Network Description Language Update

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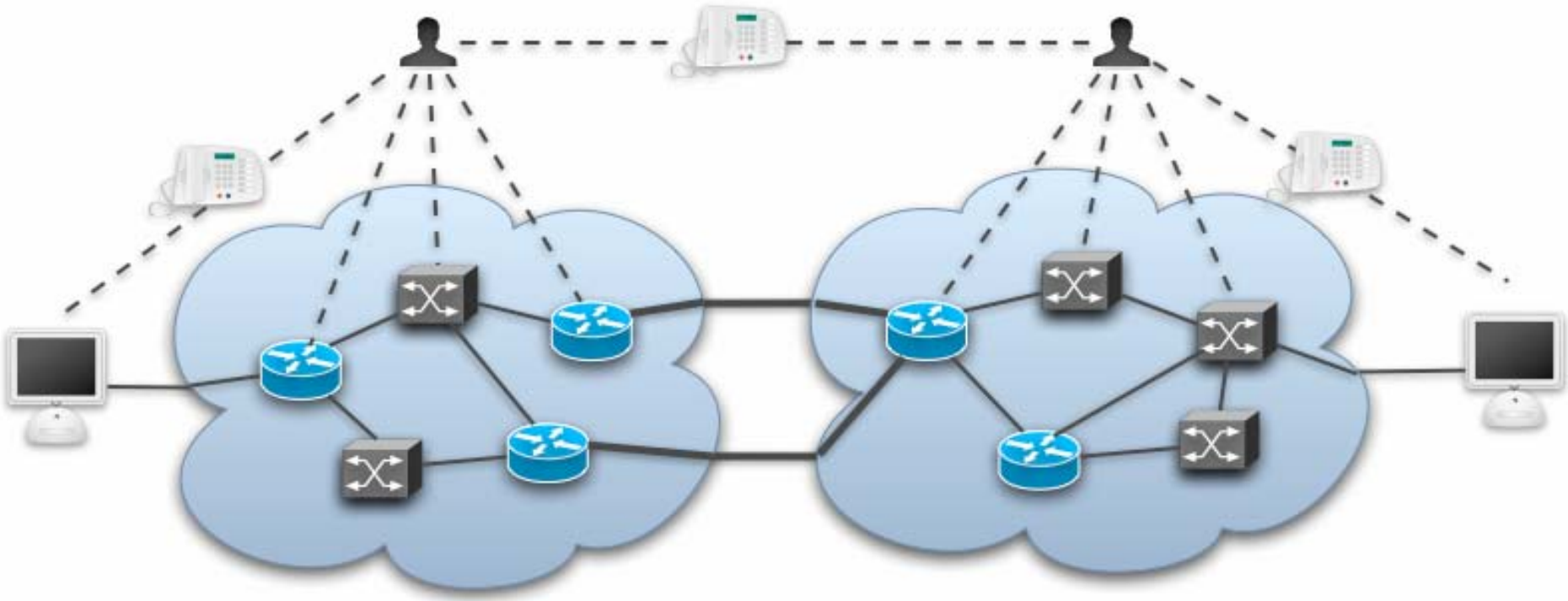
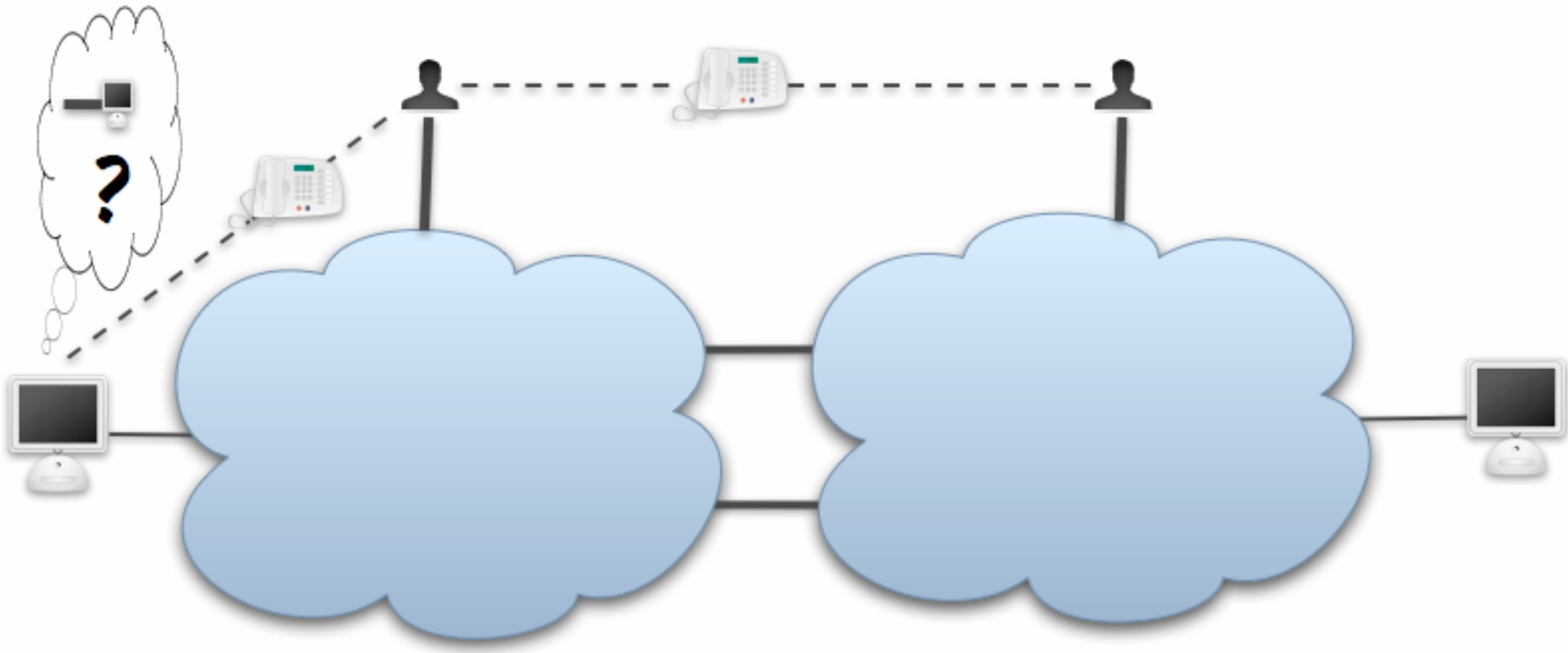
Outline

- Current Provisioning
- Network Descriptions
- NDL Recap
- Tools for NDL

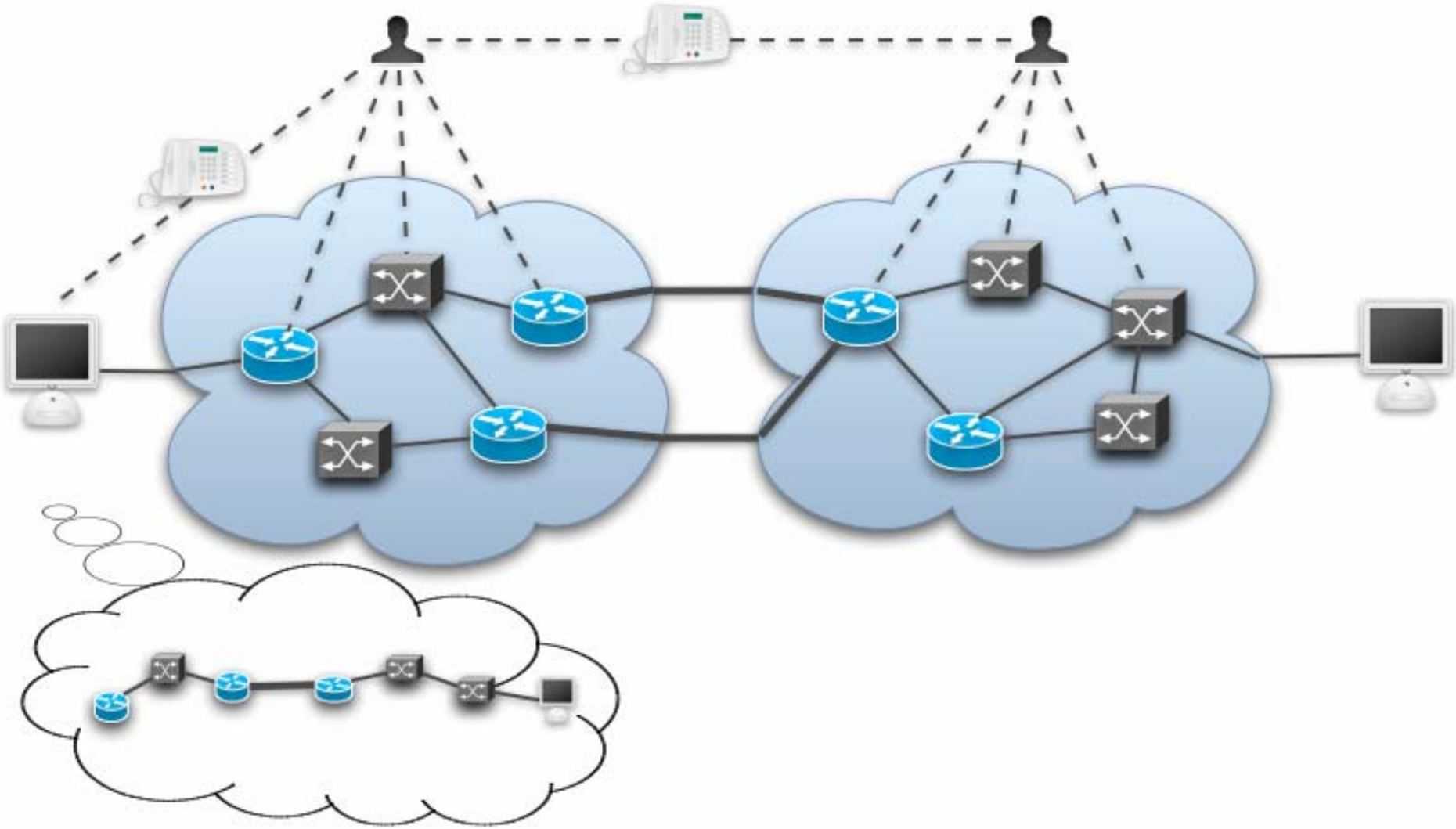
Current Control Plane



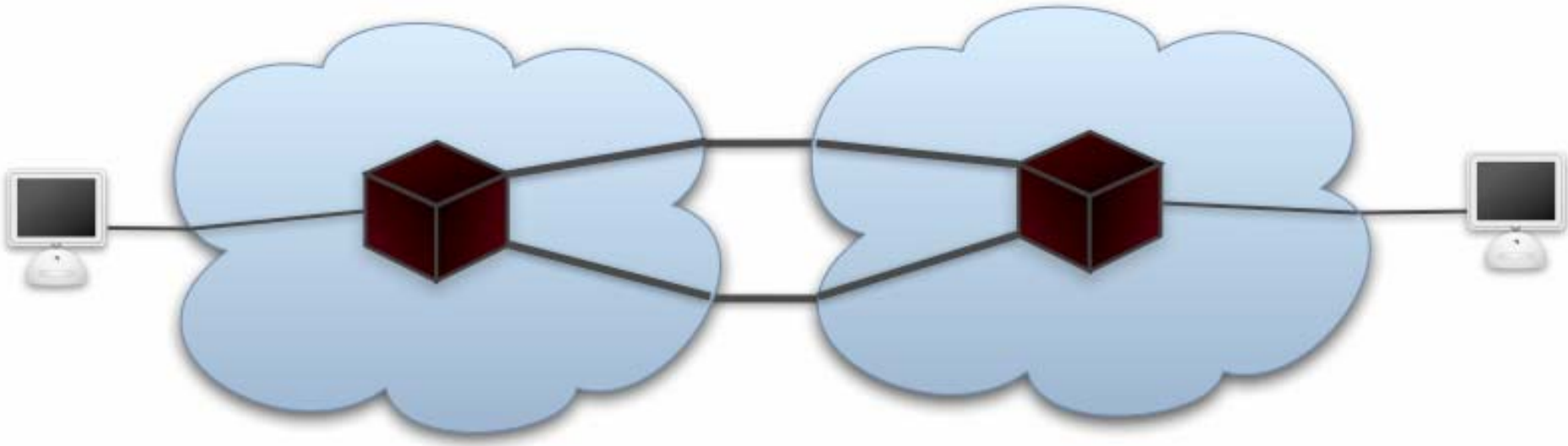
Current Provisioning Process



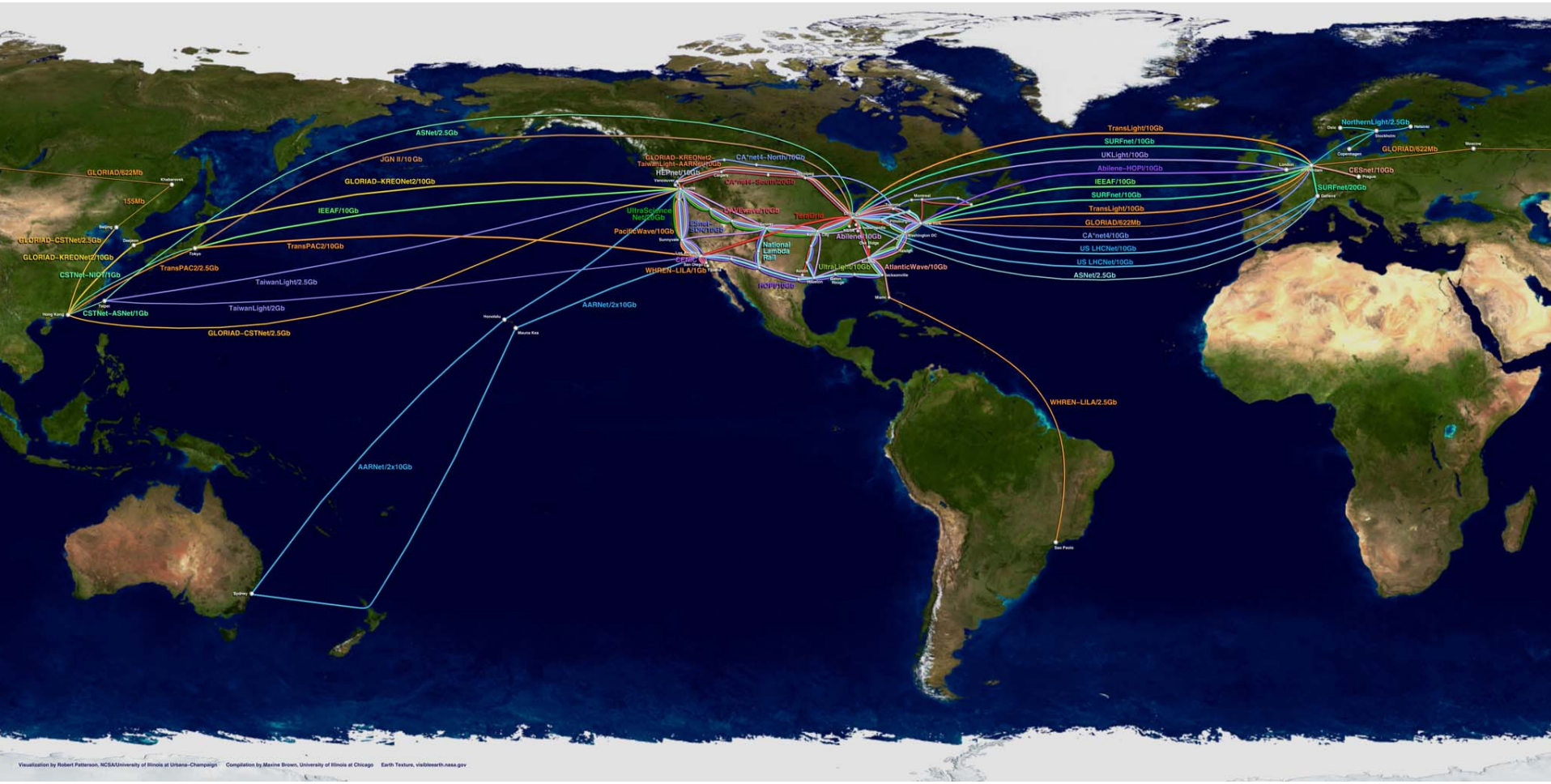
Current Provisioning Process



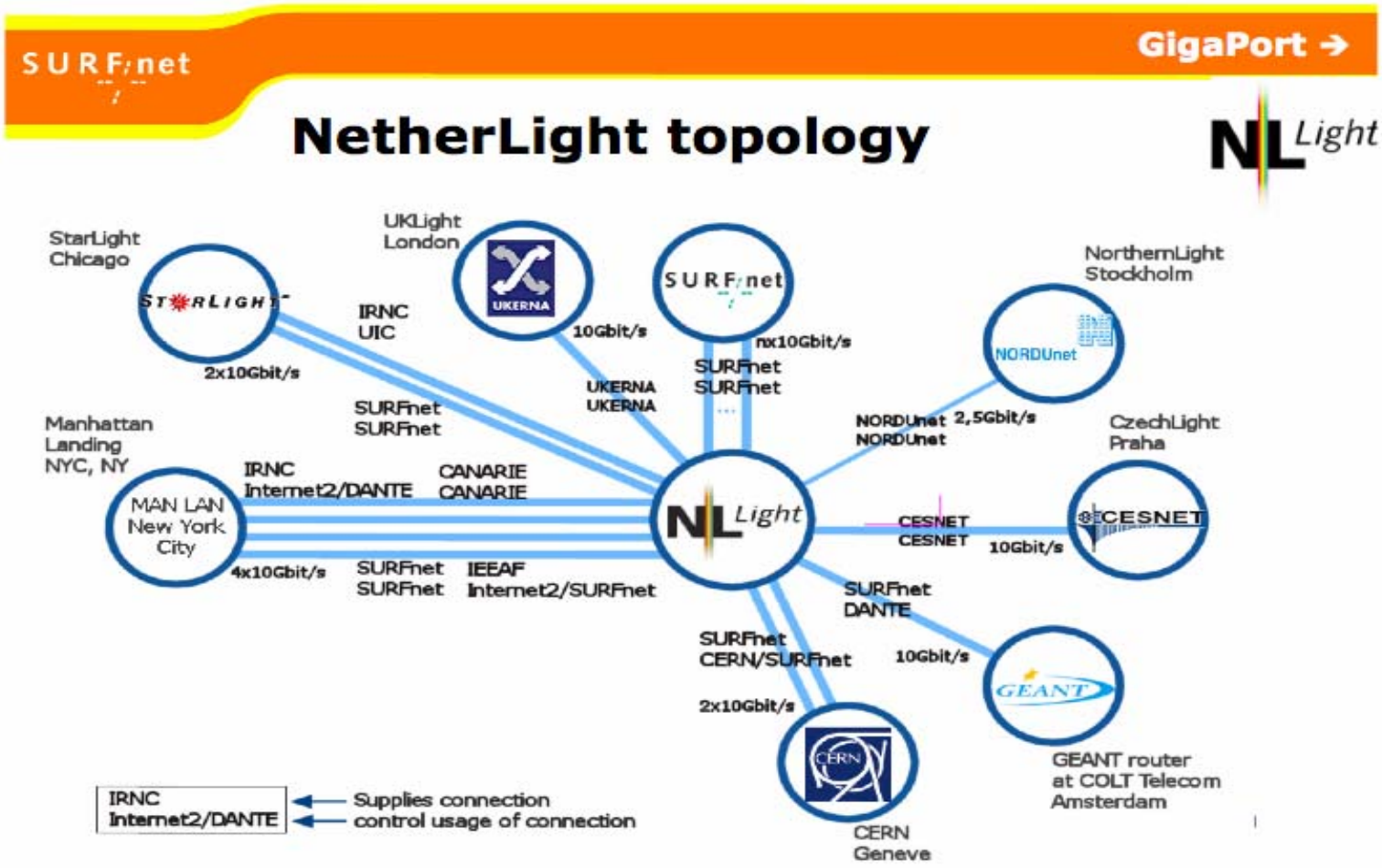
Ultimate Goal of GLIF



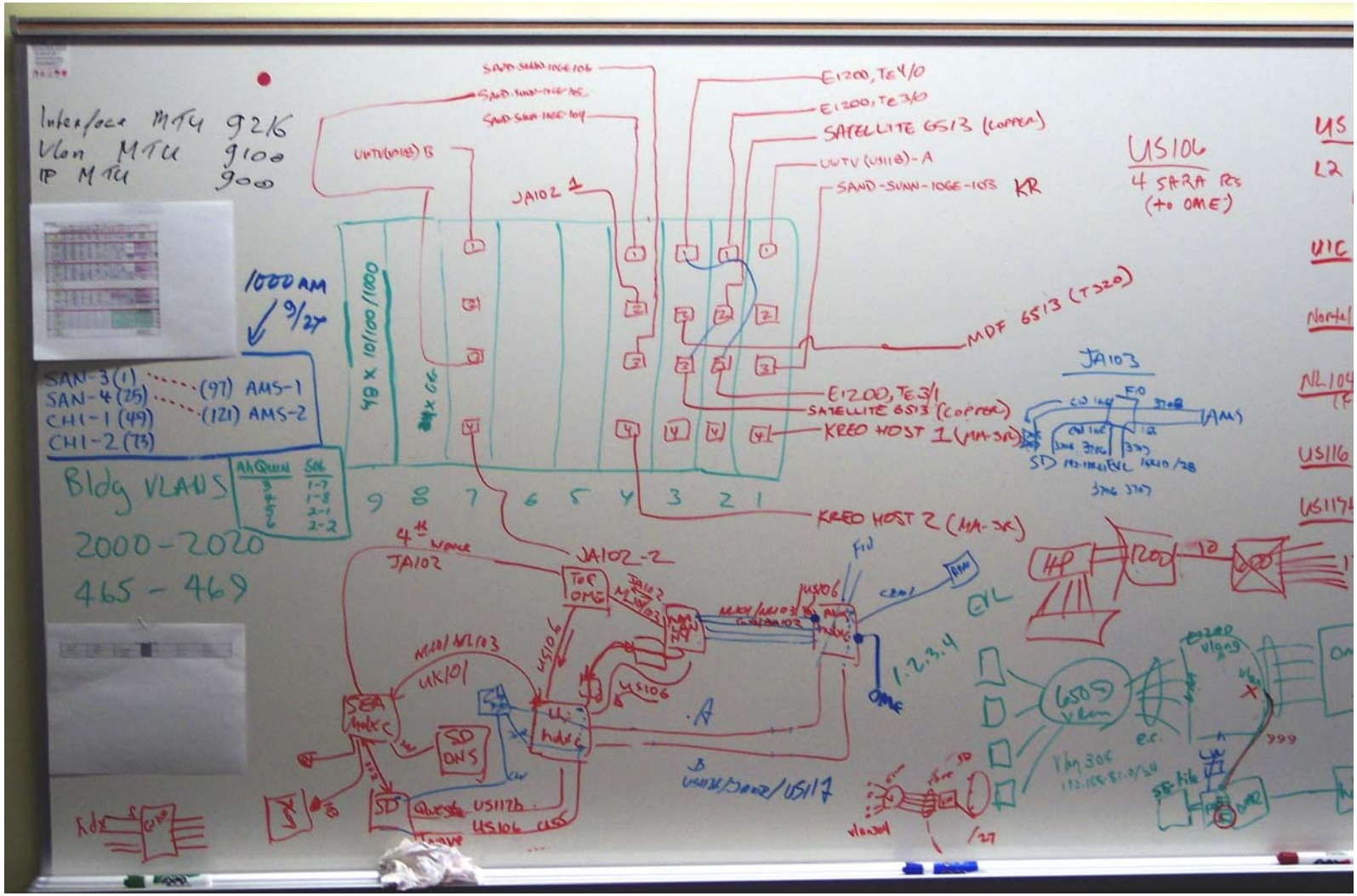
Network Descriptions - GLIF



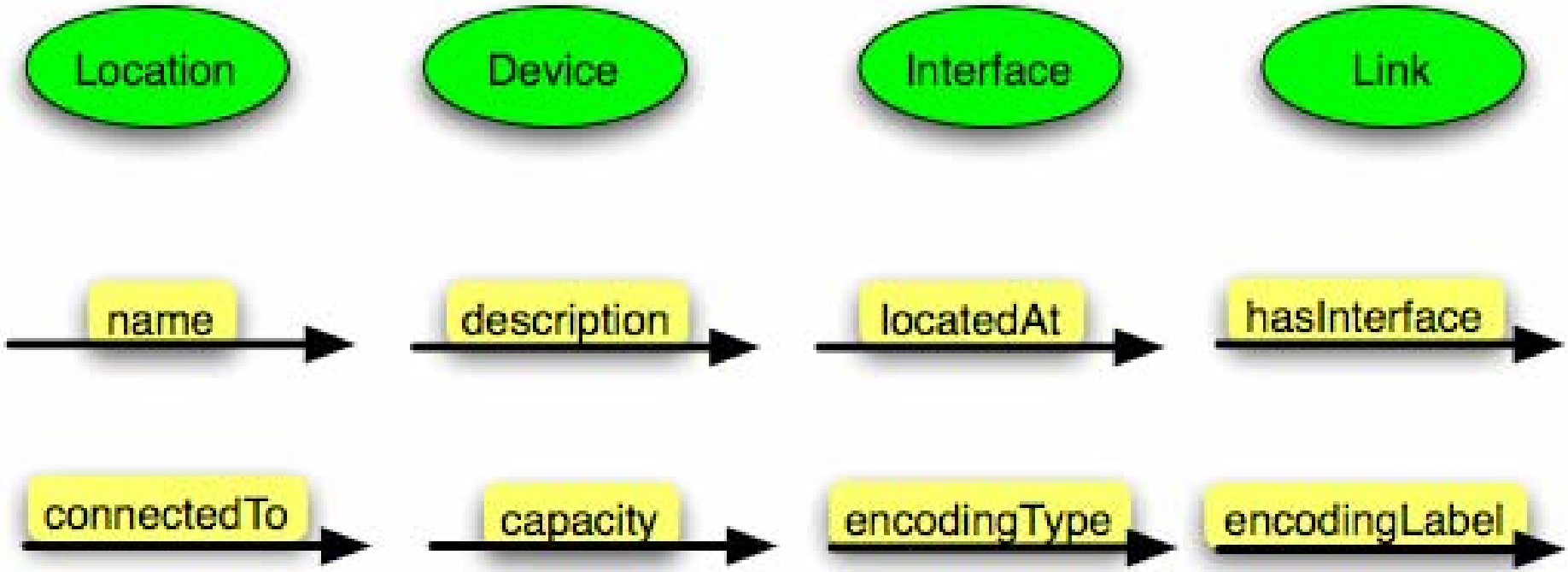
Network Descriptions - GOLE



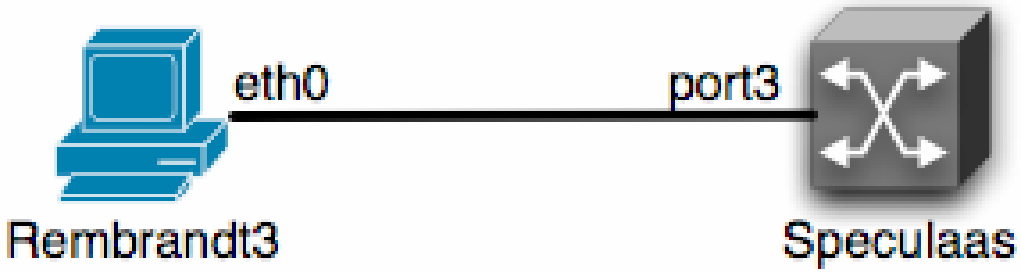
Network Descriptions - iGrid



Network Description Language



NDL Example




```
<ndl:Device rdf:about="#Rembrandt3">
    <ndl:name>Rembrandt3</ndl:name>
    <ndl:locatedAt rdf:resource="#Lighthouse"/>
    <ndl:hasInterface rdf:resource="#Rembrandt3:eth0"/
</ndl:Device>
<ndl:Interface rdf:about="#Rembrandt3:eth0">
    <ndl:name>Rembrandt3:eth0</ndl:name>
    <ndl:connectedTo rdf:resource="#Speculaas:port3"/>
</ndl:Interface>
```

NDL Generator

Step 1 - Location

Indicate the name and a short description of the network that is going to be described in NDL.

Name Lighthouse Description SNE Lab

Provide also the latitude and the longitude of this location: this will aid the vizualization programs.
Both latitude and longitude should use **floating point** notation.

Latitude 52.3651 Longitude 4.9527

Step 2 - Devices

Indicate the name of all the devices present in the network. If you need to describe more than 3 devices just "Add a Device"

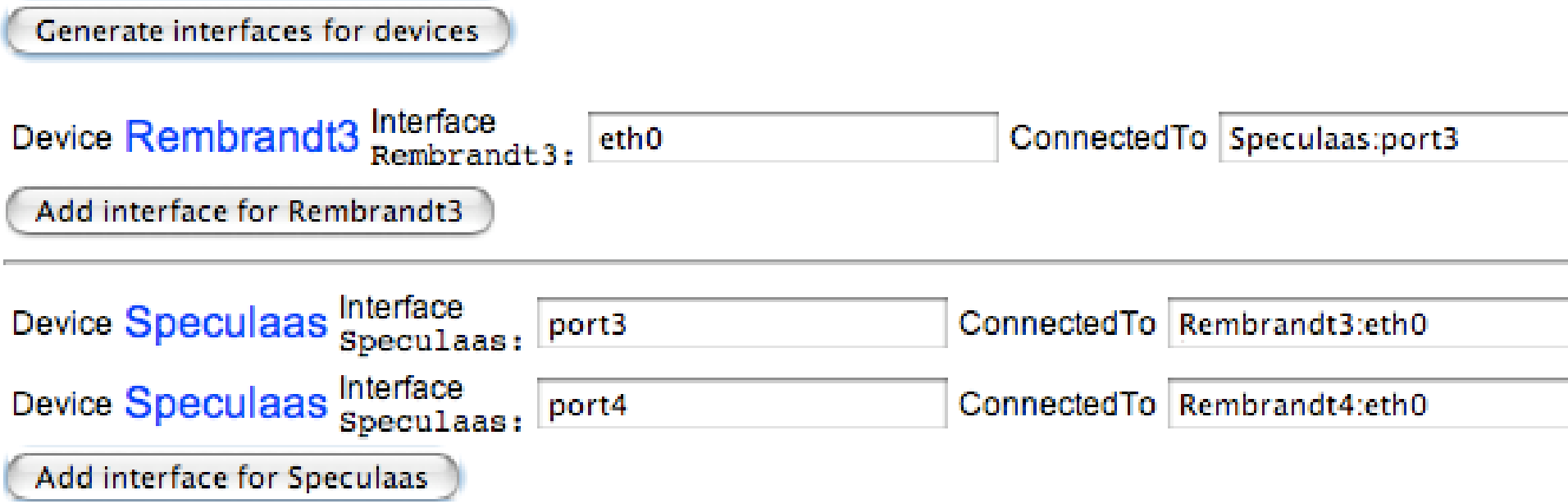
Device Rembrandt3

Device Speculaas

Device

Add a Device

NDL Generator (ctd.)

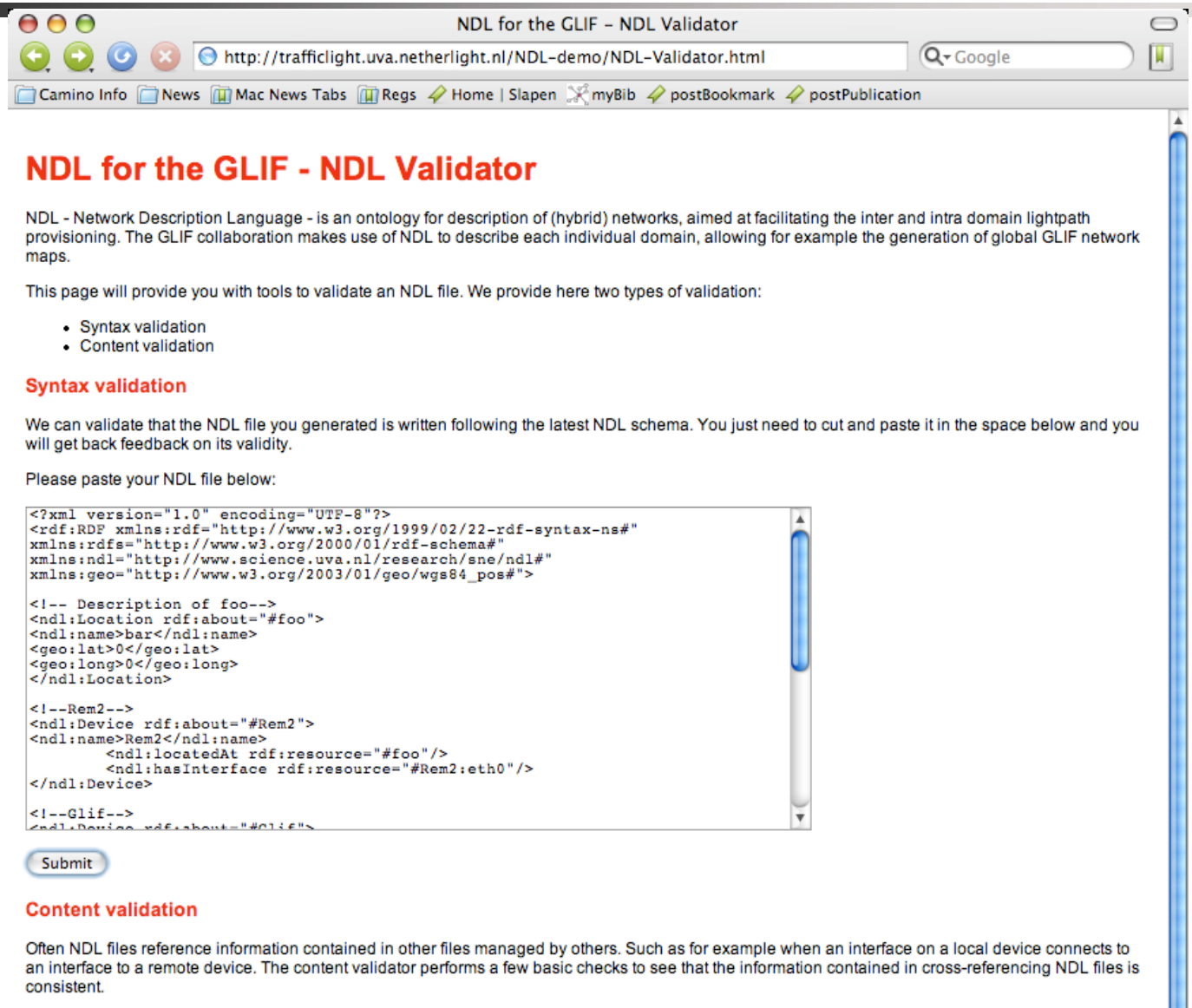


http://trafficlight.uva.netherlight.nl/NDL-Demo/

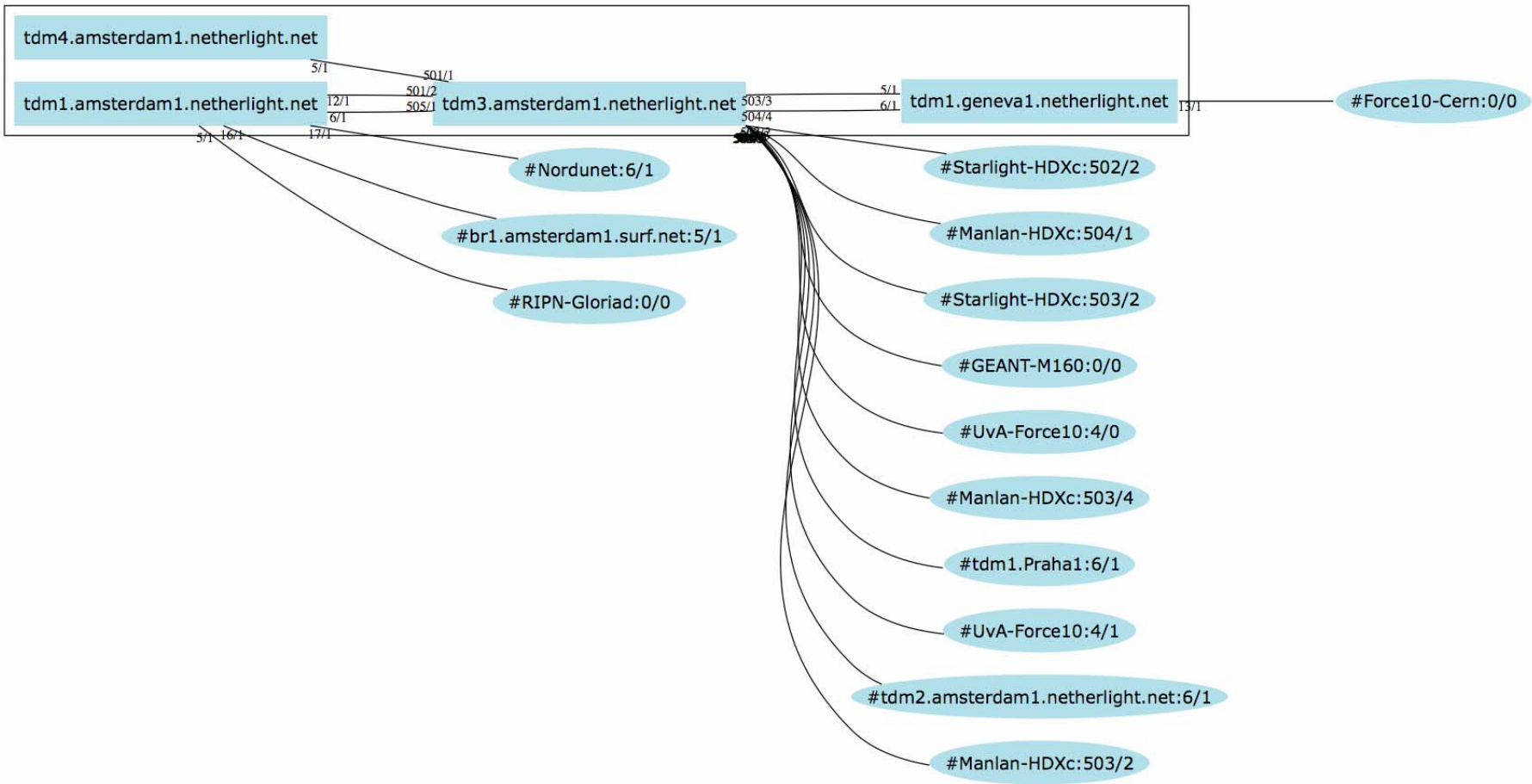
NDL Generator Result

```
<?xml version="1.0" encoding="UTF-8"?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
xmlns:ndl="http://www.science.uva.nl/research/sne/ndl#"
xmlns:geo="http://www.w3.org/2003/01/geo/wgs84_pos#">

<!-- Description of Lighthouse-->
<ndl:Location rdf:about="#Lighthouse">
<ndl:name>SNE Lab</ndl:name>
<geo:lat>52.3651</geo:lat>
<geo:long>4.9527</geo:long>
</ndl:Location>

<!--Rembrandt3-->
<ndl:Device rdf:about="#Rembrandt3">
<ndl:name>Rembrandt3</ndl:name>
    <ndl:locatedAt rdf:resource="#Lighthouse"/>
    <ndl:hasInterface rdf:resource="#Rembrandt3:eth0"/>
</ndl:Device>

<!--Speculaas-->
<ndl:Device rdf:about="#Speculaas">
<ndl:name>Speculaas</ndl:name>
```

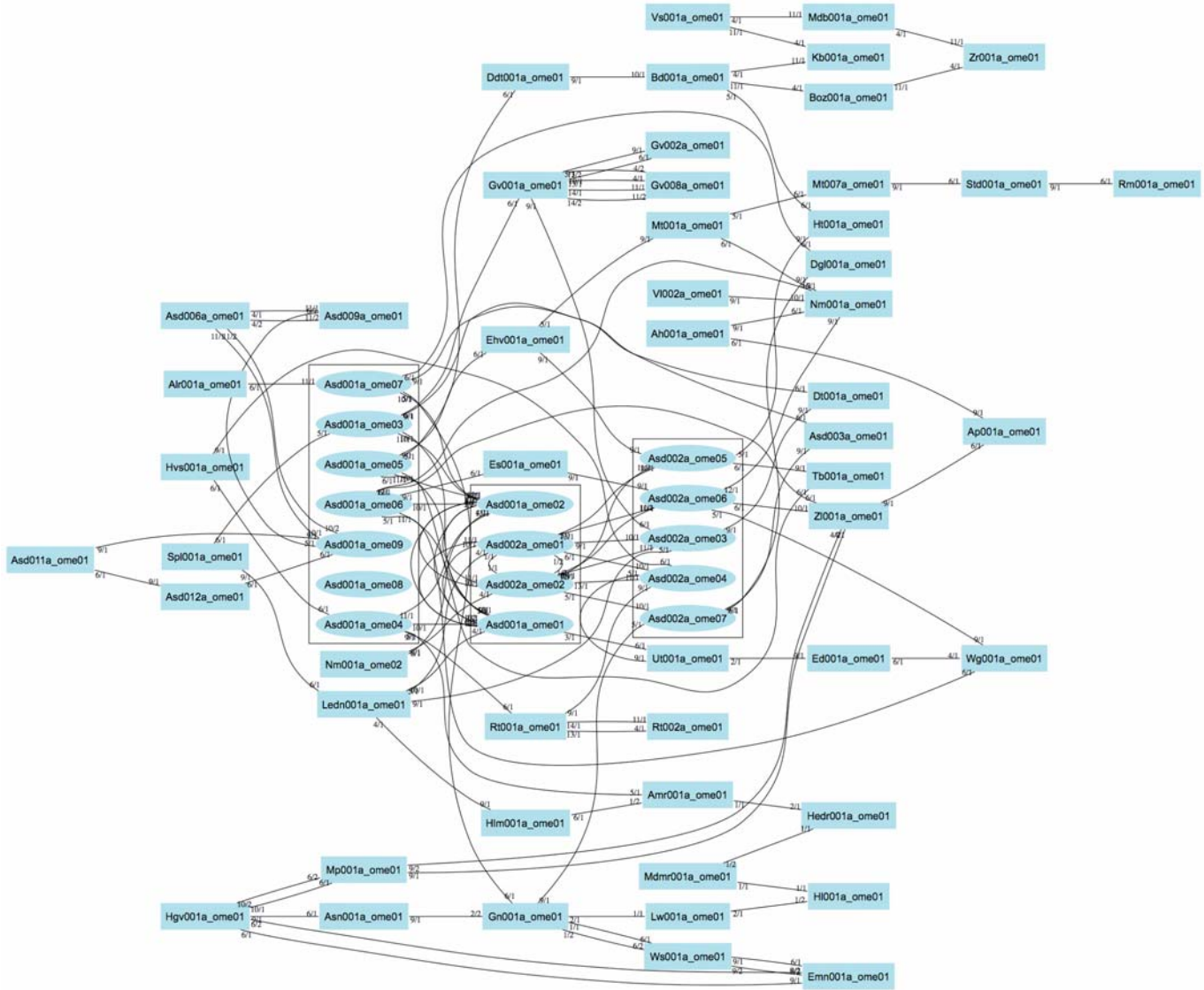
NDL Validator



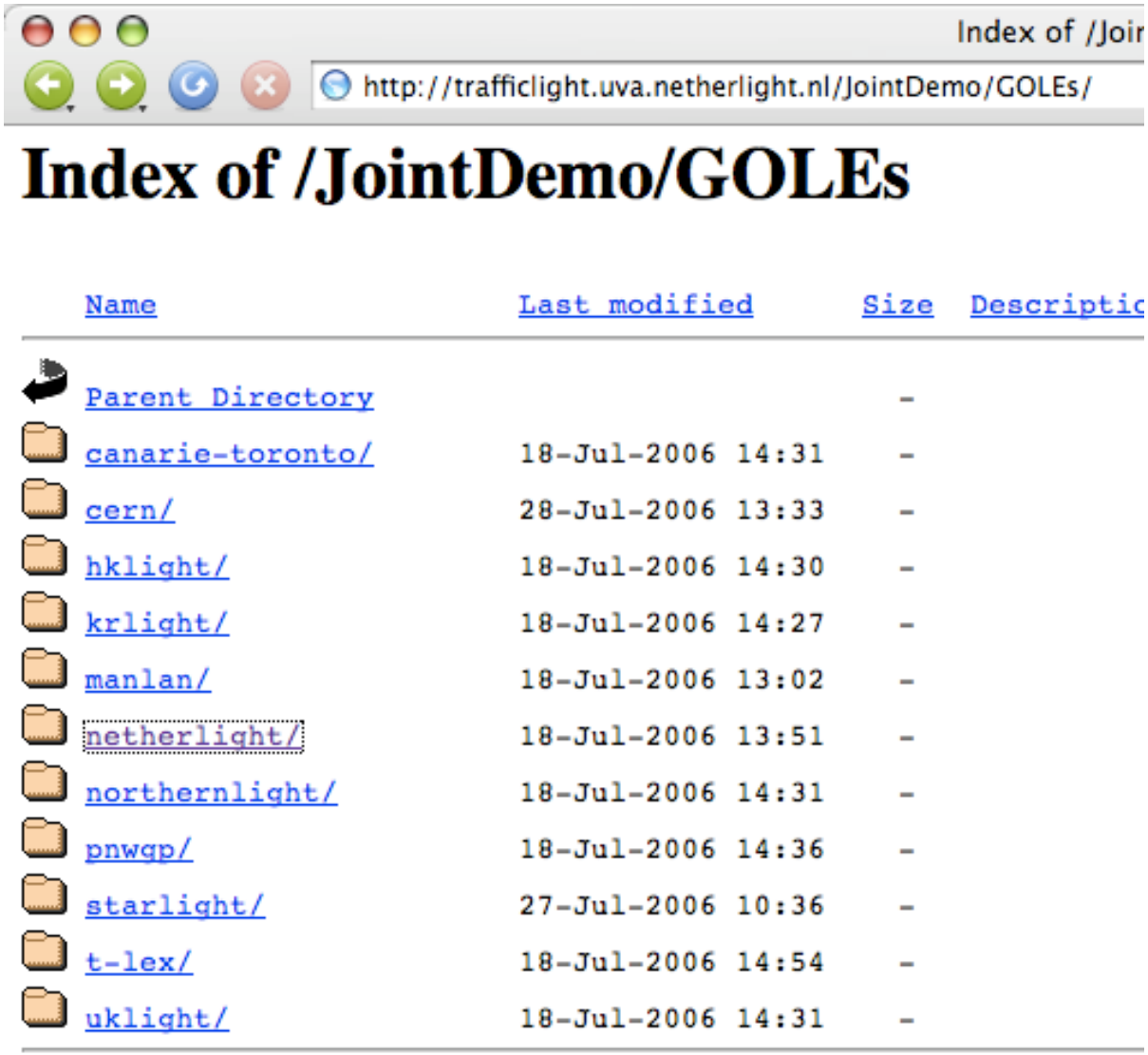
NDL Visualisation



NDL Visualisation (ctd.)



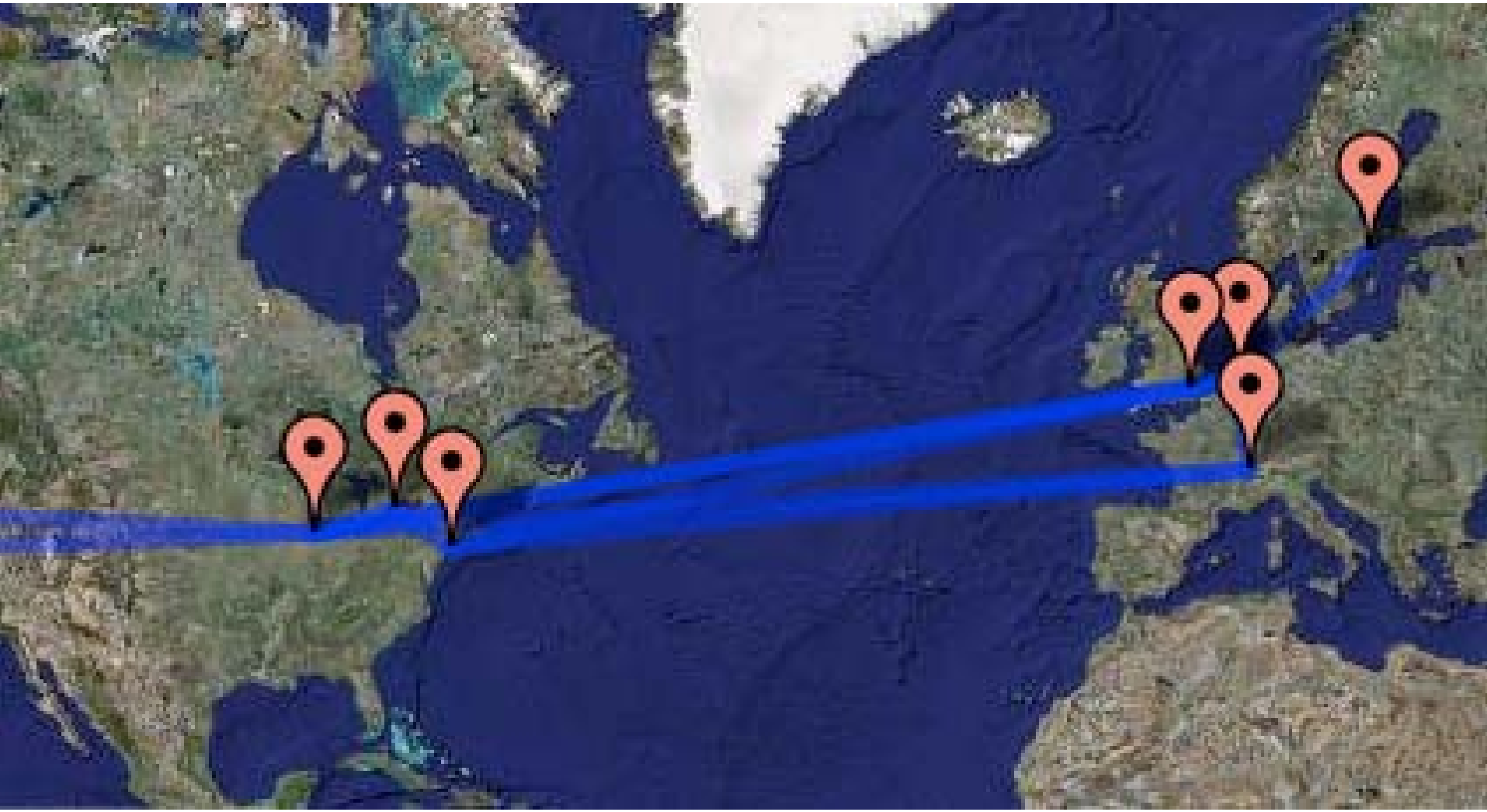
GOLE Descriptions



GOLE Descriptions (ctd.)

```
<ndl:Interface rdf:about="#netherlight:if5">
    <ndl:name>netherlight:if5</ndl:name>
    <ndl:connectedTo
rdf:resource="http://trafficlight.uva.netherlight.nl/JointDemo/GOLEs/starlight
/starlight.rdf#starlight:if3"/>
</ndl:Interface>

<!--http://trafficlight.uva.netherlight.nl/JointDemo/GOLEs/starlight/starlight
.rdf#starlight:if3-->
<ndl:Interface
rdf:about="http://trafficlight.uva.netherlight.nl/JointDemo/GOLEs/starlight/st
arlight.rdf#starlight:if3">
    <rdfs:seeAlso
rdf:resource="http://trafficlight.uva.netherlight.nl/JointDemo/GOLEs/starlight
/starlight.rdf"/>
</ndl:Interface>

<!--netherlight:if6-->
<ndl:Interface rdf:about="#netherlight:if6">
    <ndl:name>netherlight:if6</ndl:name>
    <ndl:connectedTo
rdf:resource="http://trafficlight.uva.netherlight.nl/JointDemo/GOLEs/starlight
/starlight.rdf#starlight:if4"/>
</ndl:Interface>
```

Enhanced Visualisation



Six easy steps to NDL GLIF

1. Generate description of the exchange point
2. Publish description on a webserver
3. Send URL of description to Kevin
4. URL is posted on GLIF Resources site
5. For each external connection:
   - Once relevant description is available, update your description to link to theirs
   - Conctact them to do the same

Future Research

- Path finding in GLIF
- Network Abstractions
- Multi-Layer Network Descriptions
- Implementation
  - DRAGON
  - Phosphorous
  - …

References

- http://www.science.uva.nl/research/sne/ndl/
- http://trafficlight.uva.netherlight.nl/NDL-demo/
- http://staff.science.uva.nl/~vdham/NDL/googlemap.html