

# Interdomain Open Flow ACE Starlight to Netherlight 10G

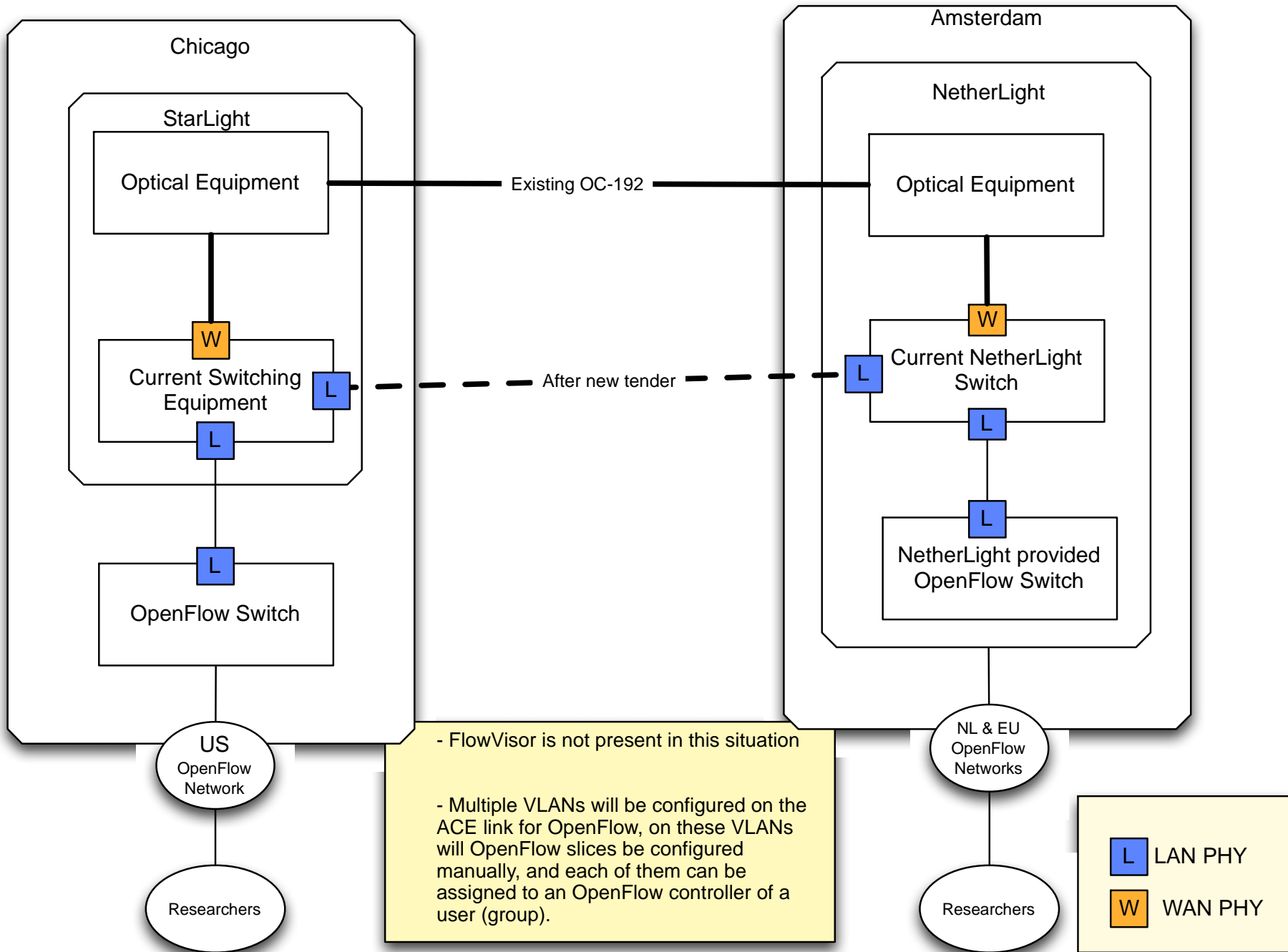
GLIF - June 6, 2013

Maastricht, Netherlands

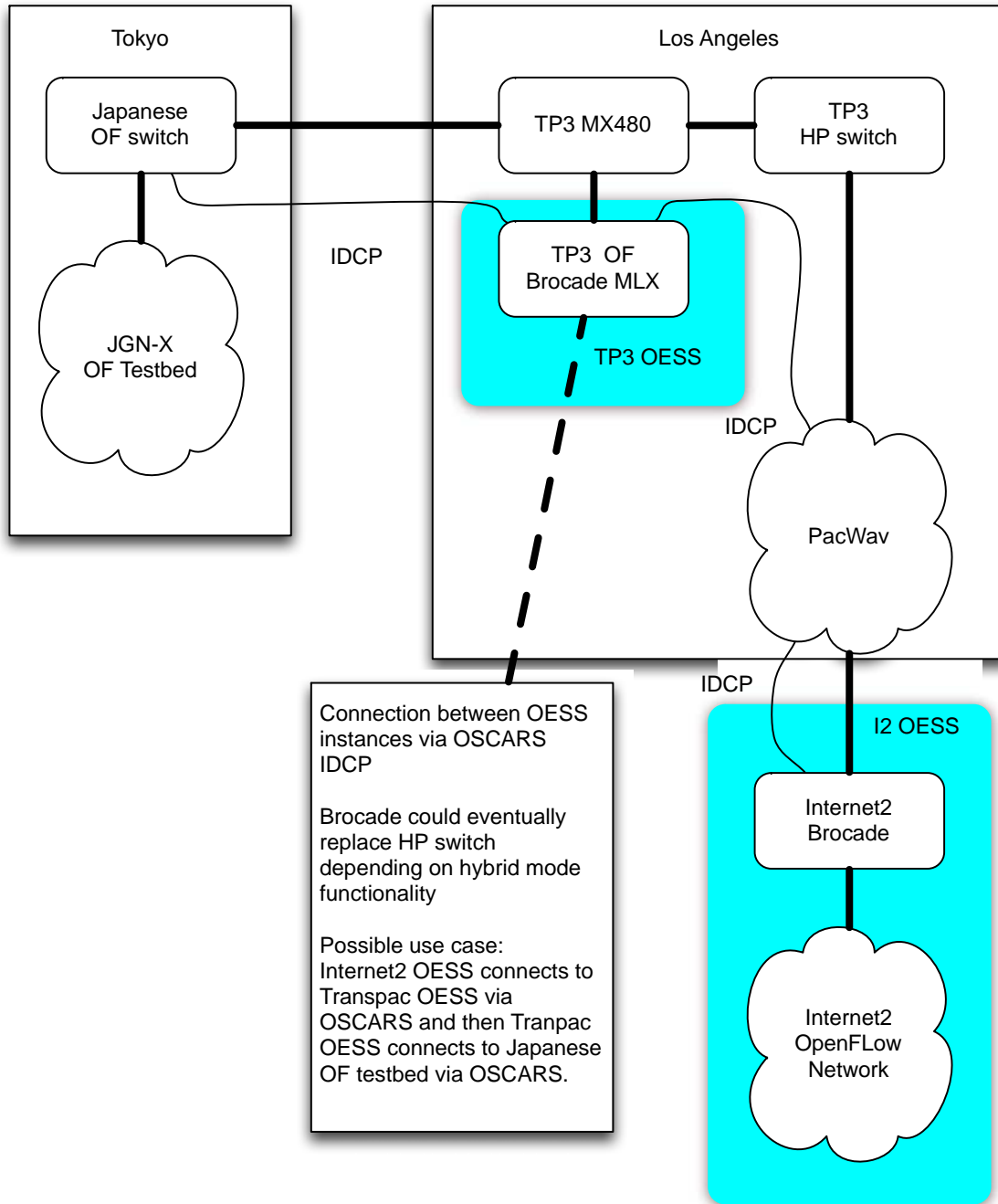
# Inter Domain Open Flow

## Recall that:

- Goal is to provide a facility allowing testing of any techniques for allowing distinct Open Flow Aggregates/Domains to interact:
  - Build interdomain slices?
- The intent was ultimately to provide an Open Flow path from Europe to the US and from the US to Asia.
- The original representations were:



Phase 1  
Possible solution using OESS



# What is in place now

- This work was done by John Hicks of the ACE project and Ronald van der Pol with assistance from StarLight.
- They set up an Open Flow demo from the US to Terena across the Chicago/Netherlight ACE circuit.

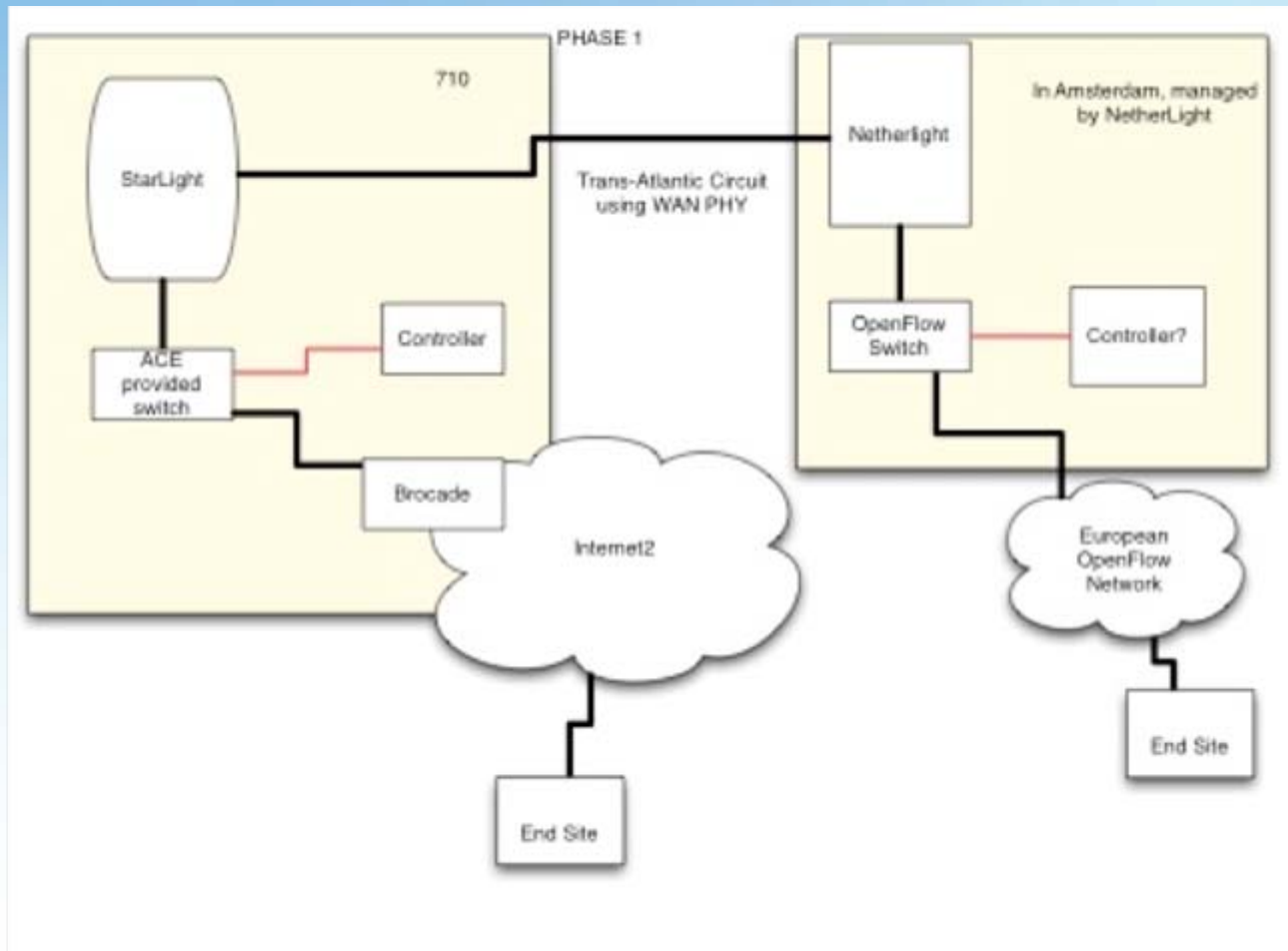
# ACE SDN

- ACE is funded by the NSF and managed by Indiana University
- John Hicks is the PI
- ACE is at MANLAN, WIX, and Starlight
  - MANLAN to Amsterdam
  - MANLAN to London
  - Wash. DC (WIX) to Frankfurt
  - StarLight to NetherLight
- StarLight to NetherLight circuit designated for SND

# ACE SDN setup

- ACE CHI – AMS circuit is a 10G LANPhy
- Static vlan range configured on circuit and though StarLight
- ACE Blade Network Technologies OpenFlow RackSwitch G8264 connected to StarLight
- Using CLI but will soon add other test controllers
- Direct connection between ACE Blade OF switch and AL2S
- OpenFlow connection between US and EU
- Hope to connect ACE OF circuit to GEANT OF PoP in Amsterdam

# ACE SDN setup diagram





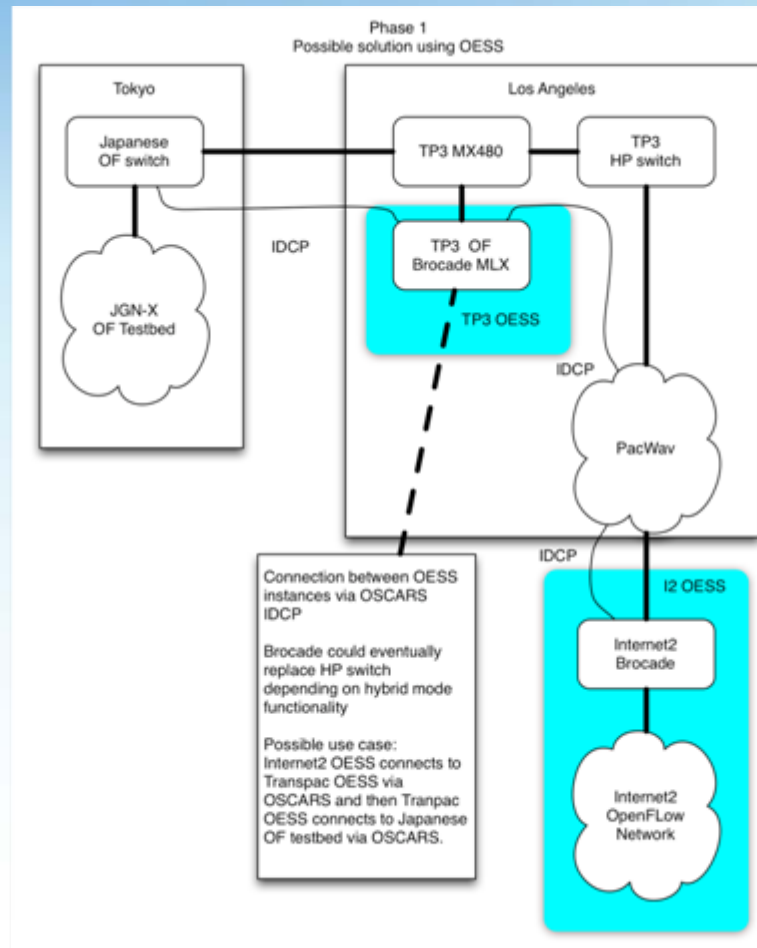
# TransPAC3

- TransPAC3 is funded by the NSF and managed by Indiana University
- John Hicks is the PI
- 10G REN transpacific circuit from LA to Tokyo
- Dynamic VLAN configuration between US and Asia via OSCARS
- TransPAC3 connects to PACWAV
- Peers with APAN, CERNET, Internet2, NLR, and ESNET
- TransPAC3 is L2/L3

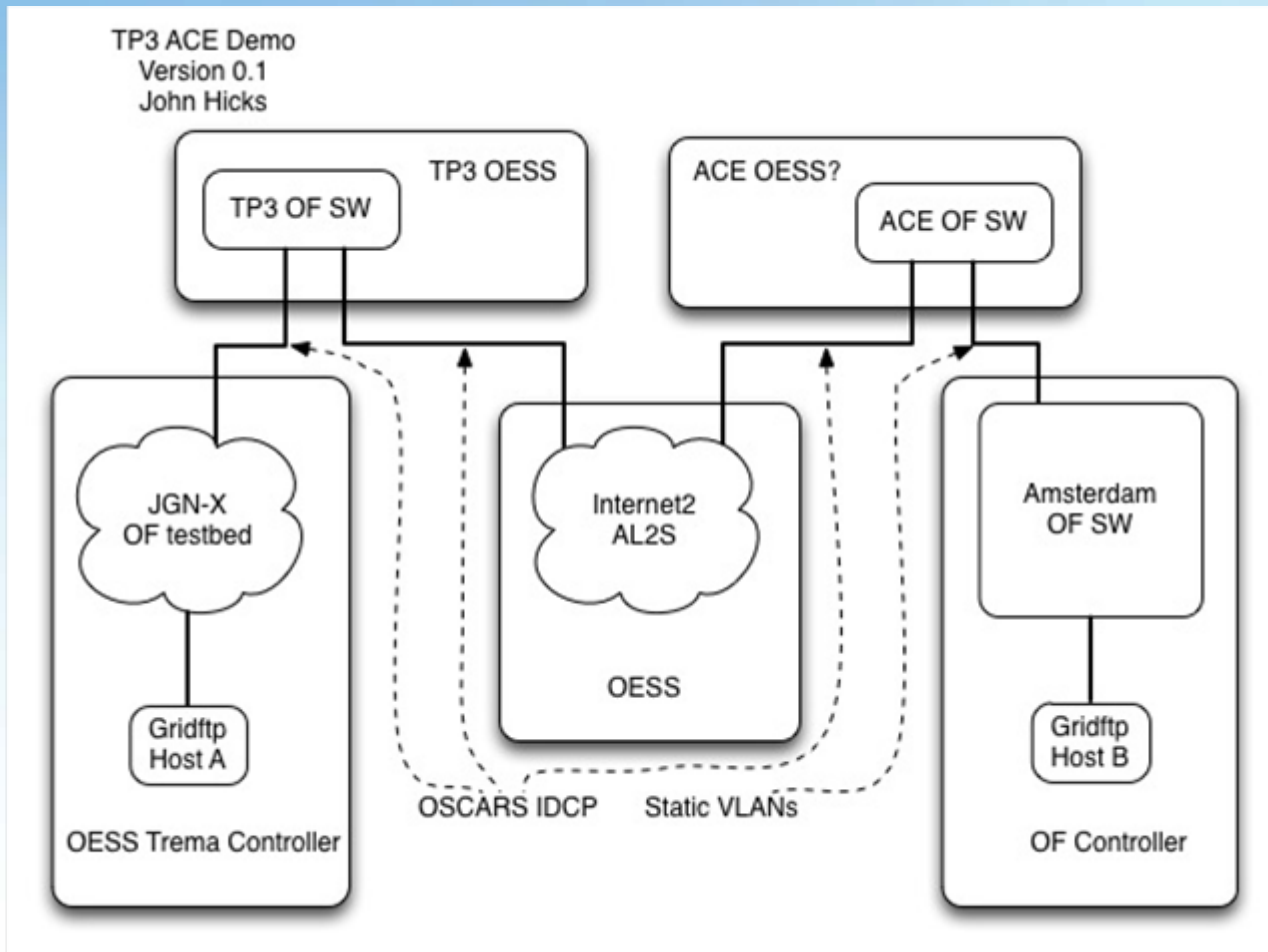
# TransPAC3 SDN

- TransPAC3 circuit is 10G LANPhy
- Brocade MLX-4 switch with OpenFlow enabled
- Using OESS (NOX), FloodLight, Custom, and CLI
- Direct OF connection to the RISE JP switch
- OpenFlow connection between US and Asia
- Hope to connect TransPAC3 OF switch directly to AL2S Brocade in LA

# TransPAC3 SDN diagram

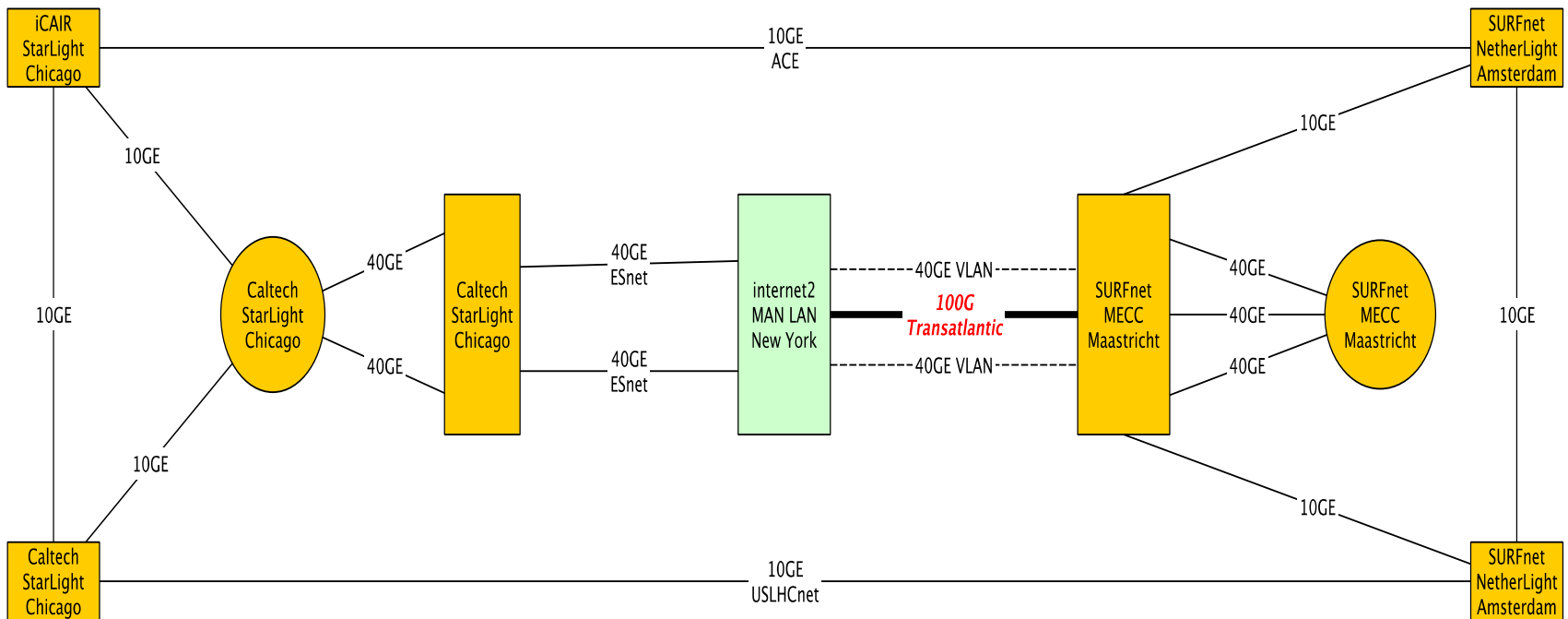


# Planned TP3-I2-ACE Demo



# TNC Demo

100G OpenFlow Multipath Demo  
OpenFlow topology  
v1.0  
Ronald van der Pol



# References

- US National Science Foundation
  - <http://www.nsf.gov>
- International Networking at Indiana University
  - <http://internationalnetworking.iu.edu/>
- Incntre SDN Lab at Indiana University
  - <http://incntre.iu.edu/>
- Global Network Operations Center
  - <http://grnoc.iu.edu>
- Internet2
  - <http://www.internet2.edu>