

Practical demonstration of Network Descriptions

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GLIF meeting, Tokyo



Introduction

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- What can NDL do for you?

A white speech bubble with a black outline and a black drop shadow, set against a black background. The text inside the bubble is in a bold, red, sans-serif font.

**what's
in it
for me?**

- SARA as partner in the SURFnet6 NOC-alliance responsible for:

- Netherlight
- SURFnet6



- NDL used in several applications:
 - Visualization
 - Path Finding
 - Monitoring / Fault isolation
 - Reporting of resources

Describe your network



“Power” of NDL:

- **Create an NDL description of all your network(s), use your* generic NDL tools for all your networks!**

*** or use already existing tools!**

2 sources of information per network:

- **Network Description (NDL) (static)**
- **MySQL database with crossconnect information (dynamic)**

- **NDL Perl library**

- Perl library which provides access to the NDL and SQL information:

- **Examples NDL.pm:**

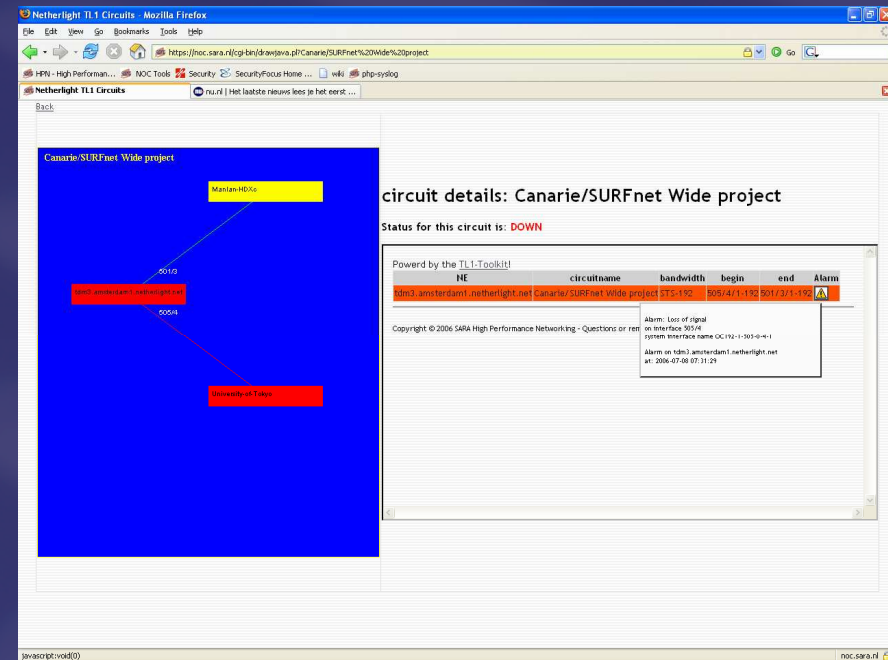
- `GET-IF-LIST() ;`
- `GET-IF-LIST-TIMESLOT($number_of_timeslots) ;`
- `GET-VC4-LIST($interface) ;`
- `GET-PATH($hostA, $hostB, $bandwidth) ;`
- `GET-PATH-PROT($hostA, $hostB, $bandwidth) ;`
- `GET-neighbour($interface)`

And lots more ☺

FREE DOWNLOAD: <http://nrg.sara.nl/ndl/>

Demonstrations

- SURFnet6 Lightpath planning (Reservation system)
- SURFnet6 reporting capacity of SDH network
- Netherlight Lightpath status overview
- GLIF NDL webservices



The screenshot shows a web browser window titled 'Netherlight TLI Circuits - Mozilla Firefox'. The address bar shows the URL: <https://noc.sara.nl/cgi-bin/showjava.pl?Canarie/SURFnet%20Wide%20project>. The page content includes a network diagram on the left and circuit details on the right.


Canarie/SURFnet Wide project

The diagram shows a network topology with nodes: 'Mantien-HD/ce' (yellow), '2012' (red), '2004' (red), and 'Utrechtback-Taps' (red). Lines connect 'Mantien-HD/ce' to '2012', '2012' to '2004', and '2004' to 'Utrechtback-Taps'.

circuit details: Canarie/SURFnet Wide project

Status for this circuit is: **DOWN**

Powered by the TLI Toolkit!

NE	circuitname	bandwidth	begin	end	Alarm
tdm3.amsterdam1.netherlight.net	Canarie/SURFnet Wide project	575-152	2007/4/1-133	2011/11/192	

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Alarm: Loss of signal on interface 302/4 (system interface name OC 192-1-103-0-1) Alarm on tdm3.amsterdam1.netherlight.net at: 2006-07-08 07:31:29



Lightpath Planning in SURFnet6

- **The challenge:**

- Dense SDH network
- Difficult to find (protected) paths manually
- Requirement to make reservations

- **The resources:**

- Description of the SURFnet6 SDH network in NDL *
 - Automatically generated by retrieving NE information
- SQL Database with timeslots information *

* Powered by the TL1 Toolkit

- **The result.....**



Lightpath Planning in SURFnet6



SURFnet6

Research on Networks

Please choose the two endpoints of the lightpath:

Asd001a_ome06:3/3

Gn001a_ome01:3/1

- Dt001a_ome01:1/4
- Dt001a_ome01:2/3
- Ed001a_ome01:14/1
- Ed001a_ome01:14/2
- Ehv001a_ome01:3/4
- Emn001a_ome01:12/1
- Emn001a_ome01:12/2
- Es001a_ome01:1/4
- Gn001a_ome01:3/1**
- Gn001a_ome01:3/2
- Gv001a_ome01:1/1
- Gv001a_ome01:3/3
- Gv001a_ome01:3/4
- Gv001a_ome01:4/3
- Gv002a_ome01:2/1
- Gv008a_ome01:2/2
- Hedr001a_ome01:3/1
- Hedr001a_ome01:3/4
- Hlm001a_ome01:1/1
- Hlm001a_ome01:1/2



Lightpath Planning in SURFnet6



Lightpath between Asd001a_ome04:1/4 and Rt001a_ome01:1/3:

Should this be a protected path? yes no

How many VC-4s?

Name of this lightpath:

(finding a path may take some time)



Summary


Primary path		Backup path	
From	To	From	To
Asd001a_ome04:1/4	Asd001a_ome04:9/1	Asd001a_ome04:1/4	Asd001a_ome04:10/1
Rt001a_ome01:6/1	Rt001a_ome01:1/3	Asd001a_ome01:6/1	Asd001a_ome01:10/1
		Asd002a_ome01:10/1	Asd002a_ome01:6/1
		Asd002a_ome04:10/1	Asd002a_ome04:9/1
		Rt001a_ome01:9/1	Rt001a_ome01:1/3

Detailed information

circuitname	Host	nr of timeslots	from	To	protection
Asd001a-Rt001a_GE1 (THIS IS A GLIF DEMO TEST)	Asd001a_ome04	3	1/4 1	9/1 8	10/1 44
Asd001a-Rt001a_GE1 (THIS IS A GLIF DEMO TEST)	Asd001a_ome04	3	1/4 2	9/1 9	10/1 45
Asd001a-Rt001a_GE1 (THIS IS A GLIF DEMO TEST)	Asd001a_ome04	3	1/4 3	9/1 10	10/1 46
Asd001a-Rt001a_GE1 (THIS IS A GLIF DEMO TEST)	Asd001a_ome04	3	1/4 4	9/1 11	10/1 47
Asd001a-Rt001a_GE1 (THIS IS A GLIF DEMO TEST)	Asd001a_ome04	3	1/4 5	9/1 12	10/1 48

Overview of resources

- More Examples:
 - Overview of resources:



interface information for Asd001a_ome05

Interface	Card Type	Neighbour	Capacity (STS Timeslots)	number of free STS timeslots
Asd001a_ome05:1/1	GigE	NA	21	0
Asd001a_ome05:1/2	GigE	NA	21	0
Asd001a_ome05:1/3	GigE	NA	21	21
Asd001a_ome05:1/4	GigE	NA	21	0
Asd001a_ome05:10/1	SONET	Asd001a_ome01:9/1	192	84
Asd001a_ome05:11/1	SONET	Asd001a_ome02:12/1	192	87
Asd001a_ome05:2/1	GigE	NA	21	0
Asd001a_ome05:2/2	GigE	NA	21	0
Asd001a_ome05:2/3	GigE	NA	21	0
Asd001a_ome05:2/4	GigE	NA	21	0
Asd001a_ome05:3/1	GigE	NA	21	18
Asd001a_ome05:3/2	GigE	NA	21	21
Asd001a_ome05:3/3	GigE	NA	21	18
Asd001a_ome05:3/4	GigE	NA	21	21
Asd001a_ome05:4/1	GigE	NA	21	0
Asd001a_ome05:4/2	GigE	NA	21	18
Asd001a_ome05:4/3	GigE	NA	21	21
Asd001a_ome05:4/4	GigE	NA	21	0
Asd001a_ome05:5/1	SONET	Ddt001a_ome01:6/1	192	21
Asd001a_ome05:6/1	SONET	Tb001a_ome01:6/1	192	129
Asd001a_ome05:9/1	SONET	Elv001a_ome01:6/1	192	0

Resource capacity

- SDH Backbone usage:

Ah001a_ome01:6/1 - Ap001a_ome01:9/1	OC192 - free timeslots 42	78%
Ah001a_ome01:9/1 - Nm001a_ome01:6/1	OC192 - free timeslots 39	80%
Alr001a_ome01:6/1 - Asd001a_ome07:11/1	OC192 - free timeslots 129	33%
Amr001a_ome01:1/1 - Hedr001a_ome01:2/1	OC48 - free timeslots 0	100%
Amr001a_ome01:1/2 - Hlm001a_ome01:6/1	OC48 - free timeslots 6	88%
Amr001a_ome01:5/1 - Asd001a_ome04:5/1	OC192 - free timeslots 102	47%
Ap001a_ome01:6/1 - Zl001a_ome01:9/1	OC192 - free timeslots 42	78%
Ap001a_ome01:9/1 - Ah001a_ome01:6/1	OC192 - free timeslots 42	78%
Asd001a_ome01:1/1 - Asd001a_ome02:1/1	OC48 - free timeslots 6	88%
Asd001a_ome01:1/2 - Asd001a_ome02:1/2	OC48 - free timeslots 6	88%
Asd001a_ome01:10/1 - Asd002a_ome01:10/1	OC192 - free timeslots 51	73%
Asd001a_ome01:12/1 - Asd002a_ome01:11/1	OC192 - free timeslots 192	0%
Asd001a_ome01:13/1 - Asd001a_ome06:11/1	OC192 - free timeslots 69	64%
Asd001a_ome01:3/1 - Ut001a_ome01:6/1	OC192 - free timeslots 150	22%
Asd001a_ome01:4/1 - Ledn001a_ome01:5/1	OC192 - free timeslots 108	44%
Asd001a_ome01:5/1 - Asd001a_ome03:10/1	OC192 - free timeslots 3	98%
Asd001a_ome01:6/1 - Asd001a_ome04:10/1	OC192 - free timeslots 60	69%
Asd001a_ome01:9/1 - Asd001a_ome05:10/1	OC192 - free timeslots 84	56%
Asd001a_ome02:1/1 - Asd001a_ome01:1/1	OC48 - free timeslots 6	88%
Asd001a_ome02:1/2 - Asd001a_ome01:1/2	OC48 - free timeslots 6	88%
Asd001a_ome02:10/1 - Asd002a_ome02:10/1	OC192 - free timeslots 6	97%
Asd001a_ome02:12/1 - Asd001a_ome05:11/1	OC192 - free timeslots 87	55%
Asd001a_ome02:13/1 - Asd001a_ome04:11/1	OC192 - free timeslots 150	22%
Asd001a_ome02:14/1 - Asd001a_ome03:11/1	OC192 - free timeslots 108	44%
Asd001a_ome02:3/1 -	OC192 - free timeslots 186	3%
Asd001a_ome02:4/1 - Nm001a_ome02:6/1	OC192 - free timeslots 192	0%



Experiences with NDL @SARA

- These were some tools we use for SURFnet6
- If you have a SONET/SDH network you could use our set of tools too! They're free!

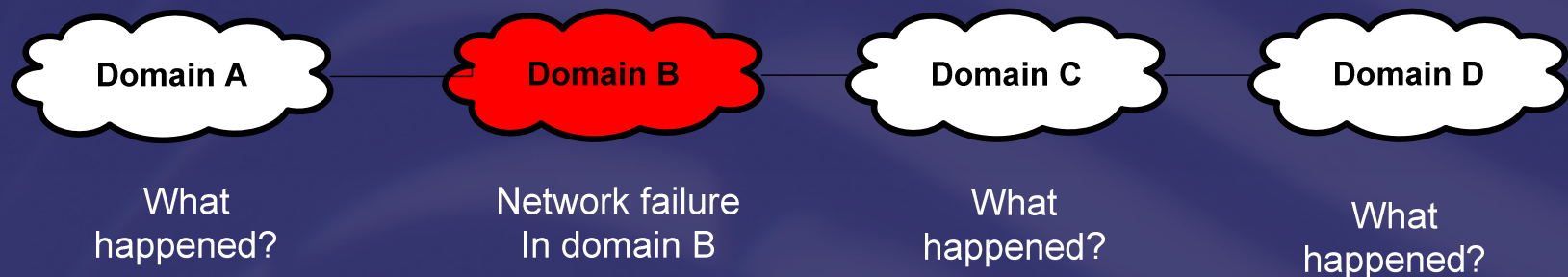


NDL and Netherlight

What about Netherlight.....

- **The challenge:**

- Customer call: Lightpath between Canada and Netherlands is down!
- Multiple domains:
 - Do I see alarms in my domain?
 - What do the other domains see for this lightpath?



- *The resources:*

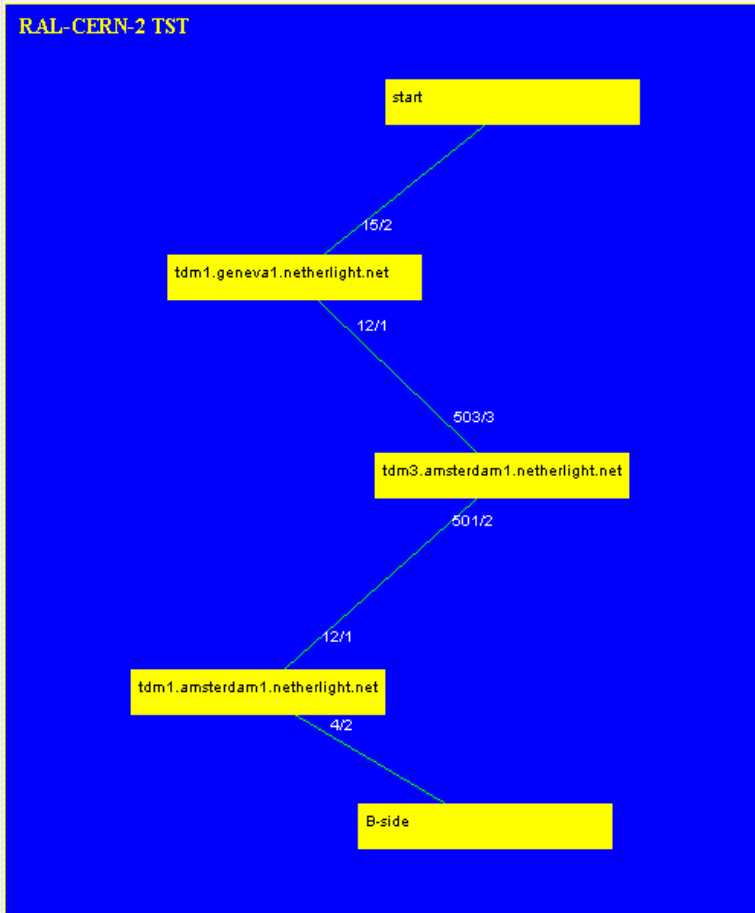
- Description of your GOLE in NDL
- SQL Database with alarm information of your GOLE*

* Powered by the TL1 Toolkit

- *The (current) result..... (live demo)*

BACK

RAL-CERN-2 TST



circuit details: RAL-CERN-2 TST

Status for this circuit is: **UP**

Powered by the [TL1-Toolkit!](#)

NE	circuitname	bandwidth	begin	end	Alarm
tdm1.amsterdam1.netherlight.net	RAL-CERN-2 TST STS-24	GE 4/2	12/1/97-120	OK	
tdm1.geneva1.netherlight.net	RAL-CERN-2 TST STS-24	12/1/169-192	GE 15/2	OK	
tdm3.amsterdam1.netherlight.net	RAL-CERN-2 TST STS-24	501/2/97-120	503/3/169-192	OK	

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NDL and Netherlight

Global Crossing fiber cut between Amsterdam and Geneva (CERN):

Back

circuit details: RAL-CERN-2 TST

Status for this circuit is: **DOWN**

Powered by the TL1-Toolkit!

NE	circuitname	bandwidth	begin	end	Alarm
tdm1.amsterdam1.netherlight.net	RAL-CERN-2 TST	STS-24	GE 4/2	12/1/97-120	
tdm1.geneva1.netherlight.net	RAL-CERN-2 TST	STS-24	12/1/169-192	GE 15/2	
tdm3.amsterdam1.netherlight.net	RAL-CERN-2 TST	STS-24	501/2/97-120	503/3/169-192	

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Alarm: Loss of signal on interface 503/3 system interface name OC192-1-503-0-3-1

Alarm on tdm3.amsterdam1.netherlight.net at: 2006-08-29 07:29:12



Interdomain fault resolution

- up to date status overview via webinterface
- We propose to provide a webservice (SOAP) interface
- Every GOLE advertises the status of their lightpaths

- To setup distributed monitoring in GLIF!
 - Discuss in tech-session

- SARA & UvA created a NDL description of each GOLE

<http://trafficlight.uva.netherlight.nl/JointDemo/GOLEs/>

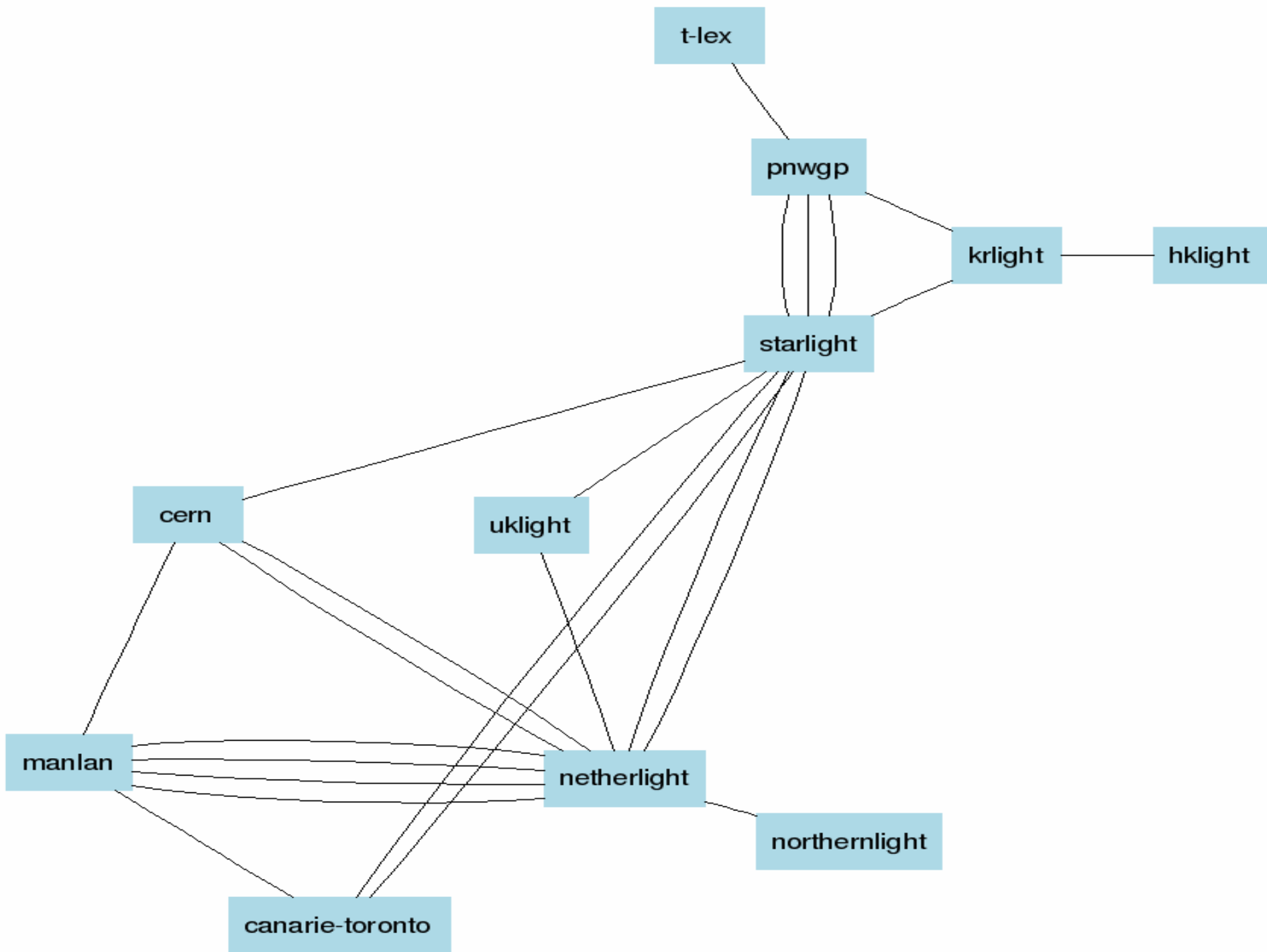
- started with making some example webservices

<http://trafficlight.uva.netherlight.nl/NDL-demo/GLIF-rpc.wsdl>

Demonstration of webservices:

<http://trafficlight.uva.netherlight.nl/NDL-demo/GLIFWebServices.html>

- We would like to ask every GOLE to create their own NDL file.



- **Having NDL files of each GOLE enables:**
 - **PATH finding through the global GLIF network!**
 - **Up to date overview of the GLIF resources**
 - **Automatically generate pictures of the GLIF network**
 - **Help with Monitoring / Fault isolation**

- **We need your help to realize this!**

URLs + Questions

- SARA's network research group:
Information about TL1 toolkit & NDL tools.
<http://nrg.sara.nl/>
Email: nrg@sara.nl
- **NDL for the GLIF**
<http://trafficlight.uva.netherlight.nl/NDL-demo/>
- **Netherlight status overview**
<http://noc.netherlight.net/cgi-bin/netherlight-status.pl>
- Network Description Language:
<http://www.science.uva.nl/research/sne/ndl/>

That's all Folks!