

Internet2 Governance and Nominations Committee

REPORT AND RECOMMENDATIONS

December 29, 2006

CONTENTS

Introduction	1
Executive Summary	3
I. Background	5
II. Prescription: Directions for Change	7
A. Underlying Principles and Overall Philosophy.....	7
B. First Recommendation: A New Advisory Council Structure	8
C. Second Recommendation: A New Board Structure.....	12
D. Third Recommendation: A More Formalized Approach to Communications and Accountability	17
E. Evaluation and, if Necessary, Sunset.....	18
III. Other Matters	21
A. Membership.....	21
B. Operating Relationships with State and Regional Operating Networks	21
C. Mechanisms to Stimulate Continuous Innovation	22
D. Policy Formation and Strategic Planning.....	23
E. Transition Issues	24
Conclusion	25
Appendix A: Description of Current Internet2 Governance and Communications Structures	27
Appendix B: Areas for Possible Change	45

Introduction

This is the final report of the Internet2 Governance and Nominations Committee (the “GNC”).

The GNC was convened by the Internet2 Board during the summer of 2006. As Internet2 approached the tenth anniversary of its founding, it was time to consider fully what changes in the governance structure might be appropriate for the organization’s current structure and circumstances. The timing of such a review seemed especially apt in the aftermath of the unsuccessful attempt to merge with National LambdaRail during the first half of this year.

The task of the GNC is both descriptive and prescriptive. The descriptive responsibility is to develop a clear picture of the current governance matrix, showing the extent of each set of interested institutions’ and individuals’ power and voice within each governance forum, and describing criticisms that have been presented of different elements of that picture. The prescriptive responsibility is to recommend how that governance matrix should change, in light of institutional experience and changes in our environment over the past decade.

After four months of work, the GNC is ready to present this final report. A discussion draft version of this report was published on November 30, 2006, and posted on the Web at that time. It was the subject of discussion and focus groups at the meeting of Internet2 members in Chicago during the first week of December. This final draft reflects the GNC’s consideration of comments received at that meeting and by other means since the release of the discussion draft.

The descriptions and recommendations included in this report are directed to the Internet2 Board of Trustees. It is our hope, however, that the document will be of benefit to the much larger community that cares about the future of advanced networking for the benefit of research and education.

Executive Summary

Internet2 is a complex ten-year-old consortium of universities with a broad scope of activity that involves many different kinds of stakeholders – organizations and individuals; members, partners, collaborators, and staff.

The current governance structure was largely put in place at the time of its creation. It may be usefully visualized as a matrix of governance (the Membership, the Board of Trustees, Committees, Councils, etc.) within which the interested institutions and individuals are given voting power and/or voice.

The task of governance modification and improvement is an ongoing one and should be grounded in a clear understanding of the status quo. Our committee undertook to provide a detailed synthesis of the variety of governance and communications structures in use at Internet2 today.

Part I presents a brief overview of that effort, the bulk of which is set forth at great length in Appendix A. Readers who are interested in a detailed description of the current structure are directed to that Appendix.

Part II sets forth our recommendations for change. Working from a set of general principles, the GNC has developed the following three primary recommendations:

- To replace the existing Advisory Council structure with a new structure of Councils that are heterogeneous, defined by operational function and more tightly connected to the membership, to Internet2 management, and to the Board.
- To modify the structure of the Board to ensure the presence of a broader set of perspectives within Board deliberations without compromising Board efficiency and effectiveness.
- To adopt a more formalized approach to communications that will increase the organization's overall level of transparency.

Part III identifies several issues that are beyond the immediate mandate of the GNC but that we nonetheless hope the Board will take up in the near future: Membership, the operating relationship with state and regional networks, mechanisms to stimulate continuous innovation, policy formation and strategic planning, and transition matters.

I. Background

The GNC members were appointed by the Internet2 Board after the Board solicited recommendations from the broader community of stakeholders. The GNC was constructed to be broadly diverse, reflecting a wide range of professional experiences, and including individuals who have interacted with Internet2 from a wide variety of vantage points. The full list of members and their professional affiliations appears at the end of this report.

The chair of the GNC is Diana Natalicio, president of the University of Texas at El Paso. In August, flooding in El Paso required President Natalicio's full attention. In her absence, the work of the GNC has been led by its vice chair, Jeffrey Lehman, professor of law and former president of Cornell University.

The Internet2 Board charged the GNC with "1) assessing the Governance performance and advising on modifications to the Internet2 governance structure as outlined in the Bylaws, and 2) ... recommend[ing] a process for recruiting and nominating qualified individuals to serve on the Board and Advisory Councils, thus ensuring strong broad member representation in Internet2 governance."

The GNC interpreted this charge as providing a broad mandate to explore all areas relevant to the governance of the organization. That mandate inevitably led the GNC to consider and discuss matters beyond governance – questions of strategic vision, mission, and operational effectiveness. This bulk of this report will address itself to matters within the scope of the GNC's mandate. In Part III, however, we shall touch briefly on several questions that go beyond the subject of governance that are likely to have an impact on the effectiveness of Internet2 governance structures in the future.

The GNC held its initial meeting at the Westin Hotel at Detroit Metro Airport on September 26, 2006. Prior to that meeting, the GNC used email communications to begin to develop the description of current governance practices found in the next section. During the September 26 meeting, that description was advanced further, and the GNC developed an agenda that has guided its work thereafter. Since the September 26 meeting, the GNC has held six meetings via teleconference. Four of those meetings concentrated on the role of four different stakeholder groups in governance – university CIOs, network and disciplinary researchers, leaders of state and regional networks, and industry leaders. The final two meetings synthesized the work of the committee into a set of formal recommendations.

Beyond the meetings of the GNC, individual committee members have held a variety of conversations – both formal and informal – with different members of the larger community to solicit advice and reactions.

The current arrangements for Internet2 perhaps may be best seen as a matrix in which the major organizational stakeholder groups form the rows, and the major means by which

governance is performed are shown as columns. This matrix might be visualized as follows:

	Members	Board	ASC	ISC	NPPAC	NRLC	Committees	Working Groups	SIGs	BOFs	Advisory Groups	Task Forces
Universities												
CIOs												
State/Reg Nets												
Network Researchers												
Disciplinary Researchers												
Industry												
Service Partners												
Government / K20												
International R&E Nets												
Anchor Tenants												

The cells of this matrix – the ways in which different stakeholder groups participate in different governance fora – do not lend themselves to a simple coding formula. Appendix A presents, in narrative form, a detailed description of how those different areas of participation are structured.

Committee discussions with the larger community also revealed a number of areas in which the current structure might be adapted and modified in the future. Some of these areas concerned “scaling governance up” to accommodate a larger and more diverse mix of stakeholders, increasing the overall level of transparency within the organization, giving a stronger voice to certain stakeholder groups, facilitating multi-perspective conversations in governance fora other than the Board, facilitating more effective two-way communication between the leadership and stakeholder communities, and providing greater opportunities for volunteer participation. Appendix B presents, in narrative form, a detailed description of these different possibilities.

II. Prescription: Directions for Change

A. Underlying Principles and Overall Philosophy

The GNC's recommendations were derived from the following principles:

- The Internet2 Board should function as an oversight board rather than as a managing board. The CEO directs a vigorous, nimble and capable organization that is highly responsive to and communicative with its membership.
- The membership of the Internet2 Board should be selected from among research university CEOs, CIOs, chief research officers, chief academic officers, regional state network operators, researchers, and representatives from industry and government. Internet2 Board members should be visible within the community and approachable by members. The Internet2 Board should model how diverse elements of our community can work together in the best interests of the membership as a whole.
- A small number of heterogeneously populated Advisory Councils composed of Board members and others should provide guidance regarding the most strategic thrusts of Internet2. These Advisory Councils should be supported by senior management, and the membership should have confidence that the Councils have the ability to significantly influence the directions of the organization in their areas of responsibility.
- Internet2 should cultivate additional constituent groups, Councils, interest groups, affinity groups and member-driven collaborations to support more homogenous interests and specific activities among our members and affiliates. These need not all be part of formal organizational governance structure, but should have formal channels to the governance structure.
- On major matters of community-wide concern (e.g., membership and dues structure), the Internet2 governance process should ensure that there are mechanisms in place and publicized to the entire community to allow input on the matter at hand, and should ensure that those mechanisms are employed before a decision is made.

These principles all reflect an appreciation for the fact that the most important questions of policy and strategic direction that Internet2 must address are

increasingly multidimensional and complex. The recommended governance reforms are intended to bring a broader base of talent and experience to the development and adoption of Internet2 strategic directions, coupled with strengthened connections between this revitalized advisory structure and the Internet2 Board and management.

In particular, the GNC has developed a set of recommendations that will preserve much of the present governance structure but contains several important changes, of which perhaps the most important is an effort to refashion the major Advisory Councils into more diverse units with a broader range of experience, with their members drawn from an expanded membership base. The diversity sought in the Councils is carried to Board membership as well, with an increase in Board size to fifteen and new mechanisms for Trustee selection.

B. First Recommendation: A New Advisory Council Structure

Internet2 is a member-driven, research and education organization that aspires to engage in technology-based, leading-edge networking. Such an organization ought to focus its strategic energies on defining the future course of network technology and the needs of its members in adopting and using advanced networks.

To pursue this goal effectively, Internet2 must develop a way to bring the full strength of its members' talent base to bear on the most challenging strategic issues it confronts. The GNC believes that the current Council structure falls short of this goal, by virtue of the largely similar backgrounds shared by the members of the different Councils.

Accordingly, the GNC recommends that the four existing Advisory Councils be eliminated and that four new Advisory Councils be created in their place. The goal is to organize the four Councils around functional activities that are (approximately) mutually exclusive and exhaustive. The goal is further to ensure that each Council is designed to include the perspectives of different stakeholder communities.

The creation of these Advisory Councils is the essential core of the GNC recommendations. We believe that the future vitality of the organization requires that these Advisory Councils be strong and vital, and that they be effectively linked both to the policy work of the Board of Trustees and to the operational work of the Internet2 administration. While Council recommendations may not always be followed, it is expected that they will be sought early and given significant weight regarding matters within their special expertise.

1. The Four Councils

a. *Architecture and Operations Advisory Council.*

This Council will focus its attention on the network and its operations, with special attention to matters of infrastructure and architecture, including international connectivity. As a shorthand, the GNC conceived of this Council as being focused on activities associated with Layers 0 through 4 of the OSI model. It is expected this will be a very busy Council as the organization continues to deploy the new hybrid network and to plan for the ongoing development of its successors into the future.

b. *Applications, Middleware, and Services Advisory Council.*

This Council will focus its attention on network services at the upper layers of the OSI model. During its first decade of existence, Internet2 has made important contributions to the networking community by facilitating the development of new network applications and middleware. The GNC foresees an ongoing need for Internet2 to make wise strategic choices about how and where to invest resources to support such initiatives in the decade to come.

c. *Research Advisory Council.*

This Council will focus its attention on Internet2's support for research, both network-focused research and disciplinary research that makes use of the network as a tool. Internet2 undertakes only limited network and disciplinary research through its own staff. A core motivation for the organization's creation, however, was to support the development of resources that will facilitate such research by others. The goal of this Council is to provide a forum through which the organization can confront strategic questions about how best to provide such support in the future.

d. *Industry, Government, International, and External Relations Advisory Council.*

Many of the most challenging strategic and policy issues confronting Internet2 relate to the organization's relations with the outside world. This Council will focus its attention on the many different dimensions of external relations. Significant elements of external relations include:

i. *Industry.* The new Acceptable Use Policy is an important step in the ongoing evolution of the relationship between Internet2 and private industry. The GNC anticipates that over the coming decade there will need to be an ongoing strategic focus, both by management and at the Board level, on the dynamics of Internet2's

relationship to private industry. This thinking will likely include such matters as the two-way transfer of technology between Internet2 and industry, and the rules of engagement between for-profit industry research activities and the organization.

ii. *Government.* The federal government can be a critical strategic partner with Internet2 in advancing an agenda in which the nation's network infrastructure is a vital resource for economic, scientific, and cultural development. The GNC expects that this partnership will require sustained close attention if it is to flourish in the next decade.

iii. *International.* Other countries and regions of the world are investing in their own research and education networks and are important technical and organizational contributors. It is important that Internet2 maintain strong bilateral partnerships with them, and that it also be a leader in the emergent structure of multilateral collaboration.

iv. *Standards.* From time to time Internet2 activities have resulted in development of new technical standards. These should be considered for formal standardization through international standards bodies when appropriate.

v. *New Members.* The fiscal vitality of Internet2 requires a member base that is broad and inclusive, while remaining united by a commitment to advanced network development – advanced in ways that are often of limited short-term benefit to individual members.

2. Council Composition and Elections

a. Membership.

It is proposed that each of the four Councils have fifteen members who serve staggered three-year terms (and no more than six consecutive years per member). Twelve Council members will be elected by the members of Internet2; three will be appointed at-large by the Board of Directors. Three of the elected members will have backgrounds in research, three will have backgrounds as university CIOs, three will have backgrounds in industry, and three will have backgrounds with state or regional operating networks. Among the Council members appointed by the Board of Directors, it is hoped that some directly elected Board Members will be willing to serve in order to increase the cohesion between the Board and Councils. No Council member will serve more than 6 consecutive years.

b. *Nomination and Identification of Candidates.*

Annually, the GNC will issue an open call for nominations for Council members of the requisite backgrounds. The GNC will select/recruit candidates for each open Council slot, ideally two candidates for each opening.

The GNC recognizes that there may sometimes be a tension between the interest in recruiting the very best candidates to the Councils and the interest in holding contested elections. (Council service will undoubtedly be more of a mark of professional distinction in some communities than in others.) Whenever it is possible to have outstanding candidates participate in a contested election, that is to be considered optimal. But the GNC will be authorized to determine when circumstances dictate another course.

c. *Election by Members.*

The three members of each Council who are to have backgrounds with state or regional networks will be elected by the Internet2 network members (one vote per member). The three members of each Council who are to have backgrounds with industry will be elected by the Internet2 industry members (one vote per member). The three members of each Council who are to have backgrounds in research will be elected by the Internet2 university members (one vote per member), in a manner whereby the individual with authority to cast the vote for a university member is encouraged to consult with someone at the university in a position to evaluate the different candidates. The three members of each Council who are to have backgrounds as university CIOs will be elected by the Internet2 university members (one vote per member), in a manner whereby the individual with authority to cast the vote for a university member is encouraged to consult with someone at the university in a position to evaluate the different candidates.

d. *Council Chair.*

Each year each Council will elect one of its members as Council Chair. The Council Chairs also serve *ex officio* as voting members of the Board of Trustees. Councils may also choose to elect Vice-Chairs, however, Vice-Chairs may not represent the Council as a voting member of the Board of Trustees.

3. **Council Relationship to Management**

a. *Liaison Relationships.*

In addition to administrative support from Internet2 staff, each Council will have an assigned liaison from Internet2 executive

management staff to coordinate the development of the annual Council agenda and study issues. These individuals will be responsible for seeing that Council members are fully briefed on management initiatives in areas of the Councils' respective charters.

b. New Chief Scientist position.

Internet2 does not currently have a senior executive position that would be a natural liaison to the proposed Research Advisory Council. The GNC recommends that the CEO and the Board create an executive position of Chief Scientist, and initiate a national search for a well qualified scientist to fill the position, whose responsibilities would include service as executive liaison to the Research Council.

c. Coordination Where Issues Touch Multiple Domains.

Notwithstanding the objective of defining the Councils' domains to be mutually exclusive, there will no doubt be issues that are properly the concern of more than one Council. It is expected that the Council Chairs will continue the practice of the current Council Chairs to meet regularly to discuss matters of common concern. The Council Chairs and staff executive liaisons will be responsible for ensuring cross-Council coordination so that the Board and Management receive thoughtful and comprehensive advice on such issues.

4. Council Relationship to the Board of Directors

A central goal of the GNC's proposed modifications to the Internet2 governance structure is to strengthen the link between the Board and the new Councils, so that their advice may be obtained in a timely fashion. Toward that end, it is expected that management, Board leadership, and Council leadership will collaborate to obtain Council input on important strategic and policy issues. It is expected that all parties concerned will develop standard operating procedures and protocols to facilitate this development. (For example, the Board might develop a standard operating procedure whereby the first Board member to speak to an agenda item is the Council Chair or Chairs of the relevant Council or Councils. Similarly, Board agendas should, to the extent possible, be shared with Board members early enough that Council chairs can solicit feedback from Council members.)

C. Second Recommendation: A New Board Structure

As noted above, the GNC is committed to a philosophy of Board governance in which a Board of manageable size is structured so as to maximize the

diversity of perspectives that are considered, while continuing to define Board members as directors of the entire organization rather than as representatives of particular constituencies. The challenge facing the GNC was to develop a mechanism through which (a) overall diversity of perspectives might be increased, (b) overall Board size might remain manageable, (c) potential Board members might be considered as individuals, recognizing each individual's capacity to bring multiple perspectives to the table, and (d) talented candidates might be recruited to Board service.

A particular challenge was the goal of preserving a critical mass of presidents and former presidents of research universities on the Board. Such Board members have in the past provided significant value, both by virtue of their perspectives on the management of complex research organizations that serve multiple stakeholder groups and also by virtue of their effectiveness in advocating for Internet2 in other settings of importance to the organization. The GNC recommendation reduces the presence of university presidents on the Board below a majority. Nonetheless, the GNC believes that it provides a sufficient ongoing role for university presidents that Internet2 should be able to continue to recruit outstanding presidents to the Board.

1. Board Composition

At present the Board comprises thirteen active members and two honorific members (former Board chairs). The GNC recommends that a new Board structure be created that consists of fifteen active members and no honorific members.

Not all Board members will be selected in the same manner. One member will be the CEO of Internet2. Four members will be the Chairs of each of the new Advisory Councils, elected by the members of the Advisory Councils, as described above. The remaining ten members of the Board will be elected to three-year staggered terms, through a process described below. No Board member will serve more than six consecutive years.

2. Board Diversity

A critical goal of the GNC recommendations is to increase the overall diversity of perspectives found within the Board. That goal will be pursued by having the selection process take place after the Council Chairs are elected, so that the characteristics of the Council Chairs (as well as of the Internet2 CEO and of appointed Board members whose terms have not yet expired) will be known to the GNC and may be taken into account as they work to round out the Board.

The GNC recommends that the Board be constructed so as to be diverse along many dimensions, including individual demographic characteristics, as well as the location and character of the institution with which the member is affiliated. The GNC has, however, made specific recommendations with respect to certain aspects of diversity that it deems especially significant to the successful operation of Internet2. In each of these categories, the GNC has identified a “target” number of Board members who would share that background. It has also identified a “minimum” number of Board members who would share that background. The “minimum” requirements are absolute. If it is impossible to meet the minimum requirements within the constraints of a fifteen-member Board, an additional one or two temporary Board positions could be filled in order to meet those minima.

The specific minima and targets, by category, are as follows:

- Financial executive qualified for Board audit duties (minimum 1, target 1)
- University CEO, current or ex- (minimum 5, target 7)
- University CIO, current or ex- (minimum 3, target 3)
- Network Researcher (minimum 1, target 1)
- Discipline-based Researcher (minimum 1, target 1)
- Regional/State Network Leader (minimum 1, target 2)
- Industry Leader (minimum 1, target 1)

3. Selection of Board Members

In order to achieve the desired level of Board diversity within a Board of only fifteen members, it will be important to take full advantage of the fact that individuals wear multiple hats. For example, a single individual might be (a) the former CIO of an east coast AAU research university, (b) a current regional network leader, and (c) an audit-qualified financial executive. The following sequence of actions by the Advisory Councils and the GNC is designed to enable the organization to take maximum advantage of that observation.

First, in January of each year, the GNC will issue an open call to the membership and to individuals knowledgeable about Internet2, soliciting nominations to the Board.

Second, while that nominations process is proceeding, each Advisory Council will elect its chair (perhaps subject to an individual’s being reelected to the Advisory Council).

Once the Advisory Council chairs have been selected, 11 or 12 seats on the Board for the following year will have been specified. (Four Advisory Council chairs, one Internet2 CEO, and six or seven current Board members entering the second or third year of a three-year term).

The GNC will then be responsible for identifying candidates for election to the remaining open seats. It will take note of which of the diversity criteria will already have been satisfied by the 11 or 12 existing Board members and which remain to be filled. It will then evaluate the individuals who have been nominated for consideration, taking consideration of the need to satisfy remaining diversity goals, as well as individual candidates' professional distinction, experience in managing large, complex, multi-stakeholder organizations, and ability to defer to the expertise of others.

The GNC will have substantial discretion about how then to present candidates to the membership for election. In some years it may present a single slate of nominees. In others it may present two or more different slates. In others it may consider each open seat separately, recommending only one candidate for some seats and more than one candidate for others.

The ultimate election of candidates to the Board will be by the full membership, with each member casting a single vote.

The GNC recognizes that in some years the GNC may find it impossible to satisfy even the "minimum" levels of Board diversity described in section 2 above within a fifteen-member Board. The GNC proposes that the bylaws authorize the creation of up to two temporary Board positions that would be used to satisfy those minima in such years.

4. Board Leadership and Succession Planning

The scale and scope of Internet2 are such that the organization could be significantly compromised without a clear line of succession within the Board of Trustees. Towards that end, the GNC recommends that a position of Vice Chair be created within the Board, with the expectation that the Vice Chair would fulfill the responsibilities of the Chair in the event of the incapacity or absence of the Chair.

5. The Ongoing Role of the GNC

The Governance and Nominations Committee (formerly the Nominations Committee) is a standing committee of the Board. Its first task since the expansion of its charge concerned the subjects addressed in this report.

It bears mention, however, that the GNC is expected to remain itself an ongoing feature of the Internet2 governance structure. As such, we anticipate that the GNC will, from time to time, consider additional governance structure questions not addressed in this report. Moreover, the GNC will hold primary responsibility for coordinating the annual process by which Internet2's governance is maintained and refreshed at the Council and Board levels. And the GNC will also be responsible for recognizing critical changes in the community's priorities, funding sources, and/or stakeholders that may imply the need for further governance reforms.

In the long run, however, it is likely that the most important challenge facing the GNC will be to manage successfully the processes through which slates of candidates for the Board and the Councils are developed. It is important that the GNC develop clear, written goals, policies, and standards for how it will carry out its role in these processes. This is an area where transparency is especially important, in order that the GNC be viewed as a highly trusted and independent group committed to overseeing an open, inclusive, and well-understood process.

In this regard, it is important that the Board develop a clear set of standards and processes that will explain how the Board will populate the GNC itself in the future. The expected distribution of GNC members would be across constituencies and geographic areas in order to ensure a balanced representation, and further selection recommendations as noted below.

- GNC members will serve three-year terms, with no member serving more than six consecutive years.
- The Chair will be appointed by the Board chair.
- All four Council chairs will automatically serve.
- At least two, and preferably three, of the CEOs on the Board will serve.
- Six members will be drawn from the membership through an open nominations process on rotating three-year terms, with two each year, and selected from that pool by the current GNC.
- The Board may appoint 1-2 additional committee members from the membership at large to fill out an expertise or representation gap, making the minimum 12 and maximum 13.

For the Internet2 community to have confidence in the effectiveness of its governance, the scope and charge of the Councils, desired characteristics of the individuals nominated for Council service, and the mechanism by which those individuals are nominated and confirmed for service must all be clearly communicated and understood. Effective two-way communication

mechanisms should be established along with the nomination and selection process itself, both for the initial implementation as well as for the ongoing process.

We hope and expect that in due course a calendar will be developed and made public on the Internet2 web site that clearly indicates the timeline for nominations and selection of Council and Board members.

D. Third Recommendation: A More Formalized Approach to Communications and Accountability

One of the great challenges facing Internet2 is how to remain operationally efficient and nimble, while at the same time maintaining a high level of institutional transparency, and robust and communicative relationships with its many stakeholders. The GNC recommends that one step towards meeting this challenge will entail a shift away from informal processes of communication among governance fora, in favor of more formalized processes of communication.

In this context, the term “formalized” should not be understood to mean stuffy or bureaucratic. Rather, we intend to suggest processes that are regularized and consistent, that may be depended upon by all concerned.

By way of example, we note the matter of communications between the Board and the membership as a whole. At the present time, such communications take place on an as-needed basis, following whatever form seems most appropriate to the message and the circumstances.

Without advocating that such forms of communication be eliminated, the GNC recommends that they be supplemented by other, more predictable forms of communication. At a minimum, agendas and minutes of Board meetings should be available in appropriate form for members to read. Other approaches to increased communication could take the form of in-person appearances by Board members or the Chair at member meetings, or annual or more frequent written messages from the Board. The GNC is not recommending any particular form. Rather, it is recommending that the Board settle on one or two that represent manageable commitments and that will strengthen the relationship between the membership and the Board.

The GNC believes that similar needs for more formalized communication exist across other sectors of the Internet2 community. These include communications between the Councils and the membership, and communications across other governance mechanisms, including working groups and advisory groups. The GNC recommends that visible and well-

communicated mechanisms be instituted for members to suggest items for Council agendas, and that holding open meetings at which Councils share their current work and solicit input, such as those currently held by NPPAC at each member meeting, be considered for all Councils.

In this report we have noted the importance of Internet2 working alongside rather than in competition with the state and regional networks. With the recent establishment of a new membership category for regional and state networks, and with the formal recognition of their role on the Councils and Board, specific fora should be established to improve mutual understanding. One model might be the Community Leaders forum recently established for the executive liaisons of individual member institutions.

Such approaches to internal communications might best be approached as elements of an overall strategy for communications across the organization. Such a strategy should take account of the fact that university members are themselves complex, multi-stakeholder entities. For that reason, it may be important to ensure that member communications are sent redundantly to multiple individuals within each university. Or member communications might be generally available, on a subscription basis, to anyone who expresses an interest in receiving them.

The GNC also notes the importance of clear accountability mechanisms to maintaining the larger community's confidence in the institutions of governance. Such mechanisms are especially important with respect to the Board and the Internet2 CEO. With respect to the Board, the GNC proposes that the bylaws clearly define a process whereby a majority of the members might vote to recall one or more Board members. With respect to the CEO, the GNC proposes that the bylaws clearly define a process whereby the CEO receives a comprehensive performance review from the Board at least every three years; it is expected that the results of such a performance review will be private to the Board and the CEO, but that the process will provide an opportunity for all interested members of the community to give input.

E. Evaluation and, if Necessary, Sunset

The GNC recognizes that it is proposing an ambitious set of recommendations that will require the organization to undertake activities and ways of doing business that it has not undertaken before. It is to be expected that some of these recommendations will prove unmanageable or will create unexpected problems that require responses of their own. As part of these recommendations, the GNC recommends that a comprehensive evaluation be conducted in 2010, in order to ascertain how well these

recommendations are working out, and to make whatever modifications seem prudent at that time.

III. Other Matters

As we noted at the outset of this report, the formal mandate of the GNC is restricted to the governance structure of Internet2. Towards that end, Part II of this report contained recommended changes to the long-term governance structure of the organization.

During the course of the GNC's work, however, we also encountered several issues that, while beyond the immediate scope of the GNC's mandate, nonetheless raise questions that we hope will be considered seriously by the Board in the near future.

In this section, we present a brief description of each of those issues. We attempt to characterize the nature of the value tradeoffs we see implicated within them. And we offer tentative suggestions for approaches to the issues that we hope might prove helpful whenever the Board takes them up.

A. Membership

As noted, in Part II above, Internet2 currently provides opportunities for membership to universities, corporations, associations, as well as other opportunities for "affiliate membership." At the same time that the GNC has been carrying out its work, the Membership Committee (currently NPPAC) has been working to develop a new membership structure that will enable more stakeholders to take on the rights and responsibilities of full membership.

With one exception, the GNC does not have a view with respect to the specific proposals currently under development. That exception concerns the state and regional operating networks. As noted earlier, the GNC believes that those networks are critically important Internet2 stakeholders. For that reason, this report has recommended that they be given a stronger voice in several aspects of governance. Those recommendations obviously presume the implementation of the recent recommendations of the Membership Committee that would give those networks a form of membership that is appropriate to entities holding significant governance rights and responsibilities.

B. Operating Relationships with State and Regional Operating Networks

The core operating model for Internet2 presumes that state and regional networks will play a critical role in the future of the national advanced research and education network infrastructure. Since the earliest days of the NSFnet regionals program, such networks have been part of the national research and education networking landscape. They have become increasingly important in recent years, as many move to facilities-based

models and as Internet2's network topology assumes greater aggregation of connections to the backbone.

Today, more than half the national research and educational networking infrastructure passes through state and regional networks collectively. As such, those networks need to be as technologically capable and organizationally sustainable as Internet2's backbone network and as the campuses that direct traffic across them. As new services and capabilities arise, state and regional network organizations (particularly those that serve as direct connectors) and Internet2 must function as partners to ensure integrated provision of those services.

Internet2's operating model calls for it, to the maximum extent possible, to partner with – rather than compete with – state and regional operating networks. This operating model allows the national cyberinfrastructure to evolve in a decentralized, locally responsive manner, and spares Internet2 the costs and complexity that would be required to offer its members direct connections.

At the same time, Internet2 is committed to ensuring that individual member campuses receive the services they need to allow for the development and extension of scalable cyberinfrastructure and for their participation in national-scale projects such as the Teragrid.

As noted above, Internet2's operating model calls for it to encourage members to connect through state and regional networks. On rare occasions, however, some members have sought a direct connection to the backbone. The GNC observes that such situations are fraught with danger for Internet2 as it attempts to maintain healthy and constructive relationships both with its members and with the state and regional operating networks.

The GNC suggests that the Board consider developing a standard approach to dealing with such situations, one which emphasizes the need for full and open communication among all three affected parties and which emphasizes the value of having all three parties achieve a mutually acceptable outcome.

C. Mechanisms to Stimulate Continuous Innovation

Over the past decade, Internet2's mission has evolved in response to changing member needs, technology, and federal networking strategy. It has proven especially challenging for the organization to promote the development of new technology while maintaining highly stable production capabilities.

It is the sense of the GNC that Internet2 should develop a systematic strategy for supporting disruptive developments in technology at the cutting edge. Since potential technology innovations will almost always be visible first to researchers within the membership, the most promising strategy is likely to involve collaboration with members on development projects to extend the state of the art.

Some of the proposals in Part II involving the new Research Advisory Council and the establishment of a new Chief Scientist position might facilitate the identification of appropriate collaboration opportunities. At the same time, the GNC believes that these opportunities might well go unrealized without further attention to how they might be nurtured, evaluated, and (in appropriate cases) pursued. This will involve serious attention to what levels of investment are appropriate to the organization, as well as what combinations of investment level, potential benefit, and odds of success define the space of activity that Internet2 will support. In shaping those parameters, it is to be expected that special attention will be paid to the distinctive features of Internet2, most notably the fact that its largely member-driven funding reduces the organization's exposure to changes in external (especially government) funding policies.

D. Policy Formation and Strategic Planning

It is the responsibility of the Board of Trustees and the senior management of Internet2 to formulate and execute the strategies and policies whereby the organization carries out its institutional mission. Through the recommendations contained in this report, the GNC proposes that the Board and senior management make extensive use of four heterogeneous expert Advisory Councils in the development of such strategies and policies.

The GNC believes that, from time to time, these ongoing processes should be supplemented with a more comprehensive strategic planning exercise. Such an exercise should be one that helps the relevant decision makers to take a step back and assess the organization's mission, priorities, and business models in light of current conditions. The GNC recommends that such processes should be open and inclusive, drawing input from a full cross-section of organizational stakeholders, and drawing especially on the expert knowledge of the Advisory Councils.

Conducting or designing such an exercise is beyond the scope of the GNC's governance mandate. However, the GNC urges that such an initiative be an early priority of the new Board once it is seated in 2007. Based on what the GNC has heard during its deliberations, we believe this will be an important way for the new Board, new Councils and management to re-ground

themselves with the membership and for the membership to get to know its new volunteer leadership -- thereby building additional mutual trust throughout the organization.

E. Transition Issues

The recommendations included in Part II describe a new “steady state” for the Internet2 governance structure. Assuming that the Board adopts these recommendations, a number of issues will be presented about how to make the transition from the current structure to the new structure.

This report has not attempted to review all such transition issues, nor to propose specific approaches to resolving them. We would simply observe that in principle such issues should be manageable with the understanding that there is value to an orderly and non-disruptive transition, and that such a transition can often best be brought about through a temporal division between a “current phase,” a “transition phase,” and a “new phase,” recognizing that there will effectively be different governance structures in each phase and marking the separations between the phases with explicit dates. It is hoped that the transition phase will be underway by the Spring 2007 Internet2 Member Meeting (23-25 April).

One guideline for transition is abundantly clear. The existing Advisory Councils include individuals with invaluable experience and judgment about Internet2 and the issues it confronts. The GNC expects that the first task of any transition plan will be to ensure that this vital resource is preserved and carried forward into the new structure. The GNC anticipates that the initial members of the new Advisory Councils will be drawn from those who are currently providing such service.

Should the Board adopt these recommendations, the GNC recommends that the Board ask the GNC to develop an explicit transition plan along these lines.

Conclusion

This report has attempted to summarize and synthesize the conclusions of the GNC formulated during its work over the second half of 2006. It benefited significantly from the observations and suggestions of Internet2 members during and immediately after the Fall 2006 Member Meeting from December 2-6 in Chicago, many of which are reflected in this final document. All written communications the GNC received during the fall will be forwarded to the Internet2 Board along with this report.

The Internet2 Board is scheduled to consider this report at its meeting on January 14-15, 2007. It is our hope that the Board will act promptly on the recommendations included in this report, so that a transition phase might begin around the time of the Spring 2007 Member Meeting.

Respectfully submitted,*
The Governance and Nominations Committee

Kristine Hafner, CIO, University of California Office of the President
Steve Hall, The Thomson Corporation (Retired), *Chair of the Industry
Strategy Council*

Gwen Jacobs, Professor, Computational Biology, Montana State University
Len Kleinrock, Professor, Computer Science, University of California Los
Angeles

Michael Krugman, Executive Director, Office of Information Technology,
Boston University and Northern Crossroads GigaPoP

Larry Landweber, University of Wisconsin Madison (Retired), *Chair of the
Network Research Liaison Council*

David Lassner, CIO, University of Hawaii, *Chair of the Applications
Strategy Council*

Jeffrey Lehman, Professor of Law and Former President, Cornell
University, *Vice Chair*

Jack McCredie, University of California Berkeley (Retired), *Chair of the
Network Planning and Policy Advisory Council*

Marilyn McMillan, CIO, New York University

Diana Natalicio, President, University of Texas El Paso, *Chair*

Harvey Newman, Professor of Physics, California Institute of Technology

Mike Roberts, The Darwin Group

Pankaj Shah, Director, OARnet

Doug Van Houweling, President & CEO, Internet2 (*ex officio*)

* The Committee wishes to express its gratitude to the following individuals who provided dedicated support to the Committee's work over the past four months: Laurie Burns, Internet2; Jessica Geiben Lynn, Center for Applied Research; Sharon Moskwiak, Internet2; Barbara Nanzig, Internet2; Lynn Oppenheim, Center for Applied Research; and Tim Riley, Center for Applied Research.

Appendix A: Description of Current Internet2 Governance and Communications Structures

The governance structure of Internet2 may be pictured as a matrix whose rows reflect the many different stakeholder groups with an interest in the organization and whose columns reflect the different fora through which those groups influence the organization's direction.

In stylized form, that matrix may be envisioned as follows:

	Members	Board	ASC	ISC	NPPAC	NRLC	Committees	Working Groups	SIGs	BOFs	Advisory Groups	Task Forces
Universities												
CIOs												
State/Reg Nets												
Network Researchers												
Disciplinary Researchers												
Industry												
Service Partners												
Government / K20												
International R&E Nets												
Anchor Tenants												

This Appendix first reviews the various stakeholder groups, then reviews the different processes through which those groups can participate in the organization.

A. Stakeholder Groups

1. Universities as whole entities (through their responsible CEOs)

Presidents of Internet2 member universities are represented in the governance structure only on the Board, where they make up roughly half of the Internet2 Board seats. New members are elected by the CEOs of Internet2 University members, following Board selection of a slate that is generated through an open nominations process managed by the Nominations (now Governance and Nominations) Committee of the Board.

2. Experts on enterprise IT (e.g., university CIOs)

CIOs are represented in the governance structure primarily through the Network Planning and Policy Advisory Council (NPPAC). CIOs also typically serve as the member Executive Liaison, which includes responsibility for annual member dues, and

thus have a broad and deep interest in the activities of the organization and the community.

3. State and Regional networking organizations

State or regional networking organizations are currently represented in the Internet2 governance structure primarily through university CIOs on NPPAC who also have responsibility for the regional network in their area. Five years ago, the Quilt was formed to serve as the organization for state and regional networks in their advanced networking missions, and a representative from the Quilt sits on NPPAC. (Internet2 financially supports The Quilt in majority part.) Regional networking organizations are essential components of the networking service delivery to campuses, and many are governed by higher ed. Others are incorporated separately. Many serve industry, K20, state government, healthcare and other entities in addition to higher ed. Campuses pay service or membership fees to their regional networking organization, as well as to Internet2.

4. Researchers who study the network

Network researchers constitute one of the original constituencies of Internet2 and comprise the Network Research Liaison Council, which focuses on the development and transfer of new networking capabilities. Network researchers require access to physical or logical infrastructure to support investigations and experiments that advance networking and computer science. A number of projects exist that involve networking researchers throughout the Internet2 community.

5. Researchers who use the network to study other objects

Disciplinary researchers and faculty comprise a foundational constituency of Internet2. The ability to use advanced infrastructure for advanced science and scholarship was a primary motivation for forming Internet2 in the first place, and its mission statement has always included applications development on a par with infrastructure development. Discipline-based researchers are primarily represented on the Applications Strategy Council.

6. Industry in general

Corporate members of Internet2 represent a wide range of corporate sectors, from providers of infrastructure and technology development, to consumers of technology, to product developers. The corporate membership is currently structured to recognize those

that contribute additional resources to the Internet2 community as Corporate Sponsors or Corporate Partners

7. Industry as partner in service delivery

Corporate partners are instrumental in the development and delivery of Internet2 technology initiatives. The Abilene network and the new Internet2 network are supported by partnerships with infrastructure providers, and other technology development companies have partnered with Internet2 in the development of inter-realm authentication and collaboration technologies.

8. Other stakeholders in the broader research & education community

Government agencies and labs – approximately 15 federal agencies or labs participate as members of Internet2. Internet2's origins as a partnership among academic, industry, and government capitalized on the federal government's long involvement in national networking. In particular, the National Science Foundation's very high performance Backbone Network Service and High Performance Connections programs in the mid-1990s catalyzed the initial formation of the Internet2 community and its development of next generation networks.

K20 – the K20 community participates in Internet2 activities through the SEGP program (Sponsored Educational Group Participants), whereby state education networks are connected to Abilene. Currently, 38 states have SEGPs. The K20 Initiative facilitates collaboration and information sharing among SEGPs around development and use of advanced applications and networks in the broader research and education community in the US.

9. International partners

Internet2 currently has formal relationships with over 50 international networking organizations that facilitate the ability of Internet2 members to collaborate globally. Many of these organizations operate research and education networks that peer with Abilene and will peer with the new Internet2 network. International partner organizations perform a critical service for US-based researchers and scholars by providing many of the transoceanic links.

10. Co-investors / “anchor tenants”

The new Internet2 network will include anchor tenants, major collectives that will partner with Internet2 to use the new network infrastructure. ESnet, the Department of Energy network, is the first anchor tenant.

B. Participation Processes in Governance

1. The Membership

a. Participants

(a) Universities (208)

<http://members.internet2.edu/university/universities.cfm>

(b) Corporations (12 partners, 13 sponsors, 42 members)

<http://members.internet2.edu/corporate/corporate.cfm>

(c) Associations (2)

<http://members.internet2.edu/association/list.cfm>

(d) Affiliate Members (12 state or regional networking organizations, plus 40 others including 15 federal agencies and labs) <http://members.internet2.edu/affiliate/affiliates.cfm>

b. Representation of Members

Each member organization is required to identify a set of representatives. See <http://members.internet2.edu/member-roles.html>. In addition, many other individuals from member institutions and organizations are involved in various activities such as working groups, advisory groups, special interest groups, etc. A number of individuals at member campuses and organizations are also employed by Internet2. Official roles include:

- Executive Liaison: serves as the main contact for the member organization, and is responsible for disseminating general messages about Internet2 activities among the community and assigning the other membership roles for the organization. Each executive liaison shall be responsible for payment of dues and assessments.
- Applications Representative: serves as the lead applications developer for the member organization. Responsibilities include disseminating messages from the applications mailing lists, attending tech-related Internet2 conferences, and collaborating with other Internet2 members to develop leading applications.
- Engineering Representative: serves as the lead engineer for the member organization. Responsibilities include: disseminating messages from the engineering mailing lists, attending tech-related Internet2 conferences, and providing key infrastructure support within the organization.
- End-to-End Performance Initiative Representative: has a working relationship with majority of the campus

researchers and has responsibilities in insuring a supportive campus infrastructure for researchers. Responsibilities include disseminating messages from the End-to-End Performance Initiative mailing lists, identifying researchers and technology support personnel who are interested in collaborating with other Internet2 members to improve the end-to-end performance of high performance applications.

- **Middleware Representative:** Defined as the information technology architect who is responsible for campus-wide authentication and authorization, directory services, software infrastructure, and distributed computing.
- **Government Relations contact:** responsible for tracking government-related Internet initiatives while evaluating their relevance to activities within the organization. Other responsibilities include disseminating messages from the member update mailing lists.
- **Public Affairs contact:** responsible for help promoting Internet2 activities within the member organization. This may include press releases, electronic and print publications and uses of the Internet2 logo on internal printed material. The representative may post messages to the Internet2 news mailing list and may disseminate messages within the organization.
- **Billing contact:** receives the invoices for Internet2 membership dues and Abilene fees as necessary

c. *Allocation of Financial Burdens Across Members (Dues and Assessments)*

<http://www.internet2.edu/membership/categories/>

d. *Voting Rights*

Internet2 University member CEOs can vote for prospective members of the Board of Trustees. No other voting rights are currently defined in the Bylaws. Members have nominating power to identify candidates for Board and Council seats. No other de facto voting powers that have emerged over time.

e. *Scope of Activity*

Internet2 members supply the intellectual capital as well as financial resources through dues and fees for services to drive a broad range of activities that advance the ability of the nation's scientists and scholars to collaborate at all geographic scales over advanced networks. This includes development activities in

networking and advanced network services; middleware and security; application technologies; and collaboration enablers. Internet2 members contribute to the building of community among higher education, industry, government, and the broader educational community with international partners and collaborators for the purpose of developing new approaches, capabilities and standards.

Internet2 member organizations and institutions self-identify, creating a strong sense of community identity that is important to preserve and foster. The group of university representatives who originated Internet2 in 1996 was motivated by a desire to form a relatively small and exclusive community that could shape the advances in R&E networking. This was at a time when the National Science Foundation was moving away from its traditional role as the source of funding and motivation for advances in national R & E networking. Expectations of community size were quickly outstripped as more and more universities joined, and membership was expanded to include industry and other non-profit R&E enterprises. Internet2's initial activities did not include operating a network, instead focusing on the development of advanced network services and applications. This work eventually expanded to include middleware and other discipline-based programs and initiatives. Internet2's provision of production advanced networking services occurred with the launch of Abilene in 1998.

Internet2 has a dual identity as a service provider and a "union of peers" organization. These roles are critical to balance in the governance structure and practices of the organization, and can preclude some more common sources of membership control such as consensus decision-making.

Members carry the obligation of maintaining an advanced campus-networking environment, and specifically commit to spending at least \$500,000 annually to do so. Recently the Campus Expectations Task Force reexamined the question of what Internet2 campus membership means, and issued a new framework for member commitments.

Member Meetings occur twice a year, and serve as the principle point of broad-scale community interaction. Through working groups, SIGs, and BOFs, Internet2 members contribute substantial effort to furthering the organization's work, supported by Internet2 staff.

2. The Board of Trustees

a. *Participants*

- 1) University Current and Former CEOs: 7 (Faulkner, Coleman, Crow, Frohnmayer, Lehman, Natalicio, Randel)
- 2) Advisory Council Chairs: 4 (Lassner, McCredie, Landweber, Hall)
- 3) Appointees: 1 (Liebhaber)
- 4) Internet2 Executives: 1 (Van Houweling)
- 5) Chair emeriti: 2 (Ward, Broad)

b. *Scope of Activity*

The Board provides strategic direction, leadership and oversight for the activities of Internet2. It approves the annual budget, appoints the CEO, and approves major initiatives and strategic directions for Internet2. Three standing committees of the Board exist currently: Audit, Governance and Nominations (formerly Nominations), and Membership. The membership committee function has been delegated to NPPAC. An International Relations Committee existed at one point. Special committees are formed ad hoc. The Board meets twice a year on a regular basis and holds periodic teleconference meetings as necessary. At least one meeting per year (typically the Spring meeting) is in person.

Board agendas are set by the Board chair in consultation with the CEO. Current concerns focus on the strength of the Executive vs. the role of the Board and the Board chair in decision-making.

c. *Practices around communication with Internet2 members*

Member input comes to the Board through the Advisory Council chairs and staff. Board decisions are communicated to the membership as their actions warrant. The Board is not very visible to Internet2 members, although the chair and other Board members have participated in several Member Meetings. The current chair's recent communications directly with other CEOs was unusual. Current concerns focus on creating a more structured pattern of communication between the Board and the membership.

d. *Selection of Board members*

Candidates for open Board seats are nominated by the membership at large during an open nominations process commencing in January of each year. The Nominations (now Governance and Nominations) Committee of the Board reviews the nominees, suggests others, and selects a slate of Board candidates.

The slate is then circulated to the CEOs of Internet2 University Members for ratification.

The bylaws allow two members of the Board to be appointed by the Board itself. The Board identifies potential appointees and votes on their selection.

3. The Councils

a. *Applications Strategy Council*

1) Participants (11)

ASC members are discipline-based researchers and educators from member institutions and collaborative organizations. Two CIOs participate on the current ASC, one as chair. Attention is paid to including members from key discipline communities, such as health sciences and computational science fields. Recently a representative from one of Internet2's international partners was added. A senior-level staff liaison (Laurie Burns) and administrative support person (Terri Saarinen) are assigned.

2) Scope of Activity

The Applications Strategy Council (ASC) advises the Internet2 Board of Trustees on matters related to the conceptualization, functionality, technical design and development priorities of computer applications for research and education that utilize advanced networking facilities. It holds monthly telephone meetings and meets in person at the twice-annual Member Meetings.

3) Practices around member communication and input

Member input comes through the Council members themselves as well as from working group chairs and others who are involved with activities of interest to the Council. The ASC holds open meetings where topics warrant, such as around the development of its strategic plan. Minutes from ASC meetings are posted on the website.

4) Selection of Council members

Candidates for open ASC seats are nominated by the membership at large during an open nominations process commencing in January of each year. This process is announced in membership-wide communications starting in December of the previous year. The Nominations (now Governance and Nominations) Committee of the Board, which includes the chair of the ASC, reviews the nominees, suggests others, and selects a slate of new Council members to recommend to the Board. The Board votes on the slate

and the new Council members begin their terms of service in the spring of each year. New Council and Board members are announced to the membership when their selections are final.

Terms of service are 3 years, renewable once. Council members completing two terms can be re-elected to a Council after a one-year hiatus.

b. Industry Strategy Council

1) Participants (8 current)

ISC members are key individuals from member and non-member companies. It is not populated according to company representation, but rather by those who are dedicated to thinking broadly about Internet2's industry activities and strategies. There is one university CIO on the Council. A senior-level staff liaison (Jill Arnold) and administrative support person (Karen Doemer) are assigned.

2) Scope of Activity

The Industry Strategy Council (ISC) comprises industry leaders who provide the Internet2 Board of Trustees with strategic vision and input related to advanced networking and applications development, and helps focus technology transfer aspects of Internet2 initiatives. It holds quarterly in-person meetings. Current concerns focus on the relative importance of industry members in Internet2, given the centrality of institutions of higher education to Internet2's mission. There are many opportunities for industry engagement because of the AUP for the new network.

3) Practices around member communication and input

Member input comes through the Council members themselves, as well as through staff. Council activities are communicated to the corporate membership and to the membership as a whole through regular updates. Council meeting minutes are posted on the website.

4) Selection of Council members

Candidates for open ISC seats are nominated by the membership at large during an open nominations process commencing in January of each year. This process is announced in membership-wide communications starting in December of the previous year. The Nominations (now Governance and Nominations) Committee of the Board, which includes the chair of the ISC, reviews the nominees, suggests others, and selects a slate of new Council members to recommend to the Board. The Board votes on the slate

and the new Council members begin their terms of service in the spring of each year. New Council and Board members are announced to the membership when their selections are final.

Terms of service are 3 years, renewable once. Council members completing two terms can be re-elected to a Council after a one-year hiatus.

c. Network Planning and Policy Advisory Council

1) Participants (12)

NPPAC members are primarily CIOs from leading research institution members of Internet2, joined currently by one member of the grid community. NPPAC membership is not reserved for CIOs exclusively, but the Council is intended to be the principle vehicle for CIO involvement in the governance. One member of NPPAC is designated as a representative from the Quilt, because so much of NPPAC's charge relates to network policy that in turn affects connectors and state/regional networks. A senior-level staff liaison (Laurie Burns) and administrative support person (Sharon Moskwiak) are assigned, and other senior staff, including the CEO, participate in most meetings. The agenda is set by the chair in consultation with the staff liaison and the Council members.

2) Scope of Activity

The Network Planning and Policy Advisory Council (NPPAC) advises the Internet2 Board of Trustees on matters related to the planning, development, financing and management of advanced networks for research and education. Along with the NRLC it was one of the first two Councils established, and is by far and away the most influential. It serves as the membership committee of the Board, and also advises management on priorities. It meets often, and holds in-person meetings at least twice a year. NPPAC does not have fiduciary responsibilities, but rather serves as a key source of strategic advice on matters of policy and practice. Because of this, their advice is considered central to Internet2's decision-making processes. A current concern is the need for a conflict of interest policy, to cover those NPPAC members who also sit on the NLR Board.

3) Practices around member communication and input

NPPAC holds open meetings at each Member Meeting during which attendees hear about NPPAC's current

priorities and are able to provide input and ask questions. NPPAC does not otherwise hold open meetings. Minutes of meetings are posted on the website.

4) Selection of Council members

Candidates for open NPPAC seats are nominated by the membership at large during an open nominations process commencing in January of each year. This process is announced in membership-wide communications starting in December of the previous year. The Nominations (now Governance and Nominations) Committee of the Board, which includes the chair of NPPAC, reviews the nominees, suggests others, and selects a slate of new Council members to recommend to the Board. The Board votes on the slate and the new Council members begin their terms of service in the spring of each year. New Council and Board members are announced to the membership when their selections are final.

Terms of service are 3 years, renewable once. Council members completing two terms can be re-elected to a Council after a one-year hiatus.

d. *Network Research Liaison Council*

1) Participants (5)

NRLC members are network researchers from Internet2 member universities and corporations. A senior-level staff liaison is assigned to the Council (Rick Summerhill).

2) Scope of Activity

The Network Research Liaison Council (NRLC) advises the Internet2 Board of Trustees on matters related to working with the Computer Science research community to migrate computer systems and network research ready for prototype deployment into the Internet2 infrastructure, to enable a research component of the infrastructure, and to provide logical or physical access to such an infrastructure if it can be provided through cooperative efforts within Internet2. It does not meet regularly.

3) Practices around member communication and input

One of the original two Councils along with NPPAC, the NRLC is the least active as an organized group. Member input comes through the Council members.

4) Selection of Council members

Candidates for open NRLC seats are nominated by the membership at large during an open nominations process commencing in January of each year. This process is

announced in membership-wide communications starting in December of the previous year. The Nominations (now Governance and Nominations) Committee of the Board, which includes the chair of the NRLC, reviews the nominees, suggests others, and selects a slate of new Council members to recommend to the Board. The Board votes on the slate and the new Council members begin their terms of service in the spring of each year. New Council and Board members are announced to the membership when their selections are final.

Terms of service are 3 years, renewable once. Council members completing two terms can be re-elected to a Council after a one-year hiatus.

4. Committees

a. Scope of Activity

The Board utilizes a committee structure for a few functions as noted above, and NPPAC has formed special-purpose committees as needs arise (e.g., for membership policy changes). The ISC has also used committees from time to time (e.g., for developing the corporate value proposition).

One key example of a member-formed and member-driven committee exists, which is MACE – Middleware Committee on Education. MACE aims to foster interoperability in areas such as security and directories. Its working agenda is set by campus CIOs and by partners in higher education and research. By developing good-practices documents, designing pilot projects and inter-campus experiments, and recommending technical standards, MACE hopes to bring about the deployment of a common middleware infrastructure to support the academic and administrative needs of the research and education community. MACE charters certain working groups and determines overall development priorities. It is generally similar to an Advisory Group. See <http://middleware.internet2.edu/MACE/>. Current concerns focus on lack of visibility into how MACE operates. Middleware topics are part of NPPAC's agendas, but MACE has no formal connection to the governance structure.

Another example of a key committee is the Program Committee for the twice-annual Member Meetings. A call for participation is open at all times, and anyone can nominate themselves or suggest someone. Terms of service are three Member Meetings, so there are always opportunities to serve, and there is no set limit on the size of

the Committee. The chair seeks to balance participation from different membership categories and areas of expertise.

b. Participation

Council committees are typically comprised of Council members, and often report back only to the Council itself. MACE is chaired and populated by members, and supported by Internet2 staff. Its working groups tend to be open to those beyond the Internet2 membership, with some restrictions on size for manageability purposes.

5. Other Ways to Be Involved

Over the years, a variety of other mechanisms have evolved through which interested parties have become involved in the activities of Internet2. These mechanisms have attracted a number of different names, but it is important to recognize that the boundaries between different types of organization are not precise, and the labels used do not always carry precise meanings.

a. Working Groups

1) Scope of Activity

Working groups are formally charged and led, usually by a member but sometimes by staff, and in most cases have a flywheel (facilitator) and scribe assigned. They have specific deliverables and are accountable to a senior member of Internet2's staff. There is a handbook for chairs that specifies how these are formed, conducted, and dissolved. See <http://www.internet2.edu/wg/>

2) Participation

Working groups serve as the most common and well-used mechanism for direct involvement by members in the activities of Internet2. Working groups are formed by members in most cases, often starting as Special Interest Groups until a charge and deliverables can be identified. Once WGs are formed, they have different rules for involvement by those not on the WG itself. WGs often will hold open sessions at Member Meetings so that members can learn about progress and make comments. Working groups are usually open only to Internet2 members, and many allow non-members to be silent participants (aka lurkers).

b. *Special Interest Groups*

1) Scope of Activity

Special interest groups are quick ways to assemble a group of like-minded individuals in the Internet2 membership to make progress in an area of common interest. While there is an Internet2 staff member associated with each SIG, there are no expectations of support from Internet2, and SIGs generally don't have formal charges or deliverables.

2) Participation

SIGs can be created at any point by members, and generally are open to participation by all interested parties.

c. *Birds of a Feather*

1) Scope of Activity

BOFs are typically single-topic gatherings, often one-time activities that occur at Member Meetings. Some BOFs are ongoing, however, notably the GigaPoP/RON Coordinators BOF that is held four times a year (each Joint Techs and Member Meeting)

2) Participation

BOFs can be created at any point by anyone, and are usually open to participation by all interested parties.

d. *Advisory Groups and Task Forces*

1) Scope of Activity

Advisory groups have been used for a variety of purposes, but generally are fairly formal, member-driven activities designed to provide tactical and at times strategic guidance for particular initiatives of Internet2. Depending on the longevity and scope, they can charter working groups to carry out specific work.

The Councils have formed Task Forces from time to time, most recently the Campus Expectations Task Force, which was motivated by the ASC Strategic Plan and co-sponsored by the ASC and NPPAC. Task Forces are time-limited, focused activities accountable to a Council, the Board, or Internet2 management.

2) Participation

Both of these are usually chaired by members and populated by members, with experts drawn in from outside the member community as needed. They are typically public and there is member communication around their work and deliverables.

6. Interactions among governance fora and other groups

Participants in different governance fora learn about their respective activities through a wide array of informal communications networks, including ad hoc conversations, status reports, presentations, and newsletters, sometimes but not always mediated by Internet2 staff. At the present time, however, there does not exist a formal structure for regularized communication among working groups, advisory groups, etc., and the Councils and the Board.

Some interesting and representative forms of informal communication are as follows:

- Council chairs report on Council activities at regular Board meetings.
- Middleware work is frequently brought to NPPAC for advice and comment. Advisory groups in the discipline program areas, such as the Health Sciences Advisory Group, have reported progress to and sought advice and direction from the ASC.
- Planning for the new network has led to the formation of a Network Technical Advisory Committee (comparable to the current Abilene Technical Advisory Committee). The NTAC has proposed that formal communication channels be established with NPPAC.
- Over the lifetime of Internet2, Council chairs have had varying amount of interaction with one another. In the past three years they have established regular processes of communication through the Inter-Council Chairs group, including having face-to-face meetings where possible. These inter-Council discussions were instrumental in the joint sponsorship of the Campus Expectations Task Force by the ASC and NPPAC. The Council Chairs group is supported by the Internet2 Chief of Staff.
- Individuals from member institutions and organizations get involved with Internet2 activities by volunteering or otherwise self-identifying as having interests or expertise in certain areas. However, Internet2 currently lacks more systematic methods for soliciting interest and involvement from individuals.

7. Administration (vice presidents and executive directors)

While the administration of Internet2 is not technically part of its governance structure, the members of the GNC believed that it would be helpful to include within this report an overview of the administrative

structure of Internet2, in order to make it easier to consider the relationship between governance and administration.

Internet2 staff are organized into four main departments: Development and Infrastructure Delivery (DID); Member and Partner Relations (MPR); Organizational Infrastructure (OI); and Technology Direction and Development (TDD). Each is headed by an Executive Director or Vice-President, reporting to the CEO. The office of the CEO organizationally sits in OI, and in addition to the CEO includes the Chief of Staff and Executive Assistant to the CEO.

a. *Deployment and Infrastructure Delivery (DID)*

DID is focused on converting leading-edge technologies into valued services and products for members and the broader Internet2 community. DID has oversight for the current operations of Abilene and the deployment of the new Internet2 network, FiberCo, WaveCo, the operations of MANLAN, and InCommon and USHER. It provides internal technology support to staff and projects including technical support for the Internet2 website, and includes Internet2's meeting planning services. It is headed by the Executive Director of DID, who participates as staff at NPPAC meetings and other Council meetings as agenda items warrant.

b. *Member and Partner Relations (MPR)*

MPR is responsible for engaging members, partners, and other key constituents in the activities, projects and priorities of Internet2. MPR staff manage membership processes, services and programmatic efforts for Internet2's university, corporate, affiliate, and association members; member programs such as the Member Meetings, Joint Techs workshops, and Internet2 Days; member communications and outreach; assessment projects; and membership data and information systems. MPR also has responsibility for supporting Internet2's governance nominations process. The MPR Director for Corporate Relations is the staff liaison to the Industry Strategy Council and participates as staff in NPPAC meetings. MPR is headed by an Executive Director, and by a Managing Director who oversees the staff and operations of the department. The MPR Executive Director serves as the staff liaison to NPPAC and the ASC, and as staff support to the Governance and Nominations Committee of the Board.

c. *Organizational Infrastructure (OI)*

OI provides the core support functions of financial management, human resources administration, facilities

management and coordination of legal support services. It includes Internet2's External Relations function, which provides monitoring and analysis of Federal policy, programs, regulation, and funding affecting Internet2 and its members, as well as ongoing education of policymakers as to the achievements and goals of Internet2 and its members. OI also includes Internet2's public relations and general communications activities, which are coordinated with member communications activities in MPR. The Vice President for External Relations participates as staff in NPPAC meetings. The office of the CEO, which is organizationally part of OI, provides support for the Board of Trustees. OI is headed by the Vice-President for Operations, who serves as staff support to the Board Audit Committee and participates as staff in NPPAC meetings.

d. Technology Direction and Development (TDD)

TDD is responsible for organizing community resources to explore and develop technologies and architectures that have potential value for the Internet2 community and the Internet at large. It includes the Internet2 Middleware Initiative, which comprises numerous development projects and working groups in areas such as enterprise authentication, federations, directories, identity and privilege management, open source toolkit development, and community outreach and education; the Internet2 Security effort, which includes activities in network authentication, federated wireless network authentication, security incident handling, and NOC operational practices; the Performance Architectures and Technologies (PAT) group, which focuses resources and efforts on improving performance problem detection and resolution throughout campus, regional, and national networking infrastructures; and the Network Research, Architecture and Technologies (NRAT) group, which is dedicated to the support of network research and the examination of new network architectures and technologies for Internet2. The Director of NRAT serves as the staff liaison to the NRLC. TDD is headed by an Executive Director, a position currently vacant. The Executive Director of DID has interim responsibility for the NRAT and PAT groups, and the Director of Middleware reports directly to the CEO. The Director of Middleware also participates as staff in NPPAC meetings and other Council meetings as the agenda warrants.

Appendix B: Areas for Possible Change

Over the course of its deliberations, the GNC has attempted to solicit views from many different quarters about the effectiveness of current governance processes.

The breadth and scale of Internet2 necessarily means that a wide range of views will be voiced, and that on almost any conceivable question we encountered diametrically opposed views from different observers. The GNC attempted to listen carefully to all comments, whether critical or positive, and to use them as a basis for suggesting structural improvements to the organization.

To make beneficial use of the information it gathered, the GNC listened carefully to all praise and criticism of the status quo, with a special interest in determining what sentiments are widely shared and might support a specific improvement that can be implemented without simply substituting a new and possibly worse problem for a current one.

The GNC made special note of the following observations about possible directions for change:

- The overall governance structure could be “scaled up” to accommodate successfully an increased level of participation by a more diverse mix of stakeholders than was originally envisioned. Internet2 was originally conceived as a research collaboration among AAU research universities. Today its activities encompass multiple user constituencies, and affect their uses of advanced network facilities more broadly and deeply than ten years ago. Internet2, especially with the forthcoming deployment of its new network, is part of an ever larger and more complex “food chain” of networking services and facilities, with accompanying greater dependence on regional and campus networks for end-to-end service fulfillment. Internet2’s partnerships with industry, and with international advanced networks, are significantly larger than anticipated a decade ago, and promise to become more so in the future.
- The overall governance structure could have been designed to do a better job of communicating persuasive reasons why a merger with National LambdaRail was not consummated. Many members of the larger community saw a merger as a way to realize significant benefits for academic and research networking, and conversely saw the failure to merge as a substantial cost to the community. Whether or not the Internet2 Board was correct to decline to accept whatever terms of merger were most recently proposed by National

LambdaRail, it is important to have a governance structure through which such decisions will be considered and communicated in ways that maintain member support and confidence.

- The overall governance structure could give a stronger voice to some important stakeholders in Internet2 today. Special mention was made of the CIO community, the researcher community, industry, and state and regional networks.
- The overall governance structure could do more to ensure that competing perspectives on different policy issues are brought into contact with one another before issues reach the Board. For example, Councils and Committees could be structured to be more diverse and heterogeneous.
- The overall governance structure could facilitate more transparent and effective mechanisms of two-way communication between the leadership of Internet2 and the broader communities of stakeholders. These mechanisms could promote more effective and timely communication of relevant information and ideas to decision makers, as well as more effective and timely communication of decisions from the organization to the larger community.
- The overall governance structure could provide greater opportunities for volunteer participation in Internet2 governance and advisory activities, and for stronger interactions with other groups such as The Quilt. In light of the extensive advisory structure that Internet2 already has in place, the GNC took this observation not as a call for the creation of additional committees but rather as a call for greater transparency and more effective communication with members through governance structures of comparable size and scale to those already in place.