

Dear members of the Internet2 community:

We are writing to update you on progress toward building a sustainable relationship between Internet2 and our historic partner, Indiana University.

Please find attached a cover memorandum from Kelli Trosvig and Dave Swartz, co-chairs of the Operations Excellence Community Steering Team (OECST) and the final OECST report. This team was charged with assessing the relationship between Internet2 and the Indiana University Global NOC, and making recommendations to the Internet2 board on how best to move forward. They have produced an excellent report, which we and they are pleased to share with you.

The Board of Trustees of Internet2 has now charged a subgroup of the OECST, consisting of Steven Corbató, Steve Fleagle and Pankaj Shah, to oversee further negotiations pursuant to the principles outlined in the OECST report. They are charged with determining the basic parameters for negotiating an agreement, and overseeing the negotiations between Internet2 and Indiana University. This group has the confidence of the Internet2 Board and Indiana University leadership. Our goal, which we are very optimistic about achieving, is to have an agreement in place by the end of March that will govern the relationship for the next several years.

In addition to achieving this agreement, we are also implementing discussions that will lead to the further development of partnership principles, so that this important relationship plays a key role in developing the vision for Internet2 and how it can best serve the interests of the entire Internet2 community, and especially our research and education missions.

As you would expect, these negotiations will largely be conducted in private. We will update you in the future with significant developments. We expect to communicate to you soon regarding the composition of the search committee for a new CEO of Internet2 to succeed Dave Lambert.

Warm regards,

David

David W. Leebron
Chair, Internet2 Board of Trustees
President, Rice University

Pat

Patrick D. Gallagher
Vice-Chair, Internet2 Board of Trustees
Chancellor, University of Pittsburgh

November 23, 2016

To the Internet2 Community,

It is our pleasure to share with you the final report of the Internet2 Operations Excellence Community Steering Team (OECST).

The OECST was charged this past spring with assessing the current relationship and pending contractual issues between Internet2 and its partner, the Indiana University GlobalNOC, as well as making recommendations to the Internet2 Board on how to move this critical partnership forward. The OECST membership was comprised of a prominent group of Internet2 community leaders, including research university CIOs and regional network leaders (see membership list below). During its evaluation, the committee found fundamental structural issues between the two parties that must be resolved as soon as possible.

Over a period of seven months, the OECST has examined numerous documents, held regular meetings, and interviewed staff from both Internet2 and the GlobalNOC. This effort included a survey of the regional networks, a cataloging of best practices utilized in peer national Research and Education (R&E) networks, and a site visit to the GlobalNOC operations center in Indianapolis.

Throughout this analysis, it was evident that the front-line staff members from both organizations are committed to providing outstanding service to the community, take great pride in their work, and strongly support the mission of Internet2. However, the committee found significant issues that need to be addressed promptly, and we have listed in our report both our Findings and Recommendations for moving forward. The issues that we found are not only troubling for current network operations, but threaten the ability to meet future technological and service needs of the R&E community. It is critically important to have the highest quality service to our community, and also the engineering and architectural design support to build a network that will serve the community for the upcoming decade.

We are delighted that our report has been received well by all parties involved, including the Internet2 Board of Trustees, the Indiana University GlobalNOC, and the Internet2 leadership. Further, we are also very pleased the Internet2 Board has recommended that a subset of representatives of our group continue their involvement and assist both Internet2 and the Indiana University GlobalNOC in drafting the next network operations agreement. We expect these discussions to move forward with a long-term extension to the agreement in place before Spring 2017.

We wish to recognize and thank all of those on our committee who gave of their time and provided their expert input over these many months. It was a great pleasure and honor to

work with these outstanding community members. In addition, we want to express our appreciation to the staff members at both Internet2 and Indiana University, who supported our effort and gave generously of their time and experiences, and to the regional network leaders who participated in our survey process.

Sincerely,

Kelli Trosvig, Co-chair OECST and VP & CIO University of Michigan

Dave Swartz, Co-chair OECST and VP & CIO American University

On behalf of the OECST membership:

Steven Corbató, CTO, Information Technology Group, Oregon Health & Sciences University (OHSU)

James Deaton, CTO, Oklahoma State Regents for Higher Education (OneNet)

William Deigaard, Director, IT Infrastructure, Rice University

Steve Fleagle, CIO, University of Iowa and Member, Internet2 Board of Trustees

Kathy Gates, CIO, University of Mississippi

Patty Giuntoli, Area Lead, ESnet, Scientific Networking Division, Lawrence Berkeley National Laboratory

John Krogman, COO, Department of IT, University of Wisconsin-Madison

Dave Lois, Executive Director of WiscNet

Charlie McMahon, Vice President for Information Technology & CTO, Tulane University
Michele Norin, Senior Vice President & CIO, Rutgers University

Pankaj Shah, CEO, Lonestar Education And Research Network (LEARN) and Member, Internet2 Board of Trustees

The Operations Excellence Community Steering Team Final Report

Background

Since its inception, Internet2 has employed the Indiana University Global Research Network Operations Center (GlobalNOC) for its network operations and engineering services. GlobalNOC was founded in 1998 to provide operations, tools, and network expertise for Internet2's Abilene network. Both the GlobalNOC and Internet2 have grown significantly in size over time, as the scope of their services and customer base has grown. Historically, this collaborative partnership provided great value to the Internet2 community by leveraging the assets and expertise of both Internet2 and GlobalNOC to benefit the higher education community. In recent years, however, the relationship has become increasingly strained.

The Operations Excellence Community Steering Team (OECST) was charged with assessing the current relationship and contractual issues, as well as making recommendations to the Internet2 Board. The OECST is composed of a prominent group of Internet2 community leaders, including university CIOs and regional network leaders (see appendix for membership list). During its evaluation, the committee found fundamental structural issues between the parties that must be resolved, before the contractual issues between Internet2 and GlobalNOC can be addressed.

Over the last six months, the OECST has examined numerous documents, held community meetings, and interviewed staff from both Internet2 and GlobalNOC, as part of its evaluation. This effort included a survey of the regional networks, a cataloging of best practices from other national Research and Education (R&E) networks, and a site visit to the GlobalNOC operations in Indianapolis.

Throughout this analysis, it was evident that the front-line staff from both organizations are committed to providing outstanding service to the community, take great pride in their work, and strongly support the mission of Internet2. However, the committee found significant issues with trust between the organizations, including micromanagement of engineering staff, lack of transparency, challenges in the decision-making process, and insufficient governance.

These issues are not only troubling for current network operations, but threaten the ability to meet future technological and service needs of the R&E community. It is critically important to have the absolute highest quality engineering and architectural design services to build a network that will serve the community for the upcoming decade, particularly in light of the magnitude of the imminent network refresh that is about to be undertaken. With this in mind, the dependency on a single partner for network operations center (NOC) and engineering services represents a significant risk. This issue is addressed in our recommendations to the Board.

Findings

The Findings listed below provide a summary of the main themes that cross both organizations and those that arose from the committee's interviews with Internet2 and GlobalNOC staff.

Some themes and messages were consistent across both organizations:

- Lack of transparency in technical, operational, and financial matters
- Absence of trust at many levels of the organization
- Little sense of shared destiny – very little of the “We’re in this together” mentality
- Ineffective or non-existent communications
- Significant work is required to repair and restructure the relationship to create a culture of community with shared goals.
- Internet2 and GlobalNOC agree that the project to swap out the Brocade network switches has gone well; and both teams worked collaboratively and effectively on this project, during 2015 and 2016.
- Both partners have worked collaboratively to address a lack of maturity in security practices, as identified several years ago in an operations assessment.
- Both groups are very supportive of measured outcomes; however, the parties may have a different understanding of what that means and of their value. At present, the agreement guiding the partnership focuses on measuring inputs—mainly headcount in different support areas, rather than service levels and other measurable outcomes.

Findings from the committee's interaction with Internet2 leadership and staff:

- Internet2 leadership wants the relationship with the NOC to be governed by flexibility, visibility, and measurability of outcomes.
- Internet2 leadership wants IU to embrace and implement IT service management.
- Internet2 feels the relationship with IU leadership is difficult, due to a perceived lack of compromise.
- After our visit to IU, the committee found that, in some instances, IU is in fact delivering on what Internet2 wants. This highlights a disconnect in the relationship and communications, including about roles, responsibilities, and interactions.
- There is a perception that Internet2 has lost contact with and focus on the community and its needs.

Findings from the committee's interactions with IU, including its October 3 visit:

- Day-to-day interactions frequently consist of Internet2 senior leadership micromanaging daily operational issues (tickets) versus managing by service levels.

- There was a strong commitment by IU staff to the Internet2 project and mission, but on their own terms.
- IU engineers, who were previously deeply engaged in community technical efforts, have been asked to end this level of participation by Internet2. IU technical staff find this a disappointing development.
- Decision making from Internet2 seems to be pushed to upper management, which slows down progress.
- Concerns were consistently voiced about inadequate technical depth and leadership at Internet2, as the organization does not seem to grasp the complexity of its systems and infrastructure.
- Prioritization seems focused on revenue generating activities, at the expense of projects necessary to support the effective continued operation of existing services and those aligned with customer needs.
- A loss of interaction, discussion, and collaboration, over a period of time, has resulted in a shift where Internet2 is telling IU what to do and when, often with unrealistic time expectations.
 - The partnership has shifted to that of a sub-contractor relationship.

Recommendations

The committee has identified three possible scenarios for moving forward, which are outlined below. Regardless of the scenario selected, the following foundational actions and changes should be considered by Internet2:

- Redefine and re-evaluate the relationship between IU and Internet2, recognizing that this is one of the most critical partnerships in higher education advanced networking.
- Clearly define roles and responsibilities for all partners, including identifying a single liaison to serve as a point-of-contact in each organization.
- Develop meaningful long-term partnerships:
 - a) Recognize that the relationship between Internet2 and IU should be a partnership rather than a contracted vendor/customer relationship (primarily focused on operations and engineering of the production research network). In addition, create Service Level Agreements and processes which mitigate risks associated with the production network.
 - b) Reduce the long-term risk inherent in the single-partnership (IU) operation of the production network by fostering an ecosystem of partners and community members that can assist with network operations, engineering, and architecture.
 - c) Increase capacity of innovation by exploring and fostering additional partnerships with other community R&E entities for other strategic areas, such as new network architectures, breakable networking capabilities for advancing research networks, overlay networks for application or discipline specific research platforms, and other

areas where the expertise of a community member exceeds existing partner capabilities.

- d) Develop methods and means to facilitate co-branding activities between Internet2 and the R&E partners.
- Continue IT service management implementation in both IU and Internet2 with close collaboration.
- At Internet2, hire a network Chief Technology Officer to provide thought leadership to the R&E networking community:
 - a) Short-term: Build a new network architecture development team that draws from the community engineering expertise.
 - b) Long-term: Over next two-to-three years, build Internet2 engineering leadership and expertise which can provide technical oversight to manage various partnerships.
 - c) Increase technical and operational capacity and capability within the organization to support needed next-generation network design and architecture.
- Reduce the risk for critical system and network database lock-in over the long-term. At present, the GlobalNOC configuration management database is a proprietary repository that stores records and details on all technology installations and configurations. It holds data relating to the collection of network assets and relationships between such assets. The contents of this CMDB are critical to the future of the Internet2, despite being considered a private IU resource that is not shared or open to Internet2 and the community.
- Develop strong community governance and policy for technical oversight.
- Prioritize the enhancement of the strategic relationship with the Energy Sciences Network (ESnet) to ensure that the far-reaching community benefits of the existing collaboration grow to include more substantive technical collaboration on next-generation architectures and technologies.
- Develop a strategy to prioritize and support the three emerging primary network use cases:
 - a) A highly reliable network for core higher education purposes (enterprise and teaching and learning)
 - b) A high throughput research network for computationally based research, and
 - c) An experimental, breakable network to enable systems and network innovation

Scenarios for Consideration

The committee has identified three possible options for moving forward as soon as possible. These are listed below and include: A, B, and an option combining A+C.

Option A - Given the apparent intractability and increasing visibility of the Internet2/IU relationship fissure, there is a clear sense of urgency to resolve this issue so that critical strategic and network upgrade planning can proceed without distraction. To that end, the Internet2 Board should assume full responsibility for resolving the relationship issues under the following principles:

- d) Completely revamp and modernize the bilateral partnership and service agreement to cover a term of at least five years after the existing agreement ends. This new agreement should clearly outline mutual roles and expectations, communications channels, and service levels, as well as provisions for governance and community engagement, periodic strategic relationship validation, and clear provisions for rational dispute mediation, renewal, and termination.
- e) A commitment from IU to once again make the Internet2 network engineering and support models the flagship initiatives of the GlobalNOC, ensuring that top-level engineering talent is assigned or attracted to the project.

Option B - Clearly define negotiating boundaries for IU and Internet2. Instruct both parties to prioritize the needs of the community and work within those constraints to:

- Develop a solution that addresses the recommendations and issues raised in this report.
- Formalize a new agreement that will be shared transparently with the community.
- Work through the details of implementation.

The timeline for this process should be limited to no longer than 90 days from the date of the Board's delegation.

Option C - Complement Option A through the development of long-term partnership(s) with one or more community members to provide a source of higher level engineering talent and project delivery (e.g., leveraging the long-standing strategic ESnet partnership)

- Focus on higher level services and/or technologies to:
 - i) Establish additional opportunities for leading-edge community members to contribute at an enhanced level.
 - ii) Leverage the successful past precedent with the Internet2 Technology Evaluation Centers (ITECs) in Ohio and North Carolina, during the early days of Internet2 and the Abilene Network.
 - iii) Meet the clear community diversification need to enhance organizational risk mitigation and large-scale disaster recovery.

Conclusion

The OECST has worked diligently to review a large library of documents, interview many parties from Internet2 and the IU GlobalNOC, gather feedback from community members, and derive best practices and benchmarks from our Regional R&E Networks. The culmination of this effort is the recognition that we need to facilitate the partnership by putting in place structures that can be included in an agreement that carefully lays out a series of measurable outcomes and best practices, clarifies roles and responsibilities, improves transparency and community engagement, and works to build a shared vision and set of common goals that can guide the relationship to a fruitful partnership. The work will not be easy, but is necessary to ensure the future success of the Internet2.