



Networking Update

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Purchase and Install Active Equipment

- Purchasing Cisco ONS 15454 transparent optical muxes for Miami and Sao Paolo
- Active equipment expected to be in operation by mid to late August
- Layer 2/3 Gig-E ports and WAN-PHY functionality





Provision Circuit thru FLR to NLR

- Florida LambdaRail ready for service date estimated at January 2005
- Dedicated Gig-E service from Miami to Jacksonville to meet NLR
- SURA has offered use of its Gig-E transport service over NLR
- Peering with Abilene in Atlanta
- International peering at Starlight and MAX





Bid, Award and Provision circuit to Rio

- Circuit being provisioned to Sao Paolo
- Funding coming from Sao Paolo
- Sao Paolo has emerged as the aggregation and international exchange point for the CLARA backbone
- Giga Project transport service between Sao Paolo and Rio will be used to connect Alberto Santoro's cluster at UERJ





Miami - Sao Paolo Link

- STM-16 (2.5 Gbps) ports in Miami and Sao Paolo
- STM-4 (622 Mbps) of dedicated usable capacity
- STM-1 (155M) channel for commercial Internet usage from Sao Paolo to U.S.
- Remaining available capacity (467M) for research and experimental traffic
- Mechanisms will be deployed to dedicate bandwidth to experimental traffic





HENP Major Links: Bandwidth Roadmap (Scenario) in Gbps

<i>Year</i>	<i>Production</i>	<i>Experimental</i>	<i>Remarks</i>
2001	0.155	0.622-2.5	SONET/SDH
2002	0.622	2.5	SONET/SDH DWDM; GigE Integ.
2003	2.5	10	DWDM; 1 + 10 GigE Integration
2005	10	2-4 X 10	λ Switch; λ Provisioning
2007	2-4 X 10	$\sim 10 \times 10$; 40 Gbps	1st Gen. λ Grids
2009	$\sim 10 \times 10$ or $1-2 \times 40$	$\sim 5 \times 40$ or $\sim 20-50 \times 10$	40 Gbps λ Switching
2011	$\sim 5 \times 40$ or $\sim 20 \times 10$	$\sim 25 \times 40$ or $\sim 100 \times 10$	2nd Gen λ Grids Terabit Networks
2013	\simTerabit	\simMultiTbps	\simFill One Fiber

**Continuing the Trend: ~ 1000 Times Bandwidth Growth Per Decade;
We are Rapidly Learning to Use Multi-Gbps Networks Dynamically**



Americas Network Diagram

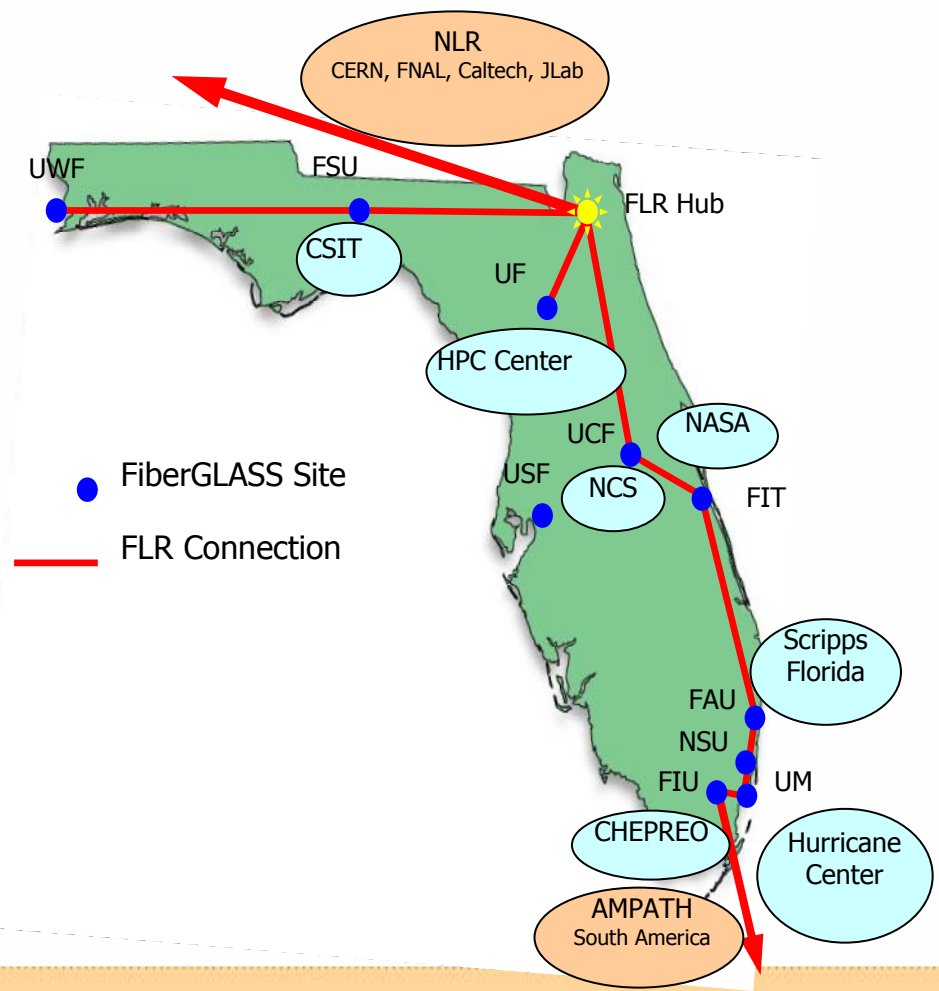




Florida LambdaRail



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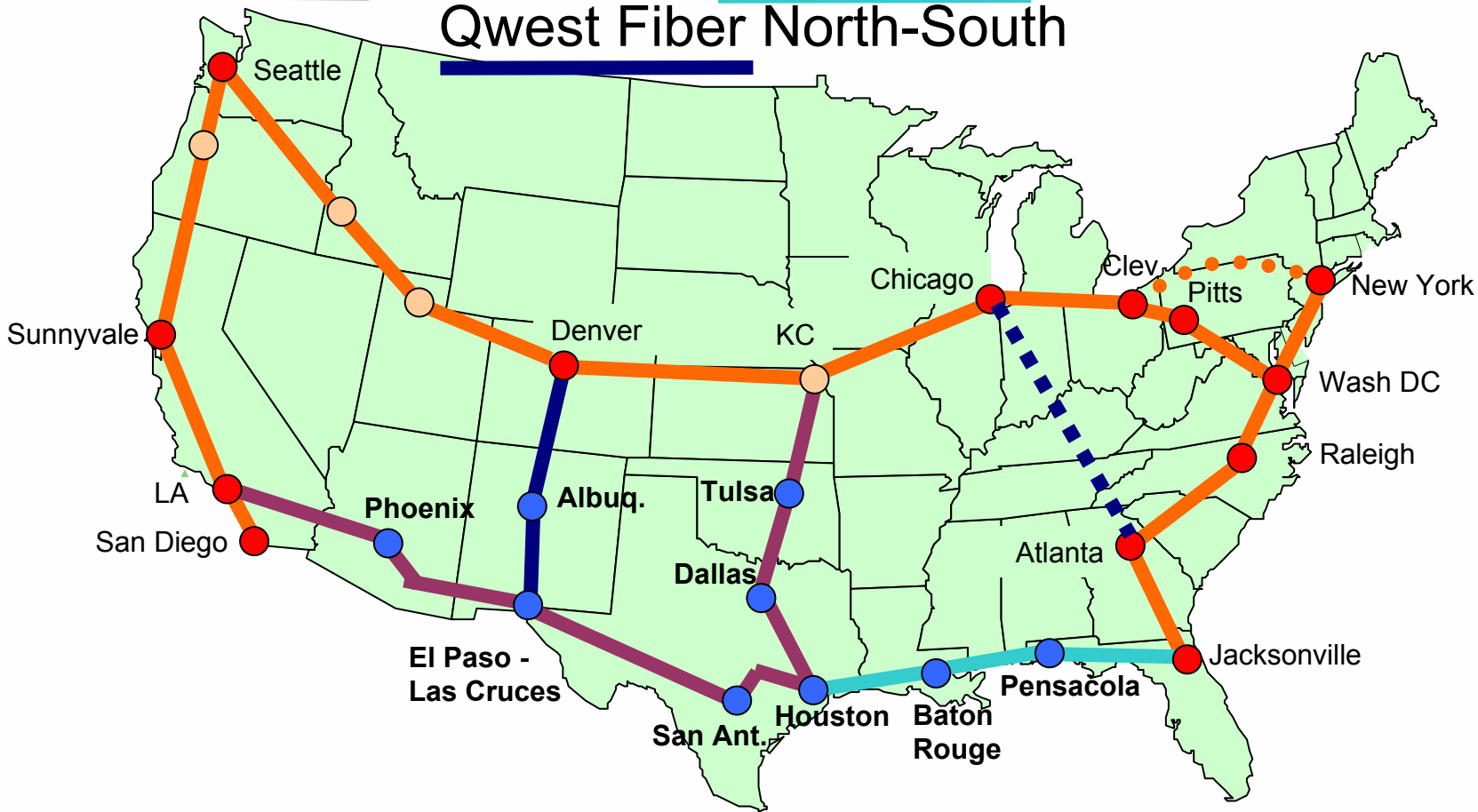
FLR-Optical-Backbone-P-20040107.jpg



NLR – Southern Route

Wiltel Fiber in the West -- AT&T Fiber in the Southeast

Qwest Fiber North-South





Funding Update

- Funding available will afford the circuit between Miami and Sao Paulo at \$2.1M from ANSP over 3 years, and \$443,250 one time from the NSF
- Negotiated STM-16 ports with STM-4 committed rate
 - Submitted proposal to the CISE IRNC program for funding to increase to 2.5G port capacity
- Cisco ONS 15454 optical equipment purchased for Miami and Sao Paulo link
 - Cisco providing partial donation and discounts to help us stay within the budget

