Florida LambdaRail (*FLR*)

Introduction
Operational Success
Network Services
Disaster Recovery Site
Connections

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Introduction

- **FLR Operational in April 2005**
- **Over 1500 Miles of DWDM fiber**
- **Membership: 12 Equity members**
  - 9 Public Universities - 3 Private Universities
  - **Members as Affiliates**
    - **4 Private Colleges/Universities**
    - **1 Public University**
    - **1 Regional Data Center**
    - **1 Library System**
    - **12 State/Community Colleges**
    - **6 Medical Research Facilities**
    - **4 County Governments**
    - **1 State Agency**
    - **1 K-12 School Dist /1 Private School**
    - **2 Hospitals/Heath Systems**

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Introduction

- FLR's Mission
  - Enable member institutions/agencies and their partners to participate in:
    - advanced research
    - education
    - and economic development activities
  - Provide high-performance experimental, research, and production networking and support infrastructure

Membership

- **Types of membership**
  - **Equity members**
    - **Charter members of the LLC**
    - **Provided equity investment in the LLC**
  - **Affiliate Members**
    - **Accepted for membership by FLR Board of Directors**
    - **Fit within the three primary mission elements of the FLR**
      - **Research**
      - **Education**
      - **Economic Development**
    - **Ability to aggregate connectors requiring <100 Mbps**
  - **Subscribers (for Aggregator Counties)**
    - **Lower bandwidth entity served by an Affiliate or Equity Member**
    - **Uses IP Address Space of Equity or Affiliate Member**
  - **Special cooperative arrangements**
    - **Multiple Peering Arrangements**
    - **DR/BC Site Connectivity**

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Our Profile

- **What FLR is Not!**
  - **A commercial ISP supplier.**
  - **Direct government funded.**
  - **Local loop supplier.**
  - **Applications host or supplier.**

- **What FLR Is!**
  - **Serve as Florida's Exclusive Research and Education Network**
  - **Provides FLRNET transport to all FLR members.**
  - **Provides direct connectivity to most major medical schools and medical research institutes in Florida.**
  - **Highly reliable high speed transport for Internet, Internet2, National Lambda Rail for FLR members.**
  - **Transport for connectivity to Disaster Recovery – Business Continuity sites on FLRNET**
  - **Potential transport of hosted applications within the FLR membership, such as medical records exchange.**

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Current Affiliates

- Barry Univ, Rollins College, Embry-Riddle Aeronautical Univ, Eckerd College & FAMU
- NWRDC
- CCLA/FDLC
- Scripps Florida Research, Moffitt Cancer Center, Orlando Health (MD Anderson), Sanford-Burnham Inst for Medical Research, Orlando VA Hospital, Max Planck Society
- Palm Beach State College & Schools, Florida State College @ Jacksonville, State College of Florida - Manatee-Sarasota, Miami Dade College, St Petersburg College, Seminole State College, Indian River State College, Lake-Sumter CC, Valencia CC, Polk State College, Pasco-Hernando CC, Santa Fe College
- Counties: Palm Beach, Orange, Martin, Lee County Court Clerk
- Tallahassee Memorial Hospital, Central Florida Health Alliance
- ENA (School District), Gulliver School (Miami)

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State Colleges/Community Colleges on the FLR

Indian River State College
Lake-Sumter Community College
Miami-Dade College
Palm Beach State College
Polk State College
Seminole State College
State College of FL, Manatee-Sarasota
St. Petersburg College
Valencia Community College
FL State College at Jacksonville
Santa Fe College
Pasco-Hernando Community College

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FLR Characteristics

- Internet (ISP) Services are separate from Transport Services
- Content provider peering is unbundled from ISP bandwidth
  - Peering significantly reduces Internet bandwidth requirements through direct connection with Peering Partners
  - Peering traffic is at FLRNET bandwidth, not Internet bandwidth subscription

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Operational Milestones

- Completed upgrade to 20 Gbps for entire backbone (Planning 40G in 2013)
- Peering arrangements with over 50 Content Providers
- FLR is the exclusive transport for these services
  - Florida LambdaRail members
  - National LambdaRail (NLR)
  - Internet2 for participation in the SEGP (Sponsored Education Group Participant), giving every non-research educational institution in Florida the right to use Internet2 and its K20 initiatives

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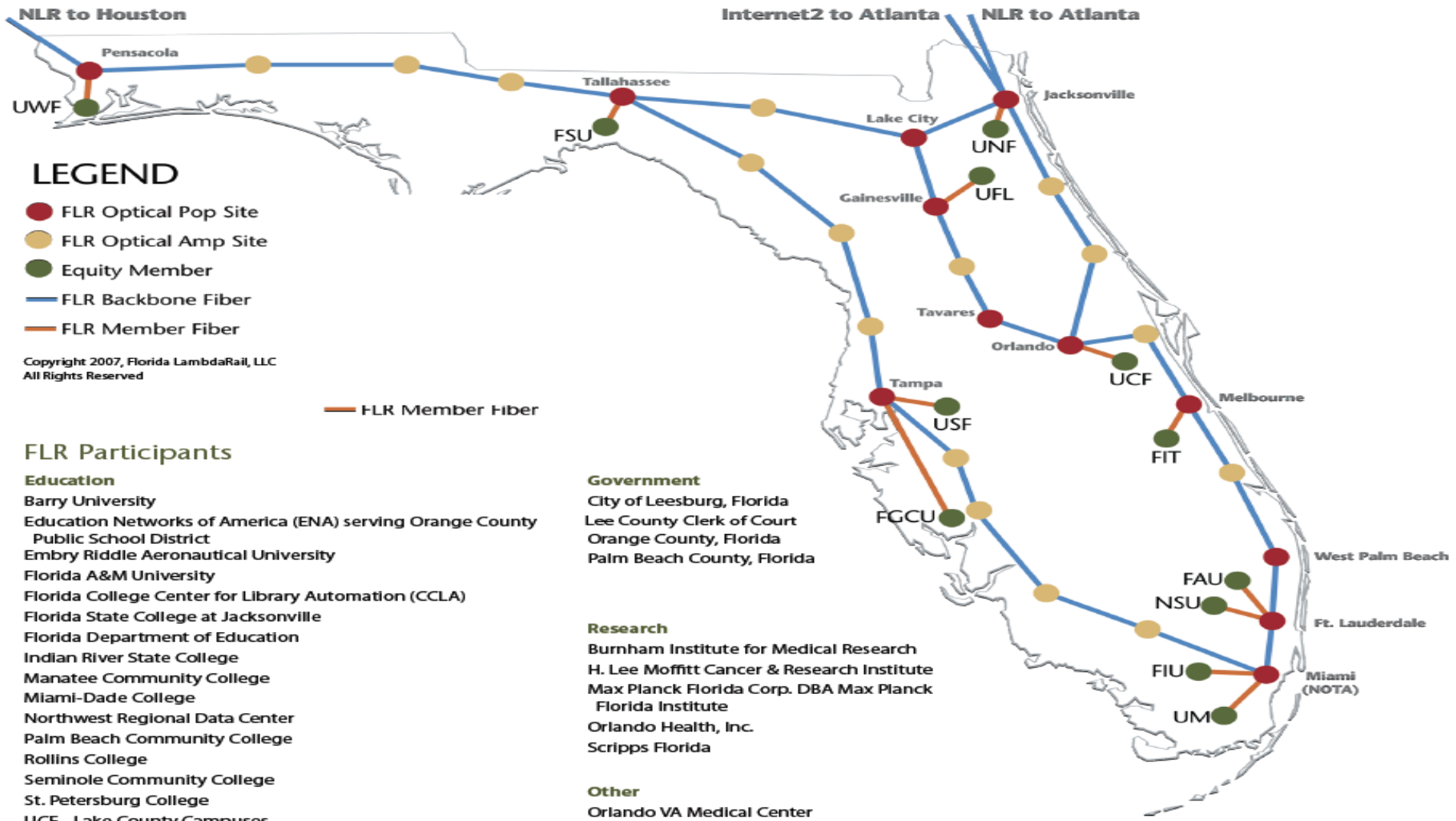
Florida LambdaRail Connector
Optical Topology Map



FLR Participants

Education

Barry University
Education Networks of America (ENA) serving Orange County Public School District
Embry Riddle Aeronautical University
Florida A&M University
Florida College Center for Library Automation (CCLA)
Florida State College at Jacksonville
Florida Department of Education
Indian River State College
Manatee Community College
Miami-Dade College
Northwest Regional Data Center
Palm Beach Community College
Rollins College
Seminole Community College
St. Petersburg College
UCF - Lake County Campuses
UF/IFAS Apopka Mid-Florida Research & Education Center (MREC)
UF - Citrus Research Center
UF/IFAS Ft. Lauderdale Research & Education Center
UF/IFAS Gulf Coast Research & Education Center (GCREC) - Plant City
UF/IFAS Gulf Coast Research & Education Center (GCREC) - Wimauma

Government

City of Leesburg, Florida
Lee County Clerk of Court
Orange County, Florida
Palm Beach County, Florida

Research

Burnham Institute for Medical Research
H. Lee Moffitt Cancer & Research Institute
Max Planck Florida Corp. DBA Max Planck Florida Institute
Orlando Health, Inc.
Scripps Florida

Other

Orlando VA Medical Center
Team Orlando Consortium

Network Services

- Main POP Locations
  - Jacksonville
  - Orlando
  - Miami
  - Tampa
  - Gainesville
  - Tallahassee
  - Pensacola

•Secondary Connection Points

•Ft Lauderdale
•Tavares
•West Palm Beach
•Winter Haven
•Crestview
•Lake Nona-Orlando

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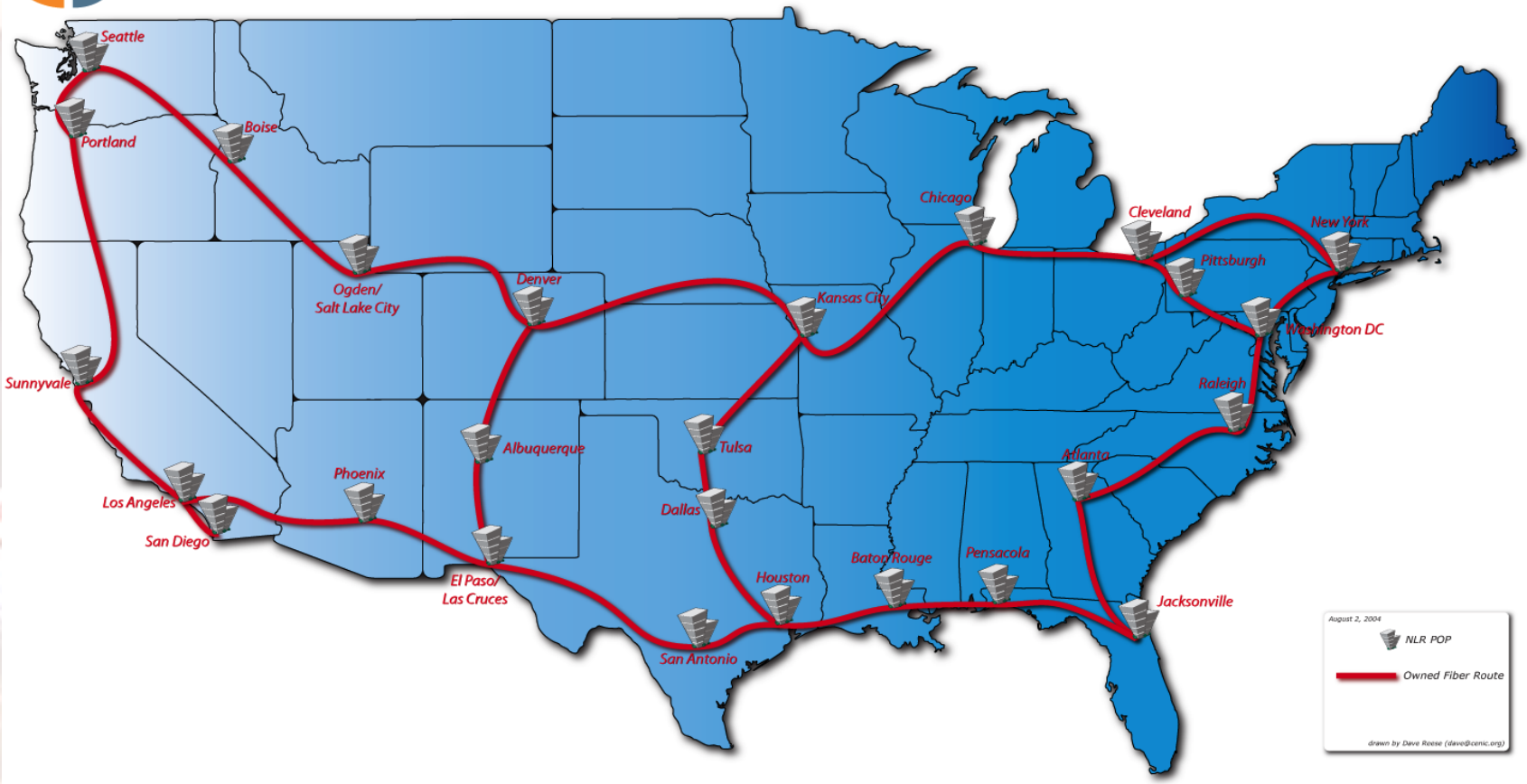
Network Services

National LambdaRail Architecture



For more information regarding NLR see http://www.nlr.net or contact info@nlr.net

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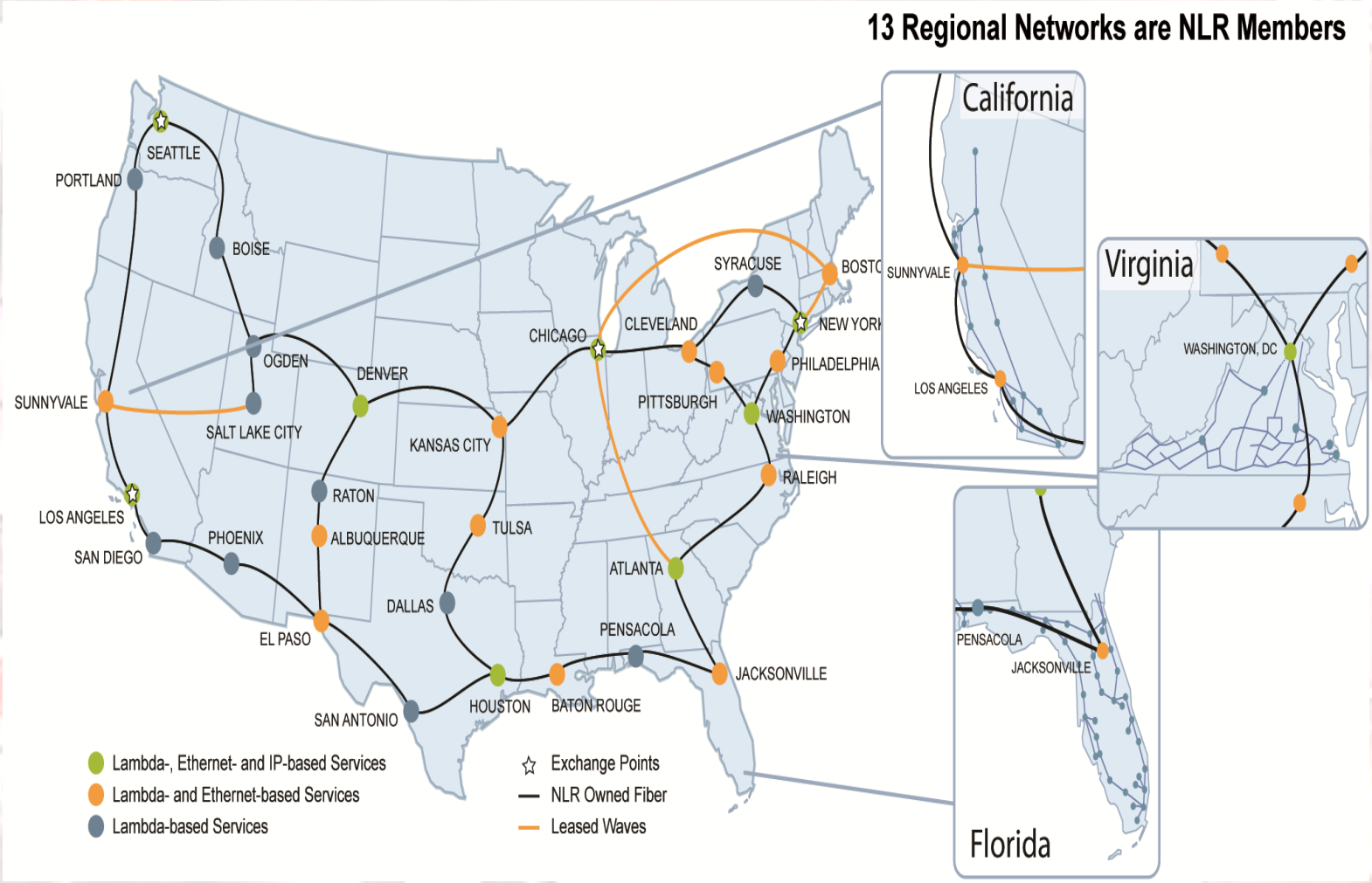
13 Regional Networks are NLR Members



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Network Services

- **Internet2 Topology Map**

Network Services

- Transport Services
  - Backbone connectivity
    - 100 Meg, 1 Gig, 10 Gig (Wave), 10 G fractional
  - VPNs, as required
  - 24 - 7 NOC Coverage
  - Multicast capable
  - Fault tolerant design
  - Connectivity to NLR/Internet2
- Internet Providers through The Quilt
  - Level3 (2 locations)
  - Cogent (2 locations)
  - Southern LightRail (Atlanta)

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FLR Internet Peering Partners

1 1&1 Internet(1a1)
2 Akamai
3 Amazon
4 BrightHouse Networks/Road
5 Runner @ Orlando
6 BroadbandONE
7 Cachefly
8 Cisco Webex
9 Clearwire
10 Columbus Networks
11 Cox Communications
12 CTBC Telecom (ctbc)
13 DENIC
14 Durand Tavola (durand)
15 Earthlink
16 EdgeCast Networks
17 ENA (Backbone Prefixes)
18 Facebook
19 FPL Fibernet
20 Free.FR
21 Google
22 GreatAccess
23 Highwinds
24 Hostway Datacenter Services
25 Hurricane Electric
26 Init Seven AG
27 Internet2 CPS (IPv6 only)
28 Justin.tv
29 Limelight Networks
30 LONI
31 McAfee
32 Media Network Services (mns)
33 Miami-Dade Broadband Coalition
34 Microsoft
35 MojoHost
36 MREN Via Sox
37 Mzima Networks
38 NationalNet
39 Net2Atlanta
40 Netflix
41 Netriplex
42 OCCAID
43 One Ring Networks
44 Packet Clearing House
45 Peer1 Network
46 PRBI
47 Sago Networks
48 SFG/Ampath
49 SMITCOMS
50 Spirit Telecom
51 Star 2 Star Communications (s2s)
52 Stealth Communication
53 STS Telecom
54 SyncGlobal (aka !DoveTel
55 Communications)
56 TDS Telecom
57 Telx Atlanta Route Servers
58 Terremark ISP
59 Total Server Solutions
60 UNE-EPM Telecom (Columbia)
61 Velocity Online (veloc)
62 Verisign
63 WBS Connect
64 Yahoo

Network Services

- **Traffic Analysis**
  - Peering has shown to have reduced subscribed Internet traffic by over 100% in an educational environment
  - FLR traffic between members is growing
- **Network Capacity**
  - Currently 20 Gig backbone
  - There is sufficient reserve network capacity for the foreseeable future (32 channel capacity)
  - Additional waves can be added quickly and easily as more capacity is needed for certain routes

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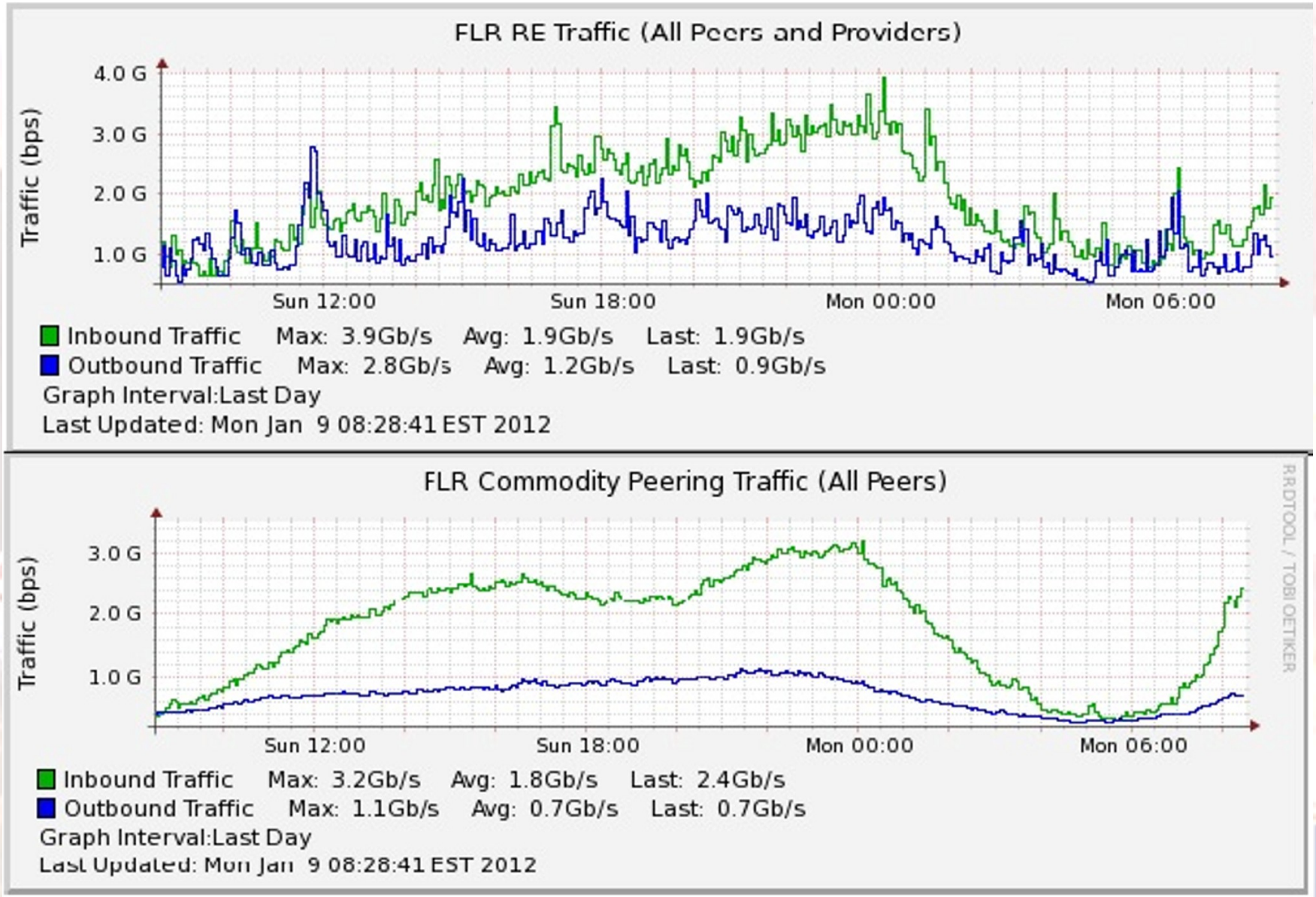
Internet vs PEERING Effect



Future Plans

- New National Initiatives
  - US UCAN (Injternet2)
  - US Ignite (White House Program)
- FLR Services
  - Access to Cloud Services
  - More Specialized Content Provides (ie Medical)

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Disaster Recovery Connections

- **Terremark** @ NAP of the Americas – Miami
  - ***John Zima***
  - *Sales - District Sales Manager*
  - *305 808 5213 Direct*
  - jozima@terremark.com
- **Gainesville Regional Utility** – Gainesville
- Wayne Wishart
- GRUCom
- wishartwb@gru.com
- 352/393-1274 Direct

Disaster Recovery Connections

- **TELX** – Atlanta
  - Donald C. Cleaves, Senior Account Director
  - Office: 917-284-6467
  - Cell: 908-303-2926
  - www.telx.com
- Inland Fiber - Winterhaven
  - Stephen Sowards, Director of Sales and Channel Development
  - Direct: 863-206-7344
  - ssowards@inlandfiber.com

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Disaster Recovery Connections

- **Northwest Regional Data Center @ FSU**
  - Bill Teasley, Asst Director
  - Phone: (850) 245-3500
  - **tim_brown@nwrdc.fsu.edu**
  - **www.nwrdc.com**

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How Do I Join?

- Contact FLR with requirements/questions
- Review and sign FLR's NDA
- FLR will:
  - Develop a Term Sheet with costs and Terms and Conditions for FLR services
  - Assist in finding and specifying local loop & connectivity options
- Review and execute FLR's Connection Agreement & arrange for local loop
- FLR NOC will coordinate connection

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More Information?

- Contact Business Development Manager
  - Jack Hall: jack.hall@flrnet.org (850) 245-3590
  - Jeff Schilit: jeff.schilit@flrnet.org (561) 843-2366
  - Brochures/Web Site: www.flrnet.org
  - CIOs/Reps at Equity member Institutions
    - UWF - Mike Diekmann
    - FSU – Michael Barrett
    - UNF - Lance Taylor
    - UF - Elias Eldayrie
    - UCF - Dr Joel Hartman
    - FIT - Dr Dick Newman
    - FAU – Mr Jason Ball
    - NSU – Tom West
    - FIU - Julio Ibarra
    - UM - Stewart Seruya
    - FGCU – Mary Banks

Web Address: www.flrnet.org

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QUESTIONS?
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