
Recursive Reviews

Halbert, Martin. "The Challenge of Multimedia Networking." The Public-Access Computer Systems Review 4, no. 1 (1993): 18-23. To retrieve this file, send the following e-mail message to LISTSERV@UHUPVM1 or LISTSERV@UHUPVM1.UH.EDU: GET HALBERT PRV4N1 F=MAIL.

There is no question that computer applications such as word processing, electronic mail, and desktop publishing have changed the way people work. These computer applications have enhanced users' capacity for communication and have improved their productivity. The success of these applications has prompted both vendors and researchers to continue to seek new ways to further advance the information technology revolution. Enter the latest innovation: networked multimedia systems.

Networked multimedia systems convey information in multiple formats: text, graphics, video, audio, numerical data, computer simulations, and so forth. Advocates of these systems argue that they are the next logical step in human communication; however, modifying our current networks to accommodate the variety of proposed media formats will present significant technical difficulties. The articles reviewed in this column examine both the promise and the peril of developing networked multimedia systems.

Koffman, Gail. "Strike Up The Bandwidth." LAN Magazine 7, no. 11 (November 1992): 38-54. (ISSN 0898-0012)

The technology of multimedia is proceeding along a familiar path: applications developed initially for stand-alone systems are now being networked. Koffman traces the recent developments from the MPC (Multimedia Personal Computer) standard to efforts by vendors to network MPC software.

The big problem, of course, is LAN bottlenecks. Networks that link local groups of personal computers are typically designed around the concept of breaking transmissions into small chunks (or "packets"), sending these packets to the destination as network traffic permits, and, at the destination, reconstituting the transmission from the packets. The problem is that individual packets may be temporarily delayed on the way by network "traffic jams." If the transmission is a live video image, the result is a choppy, halting movie that is completely unsatisfactory for viewing. Some method of providing direct, dedicated video feeds or improving the network bandwidth is needed to solve this problem.

Koffman gives an excellent overview of the issues, the industry standards, and the current thinking on possible

solutions, especially ATM technology, which is discussed later in this column (see the review of the article from PC Magazine).

Polilli, Steve. "Coming to Networks Near You: Multimedia Moves Toward Mainstream with Server Hosting Video, Sound." Software Magazine 12, no. 13 (September 15, 1992): 40-45. (ISSN 0897-8085)

While many technical questions about how multimedia can effectively be incorporated into networks continue to plague the industry, there is no question about whether vendors are interested in trying. Virtually all of them are attempting to solve the technical problems of networked multimedia through new products.

Polilli reviews the issues from several different perspectives, including the technical problems and the potential for improving instruction in the educational setting. Examples of networked multimedia use in colleges are also given.

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McQuillan, John M. "Multimedia Networking: An Applications Portfolio." Data Communications 21, no. 12 (September 1992): 85-94. (ISSN 0363-6399)

Into what categories do the many applications of networked multimedia fall? McQuillan sets out to organize the numerous current networked multimedia projects into broad classes, such as desktop publishing, videoconferencing, self-directed learning, and so on.

The recurring problem with each of these applications is the cost of solving network bandwidth difficulties. Multimedia technology has a wide variety of promising uses in any organization, but right now the cost of implementation is the major barrier.

FitzGerald, Michael, and Henry Olsen. "Genesis of a Multimedia Social Sciences Curriculum." EDUCOM Review 28, no. 1 (January/February 1993): 36-41. (ISSN 1045-9146)

Even if technical problems are solved, development of useful multimedia resources is daunting. FitzGerald and Olsen's article (part of a special issue of the EDUCOM Review focusing on multimedia) provides a good picture of the challenges involved in working multimedia into the college curriculum. While the applications discussed are largely not networked, they still require a significant effort to fund and develop. The difficulties associated with a similar effort involving the increased complexity and expense of networked resources are easy to imagine.

McHale, John. "The Hub of the Future." LAN Technology 8, no. 11 (October 15, 1992): 23-24. (ISSN 8750-9482)

The next generation of networking systems is being developed now for use in the mid- to late 1990s. These systems are being designed around the needs of multimedia and other high-bandwidth LAN applications.

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McHale provides an excellent commentary on the requirements that multimedia applications will place on LAN hubs. Hubs must become much more than simple wiring concentration points. They must be able to intelligently manage heterogenous networks that incorporate demanding new applications like multimedia systems.

Greenfield, David. "Empire Builders: Six Enterprise Hubs." PC Magazine 11, no. 19 (November 10, 1992): 291-358. (ISSN 0888-8507)

This article samples some of the newer network hubs that try to address the demands of new network applications like multimedia. These hubs provide support for Ethernet, FDDI, Token-Ring and SNMP (Simple Network Management Protocol); they possess a modular chassis; and they have an internetworking module. Unfortunately, none of them can really guarantee isochronous (uninterrupted) delivery of real-time, high-bandwidth data like video feeds.

FDDI is currently the best of the available network technologies, but it requires upgrading to the FDDI II standard (now under development but unavailable) to approach isochronous transmission capabilities.

ATM (Asynchronous Transfer Mode) network technology, currently being developed by most major network vendors, will provide the switched isochronous high-bandwidth capabilities needed for serious multimedia networking applications. ATM technology will probably be available for (somewhat) reasonable prices around 1995. Until then, the so-called enterprise hubs may be the best technology available for multimedia experiments.

Bly, Sara A., Steve R. Harrison, and Susan Irwin. "Media Spaces: Bringing People Together in a Video, Audio, and Computing Environment." Communications of the ACM 36, no. 1 (January 1993): 28-47. (ISSN 0001-0782)

What will it be like when all this multimedia technology shows up on our networks? The January 1993 issue of the Communications of the ACM focuses on examples of multimedia in the workplace, and it includes an article on a networked environment created at the Xerox Palo Alto Research Center (PARC).

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Research in advanced workgroup applications at Xerox PARC resulted in a project called Media Spaces. This project was

designed to completely integrate videoconferencing technology into the working environments of geographically separated members of a research group. The project proposed to study how videoconferencing technology could support collaboration. The project came to many unexpected conclusions about what networked multimedia technology was good for and what it was not good for. In order to be successful, the project design had to be shaped by the collaboration style of the study group. Unanticipated problems cropped up related to equipment control, interface design, and system scaling. Despite these problems, however, the Media Spaces project was perceived as a great success in exploring remote collaboration through technology. The project provides a foretaste of the kinds of working environments that will emerge when networked multimedia applications become commonplace.

Arfman, Josina M., and Peter Roden. "Project Athena: Supporting Distributed Computing at MIT." IBM Systems Journal 31, no. 3 (September 1992): 550-564. (ISSN 0018-8670)

The eight-year Project Athena effort at MIT was probably the most influential experiment in distributed computing technology during the last decade. This extensive review of the project includes a perspective on the issues of networking multimedia during the development of X Windows and Athena MUSE. The technology developed in the course of Project Athena continues to heavily influence work on distributed computing and will contribute significantly to the shape of networked multimedia systems in the future.

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Freed, Ned. "MIME Speaks Out." LAN Magazine 7, no. 7 (July 1992): 67-74. (ISSN 0898-0012)

The purpose of the MIME (Multipurpose Internet Mail Extension) protocol is to enable Internet electronic mail messages to contain multiple component parts and media formats. Electronic mail sent over the Internet is currently limited to straight text. Binary files can be sent only by first encoding them as text files (using many nonstandard methods) and then decoding them after receipt. MIME enables the routine transmission of multimedia messages containing video, audio, PostScript, and other formats. Broad access to networked multimedia will occur when MIME becomes widely used; however, it may be years before this happens.

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