Foreword

The EDUCAUSE Center for Applied Research (ECAR) was launched on January 1, 2002, to create a body of research and analysis on important issues at the intersection of higher education and information technology. ECAR is fulfilling its mission through a program of symposia and through the publication of
◆ biweekly research bulletins oriented to senior campus functional executives;
◆ detailed studies designed to identify trends, directions, and practices in an analytically robust fashion;
◆ case studies showcasing campus activities and highlighting effective practices, lessons learned, and other insights from campus leaders’ practical experience; and
◆ roadmaps designed to help senior executives quickly grasp the core of important technology issues.

Since ECAR’s inception, six symposia have been held and more than 125 research publications have been issued.

IT Networking in Higher Education

During the past three decades, providing robust, high-quality networking services to their constituents has evolved as a priority for college and university administrators. In the early days, when BITNet was the norm, we marveled that electronic mail could be delivered in a day or so—or even hours—if the forwarding scheme worked optimally. Over time, people discovered e-mail’s usefulness and the paramount power of the network, and the value of these services continues to increase daily.

During the past 10 years, the network has evolved into a mission-critical resource in higher education; some would say it is as essential to institutional success as libraries, faculty, and buildings. Whether supporting a scholar’s research or enhancing education, the network and its services are central to the enterprise.

Today, campus networking strategies go far beyond merely installing a high-capacity connection to the Internet or to Internet2. Campus networks are strategic, indispensable, and technology rich. Networking strategies must deal with deployment issues both on campus and among multiple institutions in ways not envisioned 15 or even 10 years ago. For example:
◆ On-campus networks are integrating (converging) voice, data, and video.
◆ Increasingly, science curricula and content can be found on the network.
◆ Many large funded research and curricular projects are either interinstitutional or multi-institutional.
◆ Distance or distributed education strategies are becoming mission central for many institutions.
◆ An expanding number of higher education and K–12 science projects use the network for collaboration purposes.

It’s no wonder that campus IT executives are contemplating strategies to ensure that
their constituencies can assume “dial-tone reliability” and availability of networked resources and services in a converged network environment. Understanding the network’s evolution and its future is the rationale for this study.

Despite the national attention and ongoing efforts of EDUCAUSE, Internet2, and other organizations to foster cross-communication about networking in higher education, our knowledge of the current state and future plans of college and university networking has been largely anecdotal. Indeed, we could write extensively about such terms as authentication, encryption, H.323, data collaboration, video directories, numbering schemes, converged services, organizational structures, financing models, Session Initiation Protocol, standards, certificates, bandwidth management, quality of service, and streaming technologies and not begin to cover the topic. Furthermore, although campus initiatives continue to advance understanding and deployment of networking technologies, universities and colleges have limited summative information on implementation trends in networking technologies to support their instructional, research, and community service missions. It is interesting to see how things have changed. Consider Educom’s (now EDUCAUSE) effort in 1988 to inform the U.S. higher education establishment about campus networking strategies. Not one of the technologies and strategies we’ve just listed (or dozens more like them) appeared in the text.¹

EDUCAUSE has long been a major participant in national efforts to advance higher education’s communications and computing initiatives, with noteworthy results. The outcome of an EDUCAUSE/NET@EDU Voice over IP (VoIP) Summit sponsored by the National Science Foundation offers an excellent example. The resulting report, which lists more than 50 issues facing campus executives today, notes that VoIP is only one facet of campus networking. These issues represent a framework for a much larger set of items that affect our universities’ ability to support their research, science, and education agendas.² Of particular note are four EDUCAUSE NET@EDU working groups addressing the issues of integrated communications strategies, broadband policy, wireless, and security. These working groups address themes that are central to campus networking today and in the future, and readers will find elements of each contained in this study’s outcomes.

This ECAR study considers a wide range of campus networking issues and has engaged a broad audience, from large public research institutions to small private colleges. It is designed to provide a fact-based and national perspective on higher education’s networking environment that can ultimately improve networking efforts. It establishes a baseline for higher education networking—where things stand today and how they’re evolving. Institutions will be able to compare their investments and practices with those of peer institutions. We’ve obtained results at several levels: planning and policy, technical solutions, operations, and future trends.

**Important Contributions**

I was honored when asked more than four years ago to serve as chair of the EDUCAUSE/NET@EDU Integrated Communications Strategies (ICS) Working Group. Eighteen months ago, ECAR asked the ICS for guidance on a study that would assess the national status of higher education networking. This important initiative is central to ICS’s work—that of understanding the status of networking in our colleges and universities. My colleagues on the ICS steering committee provided significant contributions to this work: co-chair Jim Jokl, University of Virginia; Doug Carlson, New York University; Tammy Closs, Georgetown University; Mike Enyeart, Indiana University;
Mark Katsouros, University of Maryland; Holly King, Northwestern University; Chris Peabody, L Robert Kimball & Associates; Steve Updegrove, Penn State University; Jose Valdes, Colorado State University; and Wendy Wigen, EDUCAUSE staff liaison. Special note goes to Mark Luker, EDUCAUSE vice president and head of the Net@EDU program, for his continued support of the working groups and especially for the initiative that launched this study.

ECAR research studies are the result of a team effort. Judith A. Pirani and Gail Salaway, ECAR Fellows, coauthored this report with guidance from EDUCAUSE Vice President Richard Katz. John Voloudakis, former ECAR fellow and now with Bearing Point, spearheaded the creation of the IT networking survey, the results of which form the foundation of this report. Others volunteered to participate in our networking case studies: R. David Vernon and Scott Sheavly of Cornell University, Steve Relyea and Elazar Harel of the University of California at San Diego, and Jack Duwe of the University of Wisconsin at Madison shared their efforts in creating new network funding models; Daniel Sidebottom of the State University of New York College at Cortland made his staff available for an on-site review of SUNY Cortland’s VoIP service; and SURF, a Dutch higher education and research partnership, collaborated with EDUCAUSE on a case study of higher education applications of mobile technology in The Netherlands.

Of course, the real team in any ECAR study is the EDUCAUSE community. The ability to develop a good understanding of practices, policies, and directions in higher education depends on the goodwill of ECAR’s associates. Hundreds of busy chief information officers and networking officers shared their experiences and expertise by responding to our online survey, and dozens more generously gave their time for interviews. In addition, at the summer 2004 ECAR symposium, Dewitt Latimer of Notre Dame, Douglas Hurley of the University of Memphis, Karen Steinbrenner of the University of North Carolina at Charlotte, and Eric Jackson of Morehouse University participated in an informal discussion on critical networking issues and provided insight and direction for the study. This report also would not have been possible without the wonderful support of the EDUCAUSE staff. Its commitment to excellence is evident in all that they do. Thank you.

Finally, ECAR, while enjoying the support of more than 300 college and university subscribers, continues to depend on the generous support of a small and dedicated cadre of corporate sponsors. Datatel Inc., HP, Microsoft, Oracle, PeopleSoft, Sungard-SCT, and Sungard Collegis not only provide direct financial support but are also generous with their advice and skilled resources.

This study reminds us that the opportunities and challenges networking poses demand both technological and cultural responses. Networking in higher education is ultimately a story of people at the user, management, and leadership levels. In the end, realizing higher education’s networking potential will depend on creativity, leadership, investment, vision, and technical sophistication, combined with communication, education, awareness, and training. Networking, with its awesome power to catalyze change and strengthen what we already do, is in its infancy. It’s going to be a great ride!

E. Michael Staman, Macon State College; Co-Chair, Net@EDU Integrated Communications Strategies Working Group

Endnotes