



Coalition for Networked Information

## PROGRAM 2003 - 2004

### MISSION

The Coalition for Networked Information (CNI) is an organization to advance the transformative promise of networked information technology for the advancement of scholarly communication and the enrichment of intellectual productivity.

November 12, 2003

Dear Task Force Representatives and Friends of the Coalition:

I'm pleased to introduce the 2003-2004 Program Plan for the Coalition. It presents a snapshot of our active initiatives and defines a program of work for the coming year that responds to the developments, needs, and challenges involved in the application of advanced technology and networked information in the service of scholarship. I hope that you will find the Program Plan helpful not only as a reference for your own use, but also as a tool for communicating the Coalition's work to others both within and beyond your organization.

This has been a year of steady and substantial progress. Many of the ideas that CNI has helped to shape and bring to the community's attention over the past two years are gaining much broader engagement and adoption. These include the development of institutional repositories and related areas, such as the documentation of performance events and the preservation of digital information. The Shibboleth distributed authorization system is gaining momentum, while work continues on the closely related area of authentication.

The concept of "cyberinfrastructure," introduced in the United States through the report of the National Science Foundation committee chaired by Dan Atkins, is gaining support as an integral part of the changing practices of scientific research. Parallel initiatives in other nations, such as the e-Science program in the United Kingdom, are also moving ahead. Extending these ideas, there is now considerable attention being focused on understanding how the practices of scholarship in the humanities are changing as a result of advanced information technologies and networked information resources, and how cyberinfrastructure approaches can be expanded to support the humanities.

There are fresh developments as well. For example, the U.S National Science Foundation (NSF) and Europe's DELOS program, working together, have prepared a series of survey papers addressing promising research opportunities in highly relevant areas, including personalization and digital preservation. In June 2003 the NSF convened a workshop to explore what it termed the "post-Digital Library" research agenda. CNI has been fortunate to be able to participate in both. Taken together, these efforts point toward a good deal of new thinking about the evolution of networked information services and systems – and toward new opportunities to apply these ideas and translate research results into broadly deployed practice.

I'm intrigued by the work on the Chandler open source personal information management system that's being supported by our colleagues at the Common Solutions Group (a.k.a. the "Stone Soup" group) and by the Andrew W. Mellon Foundation. Although it is still very early, if this effort is successful it will open up the potential to integrate networked information discovery and management tools and services with the historically rather closed environment in which people manage personal information resources, such as personal e-mail and calendars.

The Coalition has continued to build strong links and collaborations with the communities focused on instructional technology and instructional management systems, including the IMS Global Learning Consortium and the EDUCAUSE National Learning Infrastructure Initiative (NLII). There are tremendously complex overlaps and interconnections between the technical and policy interests of those involved in learning management and instructional technology and those involved in libraries, archives, records management, and information technology, but substantial areas currently are not well addressed by any of these sectors. So one of our major challenges in the next few years is first to understand the landscape (where I hope that the joint CNI/IMS white paper will be a useful contribution) and then subsequently to mobilize efforts to explore these areas.

You will find all of the issues mentioned above to be well-represented in the sessions at the Fall 2003 and Spring 2004 CNI Task Force meetings.

I also want to direct your attention to several recent documents that represent milestones in major projects: "Current Practices in Capturing Live Performance

Events,” prepared jointly with our colleagues at Internet2; Jennifer Trant’s “Image Retrieval Benchmark Database Service: A Preliminary Needs Assessment and Development Plan,” commissioned by CNI and CLIR; and the revised version of “Interoperability between Information and Learning Environments--Bridging the Gaps,” a joint CNI/IMS white paper.

A few sentences from my cover letter that accompanied last year’s Program Plan bear repeating:

*Another consequence of the constrained resource environment is that it both forces us and makes it possible for us to make choices; we can no longer do everything, simultaneously pursuing and funding both old and new approaches. In some areas the need to now make conclusive choices may actually accelerate progress. I suspect that when we look back at the decisions and choices that we are making now from the perspective of a few years in the future, we’ll recognize that this is the period in which we make large scale and irrevocable commitments to new approaches that we have validated and refined in pilot projects and experiments over the past decade.*

Continued challenging economic times have indeed forced us to make choices in terms of the organizations that we collectively support and the strategies that we employ within our own institutions. I note, for example, the demise of the Computer Interchange of Museum Information consortium and the wind-down of the National Initiative for a Networked Cultural Heritage; both are organizations that have done valuable work, but are no longer able to gather a critical mass of funding support. CNI has been working with these organizations and other members of the community to ensure that key programs and intellectual assets are preserved.

But perhaps the most exciting and most complex venue where we are making choices in response to financial stresses is scholarly publishing and the explosion of new scholarly communications. Our institutions are making serious financial and intellectual commitments to support new forms of scholarly communication through investments in the development of institutional repository services. At the same time, the broad scholarly community is now debating seriously the economic and access models that have structured traditional scholarly publishing for many decades and exploring alternatives such as open-access publications.

We will continue to use the CNI Task Force meetings to showcase new faculty scholarship using the digital medium. In addition, I have had a number of opportunities in the past year to visit with member institutions and participate in events that have engaged campus communities with these issues, and I hope to find other occasions to advance these discussions in the coming year.

I want to thank our member institutions for their support. In what I know are difficult financial times, I was both grateful and honored to see that virtually all of the Task Force member institutions renewed their support for the Coalition’s work for 2003-2004. I take this as reaffirmation of my view that CNI remains a key community strategy for advancing our collective efforts to enhance scholarship and intellectual productivity.

I greatly appreciate all those who have contributed to the work of the Coalition through participation in projects, workshops, and Task Force meetings, and through service on the CNI Steering Committee. The boards and chief executives of our two sponsor organizations, ARL and EDUCAUSE, have also provided vital guidance and support for which I continue to be grateful.

As always, I welcome your ideas and input on the Program Plan and on ways in which CNI can help your organizations to engage the future.

Sincerely,



Clifford Lynch  
Executive Director  
Coalition for Networked Information

## ■ BACKGROUND AND HISTORY

The Coalition for Networked Information (CNI) is a joint project of the Association of Research Libraries (ARL) and EDUCAUSE. ARL represents the research libraries of North America. EDUCAUSE champions the use of information technology among its broad array of members in the higher education community and the associations, organizations, and corporations that serve that community.

In establishing CNI, these sponsor organizations recognized the need to broaden the community's thinking beyond issues of network connectivity and bandwidth to encompass networked information content and applications. Reaping the benefits of the Internet for scholarship, research, and education demands new partnerships, new institutional roles, and new technologies and infrastructure. The Coalition seeks to further these collaborations, to explore these new roles, and to catalyze the development and deployment of the necessary technology base.

The Coalition is supported by a Task Force of about 200 dues-paying member institutions representing higher education, publishing, networking, information technology, government agencies, museums, libraries, and library organizations. Membership in the Coalition's Task Force is open to all organizations -- both for-profit and not-for-profit -- that share CNI's commitment to furthering the development of networked information.

The Task Force will meet twice in 2003-2004: once in Portland, Oregon, December 8-9, 2003, and again in Alexandria, Virginia, April 15-16, 2004.

The Coalition's program is guided by a Steering Committee chaired by Richard West of the California State University system. As sponsor organizations, ARL and EDUCAUSE each appoint three representatives to the Steering Committee drawn from their member leadership. Three "at large" representatives on the Steering Committee contribute additional perspectives. The executive directors of ARL, EDUCAUSE, and CNI serve as *ex officio* members of the committee.

CNI was founded in 1990 by ARL and EDUCAUSE's two predecessor organizations, Educom and CAUSE. Paul Evan Peters was the founding executive director of the Coalition, serving until his untimely death in 1996. Joan Lippincott, now CNI's associate executive director, served as interim executive director until the appointment of Clifford Lynch as the new executive director in July 1997.

## ■ PROGRAM THEMES

The work of the Coalition is structured around three central themes that we believe are the essential foundations of the vision of advancing scholarship and intellectual productivity:

### **Developing and Managing Networked Information Content**

A network that will play an integral role in scholarly discourse and productivity must be rich in content and information resources. The Coalition seeks to mobilize and bring together the many diverse communities that create and manage content. It works with these communities to develop methods of creating,

organizing, evaluating, managing, and preserving networked information resources. The Coalition also furthers the development of economic, policy, social, and legal frameworks to sustain the creation and management of networked information and facilitate its access.

### **Transforming Organizations, Professions, and Individuals**

The use of networked information is transforming institutions, professions, and the practices of learning and scholarship. For academic institutions, success in the new environment requires an unprecedented degree of collaboration among libraries, information technology groups, faculty, instructional technologists, museums, university presses, and other units; it demands new alliances and partnerships with publishers, information technology and network service providers, scholarly societies, government, and other sectors. Organizations must develop and share new strategies, policies, and best practices. Of equal importance is the need to assess and measure the impact of the new environment on institutions and their activities as the transformation progresses. Professions need to develop new competencies and enter into new dialogues that cross traditional disciplinary boundaries. The Coalition seeks to facilitate these collaborations and dialogues and to help professions and institutions work together in program strategy formulation and impact assessment.

### **Building Technology, Standards, and Infrastructure**

The networked information environment relies on the development and deployment of standards and infrastructure components in order to enable the discovery, use, and management of networked information. The ability to use collections of resources in a unified, consistent fashion is essential and requires a continuing focus on interoperability of services. At the same time, promising new technologies need to be explored, assessed and tested, and sometimes adapted to the needs of the CNI community. No one institution acting alone can build the needed infrastructure or explore the full range of new technologies as they become available. Accomplishing these goals requires a coordinated community-wide effort. CNI seeks to provide leadership in this undertaking, to offer a context for collaborative experiments and test beds, and to serve as a focal point for sharing knowledge about new technologies.

The specific program initiatives that further these themes evolve from year to year. The initiatives and strategies planned for 2003-2004 are described below; most build upon and continue efforts already underway. Many of the initiatives seek to make strategic progress relevant to more than one theme.

It is important to recognize that the networked information environment is still changing rapidly. CNI is continually adapting its activities in response to new developments and opportunities. Indeed, the Coalition believes agility is essential in the current environment and invites a continuous dialogue with the members of the Task Force on the need for additional program initiatives. Because of this, the 2003-2004 Program Plan should be viewed as a snapshot of our thinking about priorities and opportunities as of late 2003 that will inevitably develop further during the coming year.

## **■ ADVOCACY AND CONSULTATIVE ACTIVITIES**

In addition to specific initiatives to address these overarching themes, the Coalition actively conducts an ongoing program of collaboration and advocacy to advance the development of networked information and its role in transforming organizations and scholarly activities. This is accomplished through both print-

based and network publications; through participation in conferences, meetings, workshops, and committees on an institutional, regional, national, and international level; through contributions to standards efforts; through collaboration with key funding agencies, such as the National Science Foundation, the Institute of Museum and Library Services, the National Endowment for the Humanities, the Department of Education, and the Andrew W. Mellon Foundation; and through participation in organizations such as the Internet Society. Of particular note in this area are our contributions to the Library of Congress's efforts to map out a National Digital Preservation Program and to various studies and programs conducted by the U.S. National Research Council. On an international level, we collaborate with other organizations concerned with networked information, including the U.K. Office for Library Networking (UKOLN) and the Joint Information Systems Committee (JISC) in the United Kingdom, and the German Initiative for Networked Information (DINI).

In addition to contributing to the programs of our sponsor organizations, ARL and EDUCAUSE, we also support, contribute to, and collaborate closely with other organizations that share in specific aspects of our programmatic interests and priorities as a strategic part of our own program work. These include:

The University Corporation for Advanced Internet Development (UCAID) manages the Internet2 initiative to promote advanced networking and applications within the higher education community. CNI works with UCAID on numerous interests, including video and multimedia applications and standards and high-bandwidth, content-intensive applications.

The Council on Library and Information Resources (CLIR) addresses a broad range of issues involving the scholarly communication system, higher education, and libraries. The Digital Library Federation (DLF) is a CLIR program focused on the use of digital library technologies within research libraries. CNI collaborates extensively with CLIR and DLF on issues ranging from digital preservation to metadata.

CNI and the IMS Global Learning Consortium have formed an alliance designed to explore the development of common architectural and functional models leading to joint specifications and improved technical interoperability in both digital libraries and learning object repositories.

The Coalition also contributes to the development of the networked information community by hosting electronic discussion groups, such as the CNI –COPYRIGHT forum, and acting as a distribution point for materials via its Web site and the CNI-ANNOUNCE e-mail list.

## ■ MEETINGS

The Coalition's semiannual Task Force meetings, scheduled for December 8-9, 2003, in Portland, Oregon, and April 15-16, 2004, in Alexandria, Virginia, not only allow CNI to highlight activities related to its program themes and to focus attention on significant new thinking and technology developments, but also provide an opportunity for the members to showcase and discuss a wide range of emerging issues and developments in networked information. Each member organization is invited to send two delegates, typically a senior information technologist and a senior librarian. Meeting participants are introduced to new

developments that may reshape institutional plans in a forum that encourages collaborations and dialogues with others who share common interests.

CNI regularly co-sponsors a conference in partnership with JISC and UKOLN as part of our ongoing collaboration with these programs. Planning is underway for the next conference, to be held in Brighton, England, July 8-9, 2004. The previous conference was held June 25-27, 2002, in Edinburgh, Scotland.

CNI occasionally convenes invitational or public workshops to advance specific elements of its program plan and acts as a sponsor or co-sponsor for other meetings relevant to the CNI agenda. This year, such events include the IS&T Archiving Conference, April 20-23, 2004, in San Antonio, Texas; the EDUCAUSE Policy Conference, to be held in Washington, DC, May 19-20, 2004; and the Joint Conference on Digital Libraries, scheduled for June 7-11, 2004, in Tucson, Arizona.

## ■ DEVELOPING AND MANAGING NETWORKED INFORMATION CONTENT

The Coalition has broad interest in all types of digital content—including text, images, data, mixed media, and interactive objects—that can be used to support research and education. We provide a forum for the exchange of information on leading projects in this arena. In 2003-2004 we will be making a special effort to showcase innovative faculty projects from some of our member institutions at the CNI Task Force meetings. In addition, we will track developments and promote strategies for the creation of digital libraries and federated collections of digital content. Through our Task Force meetings, specialized conferences, collaborative initiatives with other organizations, papers, and presentations, we provide leadership on digital content policy, economic frameworks, and scholarly communication.

The centerpiece of our work on networked information content is constructed around the broad theme of the stewardship of institutional content resources, a central role for higher education and cultural memory organizations in the digital age. Our work here has two major components. The first is to understand and help to advance and structure the wealth of new digital content. The Coalition's projects in this area include: participation with Internet2 in the Performance Archive & Retrieval Working Group, which will make guidelines for the digital capture of a wide range of performance events available for public review and comment during this program year; our continuing efforts to understand and highlight experiments in the creation of new types of scholarly works for the digital medium, including successors to the printed scholarly monograph; and our ongoing participation in the Networked Digital Library of Theses and Dissertations, which seeks to facilitate the migration of theses and dissertations to digital form. The other major component of our work in stewardship of institutional content resources focuses on approaches to manage this wealth of new content through development of institutional repository services. Here CNI is addressing the full range of issues from policy and strategic planning through systems architecture.

Tracking rights and permissions is essential to our ability to share and reuse information; structuring appropriate metadata for this purpose is also essential for successful dissemination and long-term stewardship within the context of institutional repositories. We have ongoing efforts, building on the September 2002 NSF-funded workshop that CNI co-sponsored with Internet2, the Video Development Initiative (ViDe), and the Southeastern Universities Research

*INSTITUTIONAL  
CONTENT  
RESOURCES AND  
REPOSITORIES*

*METADATA AND  
DIGITAL RIGHTS  
MANAGEMENT*

*DIGITAL  
PRESERVATION*

Association (SURA), to advance a program for the documentation and management of rights related to digital content in educational and other non-commercial settings. Also important in the metadata area is the progression of the Metadata Encoding and Transmission Standard (METS) "packaging" for digital objects. CNI will be collaborating with the METS project in a United Kingdom seminar on METS in conjunction with the joint CNI-JISC meeting in July 2004.

Closely related to the work on stewardship of institutional content resources is the Coalition's continuing work on preservation of digital content. This is a central issue in the shift to network-based scholarly communication, and has also more recently emerged as a broad and fundamental social and public policy issue. CNI works with ARL, DLF, CLIR, the Andrew W. Mellon Foundation, JSTOR, and the Research Libraries Group (RLG) on the full range of technical, economic, and strategic issues surrounding digital preservation. We have continued to collaborate with the Library of Congress in their efforts to develop and build consensus around a national digital preservation strategy. The Coalition also continues to explore issues at the juncture of records management, archival practice, and preservation of digital materials through its support of the Arizona State University Electronic College and University Records (ECURE) conferences, the next scheduled for March 2004. As in recent years, developments in digital preservation will be highlighted at Task Force meetings.

*COMPUTING AND  
THE HUMANITIES*

CNI continues to participate with the National Academy complex, the American Council of Learned Societies, and NINCH in a Steering Committee for Computer Science and the Humanities that promotes the application of the information sciences to the understanding of the human record. The Steering Committee obtained funding from the Carnegie Corporation for the first in a series of major conferences, held in January 2003, to bring together computer scientists and humanists to advance the use of information technologies in humanities research through collaboration between these disciplines. CNI is seeking to build on this work and to help the community structure a new agenda for engaging the arts and humanities, given the restructuring of NINCH and the wind-down of the Computer Interchange of Museum Information (CIMI) consortium. We will also work with our partners to advance the inquiry into the potential nature and role of cyberinfrastructure to support the humanities as well as the sciences.

■ **TRANSFORMING ORGANIZATIONS, PROFESSIONS,  
AND INDIVIDUALS**

The Coalition has a long-standing commitment to highlighting and advancing organizational initiatives that facilitate collaborations across institutional units and professional cultures, with particular emphasis on collaboration between librarians and information technologists. We have also done extensive work on evaluation and assessment strategies. This year, after a series of milestones in our Transformative Assessment program with the EDUCAUSE National Learning Infrastructure Initiative (NLII) and the TLT Group, we will enter into wide consultation with the community about appropriate next steps and new directions in our assessment work.

*COLLABORATIVE  
FACILITIES AND  
COLLABORATIVE  
SERVICES DELIVERY*

In 2003-2004 we will continue the CNI partnership with Dartmouth College, which has produced a Web site to assist institutions in planning, implementing, and evaluating collaborative facilities. A number of institutions are offering public service points or facilities where library and information technology staff share responsibilities to serve users; other institutions are establishing teaching



and learning support centers that bring together instructional technologists, faculty, information technologists, and librarians. Typically, these service points and centers are developed in conjunction with building renovations, expansions, or new building projects. There is great interest in sharing experiences and plans in this area, and the Web site hosted by Dartmouth includes planning documents, architectural layouts, programmatic descriptions, and other information provided by institutions active in such projects. We want to increase substantially the number of institutions that are contributing to the site, and will continue to schedule project briefings at the Task Force meetings and at the EDUCAUSE annual conference highlighting initiatives in this area.

In 2003-2004 we will expand the focus of the collaborative facilities program in two directions. We will look at collaborative organizational structures and programs for service delivery that may or may not be facilities-based, and we will also look at collaborative learning spaces and spaces for service delivery, building upon our ongoing collaboration with the National Institute for Technology and Liberal Education (NITLE).

ORGANIZATIONAL  
POLICY  
IMPLICATIONS OF  
LEARNING  
MANAGEMENT  
SYSTEMS

We will continue to pursue ideas launched in the 2002-2003 program year with the paper, "The Afterlives of Courses on the Network: Information Management Issues for Learning Management Systems" (EDUCAUSE Center for Applied Research Bulletin 2002:23). This work examines institutional policy implications related to the reuse of content contained in course sites within the learning management system context.

EXECUTIVE  
ROUNDTABLE

At the Fall 2003 Task Force meeting, CNI will inaugurate a new program called the Executive Roundtable, which builds on the theme of collaboration between librarians and information technologists that has been at the foundation of the Coalition. We will assemble pairs of chief librarians and information technology officers (and perhaps one additional representative from each participating organization, depending on the topic under discussion) from about ten organizations per meeting for a focused two-to-three-hour discussion of a specific topic. Topics might include institutional repositories, learning management systems, the role of university presses, or privacy and security issues. Initially, these sessions will take place on the morning of the first day of the Task Force meetings. The topic for Fall 2003 is institutional repositories. Based on the response to the first Roundtable, we may look for additional Roundtable venues in order to permit more institutions to participate.

## ■ BUILDING TECHNOLOGY, STANDARDS, AND INFRASTRUCTURE

CNI continues to be actively engaged in key areas of standards and infrastructure development. The Coalition is particularly concerned with facilitating the difficult and delicate transition of standards and technologies into operational infrastructure for the research, higher education, and library communities. In addition to the major program initiatives described here, the Coalition is closely tracking a wide range of developments in areas as diverse as identifiers, digital books, metadata standards, federation, distributed search and harvesting technologies, and recommender systems and personalization technologies.

ARCHITECTURAL  
CONTEXTS FOR NEW  
ACADEMIC  
PLATFORMS

During the past two years, ARL has provided a focus for renewed interest from the library community in a cluster of ideas variously called "scholar's portals," "academic platforms," or "scholar's toolkits," to assist information seekers in locating, using, and contributing to the ever-growing diversity of academic and

scholarly information resources. As these ideas have been refined, we are recognizing the limitations of services such as commercial Web search engines, traditional library automation tools such as online catalogs, and stand-alone abstracting and indexing databases. We are also seeing the need to integrate with the emerging technologies of learning management systems.

The Coalition is concerned with architectural and standards frameworks that can facilitate the development of interoperable and complementary prototype systems in this area, and ultimately contribute to the development of a vibrant marketplace in such systems as they are created by the private sector, by university-industry collaborations, or by university-based projects. In the spring of 2002 we sponsored a workshop in collaboration with ARL to begin to map out developments in this area. One outcome of the workshop is the focus on institutional repositories as part of the broader issue of stewardship of institutional content resources discussed above; another was the initiation of work dealing specifically with learning management systems, also described earlier. A third result of our work in this area is an intense focus on the interactions between learning management systems and the rest of the information landscape; this is detailed below as a separate initiative. Our ongoing efforts in the area of architectural contexts is characterized by an emphasis on access and reuse of content from a user perspective, dealing specifically with portals, search engines, and the role of the open archives metadata harvesting technology.

*INTEROPERABILITY  
AND INTERFACES  
BETWEEN LEARNING  
AND INFORMATION  
ENVIRONMENTS*

In 2003 CNI launched a major collaboration with the IMS Global Learning Consortium to explore the interoperability issues and technical and standards interconnections between information and learning environments. The first objective is to survey the landscape to identify gaps and unaddressed needs, redundant or conflicting work, and architectural or terminological disagreements. A draft white paper formed the basis for a full-day joint workshop in July 2003. A revised version of the white paper, based on the workshop and other responses, will be released for further discussion by the CNI and IMS communities during the 2003-2004 program year. The final version of the paper is intended to serve as a roadmap for future work.

*AUTHENTICATION,  
AUTHORIZATION,  
AND ACCESS  
MANAGEMENT*

Authentication and authorization have emerged as essential infrastructure requirements for network-based access to information and have become a particularly critical need as institutions enter into site-license arrangements with publishers and other information providers, implement online and distance education initiatives, or form consortia for resource sharing. The Coalition has been pursuing a program to define technology approaches, standards, best practices, and policy and business issues for such an inter-organizational authentication and authorization infrastructure, and to help early adopter Task Force member organizations share implementation experiences and explore interoperability issues. Working in partnership with Internet2, EDUCAUSE's Net@EDU, and the DLF, we will continue to seek to illuminate many of the policy, strategy, operational and budgetary issues involved in access management.

A critical outcome of this work has been the development of the Shibboleth distributed authentication system as part of the NSF-funded middleware initiative at Internet2. During 2002-2003 Version 1 of this system was deployed in a series of highly successful field trials involving universities and content providers. In 2003-2004 we will work with Internet2 to expand the field trials to additional vendors and to advance Shibboleth into broader deployment; to assist in the development and validation of new tools that will be needed to support large-scale Shibboleth deployment; and to define functional requirements for future

versions of the system. Also, given the very real progress on authorization, in 2003-2004 CNI will revisit the complementary question of authentication systems to explore what can be done to accelerate progress.

The Coalition takes a broad view of security, integrity, and access management issues as they relate to management of licensed resources and stewardship and preservation of digital content. New technological capabilities – peer-to-peer resources sharing and the ability to amass large personal digital libraries of materials from licensed collections – continue to raise complex questions with both technological and policy dimensions. The Coalition believes that we must continue to explore these new behaviors and practices and to reflect this broad view in the developing focus on systems and network security within the higher education community.

## ■ RECENT PUBLICATIONS BY CNI STAFF

Clifford A. Lynch and Neil McLean, "Interoperability Between Information and Learning Environments--Bridging the Gaps," a white paper produced jointly by IMS Global Learning Consortium and the Coalition for Networked Information (December 2003).

Clifford A. Lynch, "Life After Graduation Day: Beyond the Academy's Digital Walls," *EDUCAUSE Review* 38: 5 (September/October 2003).

Clifford A. Lynch, "The Visible Classroom," *EDUCAUSE Review* 38: 4 (July/August 2003).

Clifford A. Lynch, "Reflections Towards the Development of a 'Post-DL' Research Agenda, *Wave of the Future: NSF Post Digital Libraries Future Workshop*, June 15-17, 2003, Chatham, Massachusetts.

Jamie Callan, et. al., "Personalisation and Recommender Systems in Digital Libraries: A Joint NSF-EU DELOS Working Group Report," (May 2003).

Clifford A. Lynch, "Institutional Repositories: Essential Infrastructure for Scholarship in the Digital Age," *ARL Bimonthly Report* 226 (February 2003).

Joan K. Lippincott and Malcolm Brown, "Learning Spaces: More than Meets the Eye." *EDUCAUSE Quarterly* 26:1 (2003).

Clifford A. Lynch, "Preserving Digital Information to Support Scholarship," in Maureen Devlin, Richard Larson, and Joel Meyerson, eds., *The Internet & the University: Forum 2002* (EDUCAUSE, 2003).

Clifford A. Lynch, "The Afterlives of Courses on the Network: Information Management Issues for Learning Management Systems," *EDUCAUSE Center for Applied Research Bulletin* 2002:23 (November 2002).

Clifford A. Lynch, "Digital Collections, Digital Libraries, and the Digitization of Cultural Heritage Information," *First Monday* 7: 5 (May 2002).

Joan K. Lippincott, "Developing Collaborative Relationships: Librarians, Students, and Faculty Creating Learning Communities," *College and Research Libraries News* 63:3 (March 2002).

Joan K. Lippincott, "Cyberinfrastructure: Opportunities for Connections and Collaboration," *E-volving Information Futures: Conference Proceedings for the 11th Biennial Conference of the Victorian Association for Library Automation, February 6-8, 2002, Melbourne, Australia*.

Clifford A. Lynch, "Metadata Harvesting and the Open Archives Initiative," *ARL Bimonthly Report* 217 (August 2001).

Clifford A. Lynch, "The Battle to Define the Future of the Book in the Digital World," *First Monday* 6: 6 (June 2001).

Most publications are available online via: <http://www.cni.org/publications/>

■ **MEMBERSHIP LIST** (As of November 2003)

Charter members are listed in italics.

American Library Association  
 American Museum of Natural History  
*American University*  
 Andrew W. Mellon Foundation  
 Arizona Department of Library, Archives and Public Records  
*Arizona State University*  
 Associated Colleges of the South Technology Center (ACSTC)  
*Association of College and Research Libraries*  
 Auburn University  
 Baylor University  
 Binghamton University, State University of New York  
 Boston College  
*Boston Public Library*  
 Brigham Young University  
 British Library  
*Brown University*  
 Bucknell University  
 California Institute of Technology  
*California State University, Office of the Chancellor*  
 Canada Institute for Scientific & Technical Information  
 Canadian Heritage Information Network  
*Carnegie Mellon University*  
*Case Western Reserve University*  
 Center for Educational Technology (CET)  
 Center for Research Libraries  
 Centers for Disease Control and Prevention  
 Clemson University  
 Coleslaw Group  
 College Center for Library Automation  
*Colorado State University*  
*Columbia University*  
 Connecticut State University  
*Cornell University*  
 Council on Library and Information Resources  
 Countway Library of Medicine  
 Dartmouth College  
 Duke University  
 Eastern Michigan University  
*Elsevier Science Publishers B. V.*  
 Emory University  
 Endeavor Information Systems, Inc.  
 Enoch Pratt Free Library  
 Ex Libris (USA), Inc.  
 Five Colleges, Inc.  
 Florida Atlantic University  
 Florida State University  
 Gates Center for Technology Access/Bill & Melinda Gates Foundation  
 George Mason University  
*George Washington University*  
*Georgetown University*  
*Georgia Institute of Technology*  
 Georgia State University Pullen Library

*Harvard University*  
Hewlett-Packard Laboratories  
IMS Global Learning Consortium  
*Indiana University*  
Indiana University-Purdue University at Indianapolis  
Institute for Scientific Information  
Internet Society  
*Iowa State University*  
J. Paul Getty Trust  
John Wiley & Sons, Inc.  
*Johns Hopkins University*  
Joint Information Systems Committee  
JSTOR  
*Kent State University*  
Las Vegas Clark County Library District  
Library and Information Technology Association  
*Library of Congress*  
*Library of Virginia*  
Los Alamos National Laboratory Research Library  
Lund University  
*Massachusetts Institute of Technology*  
Mayo Foundation  
McGill University  
Metropolitan New York Library Council (METRO)  
*Miami University of Ohio*  
*Michigan State University*  
Midwest Instructional Technology Center (MITC)  
MINITEX Library Information Network  
Mississippi State University  
Missouri State Library  
*National Agricultural Library*  
National Archives and Records Administration  
National Institute for Technology and Liberal Education (NITLE)  
National Institutes of Health Library  
*National Library of Canada*  
National Library of Australia  
National Library of Medicine  
Naval Research Laboratory  
*New York Public Library - Research Libraries*  
*New York State Library*  
New York University  
North Carolina State University  
Northeastern University  
*Northwestern University*  
OCLC, Inc.  
*Ohio State University*  
Ohio University  
Old Dominion University  
Oregon State University  
*Pennsylvania State University*  
*Princeton University*  
Pro Quest Information and Learning  
Public Library Association  
*Queen's University*  
*Rensselaer Polytechnic Institute*

*Research Libraries Group, Inc.*  
*Rice University*  
*Rochester Institute of Technology*  
*Rutgers University*  
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