

Preface

The increasing trend toward distributed data processing, with its networks of computers, has brought the interests of the communications and computing industries into close alignment. Issues such as communication protocols, computer network operation and management, and future technology are receiving increasing attention. In this issue of the Systems Journal, we take a closer look at this rapidly changing environment.

In the first three papers, the emerging technology of communications architecture is analyzed. These presentations are followed by papers that discuss related IBM technology. The issue concludes with a paper on the management of an existing network and an essay on technological trends.

In the fall of 1978, Dr. Lewis M. Branscomb, IBM Vice President and Chief Scientist, participated in a keynote panel at the IEEE Compton conference. Dr. Branscomb discussed the present environment in communications and computing, the challenges to be faced, and the atmosphere needed to effectively resolve those challenges. His paper is based on that presentation. Green's paper provides a background in terminology and perspective for understanding the layered architectures that are the basic rules of computer network implementation. Following this introduction, a history of public data networks, their evolution and their characteristics, is presented by Halsey, Hardy, and Powning.

Systems Network Architecture (SNA) has played an important role in the use of IBM products in data communications. SNA has grown and changed as requirements have changed. The paper by Corr and Neal explores the relation of SNA to the International Organization of Standardization (ISO) model of layered architecture and to interfaces such as X.21, HDLC, and X.25. Different ways of making SNA and X.25 work together are reviewed, and an existing SNA implementation of X.25 is described.

The evolution of SNA from a single-system to a multi-system network architecture is the subject of the paper by Gray and McNeill. Emphasis is on the new version of SNA, which extends the multi-

system computer network capability. The paper by Ahuja continues this discussion, expanding on the routing and message flow control methods of SNA.

A practical look at the development of an existing computer network is provided by Moore's paper. The computer network discussed is the one used by IBM System Communications Division laboratories. It interfaces with the other IBM networks mentioned in Branscomb's paper. A major part of Moore's paper is a discussion of measurement techniques used to control and monitor the SCD network.

The issue concludes with an essay by Frazer on the effects of present and future technology on communications and computing. Technological trends are related both to reasons for distributing data processing and to reasons for centralizing data processing. Topics discussed include large-scale integration, optical fibers, and satellites.

The growth of communication among computers has raised many questions, the answers to which will affect both communications and computer networks. Activity in such areas as the design, simulation, and control of networks is helping to define approaches to implementation. This issue only begins to touch on some of these exciting topics.

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