STORAGE NETWORKS (p. 7) “Back-end storage networks represent a newly defined and rapidly developing form of computer networking. This type of network is being developed to handle the rapidly changing technologies of devices and systems, the increased performance requirements, the increasing complication and sophistication of interconnections and control, and the constant demand for improved reliability and availability in computer systems. … Transmission rates in the hundreds of megabits per second range for hundreds of nodes or stations typify the increased performance requirements for these back-end networks.”

NETWORK COMPATIBILITY (p. 17) “A final issue in back-end networks is the matter of compatibility. A number of HYPERchannel users have connected CPUs and peripherals from different manufacturers, proving that concepts like the back-end storage system have just as much of a place in a mixed environment as in a compatible one. Looking beyond program and software compatibility, we find a largely incompatible data environment in which conversion between character codes, while useful, barely scratches the surface.”

LOCAL NETWORKS (p. 18) “Local networks have evolved in response to a number of needs. An organization’s computing installation often requires heterogeneous mainframes and/or devices from a multiplicity of manufacturers, a ‘fail-soft’ feature (so that failure of a device or a battery of devices does not terminate all processing), and distributed computing and distributed control. Thus, the local network can be incrementally augmented and yet allow any device (mainframe) from any vendor to be incorporated into the installation.”

NETWORK SYSTEMS (p. 47) “This article has taken the position that the services supplied by a back-end storage network should be viewed within the framework of an evolving network operating system. Within such a framework design issues for an NOS and a protocol structure to support it have been examined. One does not have to create the NOS all at once, but can work toward such a goal. One important value of such an approach is that it provides for network architecture and application evolution. It also provides the basis for a better human-engineered system.”

SEMICONDUCTORS (p. 59) “Most semiconductor industry seers will maintain that we expect to continue on the [1970s] growth curve for most if not all of the 1980’s. Whereas this will most likely be true for memories, there is some serious question if logic and linear-based designs will require the density and its attendant massive capital investment. For these types of products (such as toys, calculators, watches, microprocessor machine control devices, etc.), economics may show that the VLSI capital investment cost will not justify the cost reduction benefit to the component.”

DRAWING GRAPHS (p. 69) “Intended for research workers who are not primarily computer programmers but who nevertheless want to produce high-quality graphs for inclusion in reports, theses, and professional journals, SIMPLERLOT was designed in close collaboration with users to ensure that wherever possible the range of pictures produced relates closely to their actual requirements, and that the instructions necessary to produce their pictures relate to the manual production of graphs with which they are all familiar.”

PROTOTYPES (p. 81) “If we set out to build an operational prototype rather than the production version first time out, we would have the opportunity to maintain the customer-designer dialog after the initial agreement on the specification. This approach has the advantage that the customer cannot say the system is not correct just because the prototype doesn’t match his requirements. Instead he can point out what changes of the prototype he would like in the production version and do so with a great deal more precision because there is something concrete on which to base the discussion. The customer would acquire more confidence in the software engineer, and a large number of ‘maintenance’ programmers would obtain a justified rise in status and self-esteem.”

INFRARED COMPUTING (p. 90) “Astronomers started out using the naked eye some 10,000 years ago, advanced to telescopes in the time of Galileo, and began serious observations in the infrared band of the electromagnetic spectrum only a generation ago. The computer-controlled infrared telescope of the University of Wyoming, located atop Jelm Mountain, was at the time of its installation (November 1977) the largest instrument specifically designed to operate in the 1- to 1000-micron (10,000-angstrom to 1-millimeter) wavelength range.”

PDFs of the articles and departments from Computer’s February 1980 and 1996 issues are available through the IEEE Computer Society’s website: www.computer.org/computer.
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COLOSSUS (p. 6) “During World War II, a group of scientists led by Max Newman, a mathematician from Cambridge University, and including Alan Turing and several thousand others, attacked the German high command’s coded messages to decrypt their contents and produce intelligence that became known as ‘Ultra.’ Working at Bletchley Park, England, these scientists achieved their goal, despite ever more complex encryption devices, by developing a series of computer-like machines culminating in an electronic marvel known as Colossus.

“The first prototype began operating in February 1944, and several additional machines were prepared in time for D-day in June 1944—two years prior to the unveiling of ENIAC. ...”

IMMIGRATION (p. 10) “The recruitment of high-tech expertise from overseas has ignited a controversy in the US computer industry, with domestic companies and computer professionals on opposite sides of the issue.

“On one side, a coalition of organizations representing about 250,000 computer professionals is lobbying hard for proposed legislation to control legal immigration of temporary workers. ...”

“On the other side of the controversy, such industry powerhouses as Intel, Hewlett-Packard, and Sun tell politicians that foreign workers are vital. ...”

WORKSTATION NETWORKS (p. 18) “High-speed networks and improved microprocessor performance are making networks of workstations an appealing vehicle for parallel computing. By relying solely on commodity hardware and software, networked workstations can offer parallel processing at a relatively low cost.”

ACCESS CONTROL (p. 38) “Roles define both the specific individuals allowed to access resources and the extent to which resources are accessed. For example, an operator role might access all computer resources but not change access permissions; a security-officer role might change permissions but have no access to resources; and an auditor role might access only audit trails. Roles are used for system administration in such network operating systems as Novell’s NetWare and Microsoft’s Windows NT.”

DISTRIBUTED CAUSALITY (p. 49) “Causality among events, more formally the causal precedence relation, is a powerful concept for reasoning, analyzing, and drawing inferences about a distributed computation. The knowledge of the causal precedence relation between processes helps programmers, designers, and the system itself solve a variety of problems in distributed computing. ...”

SOFTWARE JEWELS (p. 57) “Nevertheless, in spite of such helpful articles and many textbooks on software design, software jewels remain rare. Most of the software we see or buy is ugly, unreliable, hard to change, and certainly not something that [Niklaus] Wirth or [Edsger] Dijkstra would admire. If published papers contain the secret of success for software, shouldn’t we see more jewels?”

NET INDECENCY (p. 68) “At press time, debate over the telecommunications deregulation bill was moving toward final reconciliation between the House and Senate. Although the conclusive vote had not been taken, actions by House conferees made it likely that the final version of the bill will contain criminal sanctions against ‘indecent’ speech on the Net—sanctions much more stringent than those for print. Because of the nature of the Net, those sanctions could have far greater impact.”

OBJECT TECHNOLOGY (p. 76) “Earlier approaches to reusability, ever since McIlroy’s seminal paper, assumed that the routine would be the unit of reuse. With object technology, we have a coarser grain of decomposition: a class, the description of a set of objects characterized by applicable operations. ...”

THE CRYPTOCHIP (p. 78) “Developers say Norwegian cryptochips based on the Norsk Standard Krypto (NSK) system keep phone lines from being wiretapped, even by the government or police. With their own supersafe chip, developed after years of theoretical cryptography work, Norwegian officials will no longer depend on foreign cryptosystem standards or cryptochips.”

PROJECT TOOLS (p. 80) “Modern change management, or configuration control, tools must encompass changes affecting every kind of software deliverable and artifact: requirements, project plans, project cost estimates, contracts, design, source code, user documents, illustrations and graphics, test materials, and bug reports. Ideally, these tools would use hypertext to handle cross-references among deliverables so that when something changes, corresponding material is modified appropriately.”

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