

Campus Expectations Task Force meeting
Tuesday, 29 March 2005
Chicago O'Hare Airport

Present: Rick Adrion, Tom Knab, Jorg Liebherr, Kevin Thompson, Ron Hutchins, Bill Decker, Laurie Burns, Ray Ford, Marilyn McMillan, Lois Brooks, Jacqueline Brown
On phone: Henry Neeman
Unable to attend: Mark Ellisman, Stu Kippleman

I. Introductions

There were general expressions of interest in looking at where campuses are headed, in terms of cyberinfrastructure on an end-to-end basis. Nearly at the end of the first 10 years of Internet2, so timing is right to do this.

There is interest in defining a clear set of expectations for the campuses. We will also have plenty of thoughts for what Internet2 itself should be, but want to make sure focus is on campus. For long time we have been concerned about the interaction of the campus IT environment with the research enterprise.

Important to engage members in a dialog, and re-engage with researchers. It's timely for many Task Force members to think about the role of users and how they shape the future network. Need to keep international aspects in mind.

II. Background and review of charge

The Task Force was initiated by the Applications Strategy Council and co-sponsored by the Network Planning and Policy Advisory Council. It is also supported by other two Councils, and representatives from all four are present on the Task Force.

The charge includes statement about promoting and enabling advanced applications – important but shouldn't be seen as the only goal. Internet2's goal should be to support the needs of the campus, do things that support the needs of the campus. We need to engage the communities that we're trying to serve. Charge may not really speak to those requirements. It will also be important to balance responsiveness and invention; it's not always the intended community that uses what gets built, but an unexpected other.

Not all campuses are the same, in terms of their needs and their capabilities. It's important to avoid prescriptiveness, and cookie-cutter approaches.

Bill briefly summarized a meeting on 25 March of the NLR/Internet2 group looking at organizational convergence. Several different models are being considered, and it will be important to stay connected to that group. It was also noted that there are tremendous pressures from the telecomm industry, particularly with review of the Telecommunications Reform Act coming up.

III. Possible end-point products

We should start talking about end-products early, as a way of knowing when we're done, and determining who the audience is for our products. Ray Ford proposed that one end-product could be a succinct, one-page description of expectations from which case studies and best practices could be linked. The document would emphasize the notions of "good community citizenship" for campuses, what campuses should be doing for each other (for example, regarding security holes). There was discussion about whether this was too broad an approach, but support for creating concise documents.

In the beginning, good citizenship requirement was put the money into the infrastructure. What's perhaps missing is that we don't have a way to articulate an institution's, or the community's, goals for what they want to get out of Internet2 participation. Could look at descriptive components, and then becomes responsibility of each campus to figure out how those play out.

Campus expectations cut both ways – of campuses, and of I2. We need to think in terms of individual users to help shape the requirements. We should look at some of the different constituencies and what their needs are, then goals could come from that. It might be interesting to look at how those have changed in 10 years. We also need to keep in mind other kinds of organizations that have user bases.

Is our charge to just look at campuses, or also the expectations of the Internet2 organization? Laurie responded that the initial charge was the former, but the second is not out of bounds and in fact will have major implications for the organization. So it's appropriate to look at this too.

IV. Retrospective

Ron Hutchins led a retrospective on the history of Internet2, starting in 1993 with the privatization of NSFnet. An initial concept for connectivity was five Network Access Points (NAPs) nation-wide. In 1995, a workshop in Monterey began to lay out the first principles for a new effort in building an advanced national R&E network for higher ed. A cooperative agreement with MCI for access to the vBNS occurred during this time, as did the sale of SURAnet to VPN. The NSF's first High Performance Computing grants began around this time as well.

In 1996, representatives from 34 universities met at Chicago O'Hare airport and formed the Internet2 project, to respond to higher ed's desire to control its own networks. The first Internet2 Member Meeting in San Francisco in 1997 was where the gigaPoPs concept emerged, and the first expectations of campuses to invest significant dollars (\$1million) to upgrade campus and building networks. Internet2 was founded with two main activities in network engineering and applications development, and was conceived as a relatively short-term, project-based organization.

In 1998, Abilene was announced, and in 1999 it began passing traffic. The first COU was designed to avoid competition with industry and interoperate with vBNS. Around this same time the Quilt began to form, in part in reaction to not being part of Internet2's governance structure and also to give existing and emerging regional networks more of a

voice. Internet2's Middleware initiative began in this time period as well, and working groups in routing, topology, QoS and other advanced network services got underway.

2000 – Concept of sponsored (nee “secondary”) participation was introduced, bring on the first non-member connections to Abilene. Efforts to organize activities in the K/20 community started. The Quilt established itself as a 501.c.3 but shelved its incorporation in favor of being an autonomous but linked organization, hosted by Internet2. Cisco and Nortel sponsored engineering workshops, and defined an RFC for multicast. Peppered all through this were discussions about network research, and whether Abilene was the network for research, or the network of research. There were campus architecture workshops at UCDavis and elsewhere.

Work in digital video had been going on in the community since the formation of Internet2 and continued through this period. The Internet2 Commons began in 2001, building on work at SURF, Ohio State and elsewhere. In 2001, Internet2's end-to-end initiative began. With the telecom bust, the cost of fiber began to plummet and regional optical networks began to emerge. In the fall of 2001 the upgrade of Abilene to 10Gbps was announced with an associated decision to use Juniper rather than Cisco routers. Shortly thereafter, Pacific LightRail, then National LightRail, renamed National LambdaRail following a trademark search, emerged.

V. and VI. Perspectives and discussion of expectations

Discussion ensued. NAPs didn't take off because private peerings gave regionals a competitive edge. Internet2's membership quickly outstripped early predictions of roughly 50 members because many more saw the opportunity for political visibility and ability to attract grant funding. It brought scientists, CTOs, CIOs, researchers, etc. together, and built community – single best thing Internet2 did. This was at a time when the backbone was slow and campuses were where the high-speed networks were. This flipped later on – the backbone is now stable, high-performance, services-rich. Security issues emerged and are still with us.

Internet2 misread major constituencies, particularly regionals – the Qwest backhaul model had the effect of undermining business model for some. Later, with the Abilene upgrade, the decision to use Juniper routers was a major factor in relations with Cisco that still linger. Kevin Thompson recalled the multicast workshop, in which for the first time he saw campus engineers have the opportunity to talk directly with Cisco to lay out scenarios where things weren't working. Is Internet2 staying ahead of the campuses, or are we on the verge of campuses leapfrogging the backbone? Economics may dictate answer here.

How are we relating to the science interests in the community? This relates to why NLR has emerged and has attracted resources. Researchers care about the network being there, but invisible. Supercomputer centers weren't particularly interested in networking – once network was there was always tension between small number of high-use users and the masses. NSF could only be so successful in building this, but reasonably so, is now investing. There is natural tension between the needs of smaller research communities

and the broader academic community. Researchers tend to go after funding for very small communities, and if they don't get what they want out of central infrastructure they will go build their own.

Even if whole community wants something, there still needs to be a hero on the frontline to push it. We tend to be more adept at addressing crises than addressing incrementally growing needs. Even an imperfect solution to a huge problem can have huge effects. And even with crises they aren't all felt at once, always a small cadre out in front, addressing their own needs and then they become poster children. There is a large challenge in evaluating and sunsetting technologies. Can't think about a network in isolation, data comes across it and there has to be a place to put it. What does it really mean to bring up an infrastructure on campus?

Several spoke to the CIO perspective – different infrastructures and scopes aren't really about internal competition. The need is to integrate them into an operating whole. Need multiple ways to solve problems and meet needs. Need an operating definition of what we mean by Internet2.

It's important to build community to make the impact broader rather than narrower. With other groups organizing themselves to do this, what's Internet2 doing to do to make sure larger community still benefits from the sum of the parts?

From the perspective of senior research officers, the questions are things like: how do I enable collaboration on and off campus? How do I help create collaborative communities and environments, and minimize impact of distance? These have to be there to make research enterprise work. What drives this is need to be competitive in funding environment, participation in big science, NIH roadmap. Data security, ownership, authoring, etc. all do intersect with way in which network operates to support these. Worry about nature of the infrastructure in terms of how it supports highly distributed research locations, remote instruments. Not quite same as collaboration. The details matter less than just making it happen.

Library perspective is the same. Libraries need mass storage, content management across universities. Trust IT colleagues will continue to help get those things done, and will align these with the institution's mission. This is the CIO's dilemma, each constituency wants its needs met, and the CIO has to balance all these, scale all these, stay competitive. We should think about including something on how this should happen in the Task Force's end product. Internet2 is a way to help everyone, but there are fragmenting pressures and Internet2 has to be able to adapt.

From the researcher perspective, Internet2 is an organization of CIOs. The demos at Member Meetings are really impressive, but there hasn't been any real change in ease of use in last 10 years. In fact, things are more difficult now. Once a researcher could call vBNS and ask for a single ATM circuit, but can't now. Multicast doesn't really exist; throughput isn't what it should be. To some, it has seemed easier to bypass this "powerful network of CIOs". NLR is a "cry for help". Universities want to control their

destiny, but does that really translate to wanting Internet2 to succeed? Are university presidents really aware?

There is value in NLR for the network research community, but isn't going to solve desktop to desktop issues. Kevin cited an example from SC04, where a multimillion dollar NSF project was being showcased. The researcher was trying to get a huge amount of data from his machine on campus to the meeting in Pittsburgh. Campus technical staff saw a massive flow start up, thought it was a DDOS attack and shut it off. The researcher had to fly to his home campus to get data off on disks and hand-carry to Pittsburgh. Campus security issues are acute.

The scarcity of dollars forces sharing. If cost was no object many would simply resolve their own, get their own. Can we propose to Internet2 to get in room and stop competition, pull together, so that there's utilization of infrastructure? Let regionals provide infrastructure to NLR and Abilene.

We need to maintain a constituency focus, as it helps us to look at where other organizations could play and bring resources to bear. One value of Internet2 is fostering communication on campus because it's often spotty. What it means can vary hugely across different communities on campus. To make use of investment takes effort. What can Internet2 offer, besides a credential?

Does the NSF needs an organization like Internet2 at the table when it's planning programs to respond to researcher interests? Kevin cited NEES – amazing project due to its length, tackling hard sociological and cultural issues, civil engineering communities. NEES depends implicitly on Internet2, for use of shake tables, simulations. Need to get researchers really engaged. From the industry perspective, there are lots of cross-border projects, lots of engagement and collaboration. In network research, there is the emergence of sensor nets, and this is a changing field. Another community that's grown is measurement community.

VII. General discussion and brainstorming

We need to lay out assumptions and various expectations (of campuses, of liaisons, of organization, of regionals), and these will need to be tested.

Assumptions

- independent net still important
- Internet2 is a member organization
- Internet2's delivery of Abilene has resulted in a nation-wide high-performance, production resource for US R&E
- Internet2 is an organization of CIOs
- Internet2's focus has shifted from infrastructure towards higher-level things over time: middleware, applications, etc.
- Educause (Net@Edu particularly) is about policy, is Internet2?
- should Internet2 advocate with federal agencies generally, on behalf of building broad support for investments in networking?

Expectations of Internet2

- provides value over commodity internet
- international peering is important
- convenes apps workshops with members and creates new infrastructure
- facilitates research rather than competes, should not use member dollars to co-opt local efforts (Commons effort seen as this). Partner on grants.
- leverage the collective energies, facilitate research into production, we value the packaging and "making useful" role
- advocating with funding agencies (effectively).
- broker and advocate for services
- build trust (by working in a transparent fashion, by partnering, by crediting, by not co-opting, by consulting, etc.)
- Engage LSN as advocate
- Focus on last mile (building the tools)

Expectations of members

- Members expect other members will have good last mile, to selected sites
- Should there be an accreditation approach?
- Contribute and participate on tasks that build apps/middleware/
- Partner for grants
- Look to Internet2 first, don't build in isolation
- Trust
- Create connections between CIO and SRO

Expectations of the campus's diverse community

- TDB

Actions:

1. Investigate how to create dialog with NSF and LSN (Kevin Thompson)
2. Engage EDUCAUSE/Net@Edu in a dialog regarding policy roles (Marilyn McMillan)
3. Engage campus CIOs at Spring Member Meeting (Laurie Burns)
4. Identify research communities and make contact with CRA, through Dan Reed (Rick Adrion)
5. Continue dialogs between senior research officers and CIOs (Bill Decker)
6. Prepare a candidate lists of assumptions for discussion at next meeting (Tom Knab and Lois Brooks)
7. Write up one-page "straw horse" statement (Ray Ford)
8. Identify network researcher expectations (Jorg Liebeherr)
9. Prepare an initial list of constituencies (Laurie Burns)

Next meeting:

Wednesday, 4 May 2005

4:30-7:30pm EDT

Crystal Gateway Marriott, Arlington, Virginia

(Phone participation will be possible)