos Chaniotakis (ESnet) gave an update on Fenius. He reported that no new features have been requested so far. The current Fenius version can smoothly be shifted to the standardisations’ track. It seems that the Generic Network Interface Specifications (GNI-API) Task Force has completed its objectives therefore it can be closed down. The meeting participants agreed to put the efforts somewhere else and close down the task force. Evangelos was thanked for the excellent leading of the task force.

<http://www.glif.is/meetings/2011/winter/slides/110225-GNI-API-EC.pdf>

Jerry noted that there is no clear roadmap on how Fenius will fit into NSI. Fenius is a software package and not an architecture or protocol. The discussion on what we can do with a software package is completely different from the architectural design discussion. We should break down Fenius and extract the necessary architectural components. No need for new features that are not compliant with NSI (e.g., fancy web interface, etc.) to be implemented in Fenius. Gigi also mentioned that the seamless replacement of GNI-API to NSI-API will simply not work in some domains, although we need as many NSI-API implementations as possible to support the standard. Lars seconded that a new NSI Reference Implementation Task Force would help out in that respect.

A follow-up panel discussion was chaired by Gigi Karmous-Edwards (NCSU). The panellists were: Evangelos Chaniotakis, John MacAuley, Inder Monga and Tomohiro Kudoh. The panel agreed on the roadmap towards an NSI implementation and Automated GOLE end-user service by the end of 2012:

- 1) March 2011 – NSI draft specification is out
- 2) September 2011 – GLIF annual meeting in Rio de Janeiro
  - Dynamic GOLE Services TF to produce a service architecture document
  - Automated GOLE Pilot to demonstrate 4 basic NSI calls on a connection from A to B (over 3-5 domains): 1) reserve, 2) provision, 3) query, 4) cancel
  - May have a real use case demonstrated by CESNET.
- 3) December 2011 – Supercomputing 2011 event
  - Focus on Ethernet VLAN services
  - End-to-end service verification demonstration
- 4) January 2012 – GLIF Tech winter meeting in Baton Rouge
  - Preparation for the Supercomputing 2012 demonstration
- 5) March 2012 – Final OGF NSI v.1 specification is completed
- 6) June 2012 – NSI v.1 based end-to-end services code is completed
  - Massive beta testing
- 7) December 2012 – Automated GOLE service for end-users with features such as:
  - Connection request from A to B
  - Ethernet VLAN-based
  - Policing
  - Performance
  - Scheduling
  - Independent end-to-end data plane checking
  - Fully automated authorization and access
  - Fully automated path request and service

The panel was closed by requesting voluntary efforts from all the participants to make it happen as it is planned now.

## **7. Introduction to LHC Open Network Environment (LHCONE)**

Artur Barczyk (USLHCnet) gave an introduction to LHC Open Network Environment (LHCONE) project. LHCONE is a robust and scalable solution for a global system serving

Tier1, Tier2 and Tier3 LHC sites' needs. LHCONE is designed to offload general R&E Networks as the companion to LHCOPN. It has an open design; other science disciplines could also create their Open Network Environments.

<http://www.glif.is/meetings/2011/winter/slides/110225-lhcone-AB.pdf>

The network architecture fits the new computing models. It is based on a switched core with routed edge architecture; IP routing is implemented at the end-sites. The core consists of sufficient number of strategically placed Open Exchange Points interconnected by properly sized trunks. The initial deployment plan is to use predominantly static configuration (shared VLANs and lightpaths) later predominantly using dynamic resource allocation. The prototype/seed implementation interconnecting an initial set of sites will start soon. It will be an organic growth with the key role of NRENs (also in Asia).

## **8. Distributed Topology Exchange Task Force**

Jeroen van der Ham (UvA) updated the participants about the progress of the DToX Task Force. The task force was not ready to prepare a demonstration yet. It seems that it is not that easy to provide the necessary information per domain. Most of the domains have no automated tools to extract the information that is there. Jeroen will provide a simplified tool for topology editing. The URL will be distributed on the mailing list.

<http://www.glif.is/meetings/2011/winter/slides/110225-dtox-JvdH.pdf>

***ACTION 3 on Jeroen (UvA) to provide the URL to the GOLE operators for the simplified topology editing tool.***

It was agreed that only the edge ports and connections have to be described and not the complete hardware configuration of the nodes. DToX Task Force is planning to have a conference call to agree on the time line for collecting all simplified GOLE topology.

## **9. Resource Allocation Task Force**

Gigi Karmous-Edwards (NCSU) gave an update on the Resource Allocation Task Force. The main objective is to determine what high-end resources are available for researchers globally such as high voltage electron microscope, storage, etc. Determine resource characteristics, IP address, termination point technology, NREN, GOLEs, cost, configuration parameters, policy of resource, etc.

<http://www.glif.is/meetings/2011/winter/slides/110225-resource-GKE.pdf>

Gigi proposed that using social media (e.g., Facebook or Academia.edu) might be the way to achieve these objectives. It was also mentioned that maybe the network itself can automatically advertise its connected resources. The GLIF Tech WG participants agreed that the Resource Allocation Task Force may better fit into the Resource and Application WG (RAP WG) therefore it was proposed to move the task force there. Gigi will discuss this with the RAP WG co-chairs that can lead to the final decision in Rio de Janeiro.

***ACTION 4 on Gigi (NCSU) to initiate discussion with the RAP WG co-chairs (Maxine Brown, UIC & Larry Smarr, UCSD) about the Resource Allocation Task Force migration to RAP WG.***

## **10. Showcase: Troubleshooting connectivity problems with 802.1ag by end-users**

Ronald van der Pol (SARA) demonstrated live a connectivity troubleshooting tool that can be used by end-users to verify connections.

<http://www.glif.is/meetings/2011/winter/slides/110225-EOAM-RvdP.pdf>

The beta release of the tool is expected to be out in May 2011 while the first release is planned to be ready by the summer. SARA is looking for beta testers with 802.1ag capable switches or with PC connected to non 802.1ag switches.

## **11. Administrative issues, next meeting, AOB**

At the beginning of the meeting (repeating his earlier e-mail announcement) Erik-Jan Bos announced that he is leaving SURFnet and renouncing himself as co-chair of the GLIF Technical Working Group. By the end of the meeting the only candidate for his position was Lars Fischer (NORDUnet). The GLIF Tech WG meeting participants approved Lars' appointment with no objections. Lars officially took over to co-chairmanship of GLIF Tech WG from Erik-Jan at the end of the meeting. The GOV WG will be informed about the Tech WG decision after the meeting via e-mail.

Internet2 offered to host the next coming GILF Tech WG meeting in conjunction with the Internet2 Winter Joint Tech meeting in January 2012 in Baton Rouge, Louisiana, USA.

The meeting was closed by a brief summary of the agreements presented by Gig:

<http://www.glif.is/meetings/2011/winter/slides/110225-summary-GKE.pdf>

Erik-Jan said warm goodbye to GLIF Tech WG. He was thanked for all his hard work from the very beginning of GLIF.

<http://www.glif.is/meetings/2011/winter/slides/110225-WarmGoodbye-EJB.pdf>

Iara Machado (RNP) showed the next coming 10th Annual Global LambdaGrid Workshop venue to the participants. The workshop will be held on 13-14 September, 2011 kindly hosted by RNP in Rio de Janeiro, Brazil.

<http://www.glif.is/meetings/2011/winter/slides/110225-Rio.pdf>

### **List of actions**

*ACTION 1 on Ronald (SARA) to start collecting and organising information on the GLIF Wiki about technical and non-technical experiences with GLIF demonstrations done in the past.*

*ACTION 2 on Peter (TERENA) to create the <architecture@glif.is> mailing list for the potential GLIF Architecture (known as "Governance") Task Force discussions.*

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## Attendees (55)

<u>Name</u>	<u>Organisation</u>	<u>Country</u>
Kyoung Hlin Lee	ANU	AU
Young Wook Cha	ANU	AU
Iara Machado	RNP	BR
Thomas Tam	CANARIE	CAN
Chun Long	CSTNET	CN
Guang Feng Niu	CSTNET	CN
Jun Li	CSTNET	CN
Tong Yu Ma	CSTNET	CN
Xiaoran Hu	CSTNET	CN
Yun Hui Zhang	CSTNET	CN
Zhi Chuan Sun	CSTNET	CN
Michal Krsek	CESNET	CZ
Atsuko Takefusa	AIST	JP
Hidemoto Nakada	AIST	JP
Ryousei Takano	AIST	JP
Tomohiro Kudoh	AIST	JP
Jin Tanaka	KDDI / NICT	JP
Akira Kato	Keio Univ	JP
Takashi Tomine	Keio Univ	JP
Hideki Otsuki	NICT	JP
Shinji Shimojo	NICT	JP
Kwang Jong Cho	KISTI	KR
Jong Uk Kong	KREONET	KR
Seong Hoon Moon	KREONET / KISTI	KR
Seunghae Kim	KREONET / KISTI	KR
Ronald van der Pol	SARA	NL
Erik-Jan Bos	SURFnet	NL
Gerben van Malensten	SURFnet	NL
Harald Teunissen	SURFnet	NL
Jeroen van der Ham	UvA	NL
Francis Lee	SingAREN	SG
Lawrence W. C. Wong	SingAREN	SG
Simon Lin	TWgrid	TW
Wenshui Chen	TWgrid	TW
Guy Roberts	DANTE	UK
Artur Barczyk	CalTech	USA
Evangelos Chaniotakis	Esnet	USA
Inder Monga	Esnet	USA
Steve Cotter	Esnet	USA
Brent Sweeny	Indiana Univ	USA
John Hicks	Indiana Univ	USA
Matt Zekauskas	Intrenet2	USA
Steven Wallace	Intrenet2	USA
Gigi Karmous-Edwards	NCSU	USA
Dale Smith	NSRC	USA

Jacqueline Brown	Pacific Wave	USA
Kevin Thompson	US NSF	USA
George McLaughlin	APAN	
Kazunori Konishi	APAN	
Takatoshi Ikeda	APAN	
Stephen Wolff	Cisco	
Mark Prior	Juniper Networks	
Jerry Sobieski	NORDUnet	
Lars Fischer	NORDUnet	
Peter Szegedi	TERENA	