GLIF, the Global Lambda Integrated Facility

GLIF Overview

Kees Neggers

7th Annual Global LambdaGrid Workshop
Prague, 17 September 2007

Before I start…

Thank you to:

A bit of history

- The NREN Challenge at the start of this decade:

- How to accommodate needs of scientific users for higher speed, higher quality networking
- While protecting the performance of the network for current users
- And keeping the successful end-to-end model of the internet

We realized that…

- Counting on bigger routers and fatter pipes was no longer a realistic option.
- And introducing QoS was not a viable alternative of course.
- Next Generation Research Networks would not be a simple extrapolation of the current Internet evolution anymore.

The Solution: Hybrid networking

- **Hybrid Networking concept has evolved since 2001 in a global context, with yearly LambdaGrid Workshops.**

IP + lambdas

- **Packet switched internet for regular many-to-many usage**

- **Light Paths for new high speed few-to-few usage**

Lightpaths and OPNs

- Lightpath: high quality and high capacity optical network connection
- Lightpaths provide applications with dedicated bandwidth with fixed characteristics at relatively low costs and with added security
- Optical Private Network: system of permanent lightpaths to interconnect multiple locations

GLIF vision

Linking the World with Light

- GLIF community shares a common vision of building a new grid-computing paradigm, in which the central architectural element is optical networks, not computers, to support this decade's most demanding e-science applications.

Global Lambda Integrated Facility

- GLIF is an international virtual organization managed as a cooperative activity with ‘participants’ rather than ‘members’ with a lightweight governance structure.
- Open to anybody sharing the vision of optical interconnection of different facilities, who voluntarily contributes network resources (e.g. equipment, lambdas) or actively participates in relevant activities.
- Secretariat functions provided by TERENA with voluntary contributions from participants.
- 4 Working Groups

SURF NET

glif

GLIF Technical Issues Working Group

Co-Chairs: Erik-Jan Bos (SURFnet) & René Hatem (CANARIE)

Goals: The goals of the working group are to design and implement an international LambdaGrid infrastructure, identify which equipment is being used, what connection requirements are required, and which functions and services should be provided.

GLIF Control Plane and Grid Integration Middleware WG

Chair: Gigi Karmous-Edwards (MCNC)

Goals: To agree on the interfaces and protocols that talk to each other on the control planes of the contributed Lambda resources.

GLIF Tech and Ctrl WGs Focus

- **GLIF Tech: Facilitate manual use of the GLIF resources today**
- **GLIF Ctrl: Towards automated use of the GLIF resources tomorrow**

GLIF Research and Application Working Group

Chair: Maxine Brown (UIC) & Larry Smarr (UCSD)

Goals: To train a new generation of scientists on the use of super-networks.

Enlighten Your Research

5 winners received lightpath(s) for their project and funding to integrate them in their research:

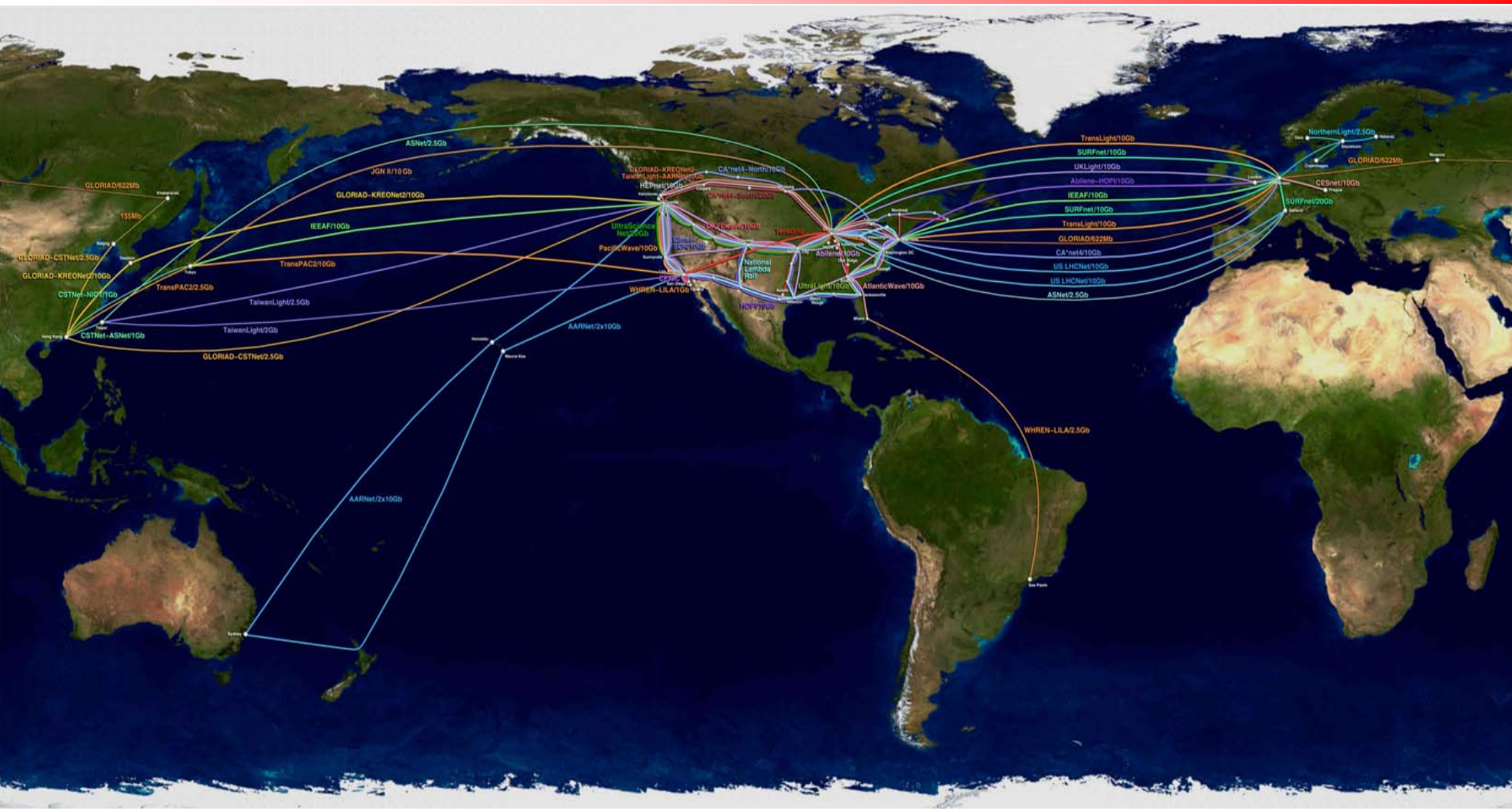
- Distribution of radiology images in the NELSON lung cancer screening study – UMCG & UMCU
- High-throughput genome-wide analyses in Amyotrophic Lateral Sclerosis (ALS) – UMCU & UCLA
- Intelligent CCTV monitoring at Arke Stadium –TI e.a.
- Electron microscopy using lightpaths – LUMC, TUE & SARA
- Remote High-Resolution Visualisation of Climate Data using Pixel Streaming – UU & SARA

GLIF Governance Working Group

Chair: Kees Neggers (SURFnet)

Goals: To identify future goals in terms of lambdas, connections and applications support, and to decide what cross-domain policies need to be put in place.

GLIF resources: lambdas



SURFNET

glif

GLIF resources: GOLEs

- GLIF lambdas are interconnected through established lightpath exchange points known as GOLEs: GLIF Open Lightpath Exchanges
- GOLEs are comprised of equipment capable of terminating lambdas and performing lightpath switching, allowing end-to-end connections
- GOLEs have an open connection policy

GOLEs around the world

- AMPATH – Miami, FL, USA
- CERN – Geneva, CH
- CzechLight – Praha, CZ
- HKOEP - Hong Kong, CN
- KRLight – Daejoen, KR
- MAN LAN - New York, NY, USA
- MoscowLight – Moscow, RU
- NetherLight – Amsterdam, NL
- NGIX-East – Washington, DC, USA
- NorthernLight – Stockholm, SE
- Pacific Wave (LAX) - Los Angeles, CA, USA
- Pacific Wave (SEA) – Seattle, WA, USA
- Pacific Wave (JSV) – Sunnyvale, CA, USA
- StarLight – Chicago, IL, USA
- T-LEX – Tokyo, JP
- UKLight – London, UK

http://www.glif.is/resources/

SURFNET

glif

Challenges

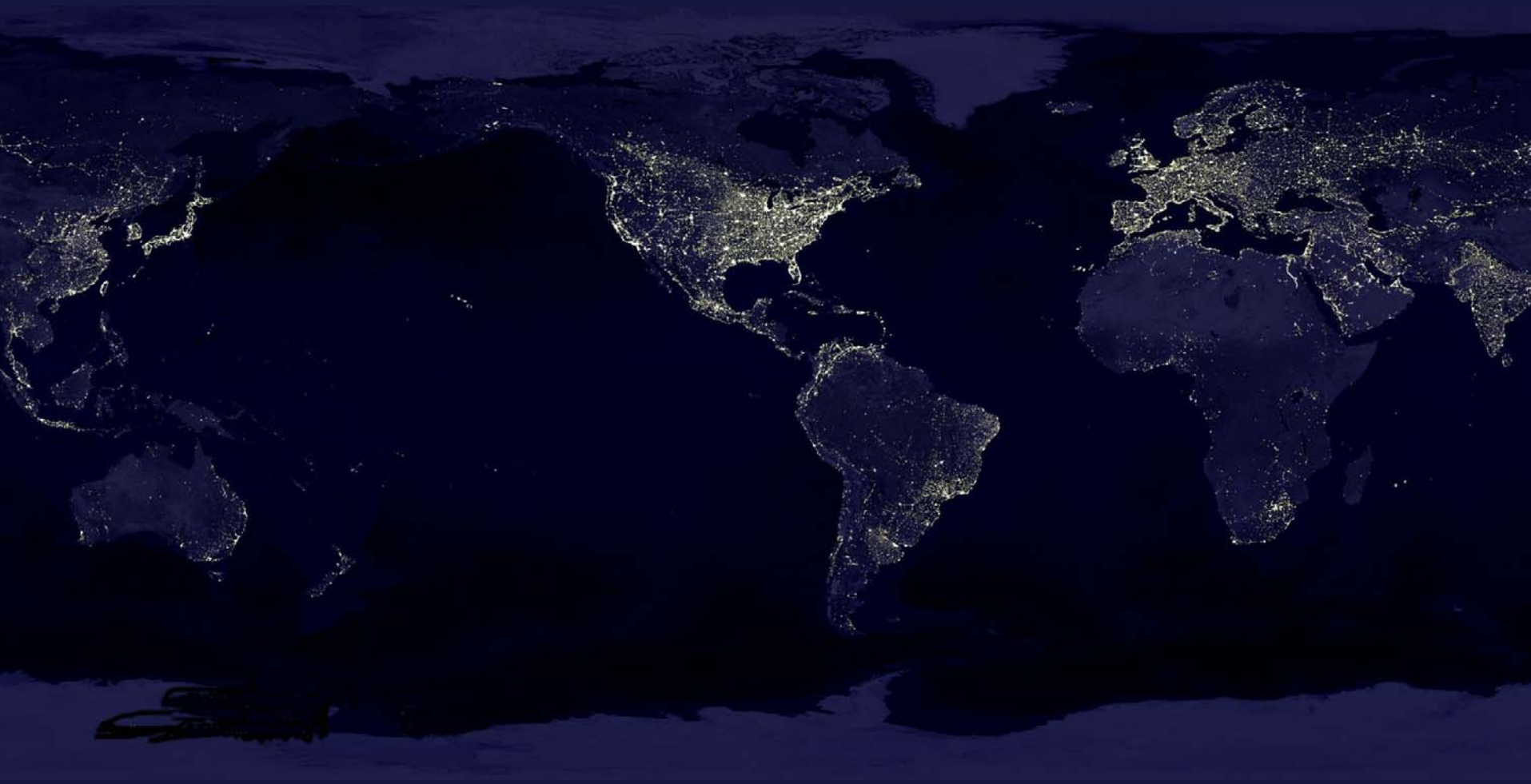
- Control plane interworking
- Advances in NDL and the TL1 Toolkit tools
- Technical challenges in VLAN-based “lightpaths”

- Communicate, educate

- Provide users with seamless access to resources

- Don’t try to turn users in operators

Thank You



http://www.glif.is/