

# Practical demonstration of Network Descriptions

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### Introduction

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### Introduction

What can NDL do for you?





# Experiences with NDL @SARA

- 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 and Perl

### 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 ©

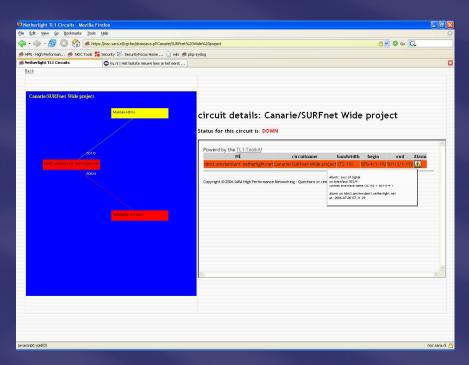
FREE DOWNLOAD: http://nrg.sara.nl/ndl/



### Live demonstrations

### **Demonstrations**

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





# 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.....





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 between Asd001a\_ome04:1/4 and Rt001a\_ome01:1/3:

Should this be a protected path? • yes ono

How many VC-4s? 7 💌

Name of this lightpath: Asd001a-Rt001a\_GE1(THIS IS A GLIF DEMO TEST)

next

(finding a path may take some time)





#### Summary

Primary path		Backup path		
From	То	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 GLIE 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	Neigbour	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	Ehv001a_ome01:6/1	192	0



### Resource capacity

### SDH Backbone usage:





# 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!

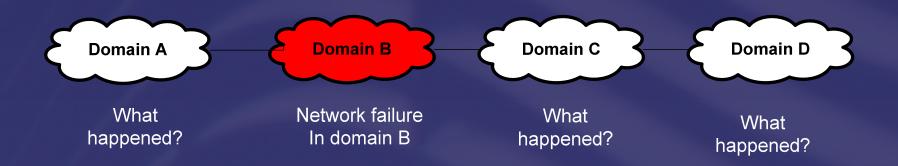


What about Netherlight.....



# 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?

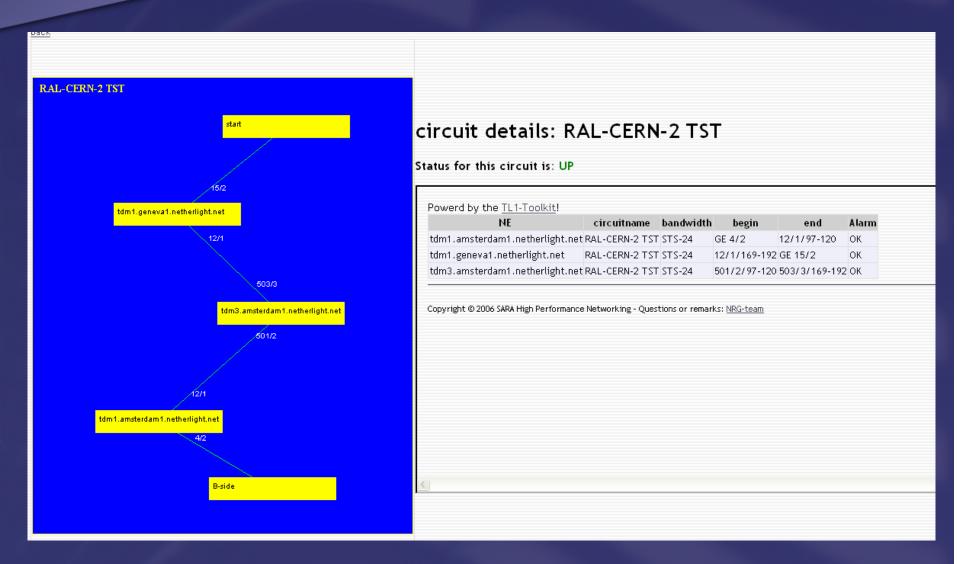




- •The resources:
- Description of your GOLE in NDL
- SQL Database with alarm information of your GOLE\*
  - \* Powered by the TL1 Toolkit

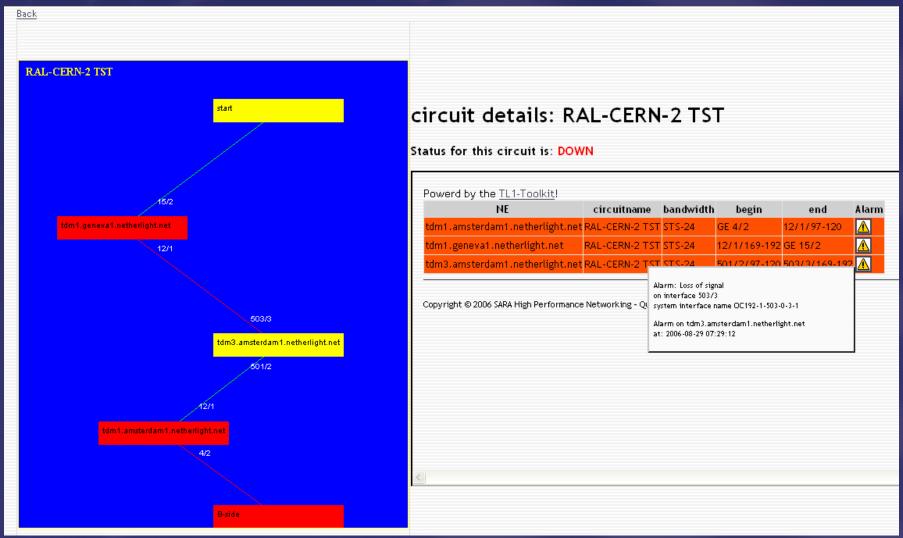
• The (current) result.... (live demo)







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





### 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



### NDL and GLIF

• SARA & UvA created a NDL description of each GOLE

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

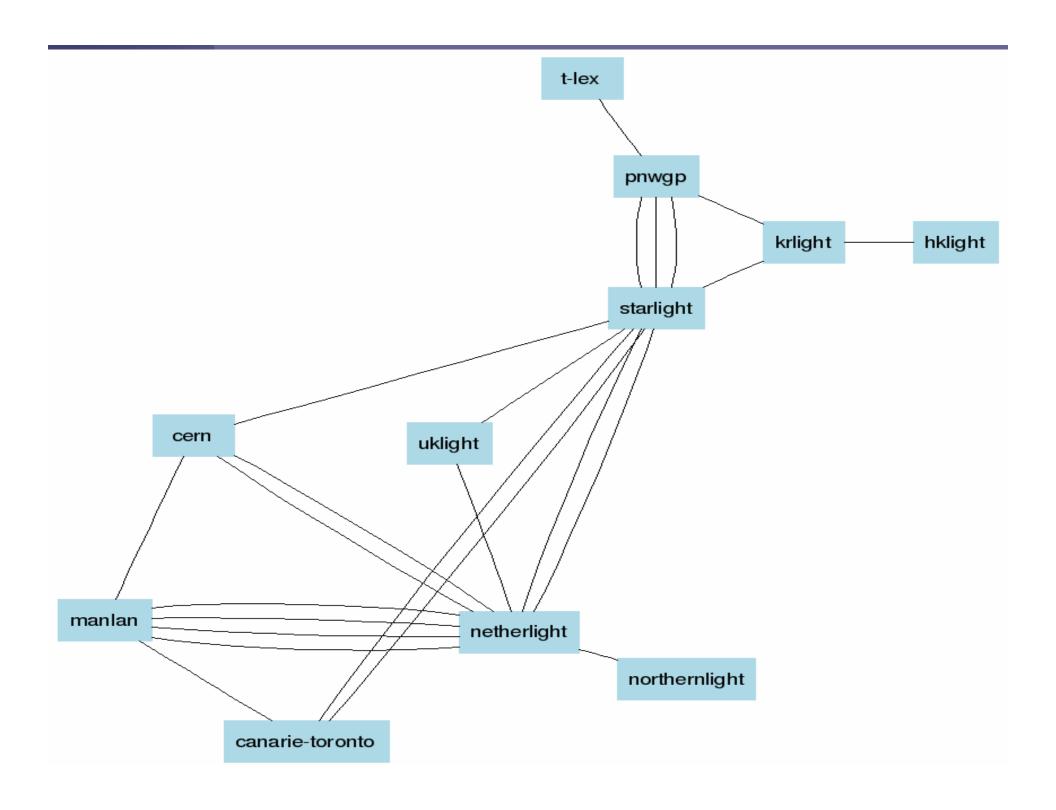
• started with making some example webservices

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.





### NDL in GLIF

- •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
<a href="http://trafficlight.uva.netherlight.nl/NDL-demo/">http://trafficlight.uva.netherlight.nl/NDL-demo/</a>

- Netherlight status overview
  <a href="http://noc.netherlight.net/cgi-bin/netherlight-status.pl">http://noc.netherlight.net/cgi-bin/netherlight-status.pl</a>
- Network Description Language:
  <a href="http://www.science.uva.nl/research/sne/ndl/">http://www.science.uva.nl/research/sne/ndl/</a>

