



Coalition for Networked Information

## PROGRAM 2002 - 2003

### 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 17, 2002

Dear Task Force Representatives and Friends of the Coalition:

I am pleased to share with you the 2002-2003 Program Plan for the Coalition. It offers an ambitious and timely agenda of efforts for this program year, presents a snapshot of our current initiatives, and situates these within the broader framework of our programmatic approach to the opportunities of networked information and advanced information technology for scholarship. I hope that you will find the Program Plan both personally helpful and valuable as a tool for communicating the scope and focus of the Coalition's work to others within your organization and beyond.

It seems to me that there is growing realization that we are entering a new and transformative era of technology deployment. Technology is changing the way we conduct scholarship and approach teaching and learning. Two very important reports have appeared this year that represent milestones in documenting these changes and seek to understand how information technology and large-scale digital content are changing our institutions and what this means for the future. The first is a report on cyberinfrastructure to support the conduct of science, produced by an NSF committee chaired by Dan Atkins. Although the specific focus of the report is on science, I believe that many of its points are applicable to all areas of scholarly work. The second report is titled "Preparing for the Revolution: Information Technology and the Future of the Research University" and was issued by a National Research Council committee chaired by Jim Duderstadt, the president emeritus of the University of Michigan. This study takes a very broad view of issues related to higher education, but recognizes technology developments as a key agent of change.

These opportunities and developments—the transformation of scholarship and of teaching and learning—are central to the mission and program of CNI.

On our campuses, it's clear that the computing environment has been fundamentally restructured by the deployment of new classes of systems such as portals, learning management systems, and institutional repositories. There's still a great deal to sort out about standards, interfaces, best practices, architectural models, organizational roles and responsibilities, and information management as we try to understand and exploit these new developments. I expect that CNI will play a critical role in this environment, and you'll see emphasis on these developments throughout the 2002-2003 Program Plan.

We are also seeing substantial changes in our core technologies. Wireless access has now been deployed on a broad scale, with the ironic effect of making the old vision of the "wired classroom" a reality; we have the increasingly ubiquitous network connections, but without the wires. Another important step has been taken with the efforts to develop what are sometimes being called "light rail" systems—dedicated networks of optical fibers, as opposed to simply bandwidth on a carrier's network—as the next generation of high performance network infrastructure for the higher education and research communities.

The network infrastructure and tools that assist in the management of networked content are maturing to the point that truly large-scale institutional initiatives are feasible. I think that the series of developments emanating from MIT have been particularly important. These include the Open CourseWare Initiative (OCW), which has now begun making teaching materials from many of MIT's courses available on the net, worldwide, without charge. OCW serves as an invitation and a challenge to all university communities to consider their mission and role in a networked information world. The DSpace institutional repository, which MIT has been developing jointly with Hewlett-Packard Corporation, has now been open-sourced and is being ported to a number of other universities with funding from the Andrew W. Mellon Foundation and other sources. I believe that institutional repositories are a key strategy for providing content infrastructure for many of the exciting developments that scholars have been pioneering in the digital environment. Understanding and shaping technical and policy developments for institutional repositories will be a critical part of the Coalition's program going forward. And the Open Knowledge Initiative (OKI), which involves MIT and a growing list of other higher education institutions, is developing an architectural roadmap for a new generation of interoperable teaching and learning tools and systems. In OKI's partnership with the Instructional Management System (IMS) initiative, we are seeing the context for the creation and management of learning objects on a broad scale.

I've already mentioned some of CNI's programmatic initiatives for 2002-2003 in the context of broader developments, and you can find all of the specifics in the attached Program Plan, but I do want to briefly highlight a few other accomplishments and prospects here.

The work on the development of the Open Archives Metadata Harvesting Protocol, which we have supported jointly with the Digital Library Federation (DLF), is now complete. I'm very proud of this effort, which is the product of a great deal of hard work by a talented technical team

led by Carl Lagoze and Herbert Van de Sompel. The project is important not only in its own right, in giving us a critical infrastructure component that is now seeing wide deployment in digital collections, institutional repositories, and other settings, but also as a model for how we might pursue rapid, low-cost, high-payoff technical infrastructure development going forward.

Since the late 1990s, the Coalition, working with an array of partner organizations, has been addressing issues involved in access management for information resources. This is an area where policy, economic, and technical issues come together in very complex ways, where successful approaches need to be developed as large-scale, multi-purpose infrastructure, and where progress has necessarily been gradual. One of the major efforts in this area has been the development of the Shibboleth distributed authorization system as part of the Internet2 middleware project and the NSF-sponsored National Middleware Initiative (NMI). I am very pleased to report that Shibboleth, which is designed from the ground up to consider privacy issues as an integral part of the distributed authentication framework, is now in experimental field trials involving a number of universities and content providers. CNI is working closely with Internet2 to help move this deployment forward and will also provide a key forum for sharing the results of these experiments.

Institutional repositories are a new and strategic component of the evolving networked information landscape. From the CNI program perspective institutional repositories are part of a broader movement to exercise stewardship over digital content created by the higher education and research communities, and CNI has a number of other activities that are intended to advance this objective. We are working with Internet2 on a guide to the digital capture of performance events—for example music, dance, or theater performances or symposia hosted by an institution. I expect that such recordings will be important contributions to institutional repositories. Recently, the Coalition has also been doing some work on rights management for digital content in the research and higher education context. Our fundamental concern in this area—and I believe it is the core concern for higher education and research broadly—is in documenting rights and permissions to facilitate dissemination and reuse of content.

In 2002 all of the organizations involved in the Coalition—including universities, libraries and our commercial sector members in the information and technology industries—have continued to struggle with a very difficult economic environment. The responses to these problems have emphasized greater reliance on collaboration both within and across organizations, strategic investments, and strategic use of information resources and technologies. The Coalition will continue to be an important force in advancing these responses. 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 was the period in which we made large scale and irrevocable commitments to new approaches that we validated and refined in pilot projects and experiments in the preceding decade. I am proud that CNI has played a significant role in preparing the groundwork and developing the community understanding and expertise for these transformative changes that now seem immanent.

In closing, I want to thank you for your 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. 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. Over the past year, I have been fortunate to be able to visit with a number of CNI member organizations and to engage their communities. These opportunities are valuable and exciting for me, and I always come away with a new recognition of the energy, innovation, and creativity at work throughout the member institutions that make up the Task Force. I hope to have many more such opportunities in the coming year.

I greatly appreciate all those who have contributed to the work of the Coalition through participation in projects 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 was founded in 1990 by the Association of Research Libraries (ARL), CAUSE, and Educom. ARL represents the research libraries of North America. CAUSE and Educom were organizations concerned with the use of information technology in higher education. In 1998, CAUSE and Educom merged to create the new EDUCAUSE organization, which has broad membership from the higher education community and their technology partners.

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 2002-2003: once in San Antonio, Texas, December 5-6, 2002, and again in Washington, DC, April 28-29, 2003, in conjunction with the EDUCAUSE Networking 2003 meeting.

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 provide additional perspectives. The executive directors of ARL, EDUCAUSE, and CNI serve as *ex officio* members of the committee.

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 that 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 impacts 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 2002-2003 are described below; most build upon and continue earlier 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 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 2002-2003 Program Plan should be viewed as a snapshot of our thinking about priorities and opportunities as of December 2002 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 World Wide Web Consortium and 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 National Initiative for a Networked Cultural Heritage (NINCH), a broad coalition of arts, humanities and social science groups. CNI, the American Council of Learned Societies (ACLS), and the Getty Information Institute founded NINCH in 1996, and CNI is represented on its board. NINCH initiatives of particular relevance include its Copyright Town Meetings and the development of the NINCH Guide to Good Practice in the Digital Representation of Cultural Heritage Materials.

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

The Computer Interchange of Museum Information (CIMI) project is focused on standards, pilot projects, and research to support network-based access and exchange of museum and cultural heritage information. CNI is a CIMI member and is represented on CIMI's executive committee.

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.

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 twice-annual Task Force meetings, scheduled for December 5-6, 2002, in San Antonio, Texas, and April 28-29, 2003, in Washington, DC, 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. The last conference was held June 25-27, 2002, in Edinburgh, Scotland. Planning is underway for another conference to be held in 2004.

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 EDUCAUSE Networking 2003 meeting, to be held in Washington, DC, April 30-May 1, 2003, immediately following the Spring 2003 CNI Task Force meeting and the Joint Conference on Digital Libraries, scheduled for May 27-31, 2003, in Houston, Texas.

## ■ DEVELOPING AND MANAGING NETWORKED INFORMATION CONTENT

CNI has broad interests in all types of digital content—for example, text, images, data, and mixed media objects—that can be used in conjunction with research and education, and we provide a forum for exchange of information on leading projects in this arena. In addition, we track developments and promote strategies for creation of digital libraries and for 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 issues, economic frameworks, and scholarly communication developments.

We have reorganized many of our initiatives in the content area around the broad theme of the stewardship of institutional content resources, a central role for higher education institutions and libraries in the digital age. This includes efforts to capture and structure digital content, such as CNI's participation with Internet2 in the Performance Archive and Retrieval Working Group, which should make draft guidelines for the digital recording of a wide range of performance events available for public review and comment during this program year. The Coalition's continuing effort to understand and highlight experiments in the creation of new types of scholarly works for the digital medium, such as successors to the printed scholarly monograph, also contributes to this theme, as does 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. Metadata schemes such as METS are fundamental enabling technology for describing and organizing complex digital content resources, and we will work with our partners at the Digital Library Federation (DLF) to advance this standards effort. Finally, our work in stewardship of institutional content

*INSTITUTIONAL  
CONTENT  
RESOURCES AND  
REPOSITORIES*

*METADATA AND  
DIGITAL RIGHTS  
MANAGEMENT*

resources also encompasses efforts to understand and share best practices surrounding all aspects of institutional repositories, from policy to system architecture, building on collaborations such as the repositories workshop that we sponsored with the Association of Research Libraries (ARL) and SPARC in October 2002.

Tracking rights and permissions is central 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 9, 2002, NSF-funded workshop that CNI co-sponsored with Internet2, ViDe and SURF, to advance a program for the documentation and management of rights related to digital content in educational and other non-commercial settings.

*DIGITAL  
PRESERVATION*

Also closely related to the work on stewardship of institutional content resources is the Coalition's continued work on preservation of digital content. This is a central issue in the shift to network-based scholarly communication, and has also now emerged as a broad and fundamental social and public policy issue. CNI continues to work with ARL and other partner organizations, including DLF, the Council on Library and Information Resources (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 its 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 ECURE conferences, the most recent of which was held in October 2002. Developments in digital preservation will continue to be highlighted at Task Force meetings.

*LEARNING  
MANAGEMENT  
SYSTEMS*

Learning Support and Management Systems have emerged as another key architectural and strategic component within the new digital landscape for scholarship. The Coalition has identified three key areas of interest here. The first is to understand and clarify the architectural, technical, and service-based relationships among learning management systems, library systems, and library-provided digital content. The second is to work with partners such as the Instructional Management System (IMS) initiative and the Open Knowledge Initiative (OKI) to clarify the relationships between learning management systems and institutional repositories. The third area of interest is to explore information management issues raised by learning management systems; in this connection, we have authored a paper, which will be available through the EDUCAUSE Center for Applied Research (ECAR) program in late 2002, that examines policy questions related to the reuse of content contained in course sites in the learning management system context. Sessions at the fall and spring Task Force meetings will examine all three of these areas.

*COMPUTER SCIENCE  
AND THE  
HUMANITIES*

CNI is participating with NINCH, the U.S. National Research Council, and the American Council of Learned Societies in a Steering Committee for Computer Science and the Humanities that seeks to promote the application of the information sciences to the understanding of the human record. The Steering Committee has obtained funding from the Carnegie Corporation for the first in a series of major conferences to bring together computer scientists and humanities scholars to advance the use of information technologies in humanities research through collaboration between these disciplines. This conference is scheduled for January 2003, in Washington, DC.



*KNOWLEDGE TOOLS*

Finally, in the 2002-2003 program year CNI will initiate work in best practices for the construction and exploitation of structured and reusable knowledge objects. This project will explore ways in which reference works and knowledge tools such as dictionaries, encyclopedias, gazetteers, vocabularies, thesauri, and taxonomies can be represented in digital form in such a way that they can provide reusable building blocks for the development of digital libraries, with the goal of providing guidance to authors, funding agencies, and digital library developers. We will focus particularly on approaches that will facilitate the computational reuse and integration of such works into emerging digital knowledge environments, and on contributions that developing technologies from areas such as computational linguistics might play. CNI expects to hold at least one workshop in this area in 2003.

### ■ TRANSFORMING ORGANIZATIONS, PROFESSIONS, AND INDIVIDUALS

*COLLABORATIVE  
FACILITIES*

In 2002-2003 we will continue the partnership with Dartmouth College, launched in the last program year, to develop a Web site featuring plans and related materials for 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 at Dartmouth includes planning documents, architectural layouts, programmatic descriptions, and other information provided by institutions active in such projects. We want to substantially enlarge the number of institutions that are contributing to the Dartmouth site, and will also continue to schedule project briefings at the Task Force meetings and at the EDUCAUSE annual conference highlighting initiatives in this area. During 2002-2003 we will also be working with the National Institute for Technology and Liberal Education (NITLE) consortium of liberal arts colleges on workshops on planning technology-enabled teaching and learning spaces.

*TRANSFORMATIVE  
ASSESSMENT  
PROJECT*

CNI will continue its work on the Transformative Assessment Project, which was launched in 2001-2002 in collaboration with the EDUCAUSE National Learning Infrastructure Initiative (NLII) and the TLT Group. This program focuses on using assessment to assist in transforming teaching and learning using technology; our work in 2001-2002 combined an in-person workshop with follow-on online course/community services. In 2002-2003 we expect to hold a second round of the program with an additional partner, the American Association for Higher Education (AAHE) Assessment Forum, in late spring 2003. We also seek to re-shape the online course/community system as a venue for peer development and consultation in a structured environment rather than as a venue in which to learn about the techniques of assessment, recognizing that the key audience for this system is a committed group of early adopters of transformational assessment approaches.

*EXECUTIVE  
ROUNDTABLE*

Finally, in 2002-2003 CNI will inaugurate a new program called the Executive Roundtable. Building on the theme of collaboration between librarians and information technologists that is at the foundation of the Coalition, this program will assemble pairs of chief librarians and information technology officers (plus

perhaps one additional representative from each participating organization, depending on topic) from about ten organizations per Task Force meeting on an invitational basis for a focused two- to three-hour discussion of a specific topic. Topics may include institutional repositories, learning management systems, the role of university presses, and privacy and security issues. Initially, these sessions will take place on the first morning of the Task Force meetings. We hope to hold the first such session at the Spring 2003 meeting in Washington, DC. If there is sufficient interest, we may extend the Executive Roundtables to other venues.

## ■ 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, CNI is closely tracking a wide range of developments in areas as diverse as identifiers, digital books, metadata standards, 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, the community is 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 also recognize the need to integrate new and existing resources with the emerging technologies of learning management systems. The Coalition supports 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 spring 2002 we sponsored a workshop in collaboration with ARL to begin to map out developments in this area. One outcome of the workshop was 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 above. Our ongoing work in the architectural contexts area is characterized by an emphasis on access and reuse of content from a user’s perspective; it deals specifically with portals, search engines, and the role of the open archives metadata harvesting technology. We will hold a follow-on workshop in 2003 to survey these issues more specifically.

### OPEN ARCHIVES METADATA HARVESTING INITIATIVE

In 2000 CNI launched a major new initiative in the infrastructure and standards area with its investment (jointly with DLF) in the Open Archives Initiative (OAI). The goal of this work, which grew out of a meeting held in Santa Fe in 1999 to federate e-print archives, is to develop the necessary standards and infrastructure to permit repository sites to expose metadata for harvesting and subsequent reuse by upper-layer applications. The technical specifications can be used to federate e-print archives, publisher Web sites, or collections of digital objects created from special collections or museum holdings, for example. A clearinghouse for the project was established at Cornell University under the management of Carl

Lagoze and Herbert Van de Sompel, and a steering committee and technical committee were set up to guide the work. The first release of the revised OAI technical specifications took place in December 2000, with meetings in the United States and Europe in early 2001 to review this work. A "final" version of the OAI technical specifications was released in 2002. A large number of implementation projects are now underway, including a group sponsored by the Andrew W. Mellon Foundation in the United States and several European-funded projects. CNI's work in this area will conclude around the end of 2002, although we will continue to feature work on applications of the metadata harvesting protocol at Task Force meetings in the coming year and may charter some additional work focused on supporting specific applications as required.

*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 DLF we will continue to illuminate many of the planning, operational, and budgetary issues involved in implementing public key infrastructure (PKI). 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; CNI, DLF, and Internet2 jointly sponsored a workshop in the spring of 2002 to present this work to the content provider community, and in the fall of 2002 Shibboleth entered initial field trials that involve a number of universities and content providers. During the 2002-2003 program year we will advance these field trials, and report on early experiences through the Task Force meetings. Another high priority for CNI in this area is to update our paper on authentication and access management to reflect current developments and provide our community with an accessible summary of the state of the art.

A related new initiative will examine content-related security issues, with a particular focus on issues at CNI member institutions that license access to content resources on behalf of their communities. We are seeing the emergence of complex new threats in this area that call for new strategies and give rise to new responsibilities for institutions that license such resources. The Coalition believes that these issues should be reflected as part of the developing emphasis on systems and network security in higher education.

*IMAGE RETRIEVAL  
BENCHMARK  
DATABASE*

Another infrastructure initiative, launched in late 2000, addresses current problems in image retrieval systems for scholarly content. CLIR is underwriting this work, and CNI chairs the planning group. The fundamental problem is that there are a wide range of proposed metadata approaches for image content (many of which are very expensive to apply), and many prototype systems for retrieving images based either on metadata or content analysis, or some combination of the two strategies. What seems to be needed is a benchmark database (including metadata) that can allow system developers to explore both the retrieval effectiveness and cost-performance tradeoffs involved in various metadata approaches and system designs. The goal is to design a benchmark database

resource that might serve as infrastructure for the communities that develop image databases and retrieval systems in much the same way as the TREC databases have served the text retrieval community. During 2000-2001 we convened a workshop to explore design alternatives; we expect that this project will conclude in early 2003 after presentation and discussion of a draft report at the Fall 2002 Task Force meeting and the subsequent distribution of a final report.

■ **MEMBERSHIP LIST** (As of November 2002)

*Charter members are listed in italics.*

American Chemical Society  
 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  
 Boston College  
*Boston Public Library*  
 Brigham Young University  
 British Library  
*Brown University*  
 Bucknell University  
 California Institute of Technology  
 California State University, Bakersfield  
*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  
*City University of New York*  
 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  
 Dynamic Diagrams/ingenta, Inc.  
 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 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  
*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  
Morino Institute  
*National Agricultural Library*  
National Archives and Records Administration  
National Institute for Technology and Liberal Education (NITLE)  
National Institutes of Health Library  
National Library of Australia  
*National Library of Canada*  
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  
Northern Illinois University  
*Northwestern University*  
OCLC, Inc.  
*Ohio State University*  
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Old Dominion University  
Oregon State University  
*Pennsylvania State University*  
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Pro Quest Information and Learning  
Public Library Association  
*Queen's University*  
Queens Borough Public Library  
Questia Media, Inc.  
*Rensselaer Polytechnic Institute*  
*Research Libraries Group, Inc.*  
*Rice University*  
*Rochester Institute of Technology*  
*Rutgers University*  
SilverPlatter Information, Ltd.  
*Smithsonian Institution*  
Society of American Archivists  
*Southern Illinois University at Carbondale*  
*Southern Methodist University*  
Special Libraries Association  
*Stanford University*  
State University of New York at Albany  
*State University of New York, System Administration*  
*State University System of Florida*  
Sun Microsystems, Inc.  
Swets Blackwell  
*Syracuse University*  
Temple University  
Texas A&M University  
Texas Tech University  
TriCollege Libraries Consortium  
Tufts University  
United States Department of Education,  
National Library of Education  
United States Government Printing Office  
University of Alabama  
University of Alaska  
*University of Arizona*  
University of British Columbia  
*University at Buffalo, State University of New York*  
*University of California, Berkeley*  
*University of California, Davis*  
*University of California, Irvine*  
*University of California, Los Angeles*  
University of California, Merced  
*University of California, Office of the President*  
*University of California, San Diego*  
*University of California, San Francisco*  
*University of California, Santa Barbara*  
University of Central Florida  
*University of Chicago*  
*University of Colorado at Boulder*  
University of Connecticut  
*University of Delaware*  
University of Denver  
University of Florida  
University of Georgia  
University of Hawaii  
University of Houston

*University of Illinois at Chicago*  
*University of Illinois at Urbana-Champaign*  
*University of Iowa*  
*University of Kansas*  
*University of Kentucky*  
*University of Louisville*  
*University of Manitoba*  
*University of Maryland at College Park*  
*University of Massachusetts Amherst*  
*University of Miami*  
*University of Michigan*  
*University of Minnesota*  
*University of Mississippi*  
*University of Missouri at Columbia*  
*University of Montana*  
*University of Nebraska at Lincoln*  
*University of Nevada, Las Vegas*  
*University of Nevada, Reno*  
*University of North Carolina, Chapel Hill*  
*University of North Carolina (System)*  
*University of North Dakota*  
*University of Notre Dame*  
*University of Oklahoma*  
*University of Oregon*  
*University of Pennsylvania*  
*University of Pittsburgh*  
*University of Rochester*  
*University of South Carolina*  
*University of Southern California*  
*University of Tennessee*  
*University of Texas at Arlington*  
*University of Texas at Austin*  
*University of Toronto*  
*University of Utah*  
*University of Vermont*  
*University of Virginia*  
*University of Washington*  
*University of Wisconsin at Madison*  
*University of Wisconsin System*  
*University System of Georgia*  
*Vanderbilt University*  
*Villanova University*  
*Virginia Commonwealth University*  
*Virginia Polytechnic Institute and State University*  
*VTLS, Inc.*  
*Washington Research Library Consortium*  
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*Wesleyan University*  
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