

Life of Lambda

In April, Jack McCredie, Editor of the Viewpoints department for *EDUCAUSE Review*, reminded me that I had promised to write this column. Of course, when I made that commitment, the submission date seemed distant; by that time, I was certain my various commitments would be more rational, providing ample time for me to sit in my office and “think great thoughts.” (This, by the way, was how an associate dean characterized my new responsibilities after my first promotion twenty years ago . . . what a bunch of hooley!)

Not surprisingly, when Jack reminded me that the deadline was drawing near, I asked whether he had a topic in mind. His answer was: “Yeah, this stuff.” Here you will need some context. Jack and I were in the Chicago Airport Hilton, midway through one in a series of day-long meetings of a small group (“Group B,” to be precise) that was exploring ways in which National LambdaRail (NLR) and Internet2 could more closely align their services and efforts. Although I knew what Jack meant by “Yeah, this stuff,” his simple answer did not fully capture the complexity of the request. Jack was asking me to write an article about an intense process that we had just begun—and that wouldn’t be complete for a few months. In addition, because of the vigor with which we are pursuing this task, some of the results of the process may be public by the time this article is published. So here I am, struggling to provide an update on where I think we are heading, but when this issue of the magazine is printed, it may already be clear if I have forecast correctly or if I will join the ranks of those who have come to regret some of

their now infamous prognostications. (You know the ones: technology company CEOs cited years later for saying, “There is no reason for any individual to have a computer in his home,” or “640K ought to be enough for anybody.”)

With that disclaimer out of the way, I’d like to answer what I think are four key questions about NLR, Internet2, and this intense process.

1. *Why is NLR critical to the research and education community?* NLR in some ways represents the epitome of change. It pushes not only technical change (using Dense Wave Division Multiplexing, or DWDM, to enable multiple networks to coexist on a national fiber footprint) but also changes in span of control (the facility is owned and operated by the research and education community, not by carriers), in emphasis on research (50% of the waves will support network research), in organizational approach (NLR employs one or two full-time staff, supplementing those efforts with personnel from campuses, Regional Optical Networks, and other organizations), and in governance (the NLR Board operates as a cooperative partnership more than an approval authority, and most board members represent coalitions of a dozen or more research universities). But beyond representing change in so many areas, NLR provides a unique approach to connecting researchers across the country (and beyond) through flexible, high-performance optical network capabilities serving diverse communities of computational scientists, systems researchers, and networking researchers. As a CIO, I need to eliminate technology limitations that might hinder faculty recruiting; partici-

pating in NLR can give Duke an edge in competing for researchers who expect to collaborate nationally and internationally.

2. *Why couldn’t NLR have happened as a project under Internet2?* Someone once asked me if NLR is the antithesis of Internet2. It is, and it isn’t. In terms of certain organizational and operational characteristics described above, yes, NLR has taken an approach quite different from Internet2—maybe even an opposite approach. However, in terms of mission, the two have much in common. Both organizations promote and support education and research by enabling high-performance network capabilities. From the beginning, the leaders of both organizations recognized the need for collaboration and complementary services rather than competition. That Internet2 is a member of NLR underscores this commitment. Still, there is the question of why NLR didn’t grow out of Internet2. To me, the answer involves disruptive change. What NLR sought to enable was, quite frankly, so different from the ongoing delivery of production services (i.e., what Internet2 was doing through Abilene and other efforts), that—I firmly believe—NLR could have come about only through the creation of a new, independent effort. Consider, for example, that whereas Internet2’s network activities are funded through a combination of five-figure membership fees and six-figure service fees from its more than two hundred members, NLR’s launch began with seven-figure commitments (\$5 million each) by less than a dozen members (including two memberships held by Internet2). Even without the other elements of disruptive change represented by NLR,

the sheer magnitude of financial commitment from a small base of members created an expectation of a much greater level of involvement in its development than was practical within Internet2's charge and governance structure. For these reasons (and others), NLR was formally launched as a not-for-profit organization in May 2003.

3. *Why is it now critical that NLR and Internet2 rationalize their activities?* Since it was launched, NLR has accomplished what some thought impossible, with the full



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nationwide footprint scheduled for completion in October 2005, a scant twenty-nine months after NLR was incorporated. As NLR and Internet2 continue to serve the research and education community, it becomes increasingly likely that both organizations will seek to expand their services. There is already some confusion within the community about which organization provides what service, and further expansion will only complicate the matter. Moreover, many in the community have long hoped that the next generation of Abilene might use NLR facilities as its underlying transport. These factors and others are likely to create situations in which NLR and Internet2 begin to rub up against one another, rather than remain in relatively distinct spheres of activity (as they have over the past two years). Instead of waiting to see how that might unfold, in January 2005 NLR and

Internet2 jointly convened a group (called "Group A" to stress its short-lived nature) to "identify and document current Internet2 and NLR service plans through June 30, 2006, and beyond if possible." The Group A report provides a glimpse of one possible future, characterized by increasing overlap in services and capabilities. Since such overlap would likely put the organizations into competition, both Internet2 and NLR are motivated to consider ways of rationalizing their efforts and even aspects of their organizations so that research universities are not forced to choose one or feel they must participate in both (NLR's sixteen members represent more than 120 universities, labs, centers, and others; at least ninety of the universities are also Internet2 members).

4. *How is this rationalization going to be achieved?* This brings us to the \$64,000 question—or, in this case, the \$160 million question, since that is the estimated aggregate five-year commitment to networking by NLR and Internet2. The process for achieving rationalization begins with a series of deliberations by Group B, which was also convened in January 2005 by NLR and Internet2. Group B is charged to "propose one or more aggregation schemes that group the [combined set of NLR and Internet2 networking] activities effectively." The charter does not constrain Group B in terms of organizational approaches: "These schemes may correspond to the current Internet2, NLR, and regional organizations, but this is neither a requirement nor a goal of the process." The end result will be a proposal to "satisfy the organizational requirements of the various services and activities while minimizing the complexity of the overall result." It is important to note that Group B was convened "as knowledgeable individuals rather than as representatives of specific organizations." Since Group B has no formal authority relative to the two organizations, any recommendations it

makes will need to be evaluated by the respective boards of NLR and Internet2 to determine whether formal action or further study will follow.

I will close by pointing out that as in the book *Life of Pi*, the "Life of Lambda" is about mutually reinforcing roles. *Life of Pi* tells the story of two fundamentally different creatures—a young boy (Pi) and a Bengal tiger—trapped together on a lifeboat. Although initially the boy sees the tiger as a threat, in time he realizes that he and the tiger have the same goal: survival. Eventually they come to depend on one another: the tiger relies on the boy to procure food, and the boy depends on the tiger as his companion and sustaining life force. What those outside the lifeboat might see as an untenable situation is actually a delicately constructed and fairly harmonious arrangement. So it has been and will continue to be with NLR and Internet2 (though I leave to the reader the question of whether NLR or Internet2 represents the Bengal tiger). As long as the two organizations have a shared goal and can provide complementary benefits, they can find ways to harmoniously coexist, be that in the current organizational forms and with the existing services of each or in some modified organizational structure that aligns the two more closely in the interest of better serving the needs of the community. After all, if a Bengal tiger can suppress its natural instinct to see Pi as his prey, anything is possible.

[*Author's note:* Several months after this article was written and just as this issue of the magazine was going to press, the NLR Board and the Internet2 Board separately passed resolutions to pursue merger discussions, with the intent that those discussions conclude in August and be followed by formal consideration by both boards in September 2005.]

Tracy Futhey is Vice President for Information Technology and Chief Information Officer at Duke University. She chairs the National LambdaRail Board of Directors and serves on Internet2's Board of Trustees and Network Planning and Policy Advisory Council.

