Customer Case Study

Florida LambdaRail Powers Advanced Academic Research and Communication

Executive Summary

Customer Name

Florida LambdaRail

- Tallahassee, Florida, USA
- 10 member institutions

Industry

Higher Education

Business Challenge

- Deploy a carrier-class optical platform to enable Florida researchers to reduce costs and participate more fully in the next-generation Internet.
- Enhance network administration, performance, and reliability to support demanding academic applications.
- Provide a flexible platform that can support a range of network services and traffic types.

Network Solution

- The Cisco ONS 15454 delivers SONET and Dense Wavelength-Division Multiplexing (DWDM) support on an integrated, manageable platform.
- Reconfigurable Optical Add/Drop Multiplexer (ROADM) capability automates many maintenance functions.
- Cisco diagnostic tools provide troubleshooting and network administrative support.

Business Value

- Improved bandwidth enhances and accelerates research initiatives and keeps institutions competitive.
- Single-platform solution eases management and enhances operational efficiencies.
- Better connectivity saves up to $350,000 in access charges.

Cisco® optical solutions enable the Florida LambdaRail high-speed research network to provide a cost-saving shared platform for advanced studies by researchers from 10 state research institutions.

Business Challenge

Florida LambdaRail (FLR) is a regional research network that is part of National LambdaRail (NLR), a major initiative of U.S. research universities and technology companies to build a nationwide infrastructure for research and experimentation in networking technologies and applications. The organization seeks to catalyze innovative research and development into next-generation network technologies, protocols, services, and applications.

Florida's research and academic community saw NLR as an opportunity for the Florida academic community to participate directly in the new national high-speed networking infrastructure. Larry Conrad, board chairman of FLR, approached potential participants and was surprised at their enthusiastic response. "We had one conference call with various public and private CIOs, and within three business days we had six institutions agree to make the commitment to invest in the NLR over five years," says Conrad. "The immediate buy-in that we received from our senior executives was astounding."

To support the FLR initiative, planners needed a carrier-class optical platform that could deliver not just the performance needed for demanding academic applications, but the flexibility to support multiple types of network traffic.

"On the research side, people want to be able to push the limits and not have that impact their production-level services," says Chris Griffin, FLR chief network architect. "On the production side, the need was not to let the research impact it, and to have a very stable, very well-understood network. These were two opposing requirements that we had to get to coexist."

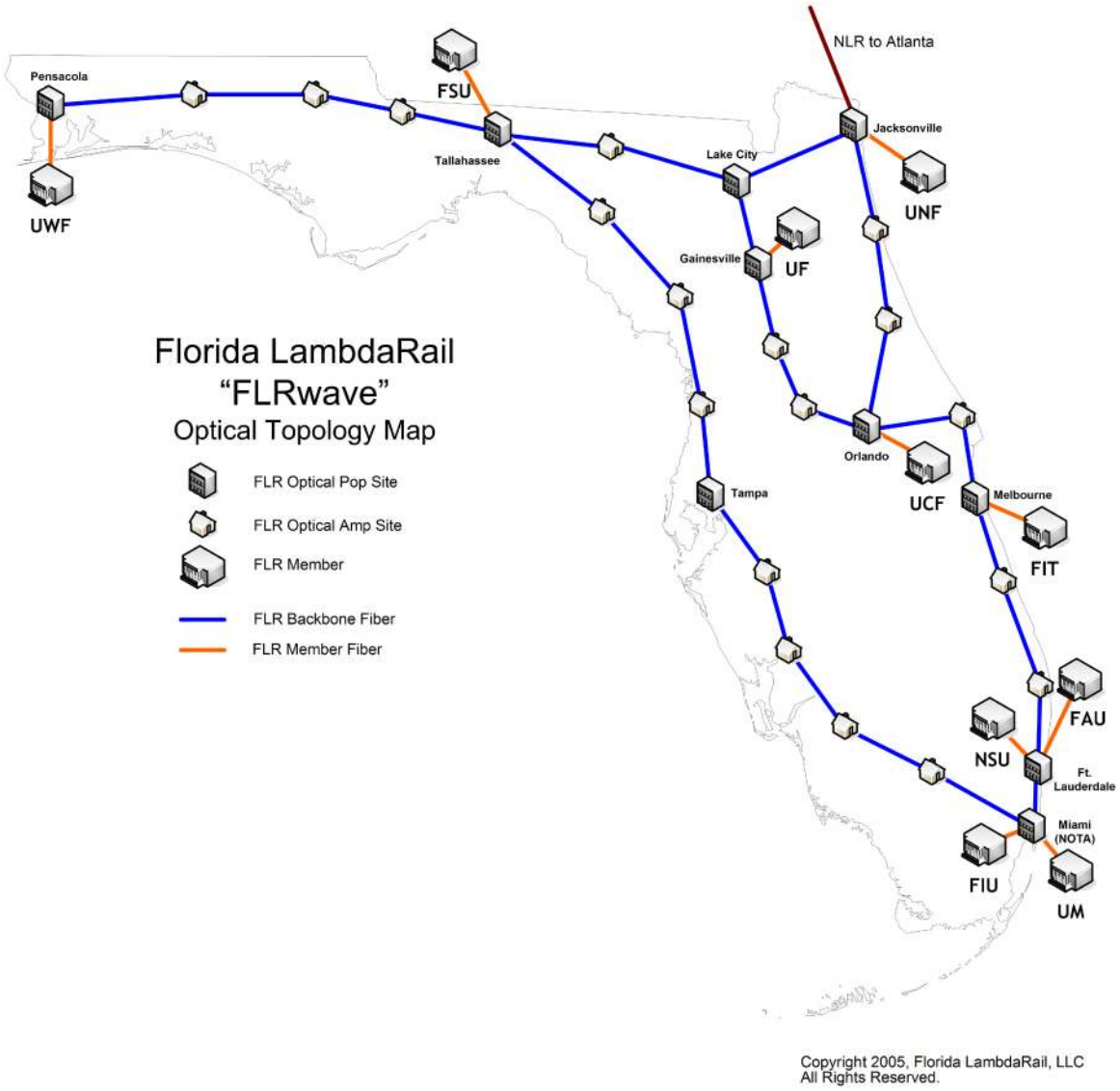
FLR administrators also needed a platform that would provide robust management tools to support dynamic academic applications.

Network Solution

After evaluating a number of options, FLR administrators selected an optical transport solution based on the Cisco ONS 15454 Multiservice Transport Platform (MSTP). Network engineers were familiar with the Cisco solution and its proven reliability and flexibility.

Figure 1

The FLR infrastructure provides a statewide, dedicated optical data facility linking major nodes throughout Florida, as well as interconnecting with NLR nodes.



"University of Florida has previous experience with the Cisco ONS 15454," explains Griffin. "We have a SONET platform in production that's very reliable for us, and we liked the idea of adding new ability to a common carrier platform. So it gave us confidence in the long-term stability and viability of the platform. It wasn't a whole new product; we were adding components to a product that has served us well for several years."

Because Griffin and his colleagues were already familiar with managing the Cisco Systems® solution, network administration and training could be minimized. "From a technical perspective, we already had experience on it and already knew the common parts on it," adds Griffin. "From a long-term viability perspective, it gave us confidence in our ability to use this product down the road."

The first service offered to FLR participants was a shared IP infrastructure. Each member has a 10-gigabit connection and a 1-gigabit backup to the network, so they could reach their commodity Internet services and Abilene Internet2 network access. The versatile Cisco platform could

also accommodate production and research traffic running side by side. And it delivers the superior performance that Florida's academic community demands.

"This puts us on equal footing with the best research institutions in the nation," says Conrad. "It levels the playing field for our faculty in competing for grants because funding agents know that we have the fastest research network connectivity available."

For example, Pat Welsh of the Division of Engineering at University of North Florida (UNF) and his collaborators in the Advanced Weather Information Systems Laboratory are working on real-time weather information systems, including real-time wireless data collection and high-resolution atmospheric modeling. Such data-intensive work requires high-bandwidth communication that FLR offers.

Not only do the field sensors and local datasets need to be rapidly assembled, but large global model results from the National Weather Service models must also be rapidly downloaded to initialize the high-resolution model. Each model run produces a file so large it would nearly fill a CD-ROM, so bandwidth is very important to the model output as well as assembly of the input. FLR delivers the performance and bandwidth that free Welsh to focus on his research, rather than on the network requirements.

"When I was at the National Weather Service Office, everything we did was bandwidth governed," says Welsh. "With FLR at UNF, I don't even worry about that – we never even have to consider bandwidth as an issue."

Business Value

Participants in the FLR network share a 10-gigabit port in the Atlanta node of the Abilene Internet2 network, saving costs dramatically for FLR members. Dave Pokorney, FLR chief technology officer, counts the advantages for the University of Florida: "We were spending approximately $350,000 a year for OC-12, and now our Abilene component is a fraction of that. Coupled with our reduction in cost for commodity Internet services, we're probably recovering $350,000 in cost savings. The FLR provides the academic and research community an enabling infrastructure that supports production and research applications. It also provides a test bed supporting network research such as Ultralight. The mix of these different kinds of activities within the same infrastructure sets FLR apart from what is offered by the commodity service providers today."

Conrad says, "Speaking for Florida State University, I anticipate that I will save $200,000 toward my FLR payment in improved pricing for Internet2 and commodity Internet connectivity. It certainly helps our ROI."

Jeffrey Schilit, associate provost of Florida Atlantic University, says, "The new network enables us to combine all our network operations into one pipe, then subdivide and segment the pipe through VPNs and channels as needed. By joining FLR and using Cisco equipment, we've saved about $200,000 in real cash, which I can then reallocate toward other uses."

Cisco ROADM capability saves still more by automating network topology discovery, setup, and wavelength additions. Cisco ROADM eases service changes and dramatically improves the visibility of the state of the network. "We've seen some strong benefits in terms of being able to monitor power levels on a per-channel basis and do a lot of power balancing," says Griffin. "On the ROADM side of the network, we've actually deployed several waves post-first light. We've found them to be as close as you can get to 'plug and play'."

Network administrators also use the Cisco MetroPlanner tool to analyze future growth and evaluate the effect of ROADM deployments on different parts of the network. Griffin credits careful planning and Cisco robust administrative tools for providing a flexible network: "We haven't had any issues with adding additional waves. That's largely due to the initial engineering process where we looked at demand and capacity and ensured that the network would scale to where we wanted to go. We did that homework up front, so adding additional capacity has not been an issue."

Product List

Routing and Switching

- Cisco ONS 15454 MSTP/MSPP
- Cisco Catalyst® 3750 Switches
- Cisco 7600 Series Routers

Next Steps

The FLR network began operation in March 2005, and its tenth member institution joined the network in September. Similar regional optical networks exist or are under way in other states, but Conrad says Florida's is the only one fully created, funded, and controlled by a group of universities. Network administrators plan to extend Cisco ROADM technology to the network.

"We're definitely looking at reinforcing our routes in western Florida for ROADM development as well," says Conrad. "We'll be hosting SuperComputing 2006 in Tampa, and we'll be called upon to take on a pretty good share of that activity next November."

For More Information

To find out more about Cisco Optical Solutions, visit: http://www.cisco.com/en/US/products/hw/optical/index.html.

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