

# 100Gb/s and beyond

## GLIF Panel

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# Hands-on with 100G



Advanced Networking Initiative goals:

- Build an end-to-end 100 Gbps prototype network
  - Handle proliferating data needs between the three DOE supercomputing facilities and NYC international exchange point

Multiple 100GE routers tested within the lab

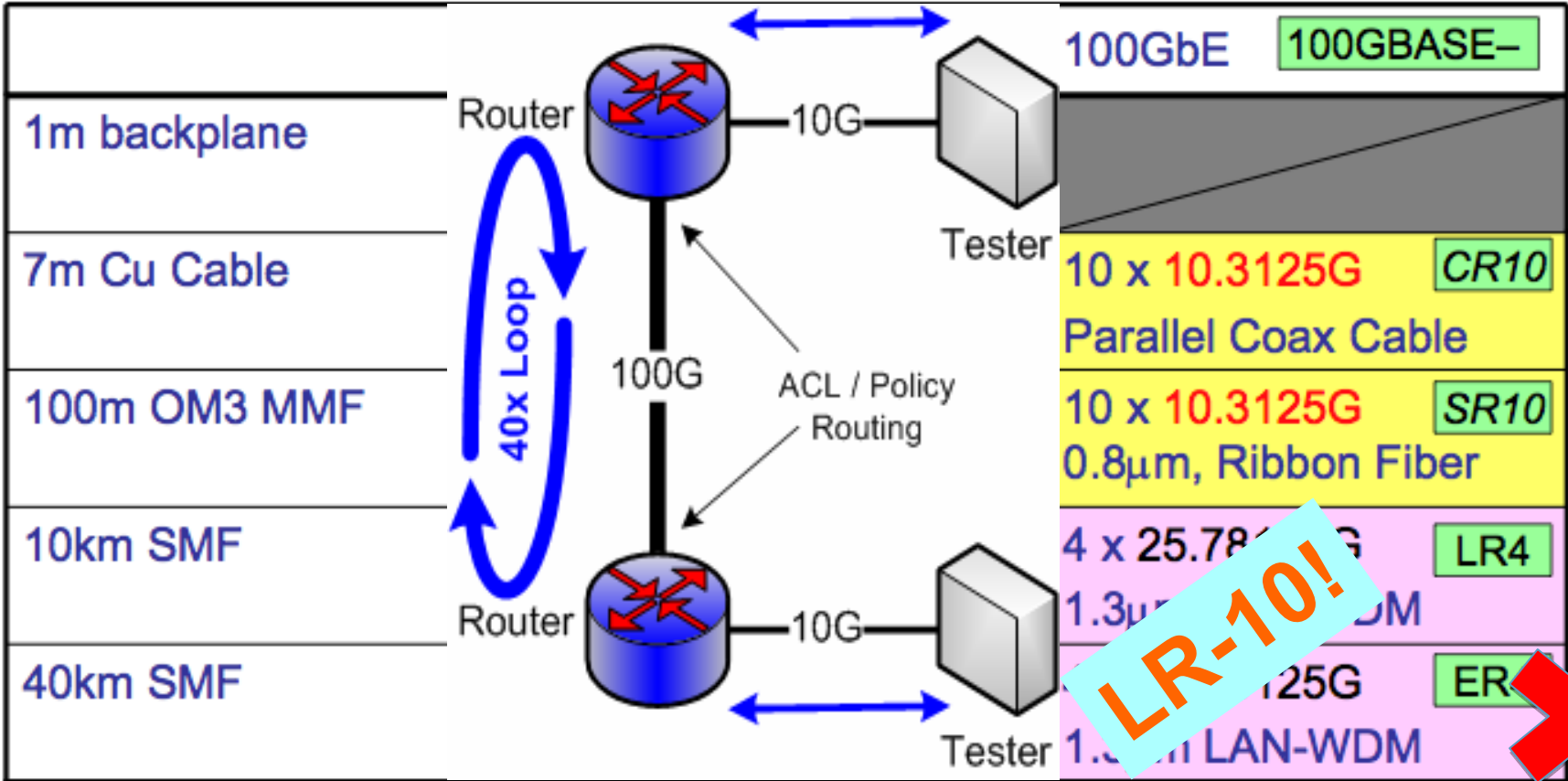
RFP for 100 Gbps transport and dark fiber released in June, responses being evaluated

RFP for 100 Gbps routers/switches due

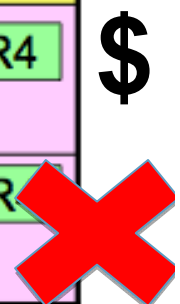
Longer term DOE Goal

- 1 Tb/s between supercomputer centers between 2015-2018

# Reality check: 100GE CFPs



**LR-10!**



Nomenclature: 40GBASE-LR4

MAC Data Rate: 40G  
Media Type: BASE  
PCS Type: L  
PMD Lane: R4

10G-based PHY (yellow box)  
25G-based PHY (purple box)



O. Ishida, "IEEE/ITU-T Std Activities in 100G," OFC2010 Workshop OSuB1



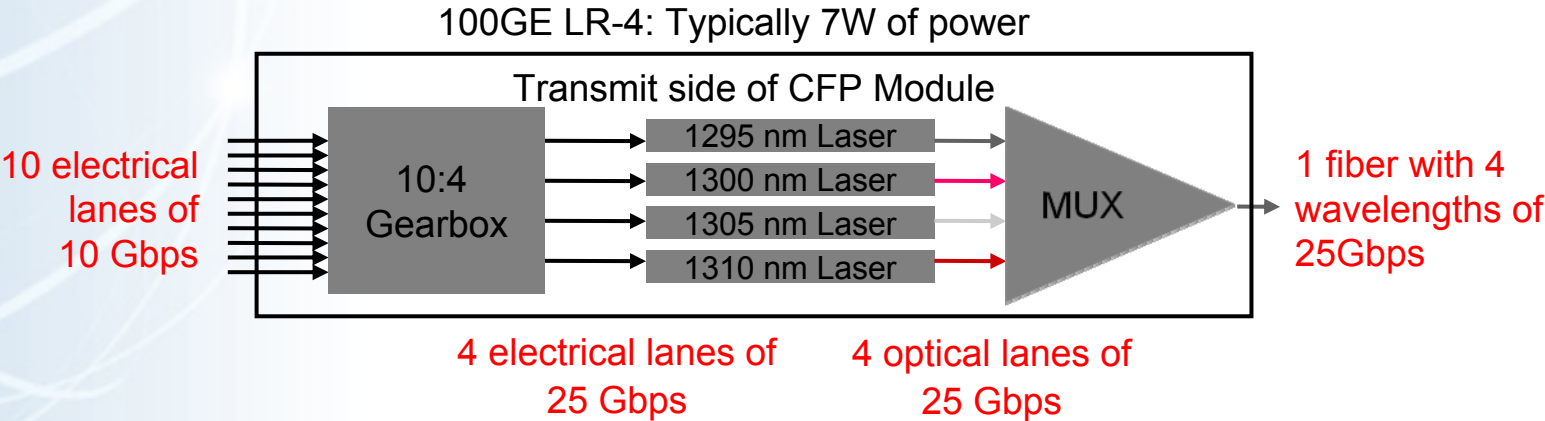
# 100GE+: Some predictors

The transmission side is looking at the next step to be 400G

- 50Ghz ITU-Grid spacing will be compromised
- Flexible grid WSS technologies will be the way forward

Can that be matched with 400GE on the client side? Or 4x100GE?

- Possible with the Multi-Lane concepts (16x25G)
- Power dissipation and economics may become the limiting factor





# 100G+: Disruptions needed!

Will routers follow the Cray supercomputers model?

- Should we call this the end of “store and forward” router architecture?
- Network performance vs power consumption
- Multi-layer networking (ARCHSTONE)

Scaling host architecture: Optical inter-connects

- End-systems motherboard architecture needs to change, just 100GE NICs not good enough
- DOE-funded Exascale research

Sandbox for applications?

- 100G ANI Prototype network
- Application need to step up, chicken and egg problem?