Distributed Topology Exchange TF

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Using RDF to Describe Networks

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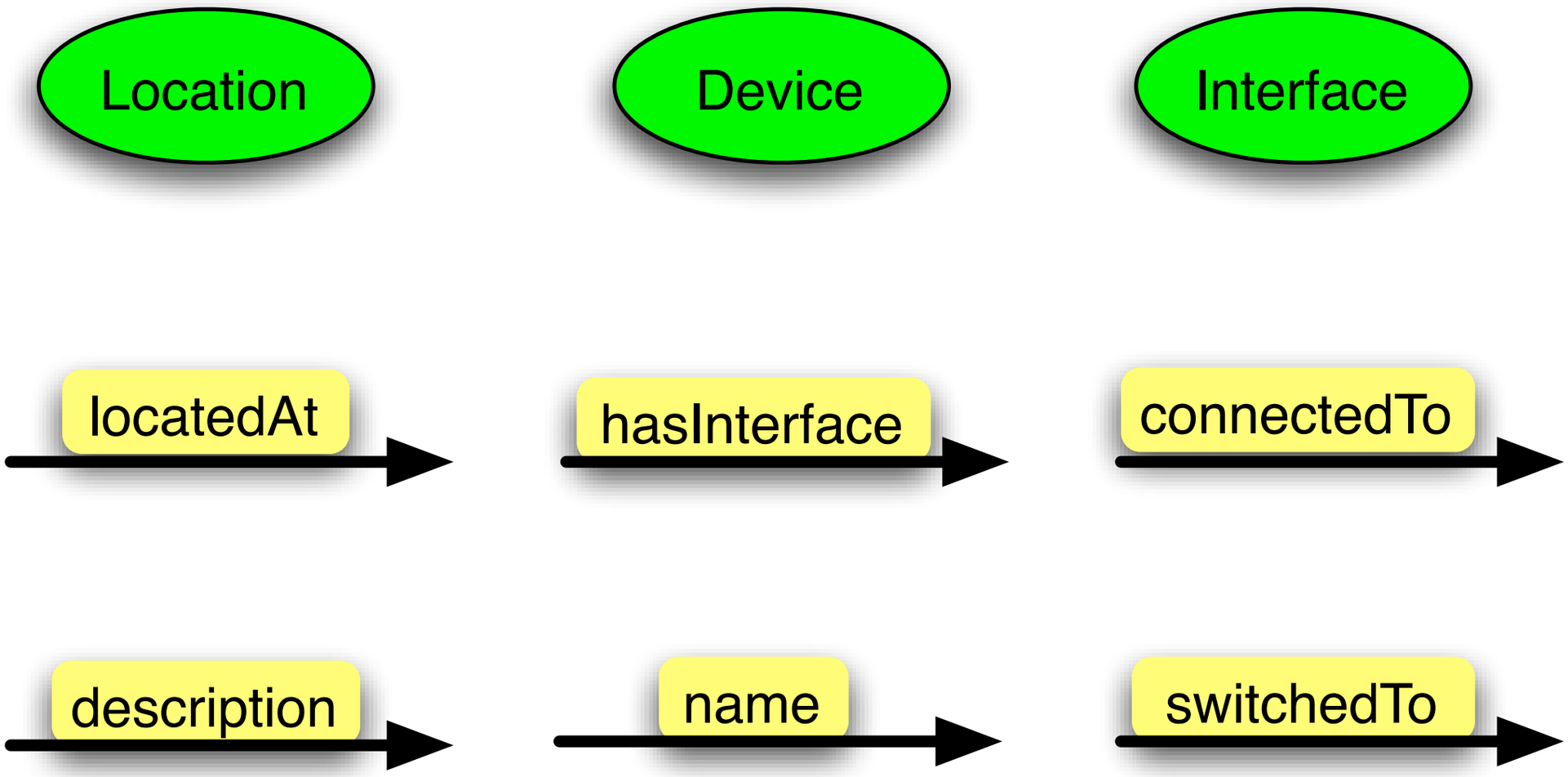
GLIF 2005

- GLIF Repository
  - Resource Scheduling - *Erik-Jan Bos, SURFnet*
  - Using RDF to describe networks - *Jeroen van der Ham, University of Amsterdam*
- GLORIAD database approach - *Greg Cole, GLORIAD*
- DNS approach - *Steve Wallace, Indiana University*

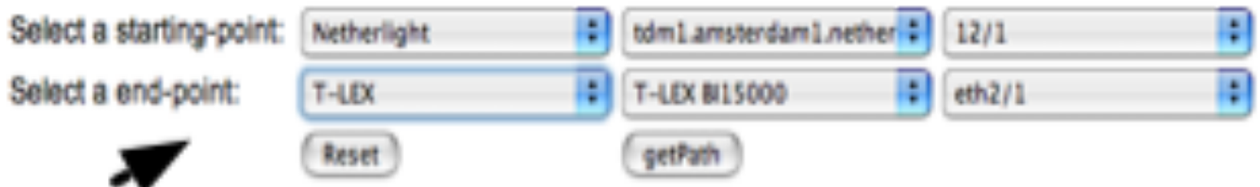
Network Description Language

We started on a set of properties and classes to describe networks:



Step 3: Pathfinding

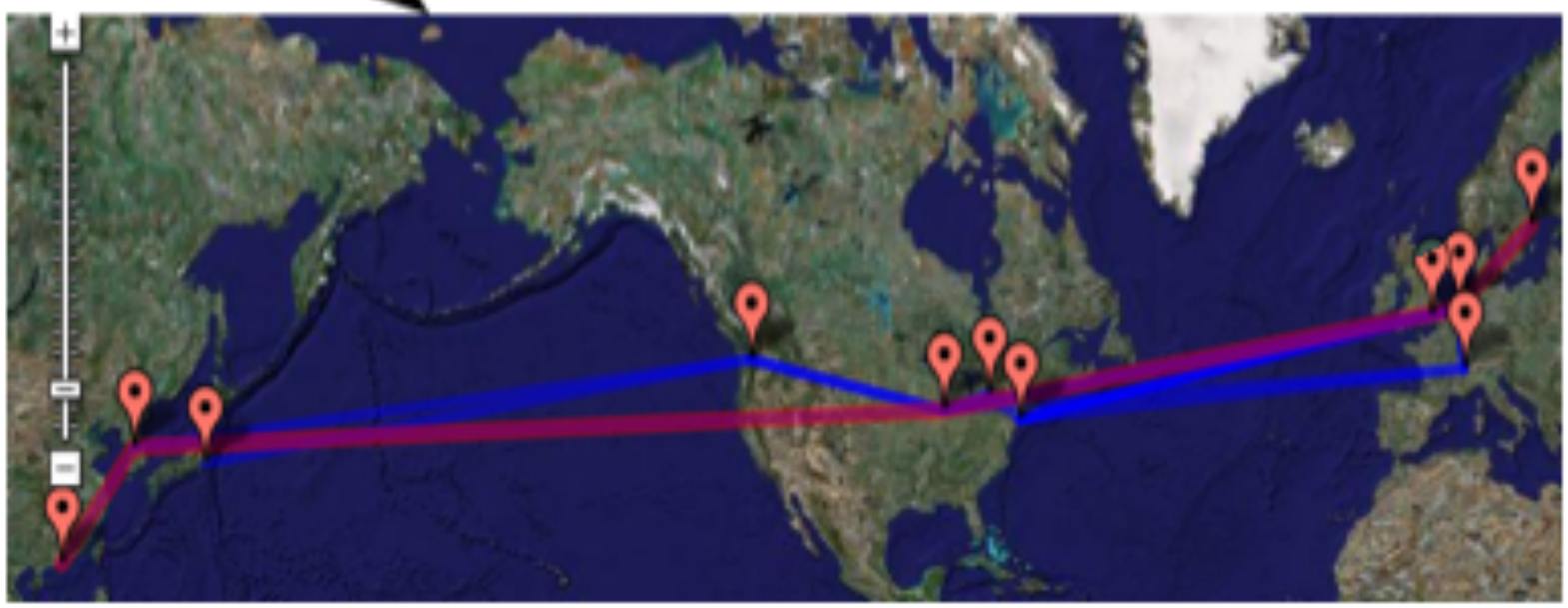
Begin- and end-point selection



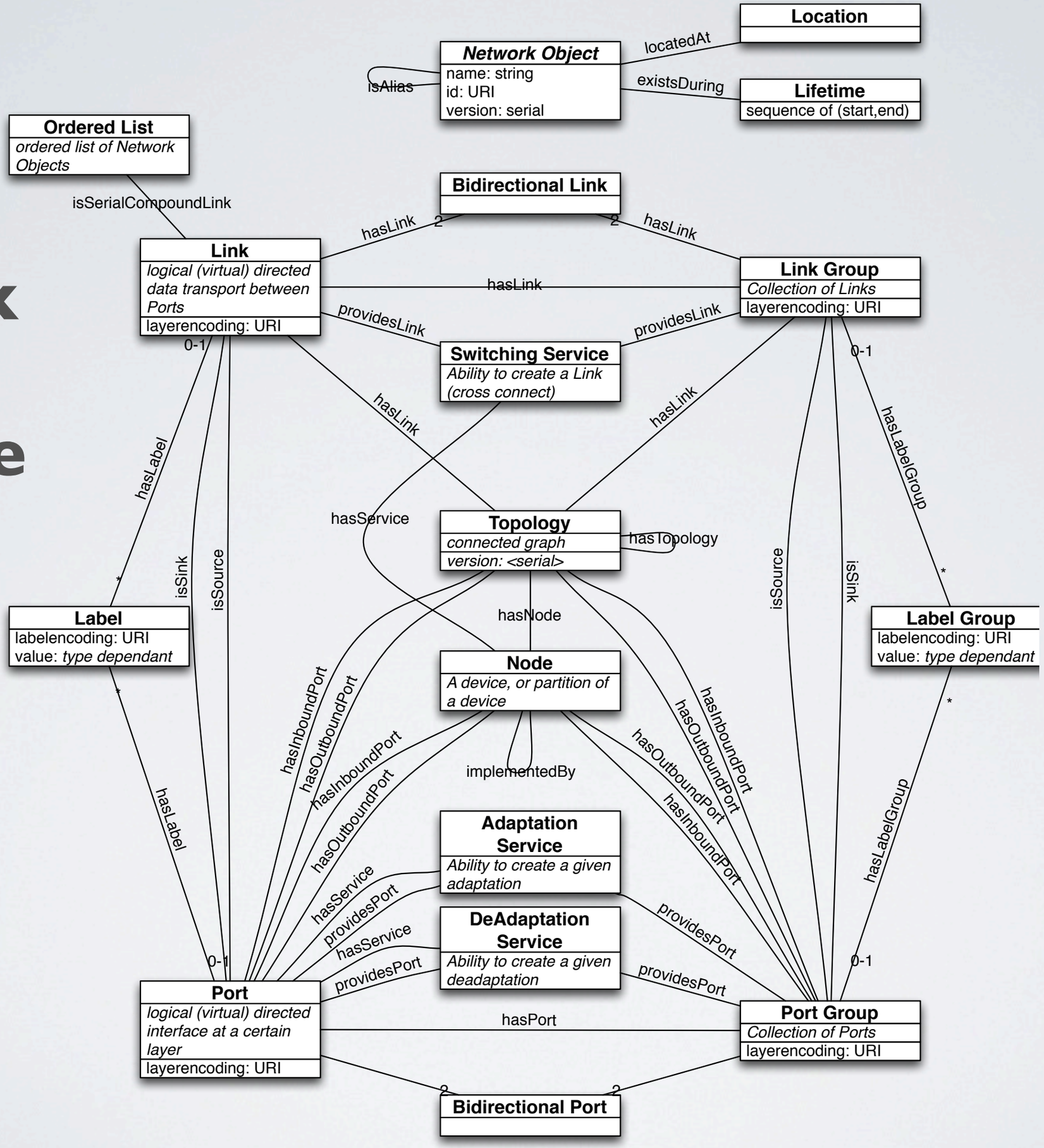
Feed into pathfinding webservice

NDL Webservice

Visualisation using Google Maps



Network Markup Language



GFD-R-P.206
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Freek Dijkstra, SURFsara
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May 2013

Network Markup Language Base Schema version 1

Status of This Document

Grid Final Draft (GFD), Proposed Recommendation (R-P).

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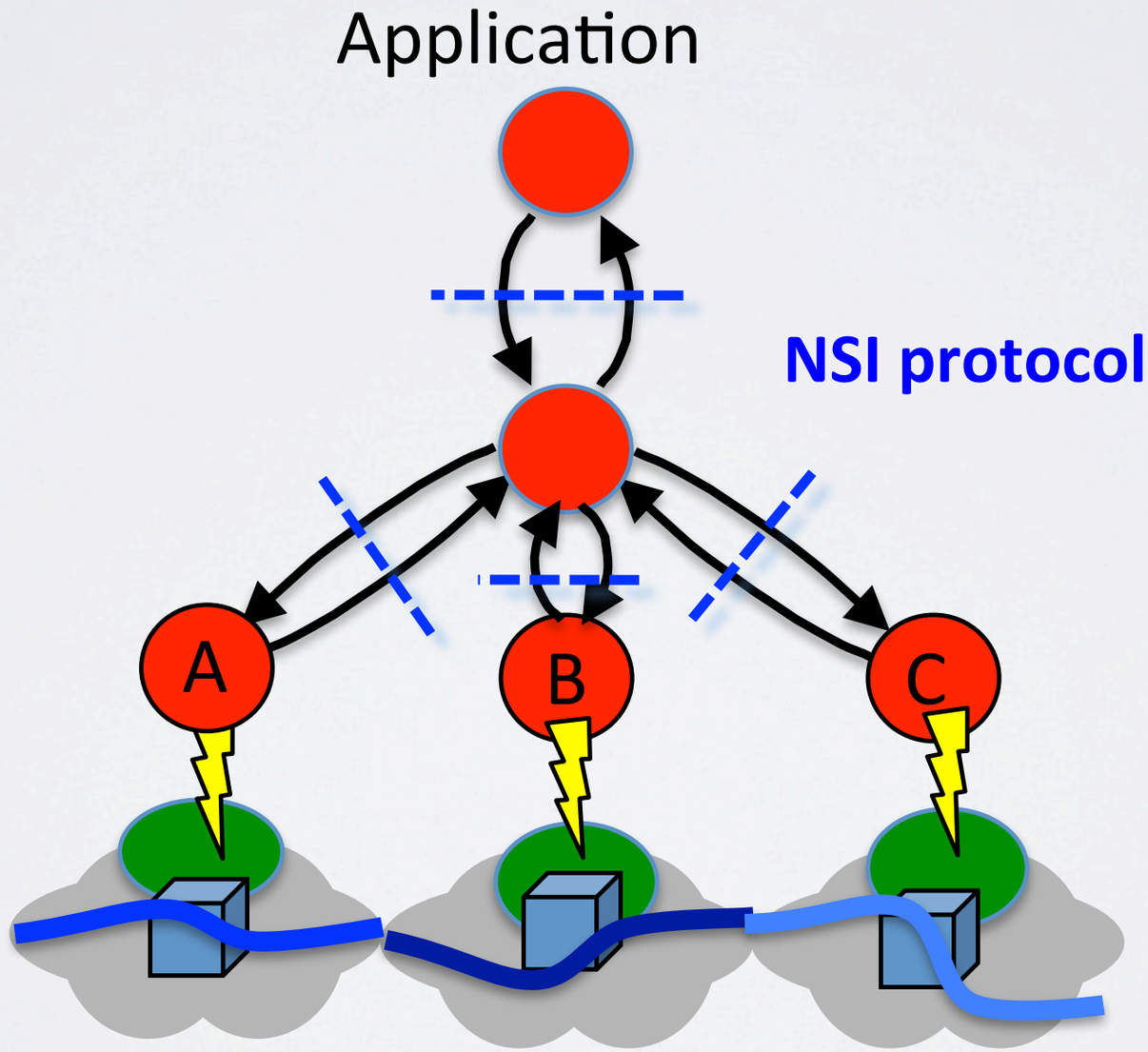
Abstract

This document describes a set of normative schemas which allow the description of computer network topologies.

Network Services Interface



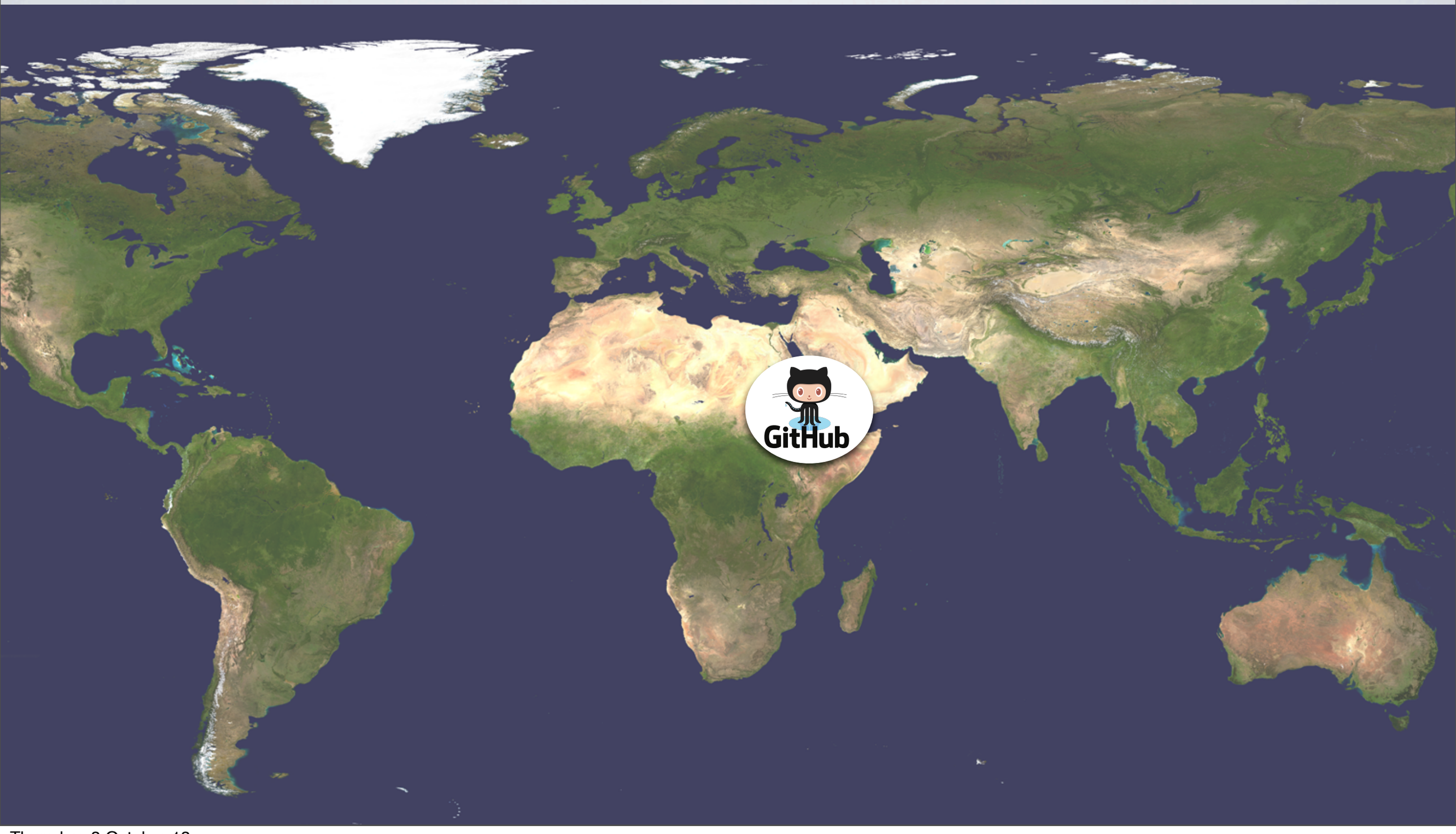
Topology Distribution

Dictator
Model

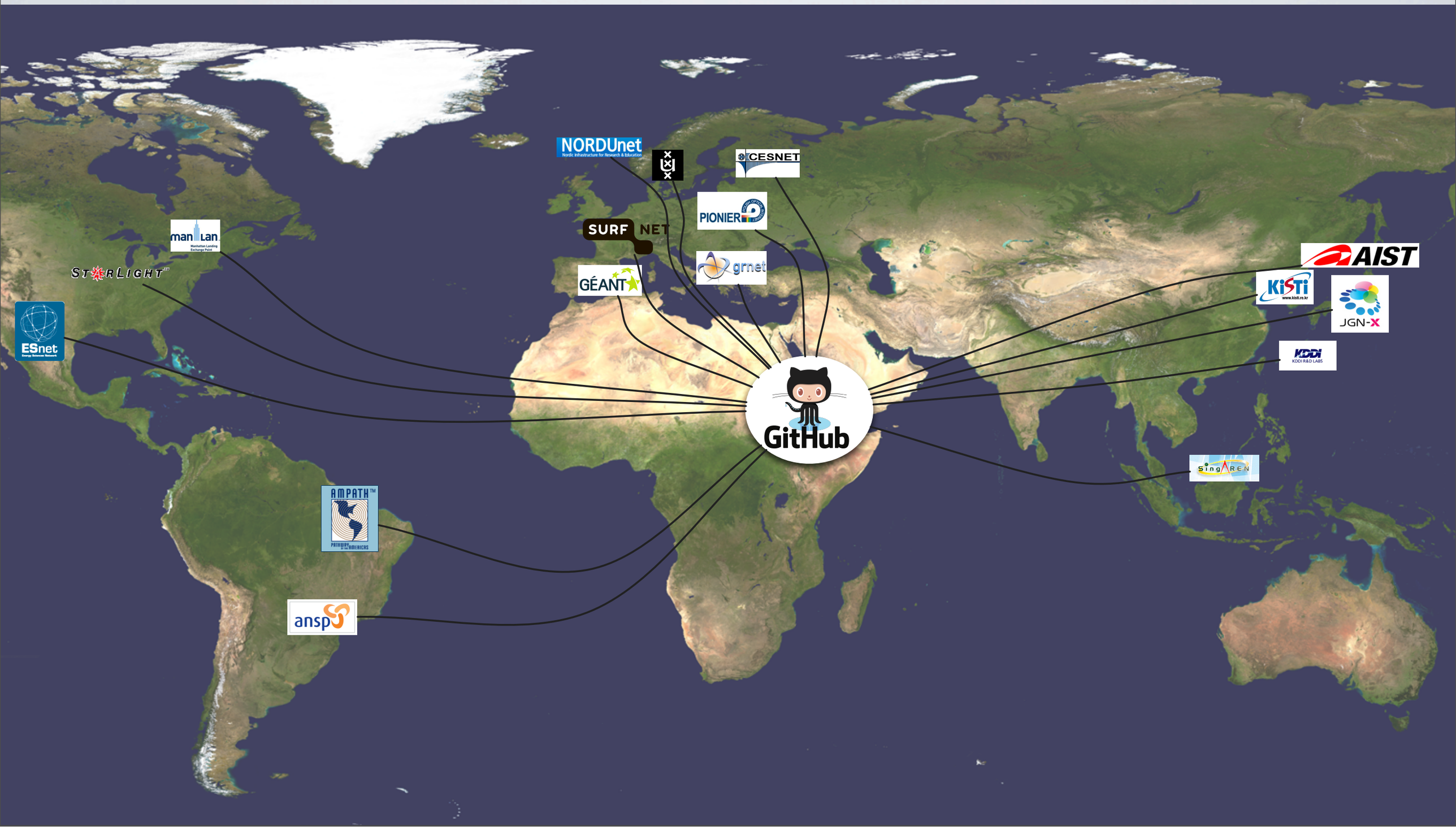
Distributed
Model

NSI
Topology-Service
Peer-to-Peer
Model

Distributed Topology



Distributed Topology

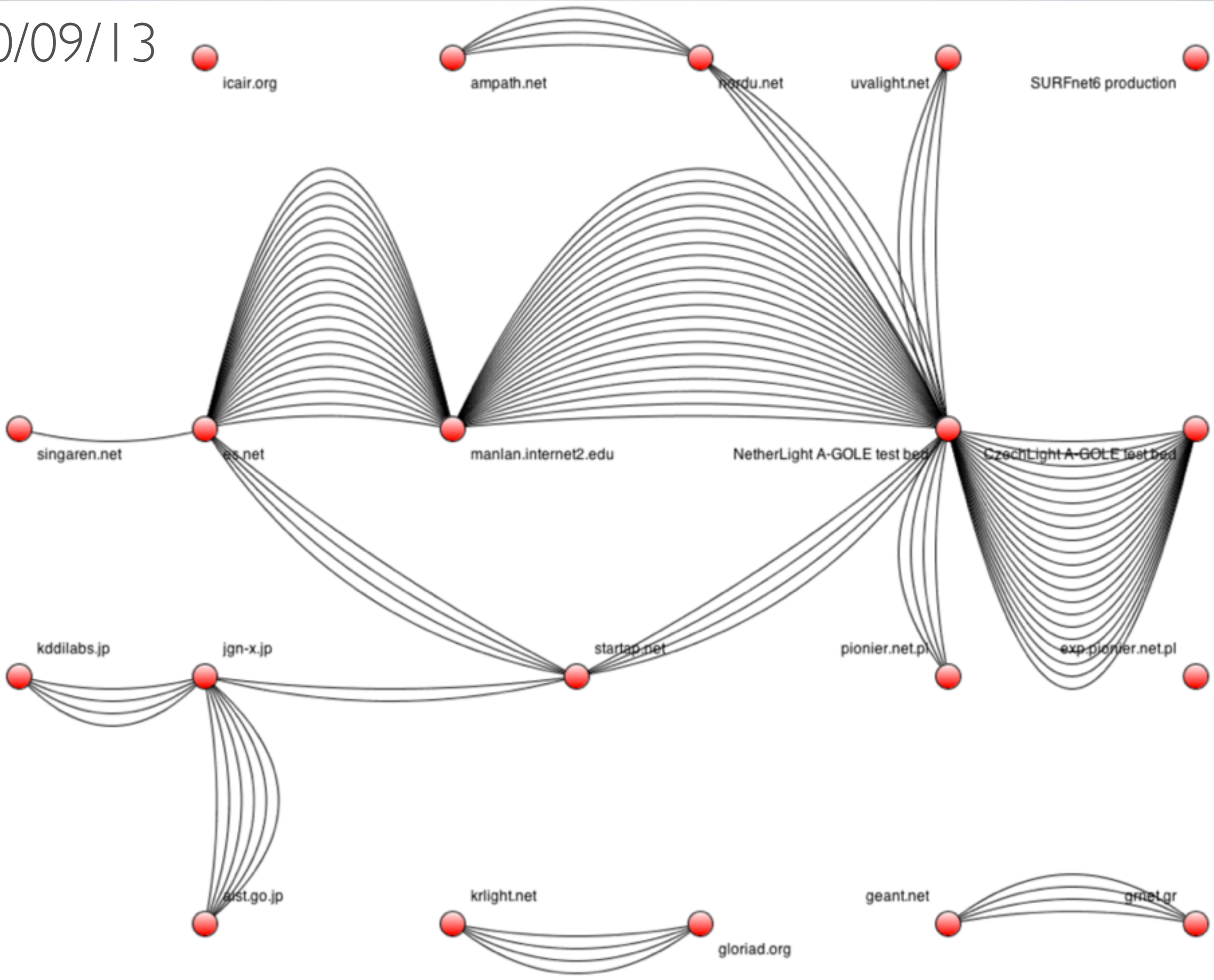


Topology Success!

Challenges

- AutoGOLE topologies
  - Syntactic validation of XML is easy
  - Semantic validation in XML is very hard
  - Semantic validation in RDF/OWL is easy...
    - Procedural changes required!

30/09/13


icair.org
ampath.net
nordu.net
uvalight.net
SURFnet6 production
singaren.net
es.net
manlan.internet2.edu
NetherLight A-GOLE test bed
CzechLight A-GOLE test bed
kddilabs.jp
jgn-x.jp
startap.net
pionier.net.pl
exp.pionier.net.pl
dst.go.jp
krlight.net
gloriad.org
geant.net
grnet.gr

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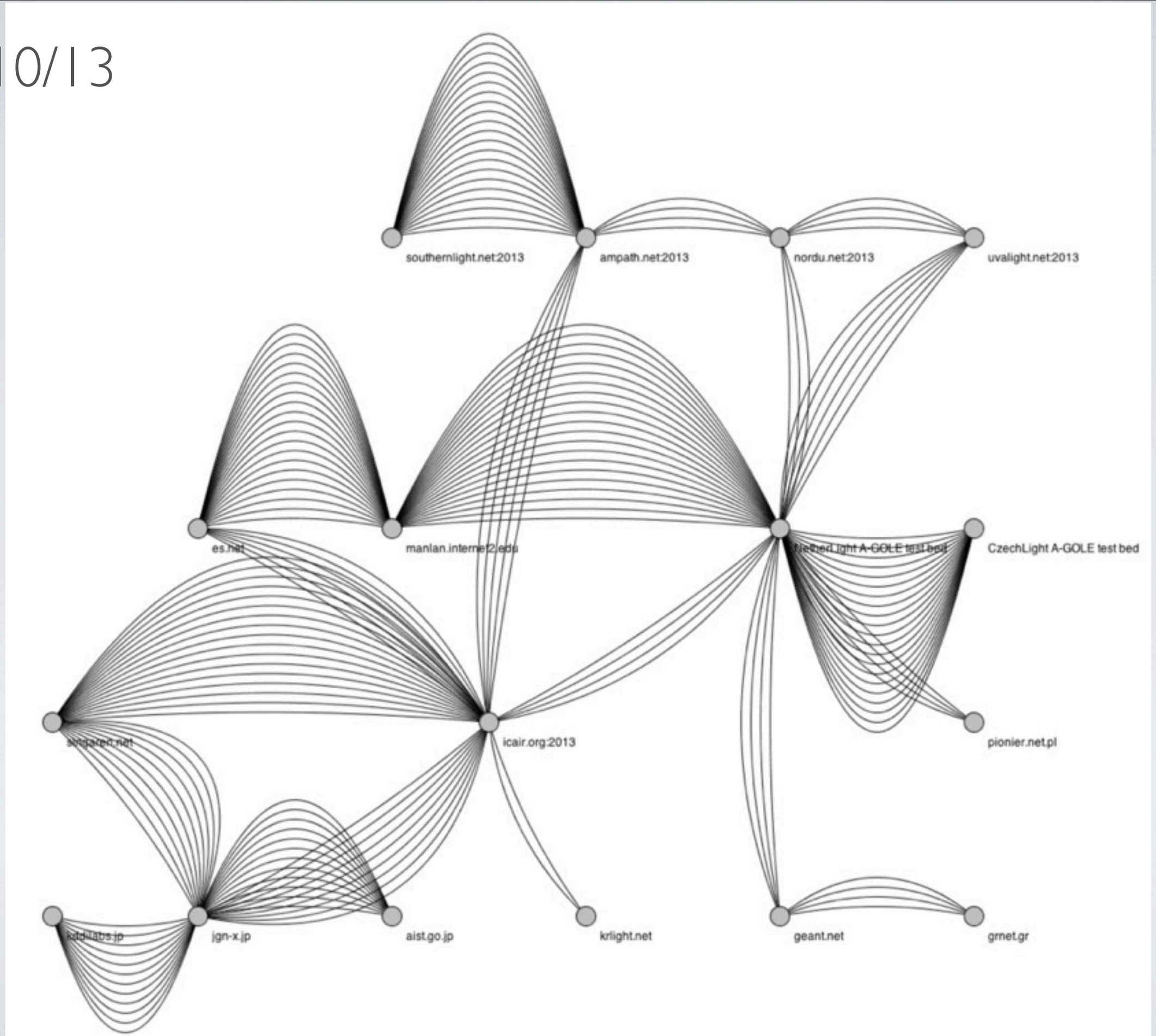
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nordu.net:2013
uvalight.net:2013
es.net
manlan.internet2.edu
CzechLight A-GOLE test bed
pionier.net.pl
icair.org:2013
aist.go.jp
krlight.net
geant.net
grnet.gr

Near-Future Challenges

- AutoGOLE topologies
  - Syntactic validation of XML is easy
  - Semantic validation in XML is very hard
  - Semantic validation in RDF/OWL is easy...
    - Procedural changes required!

Innovations

- Distributed Topology Exchange (2005) - *NDLv1*

- Zero Configuration IP in Optical Networks (2005)

- Describing Multi-Layer Topologies (2008) - *NDLv2*

- Semantic descriptions of Infrastructures (2012) - *INDL*

Current Research SNE

- ExoGENI infrastructure
- Semantic Workflow descriptions
- Semantic Energy description & GreenSONAR

Future Challenges

- Network is only the beginning
  - Need to enable computing
  - Tie in with the whole infrastructure
- SDN is a great research field
  - But still only a network transport technology

So long and thanks for all the topologies!

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