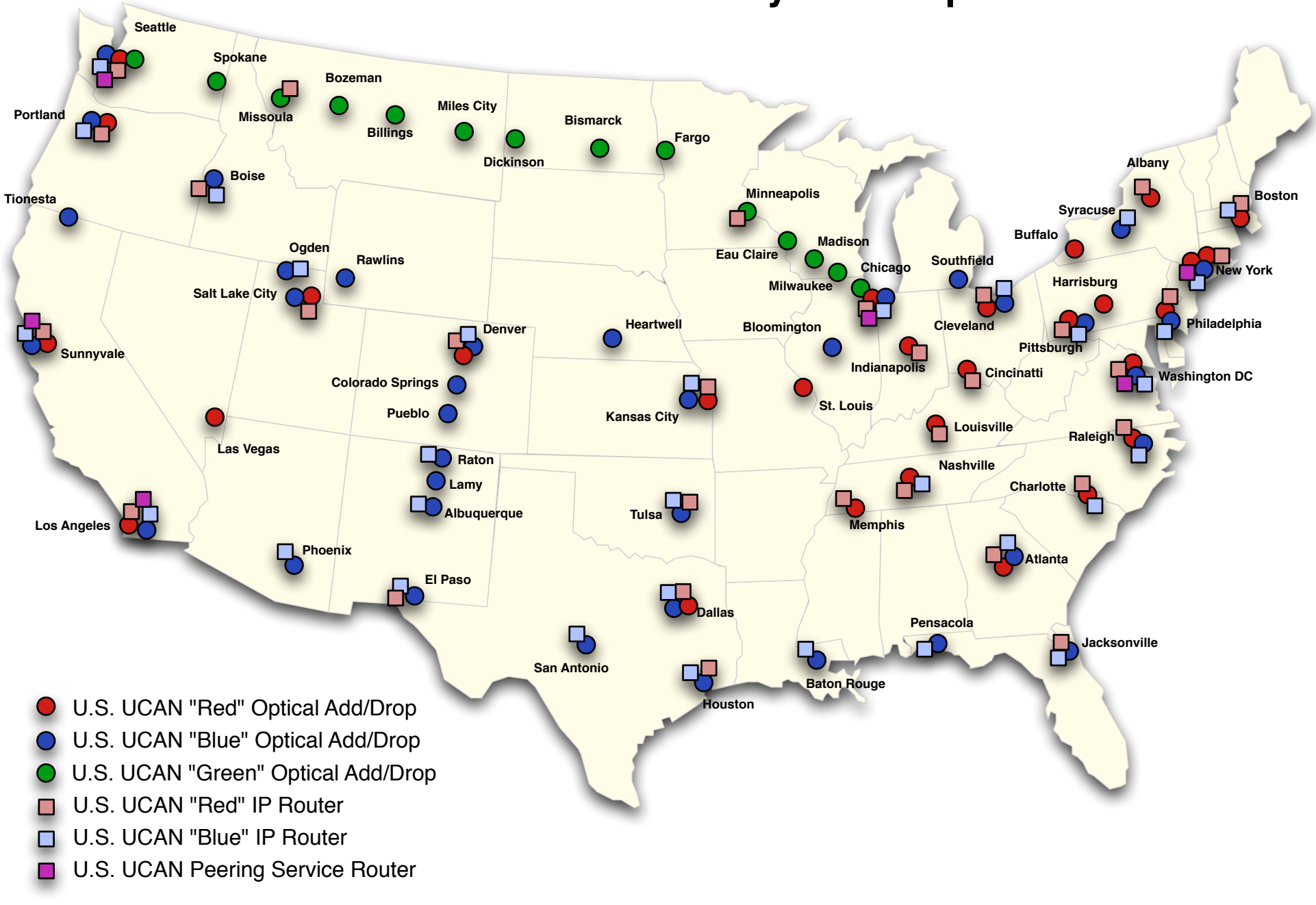
Figure A:
U.S. UCAN Combined Overall System Capabilities



- U.S. UCAN "Red" Optical Add/Drop
- U.S. UCAN "Blue" Optical Add/Drop
- U.S. UCAN "Green" Optical Add/Drop
- U.S. UCAN "Red" IP Router
- U.S. UCAN "Blue" IP Router
- U.S. UCAN Peering Service Router

Figure B:
U.S. UCAN Combined Optical System Capabilities

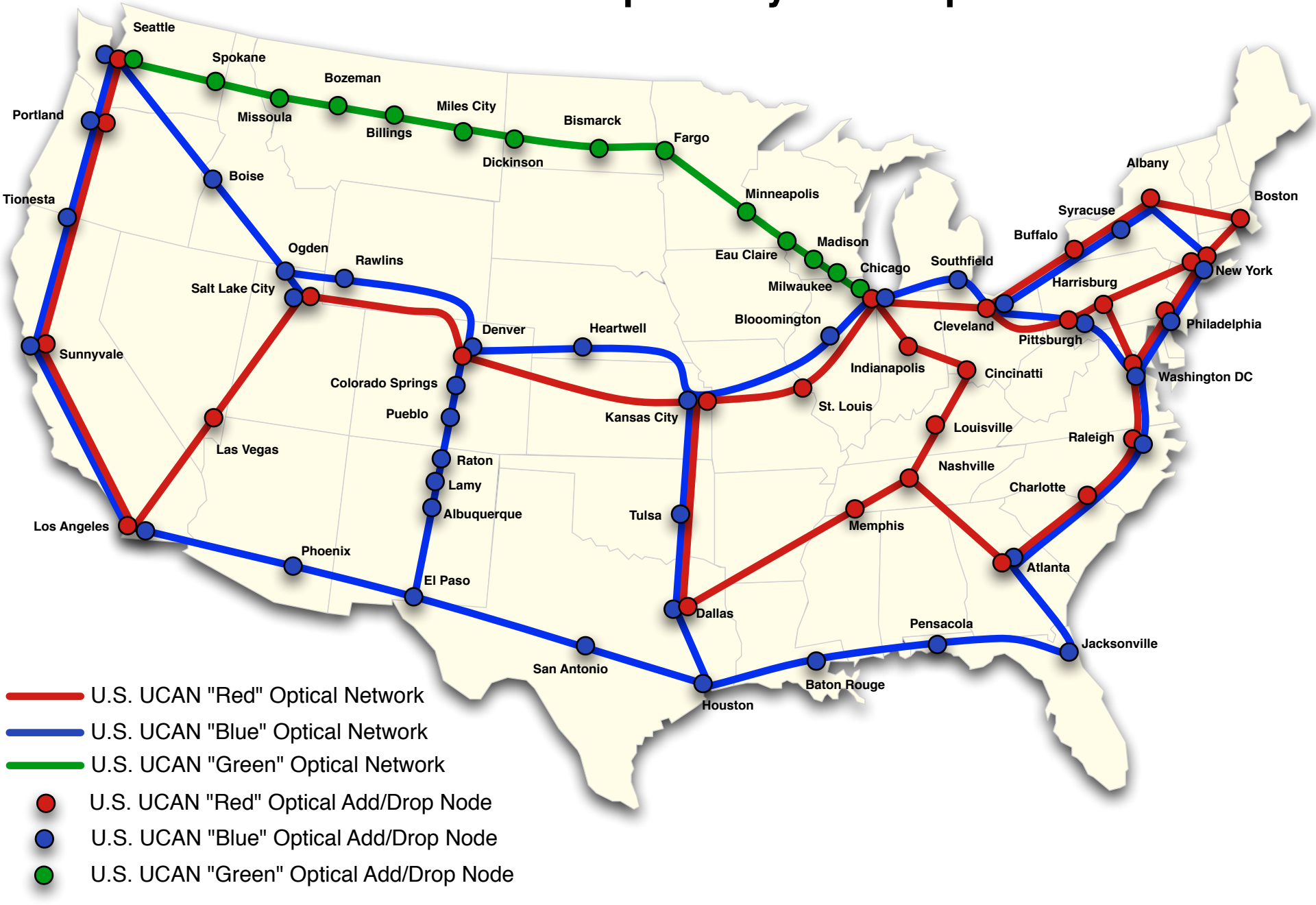


Figure C:
U.S. UCAN Optical Build with Partnerships

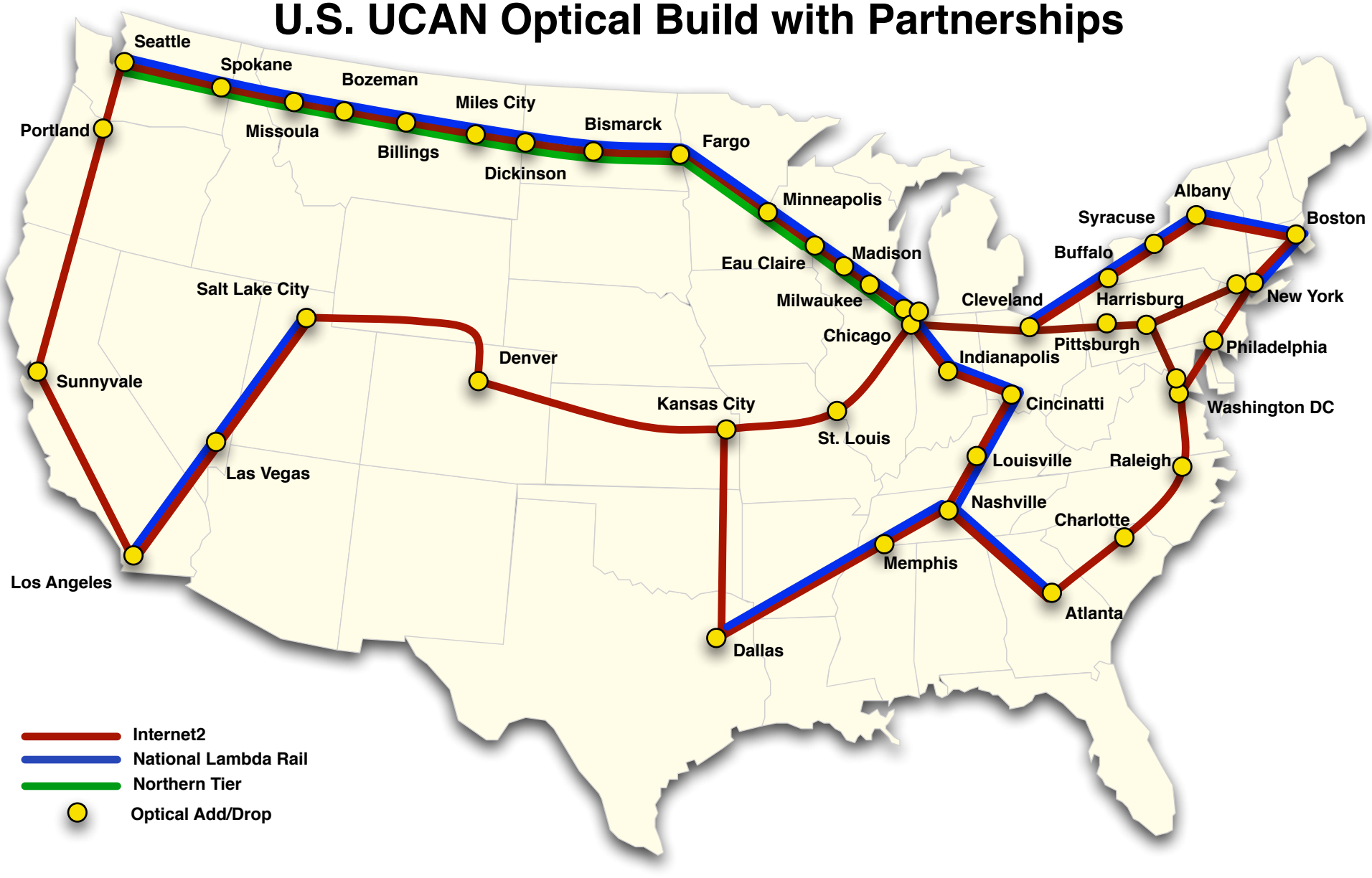


Figure D:
U.S. UCAN "Red" IP Network

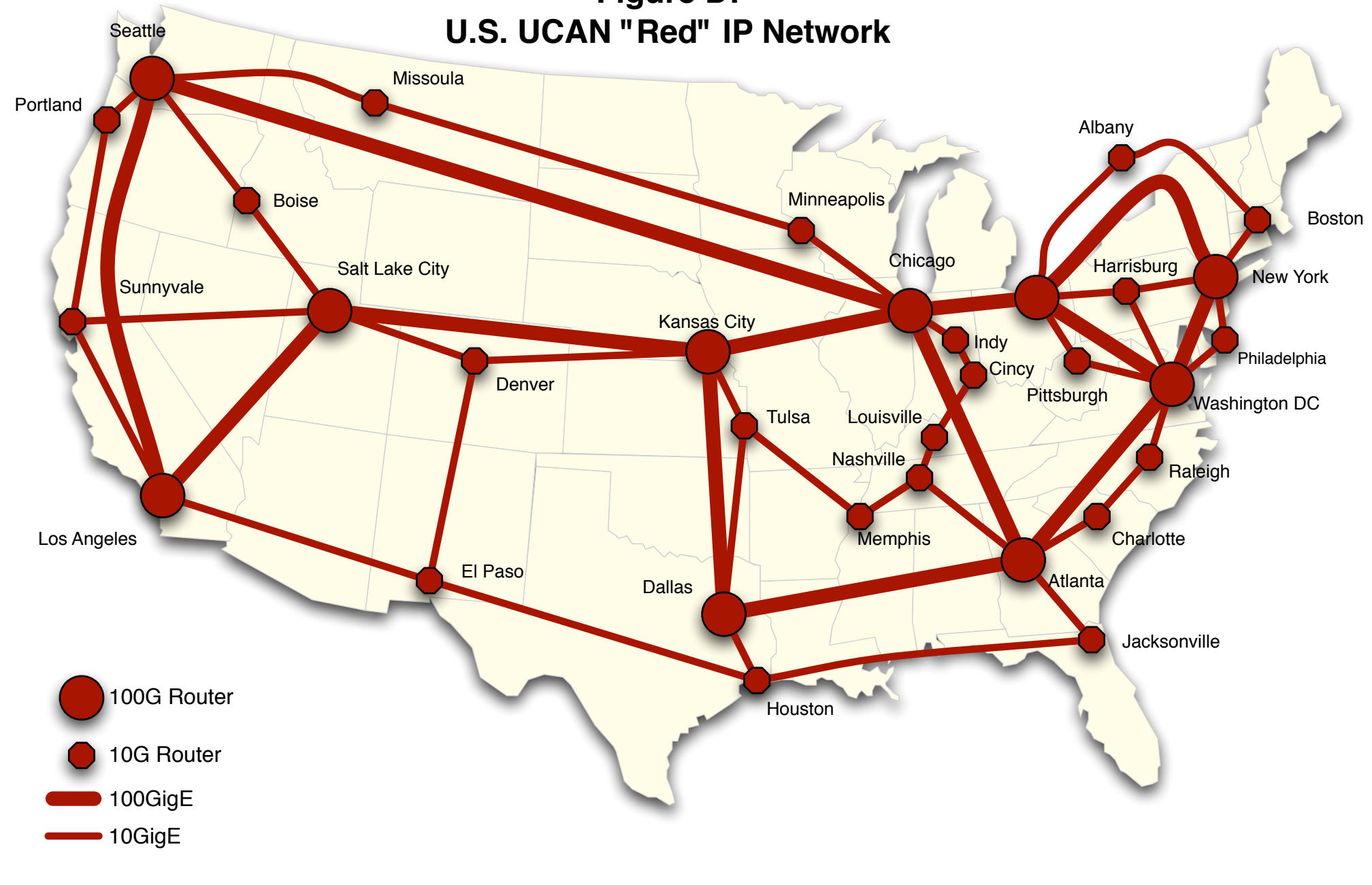


Figure E:
U.S. UCAN "Blue" IP Network

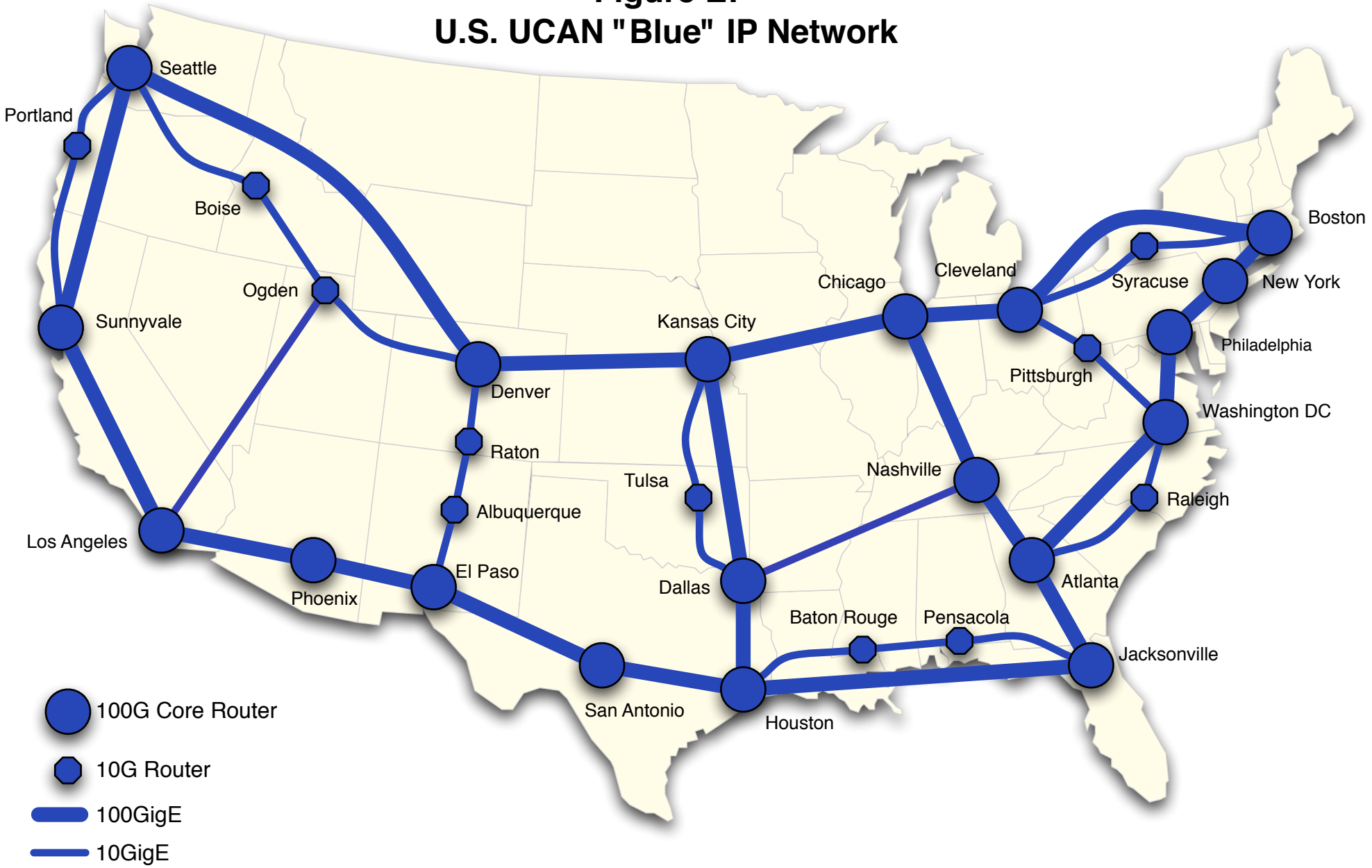


Figure F:
U.S. UCAN Peering Service Network

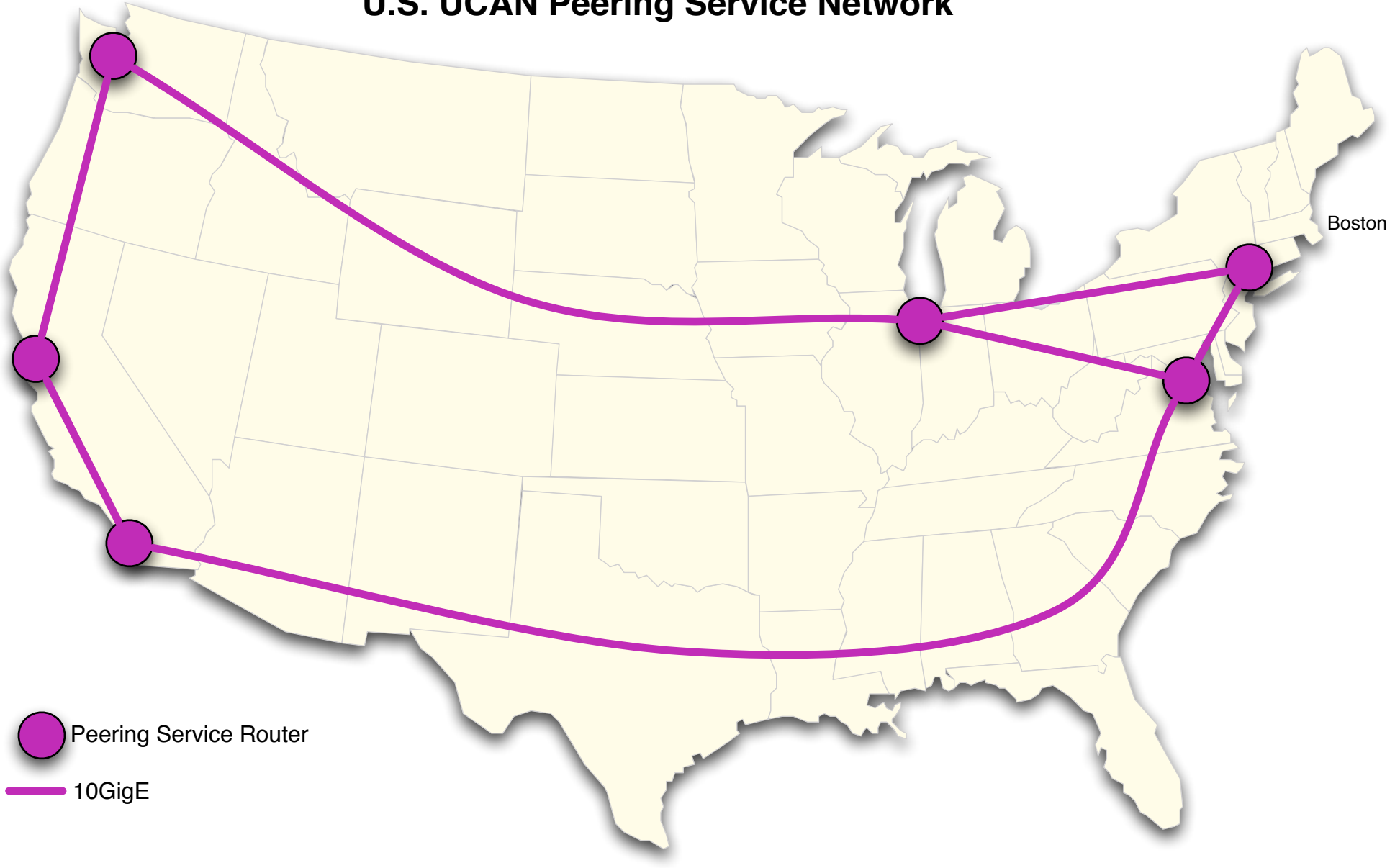


Figure G: U.S. UCAN Commodity Internet Access

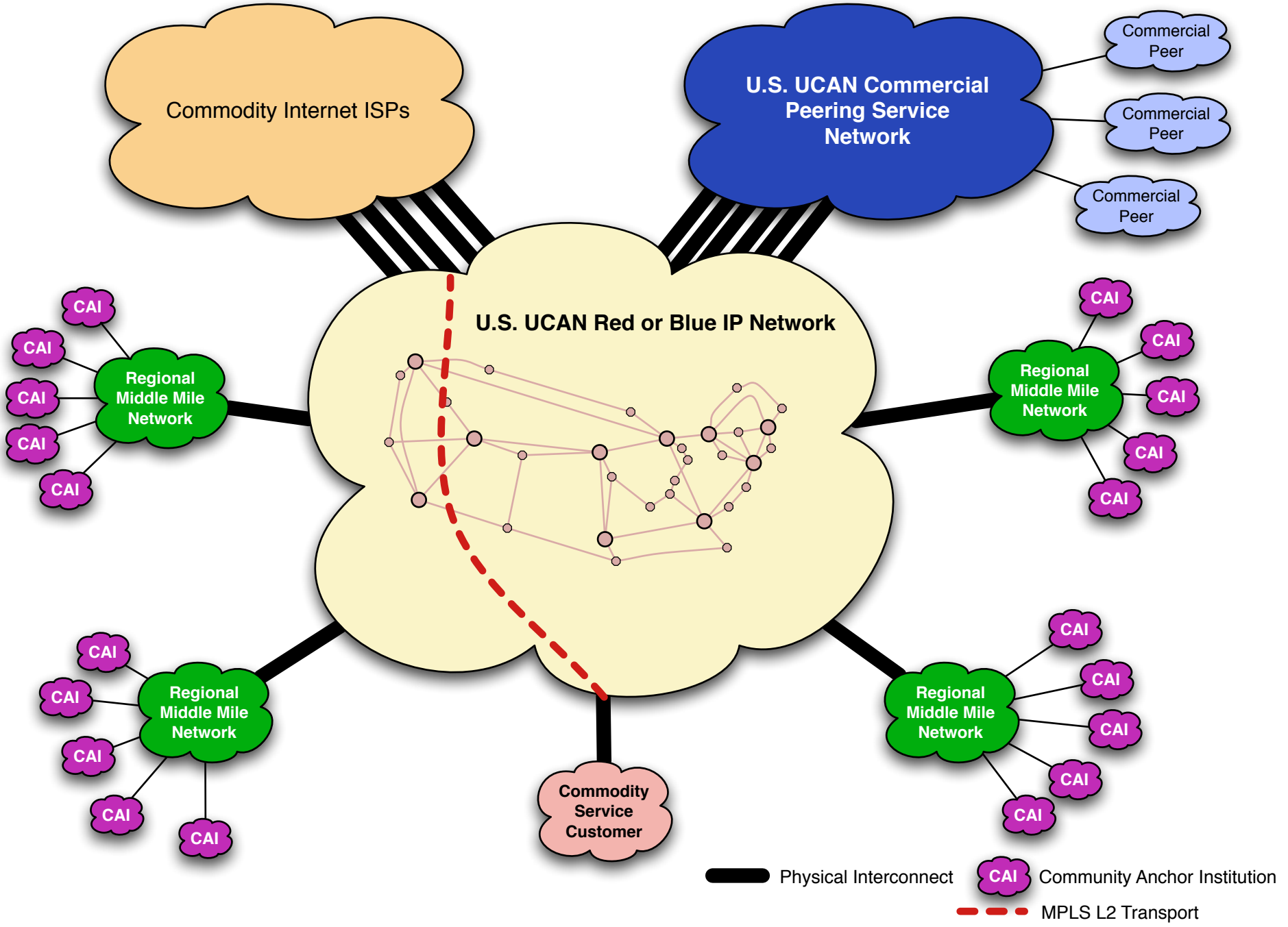


Figure H: U.S. UCAN Peer Network Access

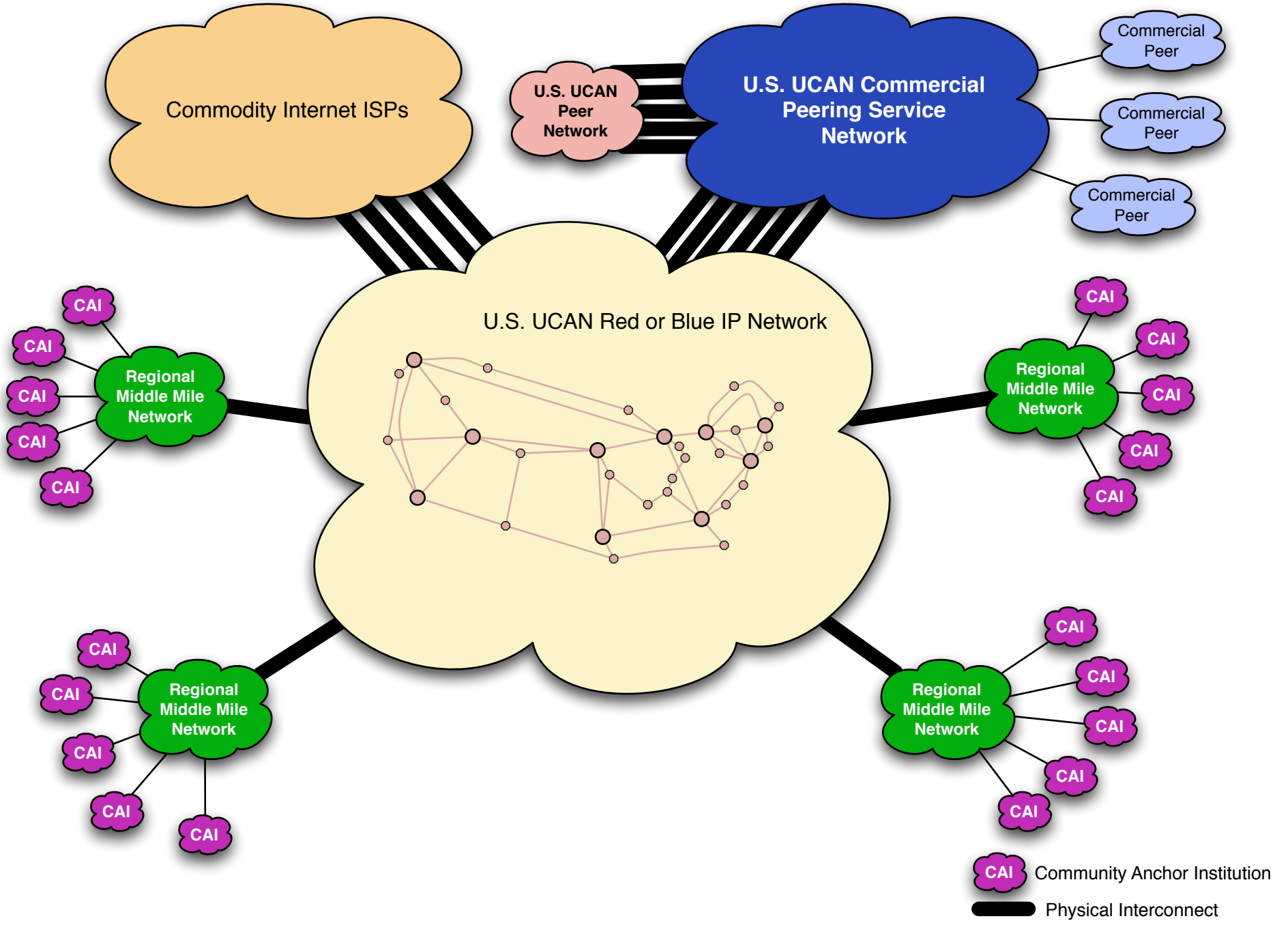
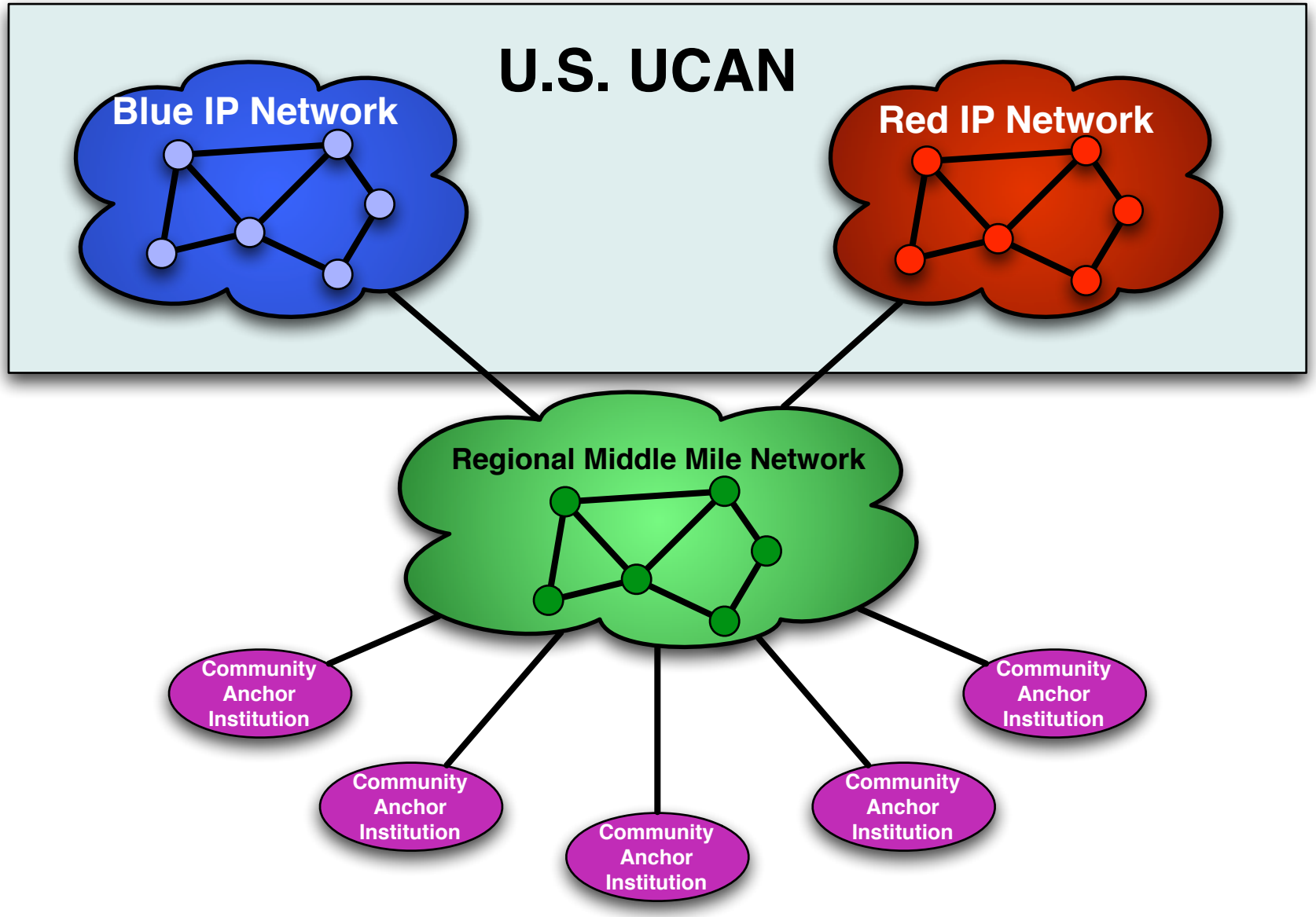


Figure I: U.S. UCAN IP Redundancy



NATIONAL SCIENCE FOUNDATION

4201 Wilson Boulevard
Arlington, VA 22230

Division of Institution and Award Support
Room 485
(703) 292-8244 VOICE
(703) 292-9171 FAX

February 15, 2007

Ms. Kathy Johnson
University Corporation for Advanced Internet Development
Internet 2
1000 Oakbrook Drive, Suite 300
Ann Arbor MI 48104

Dear Ms. Johnson:

The enclosed indirect cost rate agreement indicates the final rates approved by this office effective for the period January 1, 2004 through December 31, 2005. This agreement also provides maximum provisional rates for January 1, 2006 through December 31, 2007.

On awards containing a maximum provisional rate, NSF grant policy requires grantees to charge indirect costs at the lesser of the maximum provisional rate or the federally negotiated rate (as set forth in the enclosed rate agreement). Under recoveries from application of the maximum provisional rate, where the final rate is higher, may be allocated as part of the organization's re quired cost sharing.

If the final rate established is lower than the previously approved maximum provisional rate, the grantee may use available funds, as appropriate, to defray other costs allowable under the grant. If the amount charged for indirect cost exceeds by $300 or more the amount resulting from application of the final rate, and the amount is not used to defray other costs, the difference must be reported and credited to NSF as prescribed in GPM 440, "Cash R efunds and Credits to NSF".

Should your organization submit a grant proposal requesting a lower indirect cost rate than the approved maximum provisional rate, the lower indirect cost rate submitted in the proposal budget will be the maximum provisional rate applicable to the grant award.

If you have any questions, please contact Tamara Bowman at 703-292-8244. Otherwise, please indicate your concurrence and approval by signing the agreement and returning a signed copy of the agreement to my attention at the above address.

Sincerely,

Carol S. Orlando, Team Lead for Indirect Cost
Cost Analysis and Audit Resolution Branch
Division of Institution and Award Support

Enclosure:
Rate Agreement 0120

NPrfMI University Corporation for Advanced Internet Development 52-2060187 02/15/07!0120

NONPROFIT RATE AGREEMENT

EIN #: 52-2060187

NSF INS CODE: 5300011474

ORGANIZATION:

DATE: February 15, 2007

University Corporation for Advanced Internet Development
1000 Oakbrook Drive Suite 300
Ann Arbor, MI 48104

FILING REF: This is the first Rate Agreement with this organization

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section II.

SECTION I: INDIRECT COST RATES

Type	Effective Period	Rate	Base
FINAL	01/01/2004 – 12/31/04	62.00%	(a)
FINAL	01/01/2005 – 12/31/05	58.44%	(a)
MAXIMUM PROVISIONAL	01/01/2006 – 12/31/07	62.00%	(a)

Rate Application Base

(a) Total direct costs less capitalized equipment, subawards, and participant support costs.

SECTION II: GENERAL TERMS

A. LIMITATIONS: Use of the rates contained in this agreement is subject to any applicable statutory limitations. Acceptance of the rates agreed to herein is predicated upon the conditions that: (1) no costs other than those incurred by the grantee/contractor were included in its indirect cost rate proposal and that such costs are legal obligations of the grantee/contractor, (2) the same costs that have been treated as indirect costs have not been claimed as direct costs, (3) similar types of costs have been accorded consistent treatment, and (4) information provided by the grantee/contractor which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. AUDIT: All Federal costs, direct and indirect are subject to audit. Adjustments to amounts resulting from audit of the cost allocation plan or indirect cost rate proposal upon which the negotiation of this agreement was based will be compensated for in a subsequent negotiation.

C. ACCOUNTING CHANGES: The rates contained in this agreement are based on the accounting system in effect at the time the proposal was prepared and the rates were negotiated. Changes to the method of accounting, which affect the amount of reimbursement resulting from the use of these rates, require the prior approval of this office. Failure to obtain such approval may result in subsequent cost disallowances.

D. FIXED RATES: If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

E. NOTIFICATION TO FEDERAL AGENCIES: Copies of this document may be provided to other Federal offices as a means of notifying them of the rates agreed to herein.

BY THE ORGANIZATION:

University Corporation for Advanced Internet Development (UCAID)
(Organization)

Kathleen Johnson
(Signature)

Kathleen Johnson
(Name)

Director, Business Operations
(Title)

4-26-2007
(Date)

734 | 913-4264

ON BEHALF OF THE FEDERAL GOVERNMENT:

National Science Foundation
(Agency)

Carol S Orlando
(Signature)

Carol S. Orlando
(Name)

Team Lead for Indirect Costs
CAAR/DIAS/BFA
(Title)

February 15, 2007
(Date)

NSF Negotiator: Tamara Bowman
Telephone: (703) 292-8244

THE FCC NATIONAL BROADBAND PLAN

[EXCERPTS]

and school system.[144] Because broadband networks—particularly fiber optic networks—demonstrate large economies of scale, bulk purchasing arrangements for forms of connectivity like second-mile and middle-mile access can drive down the per-megabit cost of such access considerably. As a result, policy restrictions that impede the ability of school networks funded by E-rate to share capacity with hospitals funded by the Rural Health Care program, or the public safety system which may be funded by state and other federal sources, drive up the cost of connectivity for those institutions and for others in the community.[145]

At least 30 states have established state networks operated by public agencies or the private sector to aggregate demand among schools, universities, libraries, and state and local government agencies to reduce costs.[146] Better collaboration among government agencies could reduce the potential for waste of federal resources and maximize available federal funding for broadband-related community development projects. Federal and state policy should not preclude or limit networks that serve one category of institution from serving other institutions and the community as a whole.[147] The FCC should explore creative solutions to help schools, libraries and health care providers reduce their broadband-related costs by aggregating demand with other community institutions so that they can purchase the maximum amount of broadband with their USF dollars. For instance, the FCC should remove barriers to the shared use of state, regional, Tribal, and local networks by schools, libraries and health care providers when such networks provide the most cost-efficient choice for meeting broadband needs.[148]

Because community anchor institutions are large—if not the largest—potential consumers of broadband in even the smallest of towns, adopting these recommendations will not only expand broadband options for the institutions themselves but also will improve availability in the community as a whole.

RECOMMENDATION 8.21: Congress should consider amending the Communications Act to provide discretion to the FCC to allow anchor institutions on Tribal lands to share broadband network capacity that is funded by the E-rate or the Rural Health Care program with other community institutions designated by Tribal governments.

In recognition of the unique challenges facing Tribal communities, Congress should consider amending the Communications Act to provide discretion to the FCC to define circumstances in which schools, libraries and health care providers that receive funding from the E-rate or Rural Health Care program may share broadband network capacity that is funded by the E-rate or th Rural Health Care program with other community institutior designated by Tribal governments.[149]

RECOMMENDATION 8.22: The federal government and state governments should develop an institutional framework that will help America's anchor institutions obtain broadband connectivity, training, applications and services.

Earlier in this chapter, the plan proposes a path to ensure that homes in high-cost areas have access to broadband, largely by reforming the High-Cost program and intercarrier compensation. In other chapters, the plan proposes reforms to USF to improve connectivity to schools, libraries and health care providers. Government should take additional steps to enable these and other community institutions to better utilize their connectivity to provide a better quality of life for all people.

One approach to ensure connectivity for facilities that serve public purposes is to give a non-profit institution the mission and capability to focus on serving the broadband needs of public institutions, including health clinics, community colleges, schools, community centers, libraries, museums, and other public access points. In the past, the connectivity needs of research institutions have been met by non-profit research and education (R&E) networks such as Internet2 and National LambdaRail. R&E networks played a central role in the development and growth of the Internet itself through ARPANET and later NSFNET. Today, similar R&E networks provide high-speed (10 Mbps-1 Gbps) connectivity to 66,000 community anchor institutions.[150] But more can be done—it is estimated that only one-third of anchor institutions have access to an R&E network today.[151] This model should be expanded to other community institutions.

A group of R&E networks, including Internet2 and the National LambdaRail, with the support of the National Association of Telecommunications Officers and Advisors and the Schools, Health and Libraries Broadband Coalition, have proposed that the federal government and state governments create a non-profit coordinating entity, the "Unified Community Anchor Network," that would support and assist anchor institutions in obtaining and utilizing broadband connectivity.[152] Expanding the R&E network model to other anchor institutions would offer tremendous benefits. Many community institutions lack the institutional resources to undertake the many tasks necessary to maximize their utilization of broadband. Facilitating collaboration on network design and how best to utilize applications to meet public needs could result in lower costs and a far more efficient and effective utilization of broadband by these institutions.

Working with the R&E and non-profit community, the federal government and state governments should facilitate the development of an institutional framework that will help anchor institutions obtain broadband connectivity, training, applications and services. One method of implementation

would be to establish federal and state coordinators and consortia of anchor institutions. These coordinators would help secure connectivity and would also provide hands-on experience and capacity in the building and running of networks.[153] A coordinating entity also could have a national procurement role in negotiating bulk equipment and connectivity purchase agreements, acting as a sophisticated buyer, which would then be available to community institutions.[154] There also could be a platform for interconnected networks to share resources and applications and provide training opportunities. Coordinating and building common resources and capacity in this manner at the national and state levels would lower the overall costs of building and running anchor institutional networks.

recommendations span these national priorities.

The connectivity needs of institutions that may further national purposes are varied, and no single solution fits all. But collaboration and coordination between these institutions has significant potential to meet connectivity requirements. Government policy can promote and facilitate that collaboration.

In the past, many institutions have used a collaborative model to achieve connectivity. The Internet2 Project was established in 1996 by 34 university researchers to better support the unique needs of the research community like data mining, medical imaging and particle physics. This partnership and others like it (e.g., National LambdaRail) have emerged to provide the unique capabilities that our nation's top institutions require.

Unfortunately, the job of connecting all of our institutions is not complete. The proposed Unified Community Anchor Network (UCAN) (see Chapter 8) and other networks like it would extend the collaborative model favored by many of our research institutions for the benefit of our other community institutions such as rural health clinics and community colleges. UCAN would enable more demand aggregation and sharing, remove barriers to entry and support efforts to and empower all of our community institutions that need connectivity.[9]

Additionally, national priorities should not be restricted by caps on bandwidth. Broadband usage patterns and pricing models are evolving rapidly. In some cases, fixed and mobile broadband service providers have put in place volume caps that have differential impact on users; in other cases, they have offered specific plans that charge on a usage basis. Such pricing schemes may raise policy issues, but it is premature for this plan to address them, as there are a wide variety of methods by which they can be implemented.

If ISPs adopt volume caps or usage-based pricing as the model for how broadband should be priced, the FCC should ensure that such decisions do not inhibit the use of broadband for public purposes such as education, health care, public safety, job training and general government uses.

It is critical that the country move now to enact the recommendations in this part of the plan in order to accelerate the transformation that broadband can bring in areas so vital to the nation's prosperity. Diffusion of new technologies can take time, but the country does not have time to spare. There are students to inspire, lives to save, resources to conserve and people to put back to work. Integrating broadband into national priorities will not only change the way things are done, but also the results that can be achieved for Americans.

SUPPLEMENTAL MATERIALS
U.S. UCAN Easygrants ID #4589

FCC National Broadband Plan Excerpts

University Corporation for Advanced Internet Development Provisional Indirect Cost Rate Rate Agreement

Service Area Statistics

Letters of Support:
- State and Regional Networks – 1
- State and Regional Networks – 2
- State and Regional Networks – 3
- State and Regional Networks – 4
- Universities
- Non-profit organizations
- Community Colleges
- Health Care organizations
- Other network organizations

Douglas E. Van Houweling
President and CEO
Internet2
1000 Oakbrook Drive, Suite 300
Ann Arbor, MI 48104
dvh@internet2.edu

EDUCATION

B.S. in Government, Iowa State University, Ames, 1965
Ph.D. in Government, Indiana University, Bloomington,, 1974.

WORK HISTORY

1997-present	President and Chief Executive Officer, Internet2
1995 – present	Professor, School of Information, University of Michigan.
1995-1997	Dean for Academic Outreach, University of Michigan
1995-1997	Vice Provost for Information and Technology, University of Michigan
1984 -1995	Vice Provost for Information Technology, University of Michigan
1985 -1997	Adjunct Professor, Business Administration and Political Science, University of Michigan
1981-1984	Vice Provost for Computing and Planning, Carnegie-Mellon University
1981-1984	Adjunct Associate Professor of Urban Systems and Public Policy, Carnegie-Mellon University
1980-1981	Director of Academic Computing and Acting Director of Central Computing Services, Cornell University
1978-1980	Director of Academic Computing and Associate Director of Computer Services, Cornell University
1976-1978	Assistant Director for User Services, Cornell University
1970-1981	Assistant Professor of Government, Cornell University

PUBLICATIONS

"Beyond Convergence: How advanced networking will erase campus boundaries," Douglas Van Houweling. ACUTA Journal, Spring 2007.

"In Search of the Killer App: The Internet2 Experience and the Promise of Advanced Broadband," Ted Hanss and Douglas Van Houweling. Chapter in Austin, Robert D., and Stephen P. Bradley, eds. *The Broadband Explosion: Leading Thinkers on the Promise of a Truly Interactive World*. Boston: Harvard Business School Press, July, 2005.

"The Development of Institutional Strategies," James J. Duderstadt, Daniel E. Atkins and Douglas E. Van Houweling, EDUCAUSE Review, Volume 38, Number 3, May/June 2003.

"Delivering Value by Preserving Values: An Interview with Douglas Van Houweling, "EDUCAUSE Review, Volume 38, Number 2, March/April 2003.

"Higher Education in the Digital Age: Technology Issues and Strategies for American Colleges and Universities," James J. Duderstadt, Daniel E. Atkins and Douglas E. Van Houweling. The Oryx Press and the American Council on Education, Westport, Connecticut, December 2002

"Knowledge Services in the Digitized World: Possibilities and Strategies," *Electronic Access to Information: A New Service Paradigm,* The Research Libraries Group, Inc., Mountain View, California, July 1993.

"The Evolving National Information Network: Background and Challenges," with Michael McGill, A Report of the Technology Assessment Advisory Committee to the Commission on Preservation and Access, 1400 16th Street, NW, Suite 740, Washington, D. C. 20036, July 1993.
"The National Network: A National Interest," *EDUCOM Review*, Volume 24, Number 2, Summer 1989.
"The Information Network: Its Structure and Role in Higher Education," *Library Hi Tech*, Volume 5, Number 2, Summer 1987.
"The Information Technology Environment of Higher Education," *Campus of the Future -- Conference on Information Resources,* OCLC Library, Information, and Computer Science Series, Online Computer Library Center, 6565 Frantz Road, Dublin, Ohio, 1987.

SYNERGISTIC ACTIVTIES

Doug Van Houweling is the founding President and CEO of Internet2. A leader in higher education information technology innovation and development for over 40 years, he has played a major role in Internet development in the United States. He was Chairman of the Board of MERIT, Inc., a Michigan statewide computing network, when the National Science Foundation awarded it responsibility for operation and management of the NSFNET national backbone in partnership with IBM, MCI and the Michigan Strategic Fund in 1987. Van Houweling was also Chairman of the Board of Advanced Network and Services Corporation, a not-for-profit organization that implemented and operated the world's largest Internet backbone network from 1991 until 1995.served as a member of the National Academies Panel on the Impact of IT on the Future of the Research University. With James Duderstadt and Daniel Atkins he authored *Higher Education in the Digital Age*. Van Houweling is the recipient of the EDUCAUSE 2002 Excellence in Leadership Award, and currently serves on the boards of Advanced Network and Services, Merit Networks, Altarum, and Adaptec. Van Houweling has long been active in inter-university initiatives, serving on the EDUCOM Board and playing roles in establishing numerous initiatives to establish cooperative information technology efforts among universities. He was a founder of EDUCOM's Networking and Telecommunications Task Force and the Inter-university Consortium for Educational Computing.

RANDALL L. FRANK
Chief Technology Officer, Internet2

Education

1973-77	Candidate for PhD	University of Utah Computer Science
1973	B.S. (Engineering)	University of Michigan

Appointments

1998-2008 **Fidelity Investments, Boston, MA**
Vice President, Research and Development/Chief Architect, Fidelity Center for Applied Technology

1986-1998 **University of Michigan**
Executive Director, Information Technology, College of Engineering
Founding Director, Media Union
Project Director, University of Michigan JSTOR Project
Lecturer, Electrical Engineering and Computer Science
Director, Research Computing Facilities/Campus Networking

1976-1986 **University of Utah**
Director, Research Computing Facilities/Campus Networking

Mr. Frank has had extensive experience in leading innovative activities in academic and corporate settings. In a variety of senior technology administrative positions, he has built a track record of developing, managing, and leading major projects that have advanced cutting edge initiatives both successfully and cost-efficiently. He was the leader of the University of Utah's Arpanet connection and led efforts to build the first campus-wide LAN on that campus. At the University of Michigan, he served as principal architect of LAN deployment; built the Campus Aided Engineering Network (CAEN); designed the Michigan Media Center (renamed the Duderstadt Center); and initiated JSTOR service. While at Fidelity Investments, he led development of the first wireless LANS as the prototype of VoIP environments and upgraded Fidelity's global intranet to support multicast.

Robert P. Vietzke
Executive Director, Network Services
Internet2
1000 Oakbrook Drive
Ann Arbor, MI 48104
rvietzke@internet2.edu

A. Professional Preparation
B.A. in Communications Sciences, University of Connecticut (1993)

B, Appointments

2008-present	Executive Director, Network Services, Internet2, Ann Arbor, MI
2007	Director, Networking and Telecommunications, University of Connecticut, Storrs, CT
2006-present	Board member, Connecticut Academy of Math and Sciences, Middletown, CT
2006-2007	Project Director, Network Evolution, Internet2, Ann Arbor, MI
2004-present	Founder, Board Member, Corporate Secretary, North East Research and Education Network, Inc., West Warwick, RI
2004-2007	Director and Network Architect, Connecticut Education Network, State of Connecticut Department of Information Technology, East Hartford, CT
2001-2004	Chief Systems Architect, University of Connecticut, Storrs, CT

C. Publications
Vietzke, R., “UConn Battles for Control of Campus Infrastructure,” ACUTA Journal, Spring 2000
Vietzke, R., “Network Design for the 21st Century School,” @EDU Magazine (Premiere issue feature article), April 2000
Vietzke, R., "Networks Layer by Layer", Curriculum Administrator, April, 1999
Vietzke, R., "Media Retrieval Meets Digital Video", Curriculum Administrator, November, 1998
Vietzke, R., "Networked Multimedia at the University of Connecticut," Technological Horizons in Education, February, 1997
Vietzke, R., "The Path to Successful Networking," Technology and Learning, November 1996

D. Synergistic Activities
Robert Vietzke is the Executive Director of Network Services at Internet2, where he is the primary executive in charge of operations, management, and business of the nation’s most advanced research and education network. In this capacity, he leads discussions and develops advanced services with regional networking organizations and campus leaders to deploy services in support of the United States cyber-infrastructure and network research agenda. He also supervises and oversees additional programs including international networking relationships, the K20 program, and Internet2’s Fiberco subsidiary. In addition, he directs business activities associated with a $25M annual network activity, including a 13,500 mile dedicated 100Gbps+ optical network; coordinates and negotiates supplier strategies and partnerships for advanced networking initiatives; and provides oversight to internal information technology and web development teams. Mr. Vietzke has over fifteen years of experience designing, implementing, and managing multiprotocol label switching, border gateway protocols, optical and other resilient networks, and routing and network protocols. Prior to joining Internet2, he directed, designed and implemented the nation’s first all-optical gigabit-ethernet community anchor institution network to the 169 school districts and 70 college campuses in Connecticut. He also has proven expertise in coordinating diverse groups of collaborators and partners, including higher education representatives, regional networks, and vendors. A Board Secretary and Founding Board member of the Northeast Research and Education Network (NEREN) and Board member of the Connecticut Academy for Science, Math, and Technology, he also is a member and speaker at Educause, Net@EDU, the Association of College and University Telecommunications Professionals (ACUTA), and the Association of Higher Education Cable Television Administrators (AHECTA).

James A. Pflasterer
Chief Financial Officer
Internet2
1000 Oakbrook Drive, Suite 300
Ann Arbor, MI 48108
japflasterer@internet2.edu

A. Professional Preparation:
MBA, Michigan State University, Lansing, Ml, 1997
CPA, PA license no. CA-18156-L, Ml license no. 11011028866, 1983
BS, Accounting & Finance, University of Virginia, Charlottesville, VA, 1976

B. Appointments:

Chief Financial Officer, Internet2, Ann Arbor, MI	2008 - present
Vice President, Finance, English Gardens, Dearborn Heights, Ml	2004-2008
Chief Financial Officer, Michigan Virtual University, Lansing, MI	2002-2004
Vice President, Finance and Administration, Zenacomp, Inc., Livonia	2000 -2002
Senior Vice President, CFO, The Harvard Drug Group	1998-2000
SUPERVALU, Eden Prairie, MN	
Vice President Finance, CFO - Foodland Distributors, Livonia, Ml	1993-1998
Vice President Finance - West Virginia Division, Milton, WV	1989-1993
Controller - Bloomington Division, Bloomington, IN	1987-1989
Senior Operations Accountant - Corporate Offices, St. Louis, MO	1985-1986
Senior Auditor - Corporate Offices, St Louis, MO	1984-1985

C. Synergistic Activities
Mr. Pflasterer has over 23 years of experience overseeing detailed budget management and financial projections for a diverse range of organizations, including Fortune 100 companies, higher education, and member organizations. This has included development of detailed financial reporting and budget systems, compliance and audit management, implementation of business management processes, and oversight of sub-units involving revenue and fee structures. These jobs have involved staff supervision and mentoring, and direct reporting to executive officers and Boards of Directors.

Ana Preston
Executive Director for Member Relations and Communications, Internet2
Internet2, 1000 Oakbrook Drive, Suite 300
Ann Arbor, MI 48104
apreston@internet2.edu

Professional Preparation

- University of Kansas, Computer Science - BS, 1993
- University of Kansas, Philosophy, Film Studies - BA, 1993
- University of Kansas, Philosophy - MA, 1995

Appointments

- Executive Director, Member Relations and Communications, Internet2, December 2009 – Present
- Interim Director, International Relations, Internet2, October 2009 - Present
- Director, State and Regional Networks, Internet2, September 2006 – November 2009
- Senior Program Manager, FiberCo, Internet2, March 2005 – September 2006
- Program Manager, International Relations, Internet2, 2001-2006
- IT administrator, Office of Research and Information Technology, University of Tennessee, Knoxville, 1997-present
- Networking consulting: Educational Funding of the South (www.edsouth.org) and other local Knoxville companies – January 97 – Summer 97
- Consulting and custom computer programming and web site management - October 1995 – August 1999.

Synergistic Activities

- **Advisory Boards and Committees:**
- Workshop chair, *Collaborative Computing in Higher Education, P2P and Beyond* (Tempe, Arizona, Jan. 2000)
- Have served in the planning and program committees for international partner conferences, including those by CUDI, REUNA, REACCIUN-2 and RNP.
- **Activities broadening the participation of underrepresented groups**
- Contributor, Work Group on Advanced Networks and Cyberinfrastructure: Organization of American States (OAS) Report on Scientific and Technology Development in the Americas (December 2003);
- Organizer, *Extending the Reach of Advanced Networking: synergies between science, aid and funding agencies and the global research and education networking community*" (April 2004)
- Board member, *Casa de Sara* (Knoxville-based, charity organization designed to help children throughout Central and South America)

As an employee of Internet2 since 2001, Ms. Preston has established synergy in a variety of roles, most recently as Executive Director of Member Relations and Communications. Prior to that time, she served as Director of State and Regional Network Relations, where she led efforts to engage, collaborate and partner with organizations providing connectivity to Internet2's network infrastructure, which resulted in over 33 organizations that are now Internet2 members. This followed her role as Senior Program Manager of Internet2's FiberCo, enabling dark fiber and services for the research and education community; and her service prior to that as Program Manager for International Relations, leading global efforts to link and partner with emerging National Research and Education Networks (NRENs), bringing more than 15 new international partners to Internet2 during that time. Ms. Preston has worked effectively with regional, national, and international organizations; has forged relationships with CIOs, faculty, network representatives, and funding agency officers; and has successful experiences in proactive communications and engagement strategy and activity.

Steven S. Wallace
Chief Technologist, Internet2
1000 Oakbrook Drive, Suite 300
Ann Arbor, MI 48104
ssw@internet2.edu

A. Professional Preparation

A.G.S. 1997 Indiana University (Human Communications)

B. Appointments

2000-Present	Director, Advanced Network Management Laboratory, Indiana University
1998-2000	Chief Architect and Manager, Indiana University Abilene Engineering Team
1996-Present	Senior Technical Advisor, Indiana University
1996-2000	Senior Manager, Abilene Network at Indiana University
1992-1996	Director of Networks, Indiana University
1990-1994	Manager, Network Operations, Indiana University

C. Selected publications

De Laat, Cees, Radius E., Wallace Steven. The Rationale of the Current Optical Networking Initiatives. Special Issue of FGSC on iGRID2002 Conference, Amsterdam, September 2002
Steven Wallace "Security at Line Speed." Presentation. Internet2 Member Meeting, Indianapolis, IN. October 2003
Steven Wallace. "Security Implications of IPv6", Advanced Network Management Lab Security Workshop, June 21-25, 2004, Bloomington, Indiana
Gregory Travis Ed Balas, David Ripley, Steven Wallace. Analysis of the "SQL Slammer" worm and its effects on Indiana University and related institutions, 2003

D. Synergistic Activities

Mr. Wallace has over twenty years of experience in developing and managing advanced network projects. Examples of similar scale projects for which he has held responsibility during the previous ten years include: the initial deployment of the Internet2 nation-wide backbone; creation and on-going management of a laboratory that focuses on advanced networking (approx. $1,000,000 annual budget); and development of a commercial peering service that provides access to 50% of the total Internet to Internet2 connected regional networks (approx $600,000 annual budget). Examples of funded sponsored research projects in which Mr. Wallace has played a leading role include "Network Management Tools for End-to-End Performance Management" (NSF 2001-2004), which resulted in findings enhancing the ability to transfer large data sets at high speed over impaired networks, improved ability to visualize layer 2 networks, and new hardware techniques to locate WiFi sources, "Advanced Network Security Pro" (U.S. Air Force 2002-2006), which resulted in activities to identify, classify, and mitigate, network-based threats in real time.

Eric L. Boyd
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Internet2
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A. Professional Preparation:

B.S.E. in Electrical Engineering (Computer Engineering), Princeton University, 1990
M.S.E. in Computer Science and Engineering, University of Michigan, Ann Arbor, 1992
Ph.D. in Computer Science and Engineering, University of Michigan, Ann Arbor, 1995

B. Appointments:

2007 –present Deputy Technology Officer, Internet2, Ann Arbor, MI

2004- 2007, Manager, Performance Architecture and Technology team, Internet2, Ann Arbor, MI.

2002- 2004, Performance Engineering Consultant, End-to-End Performance Initiative, Internet2, Ann Arbor, MI.

2000-2001, Vice-President of Research and Development, SolidSpeed Networks, Ann Arbor, MI.

1997-2000, Principal Software Engineer, Compaq Computer Corporation, Nashua, NH.

1995-1997, Software Design Engineer, Hewlett-Packard Corporation, Chelmsford, MA.

C. Publications:

J. Zurawski, J. Boote, E. Boyd, M. Glowiak, A. Hanemann, M. Swany, and S. Trocha. Hierarchically federated registration and lookup within the perfSONAR framework. In *Tenth IFIP/IEEE International Symposium on Integrated Network Management (IM 2007)*, 2007.

A. Hanemann, J. Boote, E. Boyd, J. Durand, L. Kudarimoti, R. Lapacz, M. Swany, S. Trocha, and J. Zurawski. Perfsonar: A service oriented architecture for multi-domain network monitoring. In *Third International Conference on Service Oriented Computing - ICSOC 2005, LNCS 3826, Springer Verlag*, pages 241–254, Amsterdam, The Netherlands, December 2005.

E. Boyd, Performance Evaluation and Improvement of Parallel Application on High Performance Architectures. Thesis, University of Michigan, October 1995.

E. Boyd, G. Abandah, H.H.Lee, and E. Davidson. Modeling Computation and Communication Performance of Parallel Scientific Applications: A Case Study of the IBM SP2. Technical Report CSE-TR-236-95, University of Michigan, May 95.

E. Boyd, W.Azeem, Hsien-Hsin Lee, T.P. Shih, S.H. Hung, and E. Davidson. A Hierarchical Approach to Modeling and Improving the Performance of Scientific Applications on the KSRI. , Proceedings of the International Conference on Parallel Processing, August 94.

E. Boyd and E. Davidson. Communication in the KSRI MPP: Performance Evaluation Using Synthetic Workload Experiments. Proceedings of the International Conference on Supercomputing, pp 166-175.

E. Boyd, J.D. Wellman, S. Abraham, and E. Davidson. Evaluating the Communication Performance of MPPs Using Synthetic Sparse Matrix Multiplication Workloads. Proceedings of the International Conference on Supercomputing, November 93.

W. Mangione-Smith, T.P. Shih, S. Abraham, and E.Davidson, S. Approaching a Machine-Application Bound in Delivered Performance on Scientific Code. Special Issue of IEEE Proceedings on Computer Performance Analysis, August 93.

E. Boyd and E. Davidson. Hierarchical Performance Modeling with MACS: A Case Study of the Convex C-240. Proceedings of the 20th International Symposium on Computer Architecture, pp 203-212, May 93.

D. Windheiser, E. Boyd, E. Hao, S. Abraham, and E. Davidson. KSRI Multiprocessor: Analysis of Latency Hiding Techniques in a Sparse Solver. Proceedings of the 7th International Parallel Processing Symposium, pp 454-461, April 93.

D. Synergistic Activities:

Eric Boyd is the Deputy Technical Officer for Internet2. Eric is responsible for activities in the Architecture, Performance, and Application Outreach areas of R&D, including grants, architecture, design, development, testing, and outreach. In addition, he is co-project managing the DCN pilot program, serving as the DCN Working Group Liaison, coordinating Internet2's involvement with OGF and DICE, and being the Internet2 co-chair of the Joint Techs program committee (with Phil Demar of FermiLab). Eric is actively involved in driving international collaborations on DCN and perfSONAR, in promoting cyberinfrastructure, and in participation in the OGF and GLIF. He is a leader in the design and development of advanced architecture- and network-based performance analysis techniques and tools for both academic and commercial arenas. Eric earned his doctorate at the University of Michigan, under the direction of Dr. Edward Davidson (now retired), writing his thesis on the "Performance Evaluation and Improvement of High Performance Architectures and Applications." He served as an engineering principal in the Unix Groups of both Compaq/Digital and Hewlett-Packard writing advanced performance analysis tools for enterprise-class servers. He led the research and development group at SolidSpeed Networks, creating such products as a content delivery network, a distributed peer-to-peer website performance measuring system, and a software-based global load balancer. Eric is one of three co-chairs of the Global Grid Forum (GGF) Network Measurement Working Group (NMWG). He is instrumental in the effort to develop measurement schemas to facilitate the exchange of performance monitoring data between performance measurement frameworks. As PI and CoPI on numerous collaborative proposals, Eric has a track record of expertise and experience in managing multi-organization partnerships, including: 1) SDC:Improvement: Production Services for the perfSONAR Framework: perfSONAR co-PI, 8/08-08-09 (resulted in development of common components that extend perfSONAR's user community, including common information service, visualization frameworks, and outreach to that user community for training and feature input); 2) Workshop for perfSONAR Community Engagement -PI 01/10-12/10 (workshop to capitalize on flexible multi-domain nature of the perfSONAR protocols and infrastructure as a focus to cross-fertilize ideas from the network research community and the needs of the US federal and R&E networks, so that they can work together to create a system for solving end-to-end performance problems in an efficient, scalable fashion on an ongoing basis).

Christian Todorov
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Education:
MS Candidate, Virginia Polytechnic Institute; Blacksburg, VA
BS Florida International University; Miami, FL
A.O.S. The Culinary Institute of America; Hyde Park, NY
Completed professional development course in Project Management (2005)

Work History:

2007-Present	Director, Services Management: Internet2; Ann Arbor, MI
2005-2007	Senior Network Engineer: Internet2; Ann Arbor, MI
2002-2005	Network Engineer: Internet2; Ann Arbor, MI
2000-2002	Internet Operations Engineer: Global Crossing; Southfield, MI
1999-2000	First Shift Service/Technical Lead: State Farm Insurance Company; Bloomington, IL (McDonnell Douglas Technical Services Company)

Synergistic Activities:
With over 11 years of experience in network management, Mr. Todorov has expertise in developing financial models and analyses at various organizational and inter-organizational levels; oversight and key roles in contract negotiations and development with vendors; negotiations for fiber and managed network infrastructure at local to statewide levels; network design and deployment; management of metropolitan and regional network buildouts; timely and cost-effective network project management; advanced research and education networking; daily network operational management; financial analysis of network operations; and vendor and member relationship management.

Chris Robb
Internet2 Network Operations Manager
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A. Professional Preparation:

B.S. in Computer Science, Indiana University, 2003

B. Appointments:

2008-present, Internet2 Manager of Network Operations, Indiana University, Bloomington, IN

2001-2008, Global Research NOC Network Engineer, Indiana University, Bloomington, IN

1999-2001, Campus Network Engineer, Indiana University, Bloomington, IN

1998-1999, Network Programmer and Analyst, Indiana University, Bloomington, IN

C. Publications:

D. Synergistic Activities:

Chris Robb is the Network Operations Manager for the Internet2 Network. With over twelve years of experience in higher education network operations and management, he is responsible for the day-to-day operation and maintenance of the suite of services that Internet2 provides to the higher-education and research community. In his role, he provides lead architectural directions and advice to Internet2 staff and community oversight bodies. Mr. Robb was the implementation lead for the 2007 upgrade and migration of the Internet2 Network to the Level(3) footprint on which it currently resides. This involved the coordination of multiple vendors, engineering teams and community members to minimize downtime during an in-service migration of the entire nation-wide Internet2 Footprint. He regularly interacts with community members to rationalize and develop new services and architectures that best serve the higher-ed community.

Matthew J. Zekauskas
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matt@internet2.edu

A. Professional Preparation:

ABD Ph.D., Computer Science, Carnegie Mellon University, Pittsburgh, PA, 1990--1997.
Thesis topic: Entry Consistency and Software Write Detection for Distributed Shared Memory Systems; Advisors: Brian Bershad and Adam Beguelin.

M.S., Computer Science, Stanford University, Stanford, CA, June, 1986.

B.S., Computer Science, Rensselaer Polytechnic Institute, Troy, NY, May, 1984.
Minor: electrical engineering. B.S. awarded magna cum laude.

B. Appointments:

2007-present	Senior Researcher, Internet2
2000-2007	Senior Engineer, Internet2
2001-2002	Senior Engineer, Advanced Network & Services, Inc.
2000-2001	Manager, High Performance Networking, Advanced Network & Services, Inc.
1998-2000	Internet Engineer, Advanced Network & Services, Inc.
1990-1997	Research Assistant, Carnegie Mellon University
1986-1990	Network Systems Programmer, IBM Thomas J. Watson Research Center

C. Publications:

Brian Tierney, Jeff Boote, Eric Boyd, Aaron Brown, Rich Carlson, Maxim Grigoriev, Joe Metzger, Martin Swany, Matt Zekauskas, and Jason Zurawski. Instantiating a Global Network Measurement Framework. In Proceedings of the 4th Workshop on Real Overlays and Distributed Systems (ROADS'09), October 2009.

S. Shalunov, B. Teitelbaum, and M. Zekauskas. A One-way Active Measurement Protocol. Internet-Draft, Work in Progress, May 2004.

G. Almes, S. Kalidindi, and M. Zekauskas. A One-Way Delay Metric for IPPM. RFC 2679, September 1999.

Sunil Kalidindi and Matthew J. Zekauskas. Surveyor: An Infrastructure for Internet Performance Measurement. In Proceedings of INET99, San Jose, CA, June 1999.

Matthew J. Zekauskas. Experience with the Surveyor IP Performance Measurement Infrastructure. In Proceedings of the BU/NSF Workshop on Internet Measurement, Instrumentation, and Characterization, NSF and Boston University, August, 1999.

D. Synergistic Activities:

Mr. Zekauskas has over 24 years of experience working on computer networks and distributed systems. The last 12 years have been focused on cutting-edge network architectures, Internet measurement, and the application of those measurements to advanced application development. He was part of the team that contributed to the current Internet2 Network architecture and evaluated various designs and vendor options. He was a major contributor to the design of the current Internet2 Observatory.

He has facilitated collaborative efforts by chairing multiple working groups (the IETF IP Performance Metrics Working Group, the IETF Packet-Layer Path MTU Discovery Working group, and the Internet2 Measurement Working Group) and through his involvement in key initiatives, including the End-to-End Performance initiative. His work has included coordination of measurement activities and presentation of talks and tutorials at various national and

international conferences. As lead staff for Internet2's Research Advisory Council and Network Research Review Committee, he facilitates research use of the Internet2 network. Prior to his tenure at Internet2, he directed measurement activities and deployment of over 70 measurement machines for Advanced Network & Services.

Mr. Zekauskas has a long track record of federally funded grant experience, including Measurement Infrastructure for IP Provider Metrics (NSF – 1997-1999), which created IETF metrics for one-way delay; Targeted Assistance and Instrumentation for Internet2 Applications (NSF -- 2003-2004), which resulted in the bwctl and owamp tools used on the Internet2 network today; QUALIT: QBone University and Lab Interconnect Testbed (DOE – 1999-2000), which prototyped Premium Service on the Internet2 Network; Leveraging Internet2 Facilities for the Network Research Community (NSF – 2004-2006), which influenced the design of the current Internet2 Observatory; Network Measurement for International Connections (NSF – 2005-2007), which resulted in more uniform measurement of networks funded by the NSF International Research Network Connections program; End-to-End ProtoGENI (NSF via the GENI Program Office (GPO) – 2008-present), which is deploying a nationwide prototype GENI network; and Collocation of the Supercharged Planetlab Platform in the Internet2 Network (NSF via the GPO – 2009-present), which helps fund additional GENI infrastructure.

E. Collaborators and Other Affiliations:

Collaborators:
kc Claffy (CAIDA and the San Diego Supercomputer Center)
Tom Lehman (ISI-East)
Matt Mathis (Pittsburgh Supercomputer Center)
Rick McGeer (HP Labs)
Nick McKeown (Stanford University)
Robert Ricci (University of Utah)
Martin Swany (University of Delaware)
Brian Tierney (Lawrence Berkeley Laboratory)

Graduate and Post Doctoral Advisors:
Brian Bershad (Google)
Adam Beguelin (Truveo)
Elmootazbellah [Mootaz] Elnozahy (IBM)

Barbara S Nanzig
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Education:

1983	MS, Longwood University, VA
1975	BS, Michigan State University, MI

Work History:

1997-Present	Chief of Staff: Internet2; Ann Arbor, MI
1987- 1997	Executive Assistant, Vice Provost of Technology; Associate Director Faculty Development: University of Michigan; Ann Arbor, MI
1983-1987	Executive Assistant, Vice Provost of Technology; Director, Space & Facilities: Carnegie Mellon University; Pittsburgh, PA
1982-83	Director of Red Cross – Three Counties: Farmville, VA
1979-82	Director of Alumni and Foundation Development: Longwood University; Farmville VA
1977 – 1979	Assistant Director of Admissions; Director of Housing, College of William & Mary, Williamsburg, VA
1975 – 1977	Historical Interpreter – Fine Arts & Architecture, Colonial Williamsburg, Williamsburg, VA

Synergistic Activities

Ms. Nanzig has served as Chief of Staff for Internet2 for over thirteen years, overseeing operational and strategic functions for the organization while serving as the primary liaison for governance. She brings over 35 years of administrative experience to this job, having managed academic outreach and technology facilitation for faculty as a member of the senior Information Technology staff in the Vice Provost's office at the University of Michigan; overseen space and facilities management at Carnegie Mellon University; alumni and foundation giving at Longwood University, and undergraduate admissions at The College of William and Mary. At Internet2. She serves as a member of the Internet2 Executive Leadership Team reporting to the CEO, serves as the Secretary to the Board of Trustees and manages the Governance program of the organization. In all of these capacities, her work has involved service as key liaison to faculty, coordination of strategic planning, and outreach. Her professional assignments have been accompanied by community service, including restoration of a three-county regional Red Cross

Chapter in Virginia, membership of Ann Arbor SPARK, and a board member and past Board Chair at the Ann Arbor Hands-On Museum. Ms. Nanzig also has been the recipient of a Great Lakes Technology Leaders and Innovators award, and has been recognized by CASE with a District Award for most improved development program and best practices in advancement awards.

Prior to joining Internet2 in 1997, she worked at the University of Michigan in the Academic Outreach area and served as the Executive Assistant to the Vice Provost for Information Technology. During her 10 years at the University of Michigan she was a member of the senior IT staff in the Vice Provost's office and developed the University Faculty Exploratory designed to assist faculty's use of information technology in the classroom. Her background includes work in information technology, facilities, development, and student affairs.

Dr. Glenn Ricart
President and CEO
National LambdaRail (NLR)
P.O. Box 1610
Cypress, CA 90630
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A. Professional Preparation:

B.S. in Engineering from Case Western Reserve University, Cleveland
M.S. in Computing and Information Sciences from Case Western Reserve University, Cleveland
Ph.D. in Computer Science, University of Maryland College Park

B. Appointments:

2009 –present President and CEO, National LambdaRail
2006- 2009 Technology and Development Leader, PricewaterhouseCoopers, San Jose, CA
2003- 2006 Managing Director, PricewaterhouseCoopers Center for Advanced Research (CAR), San Jose, CA
1999-2003 Founder, CenterBeam, San Jose, CA
1995-1999 EVP and Chief Technology Officer, Novell, San Jose, CA and Provo, UT
1993-1995 Program Manager, Defense Advanced Research Projects Agency (DARPA), Washington, D.C.
1982-1993 Chief Computing Officer, University of Maryland College Park
1983-1993 Co-founder and Managing Principal Investigator, SURAnet, College Park, MD
1971-1982 Various, including Head of Computing, Intramural Research Program, National Institutes of Health, Washington, D.C.

C. Publications:

R.S. Gaines, G. Ricart, A.K. Agrawala. Editor: An Optimal Algorithm for Mutual Exclusion in Computer Networks. In *en.scientificcommons.org,* 2008.

Michael Hamilton, Charles Bolton and Glenn Ricart. Message Routing with Telecommunication Number Addressing and Key Management. U.S. Patent Office application, 2006.

G. Ricart and C. Soto. Method for computer personalization. U.S. Patent Office application, 2001.

G. Ricart. Unofficial Technology Marvel of the Millennium. In *Educause Review,* 2000.

G. Ricart and Carlos A. Nevarez. Multiple storage class distributed nametags for locating items in a distributed computing system. U.S. Patent Office application, 1999.

G. Ricart. Using Up the Internet. In *Computers in Physics,* Nov/Dec 1995.

G. Ricart. Scholarly Publishing Faces Cultural Challenge. In *Computers in Physics,* July/August 1995.

G. Ricart. Preventions and Prudent Pre-cautions: Computing Security on the Internet. In *Computers in Physics,* May/June 1995.

Glenn Ricart and Ashok K. Agrawala. An Optimal Algorithm for Mutual Exclusion in Computer Networks. In C*ommunications of the ACM*, 1981.

D. Synergistic Activities:

Dr. Glenn Ricart is president and of CEO of National LambdaRail (NLR). He is responsible for setting NLR's business strategy and technology vision and overseeing the administration of the high-performance, coast-to-coast network platform for advanced research and innovation.

Glenn brings to this application a long and distinguished track record of successfully setting up new organizational models and working with diverse groups of collaborators to achieve strong results. For instance, he co-founded PricewaterhouseCoopers' Center for Advanced Research which brought together cross-disciplinary teams of researchers with businesspeople to offer fresh solutions on seemingly intractable business issues. He also co-founded SURAnet, the first internet service provider (ISP) to provide commercial connections. In addition, Glenn constructed the first NSFnet backbone for the National Science Foundation and its first regional network, operating the first Internet interconnection point (the FIX) on behalf of the U.S. Federal Government. And for 13 years he served as Chief Computing Officer for the University of Maryland College Park, leading a team of 400 professionals providing computing services to the 50,000 faculty, students, and staff of the university.

Gwendolyn (Wendy) Huntoon
Chief Technology Officer
National LambdaRail (NLR)
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Cypress, CA 90630
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A. Professional Preparation:

M.S. in Electrical Engineering, Northeastern University, Boston, 1985
B.A. in Mathematics, Bowdoin College , Brunswick, ME, 1983 (Magna Cum Laude)

B. Appointments:

2009-present	Chief Technology Officer, National LambdaRail, Pittsburgh
2005-2009	Director of Operations, National LambdaRail, Pittsburgh
1999-present	Director, Networking, Pittsburgh Supercomputing Center, Pittsburgh
2001-2004	Executive Director, The Quilt, Pittsburgh
1995-1999	Manager, Networking, Pittsburgh Supercomputing Center, Pittsburgh
1992-1995	Coordinator, Networking, Pittsburgh Supercomputing Center, Pittsburgh
1991-1992	Acting Manager, Networking and Operations, Pittsburgh Supercomputing Center, Pittsburgh
1989-1991	Network Engineer, Networking and Operations, Pittsburgh Supercomputing Center, Pittsburgh
1985-1989	Staff Engineer, CNR Incorporated, Needham, MA
1983-1985	Staff Assistant, EE Department, Northeastern University, Boston

C. Publications:

Charlie Catlett, Steve Cotter, Wendy Huntoon, Rick Summerhill and John Silvester. Shaping the Landscape, Harnessing Opportunities - Second Report from the Network Planning Team. April 2007.

Nikhil Kelshikar, Xenophon Zabulis, Jane Mulligan, Kostas Daniilidis, Vivek Sawant, Sudipta Sinha, Travis Sparks, Scott Larsen, Herman Towles, Ketan Mayer-Patel, Henry Fuchs, John Urbanic, Kathy Benninger, Raghurama Reddy and Gwendolyn Huntoon, Real-time Terascale Implementation of Tele-Immersion, Workshop on Terascale Performance Analysis At ICCS, June 2003.

W. Huntoon with R. Butler, B. Chinoy, M. Hallgren, G. Hastings, M. Mathis, P. Love, and P. Zawada. The NSF Supercomputing Centers' joint response to the Request for Public Comment ... next generation of the NSFnet. August 1992.

J. Mahdavi, G .L. Huntoon, M. Mathis . Deployment of a HiPPI-based Distributed Supercomputing Environment at the Pittsburgh Supercomputing Center. In the *Proceedings of the Workshop on Heterogeneous Processing*, March 1992.

Mahdavi, Huntoon, and Mathis . Distributed High Speed Computing. In the *Proceedings of the Third Gigabit Testbed Workshop*, January 1992.

Mahdavi, Huntoon and Mathis . DHSC Performance Bottleneck: Current Progress. In the *Proceedings of the Third Gigabit Testbed Workshop*, January 1992.

Matt Mathis and G.L. Huntoon . Connecting Heterogeneous Supercomputers with a High Speed Network. In the *Proceedings of the Second Gigabit Testbed Workshop*, February 1991.

G.L, Huntoon, M. Mathis and J. Mahdavi,. *Proceedings of the Second Gigabit Testbed Workshop*, February 1991.

A. El-Jaroudi and G. L. Huntoon . Distributed High Speed Computing (DHSC) Software Tools: Solution Manual to Introduction to Digital Signal Processing by John G. Proakis and Dimitris G. Manolakis. Macmillan Publishing Company, 1988

D. Synergistic Activities:

Wendy Huntoon is the Chief Technology Officer for National LambdaRail (NLR) and also the Vice Chair of the NLR Board of Directors. She serves concurrently as the Director of Networking at the Pittsburgh Supercomputing Center (PSC).

For the past five years she has managed NLR's Engineering and Operations functions and set the overall technology strategy for the organization. Under her leadership the organization completed an ambitious upgrade to its national footprint, established the first and only Cisco TelePresence exchange for research and education and partnered with a range of public entities to extend access to NLR to new, community-based groups, such as healthcare providers via the FCC's Rural Health Care Pilot Program.

In addition to her demonstrated ability at NLR to manage a national, multi-service broadband infrastructure, Wendy is a long-standing and well-regarded advocate for making broadband more accessible. She directs the networking resource group at PSC, which carries out advanced research and provides consulting and training to universities and research centers nationwide. Her responsibilities also include the management and direction of the Three Rivers Optical Exchange, a regional network aggregation point providing high speed commodity and research network access to sites in Western and Central Pennsylvania including K-12 and commercial entities. Prior to joining PSC, Wendy served as executive director of the Quilt, a UCAID Project whose participants are non-profit, advanced regional network organizations dedicated to promoting research and education in the United States.

As PI and CoPI on numerous proposals involving multiple organizations including several with NLR's collaborator in this application, Internet2, Wendy has experience successfully working with a diverse group of partners to align to common goals and drive optimal outcomes.

Examples of current and recent grants include:

- Title: Teragrid Resource Partners
- Organization: NSF
- Award Period: 8/1/05 – 3/31/11

- Title: NLR Experimental Support Services
- Organization: NLR
- Award Period: 1/1/07 – 12/31/10

- Title: Chief Technology Officer
- Organization: NLR
- Award Period: 1/1/10 – 12/31/10

Grover Browning
Director of Engineering and Operations
National LambdaRail (NLR)
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A. Professional Preparation:

B.A., Computer Science and Philosophy, Indiana University, Indianapolis

B. Appointments:

2009 –present Director, Engineering and Operations, NLR, Global Research Network Operations Center (GRNOC), Indiana University, Indianapolis

2006- 2009 Director, Engineering, NLR, Global Research Network Operations Center (GRNOC), Indiana University, Indianapolis

2002-2009 Manager, National Optical Infrastructures, Global Research Network Operations Center (GRNOC), Indiana University, Indianapolis

1998-2002 Senior Network Design Engineer, Indiana University, Indianapolis

C. Publications:

G. Browning, Y. Liang, K. Buckwalter et al. World Wide Web Interface to Digital Imaging and Communication in Medicine -- Capable Image Servers. In *Journal of Digital Imaging*, November 1996.

D. Synergistic Activities:

In his current role Grover oversees all technical operations for NLR under a contract with Indiana University (IU). Grover's responsibilities include managing NLR's distributed Network Operations Center (NOC) Services, including the Service Desk, Layer 1 NOC, Layer 2/3 NOC, NLR Engineering and Field Services; planning and managing the NLR infrastructure; managing NLR's technical and operational relationships as well as overall planning and design for evolving the NLR infrastructure.

Grover has extensive experience managing a wide range of multi-service, technically cutting edge national infrastructure projects. In the over three years Grover has worked with NLR, he was instrumental in setting up NLR's Layer 2 (FrameNet) and Layer 3 (PacketNet) networks, and has deployed over 12,000 miles of optical networking equipment encompassing 250 locations, 31 add/drops locations, and $100M in equipment. This includes the dark build of the NLR Phase2/southern footprint and the replacement of the lit NLR Phase1/Northern footprint on a particularly aggressive schedule with minimal customer impact.

Before NLR, Grover's experience included designing and deploying the Indiana state optical network, iLight. He also deployed the first-generation Internet2 Abilene routers as well as designed and deployed the second-generation Internet2 Abilene routed network.

Ronald D. Kraemer
Chief Information Officer and Vice Provost for Information Technology
University of Wisconsin-Madison
171 Bascom Hall
500 Lincoln Dr
Madison, WI 53706
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Professional Preparation

M.S., The University of Tennessee-Knoxville, March 1983 (Geography) – [Emphasis in Geographical Information Systems]

B.S., The University of Wisconsin-Eau Claire, May 1978 (Geography)

Appointments

2007–Present	Chief Information Officer and Vice Provost for Information Technology, University of Wisconsin-Madison, Madison, Wisconsin
2005–2007	Deputy Chief Information Officer, University of Wisconsin-Madison, Madison, Wisconsin
1996-2005	Chief Information Officer, University of Wisconsin-Extension, Madison, Wisconsin
1988–1996	Program Manager, Oak Ridge National Laboratory, Oak Ridge, Tennessee
1984-1988	Associate Director, Energy, Environment, and Resources Center (EERC), The University of Tennessee, Knoxville, Tennessee
1980-1984	Senior Systems Analyst, Lockheed Missiles and Space Co., Inc., Oak Ridge, Tennessee
1979-1980	Research Assistant, Oak Ridge National Laboratory, Oak Ridge, Tennessee

Synergistic Activities

Ron Kraemer is the University of Wisconsin-Madison Chief Information Officer (CIO), Vice Provost for Information Technology, and Executive Director of the Division of Information Technology (DoIT). In this capacity, he provides leadership for information technology services that enhance teaching, learning, research, outreach and campus services across UW-Madison and throughout the UW System.

Kraemer serves on national CIO advisory groups for Apple, Cisco, and Dell. He is also active on several regional and national leadership groups, including the EDUCAUSE Advisory Group on Enterprise Information Systems and Services (AGEISS), the Learn@UW Advisory Board, the Board of Directors for WiscNet, Wisconsin's statewide education and research network, is Secretary/Treasurer of the Broadband Optical Research, Education and Sciences Network, and is President of the Northern Tier Network Consortium (NTNC).

Bonita (Bonnie) Neas
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URL: www.ndsu.edu/vpit

EDUCATION

1989	MBA, North Dakota State University
1982	B.A., Mayville State University

POSITIONS

2009-	NDSU Presidential Search Committee
2007-	Vice President for IT, NDSU
2007-	President's Cabinet, NDSU
2006-2007	Deputy CIO for ConnectND (ND's ERP system), ND University System
2004-2006	Associate VP for Federal Government Relations in the Division of Research, Creative Activities and Technology Transfer.
2005-2008	EDUCAUSE Cyberinfrastructure Steering Committee
2002-2005	EDUCAUSE Evolving Technologies Committee; Chair, 2004-2005
2004-2008	EDUCAUSE Broadband Policy Group Steering Committee
2003-	Northern Tier Network Executive Committee Member (ND representative); Co-Chair 2003-2005
2003-2004	Internet2 OSAND Board
2003-2007	Director of the Center for High Performance Computing, NDSU
2003-2004	Internet2 Board of Trustees
2003-2004	Internet2 Audit Committee
2003-2004	EDUCAUSE Midwest Regional Conference Program Committee
2002-2005	EDUCAUSE Net@EDU Advisory Committee
2002-2006	Policy Committee, NDSU
2000-2004	Assistant Vice President for Federal Government Relations
1999-2000	EDUCAUSE Annual Conference Committee
1999-2004	Chair, Great Plains Network Executive Council
1997-2004	Internet2 Networking Planning and Policy Advisory Council; Chair 2003-2004
1996-2005	Great Plains Network Executive Council
1993-2000	Director of Information Technology Services, NDSU
1993-	President's Council, NDSU
1990-1992	Assistant to the President, NDSU
1984-1990	Manager of User Services, Computer Center, NDSU
1982-1984	Computer Center Director, Mayville State University

PUBLICATIONS

- Bartel, Charles, John Bojonny, Emilio DiLorenzo, James Duncan, Leslie Hitch, Alan McCord, John Meerts, Pablo Molina, Bonita Neas, Michael Roy. "Surveying the Digital Landscape". EDUCAUSE Review. November/December 2004. 78-92.
- B. Decker, B. Neas. "Research Universities and the Central IT Organization: Rebuilding the Partnership," EDUCAUSE Review, May/June 2003.

OTHER ACCOMPLISHMENTS

- Principal Investigator (PI) or Project Leader (PL) for following grants and contracts:

    - PL: Northern Tier Network—North Dakota (NTN-ND): $3.25M, Department of Defense, Defense Research and Engineering Network
    - PL: Northern Tier Network—North Dakota: State of ND, $2,773,800 (match of federal).
    - PI: Northern Tier Network Consortium Plan for the Member States of Idaho, Montana, North Dakota and South Dakota: NSF Shared Cyberinfrastructure (SCI), SCI 0549090: $200,000
    - PI: Center for High Performance Computing: US General Services Administration, $1,490,250
    - Center for High Performance Computing: ND EPSCoR, $222,329
    - PI: Sendit (K-12 Network management); ND Department of Public Instruction, $2,854,698
    - PI: Dakota Link High Performance Network Connection in Support of Meritorious Research; NSF ANI-9810225: $2,370978
    - PI: First Virtual Conference on Genomics and Bioinformatics; NSF ANI 0139651: $57,552.
- Awarded by ND Governor, the Information Technology Council of North Dakota's "Outstanding Achievement in Education" in 2006. The award recognized the contributions to enhance research and education in the state through the advancement of information technology over a thirty year period.
- Testified about rural networking issues before the U.S. Senate's Commerce, Science, and Transportation Appropriation Committee and U.S. President's Information Technology Advisory Committee (PITAC).
- NSF/CISE Year 2000 Committee of Visitors panel that performed a three-year review of the ANIR program.
- 1990-2003, served yearly on numerous NSF/CISE/ANIR review panels including NMI program.
- Featured in The Chronicle of Higher Education: http://chronicle.com/free/v47/i17/17a04301.htm

James A. Davis
Abbreviated CV

Contact Information

Office of the CIO
2680 Beardshear
Ames, Iowa 50011

Phone: 515-294-0323
Fax: 515-294-6191
Email: davis@iastate.edu

Professional Preparation

Iowa State University	Computer Science	BS 1975
Iowa State University	Electrical Engineering	MS 1982
Iowa State University	Computer Science	PhD 1984

Appointments

2007-Present	Iowa State University	Vice Provost for IT and Chief Information Officer
2004-2007	Iowa State University	Chief Information Officer
2003-2004	Iowa State University	Interim Director, Academic Information Technologies
2003 (S'03)	Iowa State University	Interim Chair, Electrical and Computer Engineering
2000-2003	Iowa State University	Associate Chair, Electrical and Computer Engineering
1988-current	Iowa State University	Associate Professor, Computer Engineering
1984-1988	Iowa State University	Assistant Professor, Computer Engineering

Selected Publications

Alec Yasinsac and James A. Davis, "Modeling Protocols for Secure Group Communication in Ad Hoc Networks", Springer-Verlag *Lecture Notes in Computer Science,* B. Christianson, B. Crispo, J. Malcolm, M. Row, Editors, 2004, VIII, 243 (January 2004)

James A. Davis and Melissa Dark, "Teaching students to design secure systems", *IEEE Security & Privacy*, Volume 1, Number 2, March 2003

Stephanie Holeman, Govindarasu Manimaran, James A. Davis, and A. Chakrabarti, "Differentially secure multicasting and its implementation methods", *Computers & Security*, Volume 21, Number 8, pp. 736-749, November 2002

Greg Rice and James A. Davis, "A genealogical approach to analyzing post-mortem denial of service attacks", proceedings of the Secure and Dependable System Forensics Workshop, University of Idaho, Moscow, Idaho, September 23-25, 2002

The National Security Agency Committee on National Security Systems (CNSS), Investment in Detection, Response, and Recovery Technology working group. Contributing author to Federal policy CNSS 20, "National Information Assurance Policy on Incident Detection, Response, Recovery, and Reporting Technology" (2006)

Synergistic Activities

Member of the BOREAS leadership group that oversaw the design, development, and management of the BOREAS regional optical network

Successful as PI or co-PI on competitive external funding in computer security totaling $3,122,000 between 2001 and 2003, prior to accepting full-time administrative appointments

Editorial board of *Educause Quarterly* (2008-2009); • Editorial Board of *IEEE Security & Privacy*

(2003-2005); • Editorial Board of the *International Journal of Information and Computer Security* ; • Editor for IEEE Cipher (1999-2003); • Board member of the Commonwealth (Virginia) Information Security Center (2002-2004); • Board member of the National Colloquium for Information Systems Security Education (1998-2003); • Board member of the IEEE Computer Society Educational Activities Board (2000-2004)

Program committee or organizing committee member for over 20 international conferences and workshops on computer security and cyberinfrastructure since 2003, including most recently the 2008 National Science Foundation (NSF) Cybersecurity Summit, May 7-8, 2008, Crystal City, VA; and the 14th Colloquium for Information Systems Security Education, June 6-9, 2010, Baltimore, MD.

ABBREVIATED VITA – MARCH 2010

RAY FORD

Chief Information and Technology Officer
Professor - Department of Computer Science
University of Montana, Missoula, Montana 59812
ray.ford@umontana.edu - 406-243-2964

EDUCATION

PhD, Computer Science, 1980, U. Pittsburgh.
MS, Computer Science, 1972, U. Missouri-Rolla (Mo. Inst. of Science & Tech.)
BS (honors), Applied Mathematics, 1970, U. Missouri-Rolla (Mo. Inst. of Science & Tech.)

RESEARCH/PROFESSIONAL INTERESTS Advanced networking, distributed systems, and software development processes

ACADEMIC POSITIONS In Computer Science, 1972 – present, as an Instructor at Augustana College (Ill.), then through professor ranks at Universities of Iowa, Kansas, and Montana, to Professor at University of Montana, 1996

PROFESSIONAL SOCIETIES

Member of ACM and IEEE Computer Society
Institutional representative for Educause and Internet2

PERTINENT PROFESSIONAL ACTIVITIES

* Internet2: Former member of Board of Trustees; former Chair and current member of Applications, Middleware, & Services Advisory Council; former member of Network Planning and Policy Advisory Committee; co-leader of 2008 Strategic Planning effort; member of Campus Expectations Task Force and co-author of final report.
* Northern Tier Networking Consortium: Founding member, former Secretary/Treasurer, Vice-President, and President.
* Inland Northwest Research Alliance Former Coordinator of Distance Delivery & Instructional Technology Development for the Subsurface Science PhD Program.

GRANTS & CONTRACTS

Author or co-author of 20 funded grant proposals and contracts for basic and applied research, equipment, and/or software development - from both government agencies (NSF, DoE, DoD, USFS, USGS) and commercial entities (HP, IBM, Rockwell-Collins)

PROFESSIONAL ACTIVITIES – COMPUTER SCIENCE & HIGHER EDUCATION

* Author or co-author of over 40 refereed articles in books, journals, and conference proceedings
* Referee, technical reader, grant reviewer, and program committee member for dozens of journal and conference papers, text book manuscripts, grant proposals (NSF, NASA, Australian Grants Authority), and conferences
* Supervisor of 4 PhD theses all at U.Iowa, and 31 MS theses at U.Iowa, U.Kansas, and U.Montana (all in computer science).
* Co-founder of company supporting the "OpenDX" open source visualization software

Gwen Ann Jacobs, Ph.D
Address: Center for Computational Biology, Montana State University, Bozeman, MT 59717-3505; phone: (406) 994-7334; e-mail: gwenajacobs@gmail.com

Professional Preparation

University of California, Berkeley	Anatomy & Physiology	BA	1976
University of California, Davis	Physiology	MS	1979
State University of New York Albany	Biology-Neurobiology	PhD	1984
University of California, Berkeley	Neuroscience	Postdoc	1985-1988

Professional Positions:

2006 – present: Professor of Neuroscience, Department of Cell Biology and Neuroscience; Assistant CIO and Director of Academic Computing, Montana State University, Bozeman, MT
2005- 2006: Professor of Neuroscience and Head, Department of Cell Biology and Neuroscience, Montana State University, Bozeman, MT
2000 – 2005: Associate Professor of Neuroscience and Head, Department of Cell Biology and Neuroscience, Montana State University, Bozeman, MT
2003- 2006: Director, Lariat Networking Project
2002-2010: Director, Howard Hughes Medical Institute Undergraduate Biology Program
1999 – 2004: Director, Graduate Program in Complex Biological Systems, Montana State
1997-2000: Assistant Professor of Biology, Department of Biology, Montana State U
1989-1996: Research Assistant Professor, Division of Neurobiology, Dept. of Molecular and Cell Biology, University of California, Berkeley, Ca.

Current Service on National and Institutional Advisory Panels:

Chair, Board of Directors, IPlant Collaborative, NSF Plant Cyberinfrastructure 2009 –
Member, Neurotechnology Study Section, NIH – 2007 – present
Member, Governance and Nominations Committee, Internet2: 2006 - present
Member, Teragrid Science Advisory Board 2007 - present
Member, Research Channel.org Board – 2007 – present
Member, External Advisory Board, Institute for Translational Health Science, UW

Professional Societies:

Member, Committee on Neuroinformatics, Society for Neuroscience 2004-2008

Service On Editorial Boards Of Scholarly Publications:

Member, Editorial Board, *Neuroinformatics*, Humana Press, 2002-present
Member, Editorial Board, *Frontiers in Neuroscience,* Frontiers Research Foundation, 2007 to present

Graduate and Postdoctoral Advisors

Graduate Advisor: Rodney K. Murphey, University of Florida
Postdoctoral Advisor: John P. Miller, Montana State University
Postdoctoral Advisor: Janis C. Weeks, University of Oregon

Graduate Students Supervised: Rocky Nevin, (Private Industry), Michael Landolfa (University of Florence, Italy), Susan Paydar, (NIH), Cooper Roddey, (Private Industry), Travis Ganje, (Physician), Ivan Judson, (current)

Postdoctoral Researchers Sponsored:

Frederic Theunissen, (Assoc. Prof. UC Berkeley), Sharon Crook, (Assoc. Professor, Arizona State), Erich Staudacher, (Senior Research Sci, U Freiburg) Graham Cummins (current)

Joshua M. Riedy
Chief Information Officer
AVP for Outreach Services
Dean of Outreach Programs

Gustafson Hall, Room 101
3264 Campus Road
University of North Dakota
Grand Forks, ND 58202-9021
joshuariedy@mail.und.edu

A. Professional Preparation

B.S. 1997 Agricultural Education, South Dakota State University
M.Ed. 2000 Career and Technical Education, South Dakota State University
Ed.D. 2007 Education Administration, South Dakota State University

B. Appointments

2004-2007 Director of Electronic University Consortium, South Dakota Board of Regents
2007-Present Associate Vice President and Dean of Outreach Programs, University of North Dakota
2008-Present Chief Information Officer, University of North Dakota

C. Publications

None

D. Synergistic Activities

In his capacity of Associate Vice President and Dean of Outreach Programs, Dr. Riedy planned and implemented the delivery of semester-based, online courses at the University of North Dakota resulting in considerable enrollment growth, collaboration with community colleges, increased online programs and new funding models. He also reorganized the Division of Continuing Education into functional units, thus increasing efficiency, reducing redundancies, flattening the organization and offering Division services to the rest of campus such as communication, marketing and student support.

In 2008 Dr. Riedy assumed the additional role of Chief Information Officer and has been a primary catalyst for necessary changes to the University technology infrastructure, thus enhancing the number and quality of technology services available to all students, faculty and staff. Some of his many initiatives include a campus-wide strategic planning process, a student laptop program, campus virtualization of application software, Help Desks and consolidated Web services. He also planned and coordinated an extensive information gathering process with active involvement from the campus community to define recommendations for campus-wide core technology services such as unified communication , learning management system, smart classrooms, computer labs, technology support, data storage and research technology.

Information Technology Department

600 E Boulevard Ave., Dept 112 • Bismarck, ND 58505-0100 • (701) 328-3190

LISA FELDNER, Ph. D., CIO

EDUCATION

2003	**PhD, University of ND, Educational Leadership**
1990	**MS, Minot State University, Mathematics**
1986	**BS, Minot State University, Computer Science**
1986	**BS, Minot State University, Business Education**

EXPERIENCE

2006-present **Chief Information Officer, State of North Dakota**

Appointed by Governor Hoeven, the Chief Information Officer (CIO) oversees technology activities in state and local government, K-12, higher education, and manages a staff of over 300 employees and an annual budget of over $60 million.

2006-present	**Governor's Cabinet, State of North Dakota**
2006-present	**Chair, ND Criminal Justice Information Sharing Board**
2006-present	**Member, ND Geological Information Systems**
2006-present	**Member, ConnectND Executive Board**
2007-present	**Chair, ND Statewide Longitudinal Data System Committee**
2009-present	**Chair, ND Health Information Technology Advisory Committee**
2006-present	**Member, National Association of State Chief Information Officers**
2007-present	**Member, NASCIO Health IT Working Group**
2001-present	**Member & Past Chair, ND Education Technology Council**
2001-2006	**Member, Technical Committee of ND State Network**
2000-present	**Member & Former Chair, North Dakota Association of Technology Leaders**
2000-present	**Member, North Dakota Council of Educational Leaders**
2000-2006	**Superintendent's Cabinet, Bismarck Public Schools**
1995-2006	**Leadership Team, Bismarck Public Schools**
1991-2005	**Founder & Director, Teaching and Technology Conference**
1991-2006	**Director of Technology, Bismarck Public Schools**
1989-1991	**Assistant Technology Coordinator, Minot Public Schools**

ABBREVIATED VITA – MARCH 2010

Tom Morrison

Director of Academic Computing & Network Services
Montana State University, Bozeman, Montana 59717
tpmorrison@montana.edu - 406-994-5069

EDUCATION

M. S., Telecommunications, 1995, University of Denver.
B.S., Radio & Television, 1972, University of Idaho.

PROFESSIONAL INTERESTS Advanced networking and computer systems integration.

PERTINENT PROFESSIONAL ACTIVITIES

* Participation in Internet2.
* Original member of the Northern Tier Networking Consortium.
*Implementation of MSU's advanced Lariat network funded via an NIH grant.

PROFESSIONAL ACTIVITIES

*Participated in development of the first C-band television satellite system under contract with NASA.
* Participated in development of the first Ku-band television satellite system under contract with NASA.
* Director of Systems Implementation for deployment of advanced voice/data compression and integration systems.
* Senior Telecom Analyst responsible for design procurement, installation and testing of advanced LAN/WAN systems for Texaco, Inc.
* Supervision and management of technical staffs and budgets.

David E. Jent
Associate Vice President, Networks
Indiana University
601 E. Kirkwood Ave.
Bloomington, IN 47405

Professional Preparation

Purdue University	Electrical Engineering	B.S. 1984

Appointments

2008	Associate Vice President, Networks
2004	Director, Network Infrastructures, Indiana Gigapop
2002-	Associate Director, Network Infrastructures, Indiana University
2000 -	Group Manager for Data Network Services, Indiana University
1988 -	Manager, IUPUI Data Network group, Indiana University-Indianapolis
1982	Installation Engineer, Computing Services, Indiana University-Indianapolis

Publications

1. Jent, D.E. “Next Generation Abilene Router upgrade& deployment” Proceedings of Internet 2 Members Meeting, August 2002, Los Angeles, California.
2. Jent, D.E., Love, P.E. “Abilene & Sponsored Participants: An Introductory Technical Tutorial.” Proceedings of APAN/TransPAC/NLANR/Internet2 Joint Techs Conference, January 2001, Waikiki, Hawaii.
3. Jent, D.E., Love, P.E. " Abilene SEGPs - A Tutorial on Technical Considerations." Proceedings of NLANR/Internet2 Joint Techs Conference May, 2001, Lincoln, Nebraska

Synergistic Activities:

Dave Jent has been working at Indiana University for over 25 years working with all aspects of network design, installation and project management. His strong network background provides a stable foundation for leading technical staff and managing complex engineering design, installation and support projects. His current portfolio includes managing the Global Network Operations Center Engineering team which operated the Abilene backbone network, the Indiana GigaPop which provides I1 and I2 connectivity to major state/regional institutions and I-Light, the optical network connecting Purdue and Indiana Universities. He also played a major role in the CIC connection to the NLR network.

Dave served as Project Manager for the Next Generation Abilene Router (NGAR) deployment project. This project, which started in late 2001, was essentially a “fork lift” upgrade of the entire Abilene backbone as well as deployment of a new set of measurement hardware known as the “Abilene Observatory”. He provided a focal point for vendors, engineers, UCAID management and the user community as the project moved from conception to completion.

Dave also is the primary administrative contact to the NLR project for Indiana University. He was instrumental in bringing the NLR Service Desk and Layer2/3 Support Center responsibilities to Indiana University. Working closely with the NLR Board and its CIO additional responsibilities

have come to IU; NLR deployment responsibilities for all segments of the network as well as the opportunities to lead the Layer 3 Services Task Force and the Management Task Force.

Working with collaborators at the Mid-Atlantic Crossroads (MAX) and MCREN in North Carolina Dave led the staff at IU in preparation of a winning bid to manage the Hybrid Optical Packet Infrastructure (HOPI) network. IU is providing engineering, monitoring and management services to Internet2 for this test-bed network.

The design, deployment and operational responsibility of the I-Light fiber network was another project Dave managed and continues to support. I-Light is a fiber facility completely owned, operated and supported by Indiana University.

Dave also manages the Indiana GigaPop. Located in diverse co-location facilities in Indianapolis the Indiana GigaPop provides 2.5gbps of commodity internet and 1gb of Abilene network service to its customers. Major customers include Indiana University, Purdue University and the State of Indiana. The Indiana GigaPop is active in the Quilt organization and in projects in the state of Indiana to further the deployment of high speed network access. Dave is a past member of the Internet2 Board of Trustees and chair of the I2 Architecture and Operations Advisory Council and is currently a standing member of the council.

Jon-Paul Herron
Director, Engineering
GlobalNOC at Indiana University
2711 E 10th St
Bloomington, IN 47401
jph@grnoc.iu.edu

A. Professional Preparation:

B.A. English/Philosophy, Indiana University, 1997

B. Appointments:

2009 –present Director, Engineering, GlobalNOC at Indiana University, Bloomington, IN

2004- 2009, Manager, Engineering Team, GlobalNOC at Indiana University, Bloomington, IN.

2000- 2004, Principal Network Engineer, GlobalNOC at Indiana University, Bloomington, IN

1997-2000, Network Engineer, AT&T Global Business Network Services, Schaumburg, IL

C. Publications:

Herron, JP. (2008, October 20-22). *Developing the GENI Meta-Operations Center*. Presented at Chinese American Networking Symposium, Indiana University, Indianapolis, IN.

Herron, JP., Fowler, L., Small, C. (2008, October 28-30). *Introduction to the GENI Meta-Operations Center*. Presented at GENI Engineering Conference 3, Palo Alto, CA.

Herron, JP. (2009, March 24-25). *The GENI Meta-Operations Center*. Presented at National Lambda Rail All-Hands Meeting, CalIT2, San Diego, CA.

Herron, JP. (2009, June 10). *The GENI Meta-Operations Center*. Presented at Terena Networking Conference 2009, University of Malaga, Malaga, Spain.

Herron, JP. Fowler, L. Viecco, C. Small, C. *Emergency Shutdown,* published at http://groups.geni.net/geni/attachment/wiki/GENIMetaOps/Emergency%20Shut down%20System%20Description3.pdf

Herron, JP. Fowler, L. Viecco, C. Small, C. *GMOC: GENI Concept of Operations,* published at http://groups.geni.net/geni/attachment/wiki/GENIMetaOps/GENI_Concept_of_O perations-final.pdf

D. Synergistic Activities:

As Director for Engineering at the GlobalNOC at Indiana University, Jon-Paul is responsible for the activities of the network engineering, network planning, system administration, and tool development organizations. This includes activities to operate, and provide long-term network planning expertise as well as advanced network management and measurement tool development for research and education networks such as Internet2, National Lambda Rail (NLR), and Indiana's Ilight network. This work requires long-term partnerships with organizations like Internet2 and NLR. Jon-Paul served as chair for the NLR engineering sub-committee on PacketNet, working with NLR member organizations to develop and design the plan for NLR's PacketNet network.

Jon-Paul also serves as Principal Investigator for the GENI Meta-Operations Center (GMOC) project in the NSF's GENI program. This project is developing the data formats, systems, and processes needed to provide operations for the highly-federated GENI network experimentation facility.

Luke Fowler
Manager, Systems Engineering
Global Research Network Operations Center
Indiana University
2711 E 10th St
Bloomington, IN 47401
luke@iu.edu

Professional Preparation

Indiana University	Bachelor of Science, Computer Science	2003
Indiana University	Computer Science	Continuing graduate coursework 2003-present

Appointments

2008	Manager, Systems Engineering, Indiana University
2005	Lead Software Programmer/Analyst, Indiana University
2003	Programmer/Analyst, Indiana University
2002	Network Software Specialist, Indiana University
1999	Software Engineer, Surplus Asset Management Systems

Publications

Herron, JP., Fowler, L., Small, C. (2008, October 28-30). *Introduction to the GENI Meta-Operations Center*. Presented at GENI Engineering Conference 3, Palo Alto, CA.

Herron, JP. Fowler, L. Viecco, C. Small, C. *Emergency Shutdown,* published at http://groups.geni.net/geni/attachment/wiki/GENIMetaOps/Emergency%20Shutdown%20System%20Description3.pdf

Herron, JP. Fowler, L. Viecco, C. Small, C. *GMOC: GENI Concept of Operations,* published at http://groups.geni.net/geni/attachment/wiki/GENIMetaOps/GENI_Concept_of_Operations-final.pdf

Synergistic Activities

Luke leads the Systems Engineering team at the Global Research Network Operations Center (GlobalNOC). This team, consisting of approximately 20 software developers and system administrators, is responsible for architecture, design, development, and maintenance of the GlobalNOC network measurement, management, and monitoring systems. This set of tools is used to manage all networks that the GlobalNOC supports. Additionally, Luke's team offers this suite of tools as a software service to other research and education networks in the United States.

Luke is the co-principal investigator on the GENI Meta Operations Center (GMOC) project, an effort to define and implement operational data sharing systems and procedures for GENI.

Luke has extensive experience developing best-in-class network measurement, monitoring, and management software in support of research and education networks.

Marianne Eileen Chitwood
Senior Manager, Indiana University GlobalNOC Service Desk, I-Light Network
Indiana University

Professional Preparation:

1990 Indiana University School of Telecommunications
2009 MOR Associates IT Leadership Program

Appointments:

2009 Senior Manager – Indiana University GlobalNOC Operations Center
2005 Operations Manager – I-Light Network
1990 Manager – Indiana University Regional Campus Telecommunications

Background/Activities:

Marianne Chitwood has been working at Indiana University for over 29 years working with all aspects of voice and data networks including, design, and installation and project management. Her strong network and project management background provides a stable foundation for leading technical staff and managing complex engineering design, installation and support projects. Her current portfolio includes managing the Global Research Network Operations Center at Indiana University (GlobalNOC) which serves the Research and Education (R&E) community providing a 24x7x365 network operations center serving a variety of regional, national and international networks including Internet2, National Lambda Rail (NLR), I-Light, Indiana GigaPoP, GENI Meta-Operations Center (GMOC), IPGrid, Mid-Atlantic Crossroads (MAX), TransPac2, Open Science Grid (OSG), CIC, Ampath and Connecticut Education Network (CEN).

In addition to her responsibilities for management of the GlobalNOC Service Desk, Marianne also manages Indiana's higher education optical network (I-Light). The Indiana General Assembly initiated i-Light in 1999 with a 5.3M state appropriation. The state initially built a fiber network to connect its primary research universities of Indiana University Bloomington, Purdue University West Lafayette, and the joint campus in Indianapolis. The network proved its value to grow research and education funding through high performance computing, competitive research grant success in Life Sciences and Engineering, connections to Internet2, National Lambda Rail, and favorable economics with the Indiana GigaPoP for the state to efficiently pool network traffic. In 2005 the State released an additional 12M dollars for the I-Light Expansion project, which extended the network to all corners of the state. Today, the I-Light backbone DWDM network is comprised of over 1176 total miles of fiber with 19 connection points throughout the Indiana and currently has 41 members directly connected to the fiber backbone. Additionally, I-Light provides connectivity to about 200 member sites via its circuit-based network, which provides point-to-point T1, and T3 connectivity between a member site and the I-Light POP.

Marianne currently serves on the Net@EDU StateNet CEO Steering Committee, Internet 2 Program Committee and previously served four years as a member of the ACUTA Board of Directors.

Matthew Davy
Chief Network Architect
Indiana University
2711 E 10th St
Bloomington, IN 47401
mpd@iu.edu

A. Professional Preparation:

B.S. Computer Science, Saint Joseph's College, 1996

B. Appointments:

2007 –present Chief Network Architect, Indiana University, Bloomington, IN

2001- 2007, Chief Network Engineer, Indiana University, Bloomington, IN.

1999- 2001, Principle Network Engineer, Indiana University, Bloomington, IN

1997-1999, Senior Network Engineer, ANS Communications, Ann Arbor, MI

1996-1997, Network Specialist, ANS Communications, Ann Arbor, MI

C. Publications:

Davy, M. (2009, February 1-4). *Campus Applications for MPLS*. Presented at Internet2 Joint Techs Workshop, Texas A&M, College Station, TX.

Davy, M., Bright, N. (2006, December 4-6). *Advanced Network Design Considerations for Supercomputers and Grids*. Internet2 Member Meeting, Chicago, IL.

Davy, M. (2004, July 20). *Protecting Multicast Enabled Networks*. Presented at Internet2 Joint Techs Workshop, Columbus, OH.

Shue, C., Gupta, M., Davy, M. (2008). *Packet Forwarding with Source Verification*. Computer Networks, Volume 52, Number 8, Pgs. 1567-1582

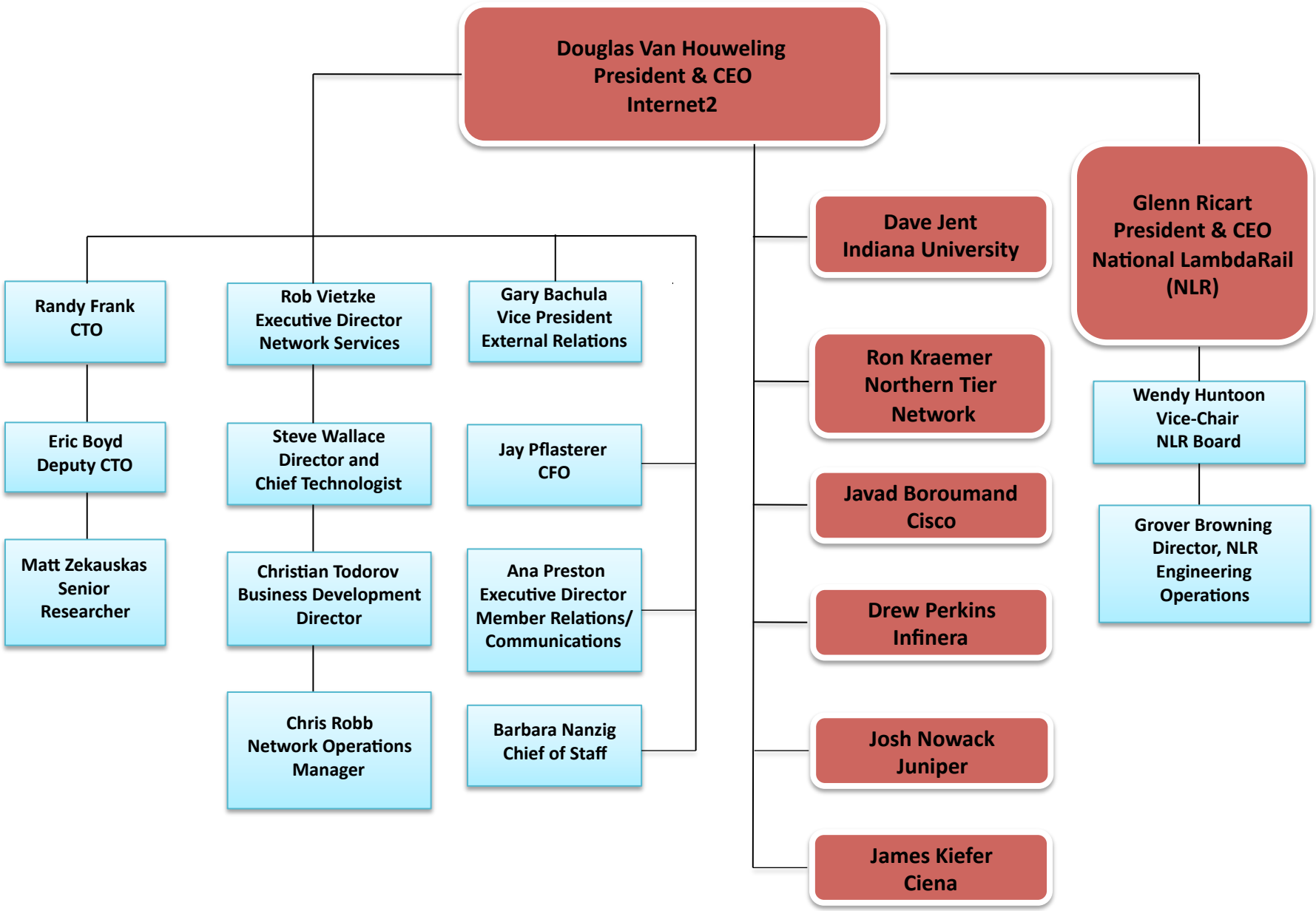
Akasaka, Y., Xi Wang, Lee, A., Davy, M., Naito, T., (2008, February 24-28) *PMD Measurement of 160-km Buried Fiber with Low DGD,* Presented at Optical Fiber Communication/National Fiber Optic Engineers Conference

Giuliano, L., Shepherd, G., Davy, M., (2003) *Framework for Deploying Interdomain IPv6 Multicast,* IETF Internet-Draft: draft-giuliano-mboned-v6mcast-framework-01.txt

D. Synergistic Activities:

As Chief Network Architect, Matthew is responsible for the architecture and design of the data network for the Indiana University system that includes 8 campuses statewide as well as the I-Light, Indiana GigaPoP, and IPGrid networks. He provides leadership in a wide variety of networking areas including network security, network authentication and authorization, Voice over IP, Wireless, and networking for large research computing applications. He provides network engineering and operations leadership for several regional, national, and international networks including Internet2, NLR, TransPAC, and MANLAN. He collaborates with members of the research and education networking community throughout the U.S. to analyze and evaluate emerging network requirement and technologies in order to design high-performance research networks that best support the needs of their users.

U.S. Unified Community Anchor Network (UCAN)



U.S. Department of Commerce
Broadband Technology Opportunities Program
Authentication and Certifications

1. I certify that I am the duly Authorized Organization Representative (AOR) of the applicant organization, and that I have been authorized to submit the attached application on its behalf.

2. I certify that I have examined this application, that all of the information and responses in this application, including certifications, and forms submitted, all of which are part of this grant application, are material representations of fact and true and correct to the best of my knowledge, that the entity(ies) that is requesting grant funding pursuant to this application and any subgrantees and subcontractors will comply with the terms, conditions, purposes, and federal requirements of the grant program; that no kickbacks were paid to anyone; and that a false, fictitious, or fraudulent statements or claims on this application are grounds for denial or termination of a grant award, and/or possible punishment by a fine or imprisonment as provided in 18 U.S.C. §1001 and civil violations of the False Claims Act.

3. I certify that the entity(ies) I represent have and will comply with all applicable federal, state, and local laws, rules, regulations, ordinances, codes, orders and programmatic rules and requirements relating to the project. I acknowledge that failure to do so may result in rejection or deobligation of the grant or loan award. I acknowledge that failure to comply with all federal and program rules could result in civil or criminal prosecution by the appropriate law enforcement authorities.

4. I certify that the entity(ies) I represent has and will comply with all applicable administrative and federal statutory, regulatory, and policy requirements set forth in the Department of Commerce Pre-Award Notification Requirements for Grants and Cooperative Agreements ("DOC Pre-Award Notification"), published in the Federal Register on February 11, 2008 (73 FR 7696), as amended; DOC Financial Assistance Standard Terms and Conditions (Mar. 8, 2009); the Department of Commerce American Recovery and Reinvestment Act Award Terms (Apr. 9, 2009); and any Special Award Terms and Conditions that are included by the Grants Officer in the award.

5. I certify that any funds awarded to the entity(ies) I represent as a result of this application will not result in any unjust enrichment of such entity(ies) or duplicate any funds such entity(ies) receive under federal universal service support programs administered by the Universal Service Administrative Corporation (USAC).

6. I certify that the entity(ies) I represent has secured access to pay the 20% of total project cost or has petitioned the Assistant Secretary of NTIA for a waiver of the matching requirement.

3/25/2010
Date

James A. Pflasterer
Authorized Organization Representative Signature

JAMES A. PFLASTERER
Print Name

CFO
Title

3Q 2010	4Q 2010	1Q 2011	2Q 2011	3Q 2011	4Q 2011	1Q 2012	2Q 2012	3Q 2012	4Q 2012	1Q 2013	2Q 2013	3Q 2013	4Q 2013	1Q 2014
PROJECT ACTIVITY														
Finish Due Diligence / Contract Award	RFP for equipment supplier(s)	Primary Fiber Contract Signed	**Phase 1a** - Procure Router Equipment	**Phase 1a** - Begin Installation of TR/CPS Routers	**Phase 1a** - Complete TR/CPS Router Installations	**Phase 2d** - Install Amplifiers	**Phase 2a** - Install OADM sites	**Phase 2a** - System Certification			**Phase 3a/3b/3c - Amplifier Installations**	**Phase 3a/3b/3c OADM Installations**	**Phase 3** - System Certification	
Internet2 / NLR Contract Signed	RFP for Fiber Supplier(s)	Supplemental Fiber Contract Signed	**Phase 1b/1c** - Colocation Build Out (NYC-HARR, MCL-HARR, HARR-CHIC) and CHIC-ATL	**Phase 1b** - Amplifier Installations	**Phase 1b** - system Live		**Phase 2b/2c -** Install Amplifiers	**Phase 2b/2c** Install OADM Sites	**Phase 2** - Marketing and Communications Announcements				**Phase 3** - Marketing and Communications Announcements	Complete transition of Internet2 customer base to expanded network
	Finalize NTIA Contract	NTNC Contract Signed	**Phase 1b** - Procure Optical Equipment	**Phase 2a/2b/2c/2d** - Finalize Engineering Designs	**Phase 2a/2b/2c/2d** - Colocation Build-out		**Phase 2d**- Install OADM sites	**Phase 2d** - System Certification		**Phase 3** - Collocation Build-Out				
		Phase 1a - Finalize TR/CPS Engineering Designs			**Phase 2a/2b/2c/2d** - Procure Optical Equipment				**Phase 3** - Finalize Engineering Designs	**Phase 3** - Procure Optical Equipment				
		Phase 1b/1c - Finalize NYC-ASHB-CHIC and CHIC-ATL Engineering Designs			**Phase 1a /1b** - Marketing and Communications Announcements									
		Phase 4a - Finalize engineering design	**Phase 4a** - Procure router equipment	**Phase 4a** - Begin installation of NLR routers	**Phase 4a** - Complete installation of NLR routers	**Phase 4b** - Procure 1/2 of 100 GE transponders	**Phase 4b** - Procure remaining 100 GE tranpsonders							
						Phase 4b - Install transponders on JACK - CHIC	**Phase 4b** - Install transponders on CHIC to LOSA	**Phase 4b** - Install transponders on LOSA to JACK	**Phase 4b** - Install transponders on KANS to HOUS					
						Phase 4c - Procure & Configure Observatory Equipment	**Phase 4c** - Deploy and Install Observatory Equipment	**Phase 4c** - Publicize Operational Transparency Tools for US-UCAN Network						

PROJECT PHASES:

Pre-project phase

Phase 1a- Transitrail CPS Routers (1/2011-12/2011)
Phase 1b - New York and Ashburn to Chicago (1/2011-12/2011)
Phase 1C - Chicago to Atlanta (7/2011-6/2012)

Phase 2A - Chicago TO KANSAS CITY TO DENVER TO SALT LAKE (9/2011-6/2012)
Phase 2B - Salt Lake CIty to Los Angelols (1/2012 - 6/2012)
PHASE 2C - Kansas City to Dallas and DALLAS to NASHVILLE
PHASE 2D - New YORK TO BOSTON TO CLEVELAND

Phase 3A - New york to Washington TO ATLANTA (1/2013 - 6/2013)
Phase 3B- Chicago to Seattle (1/2013-12/2013)
Phase 3C - Los Angeles to Seattle (6/2013-12/2013)

PHASE 4A - Upgrades of BLUE NETWORK ROUTERS (6/2011 - 12/2011)
Phase 4B - 100G BACKBONE LINK Upgrades to portions oF THe BLUE network (1/2012-12/2012)
PHASE 4C - Observatory Upgrade (1/2012-6/2012)

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Withheld in its entirety
pursuant to FOIA Exemption 4
(5 U.S.C. § 552 (b)(4))

U.S. UCAN Service Area Statistics

Note that Section E would not allow the entry of accurate Service Area data, as it only permitted the entry of up to eight digits. We therefore have listed the correct data below:

Total Square Miles in Service Area:	3,794,101
Total Population in Proposed Service Area:	308,918,000
Total Number of Households in Service Area:	114,825,428
Total Number of Businesses in Service Area:	25,409,525
Total Number of Community Anchor Institutions and Public Safety Entities in Proposed Funded Service Area	200,00+
Unemployment Rate in the Service Area	10%
Median Income in the Service Area	$52,000
Estimated Percentage of Households with Access to Broadband	99%
Estimated Percentage of Households Subscribing to Broadband	64%