The need to support applications that are distributed on wide-local area networks or on multicomputer systems and that require large data transfer and low delay, drives the development of faster and more efficient ways of transporting and switching data. This work has led to the definition of new communication protocols and to the introduction in the telecommunication networks of fast packet-based data services, such as frame relay, switched multimegabit data services and asynchronous transfer mode (ATM) cell relay service.

In particular, research activity tries to overcome the limitations of traditional networking technologies. Some of the most significant limitations are:

- **Shared access.** In shared access networks all stations share a common transmission channel, which can be saturated and imposes to all the stations (such as high-speed servers and PC) to operate at the same line speed, regardless of their transmission rate. These problems suggest, for bandwidth requirements increasing to gigabit rates, networks architectures based on switches or interconnection networks (like 2D mesh networks).

- **Network latency.** The total delay, or latency, depends on the traffic characteristics of the path through the network. It has big variations and it is very hard to predict also because of the variable length of the messages. To solve the problem of latency variations small fixed-length packets are used.

- **Network addressing and routing.** Traditional networking technology has solved the problem of non-hierarchical datalink-layer addressing information through network-layer addresses and routing. This solution is complex and gives overhead for every data transmission. Moreover, every packet in a routed network is subject to a delay introduced by the route determination function. To improve performance a connection-oriented approach that separates the routing decision task from the data forwarding task can be used.

As for the multicomputer networks, the node's communication facility is the most critical with regard to system performance and depends on the network topology, the message routing and the message flow control.

The papers in this session address problems related to the design of communication protocols for LANs, to the implementation of processor network interfaces to reduce communication overhead, and to the performance of flow control schemes for 2D mesh networks used to support node's communication in multicomputer systems.

The first paper, "A New Approach to Concurrent Ring: 1 Bit Latency" by J.D. Sandoval, C. Sandoval, A. Suarez and C. Ramirez, proposes modifications to the concurrent ring protocol used in LANs based on a token ring access method. Protocol performances are obtained by simulation studies.

The second paper, "Integrating Memory and Network Accesses: A Flexible Processor-Network Interface for Efficient Application Execution" by Y.Y. Chen and C.T. King, addresses the problem of the communication overhead reduction in multicomputer systems by a suitable design of processor-network interfaces.

The third paper, "Evaluation of a Priority Flow Control Scheme for Multicomputer Networks" by A.H. Smai and H. Wu, presents and evaluates a virtual channel flow control algorithm, which can satisfy low-latency transmission time and high network throughput requirements. Different classes of messages in a 2D mesh network are considered and the proposed flow control scheme performances are given.

The last paper, "Mad-Postman: A Look-ahead Message Propagation Method for Static Bidimensional Meshes", by C. Izu, analyzes and compares three flow-control mechanisms with reference to 2D message-passing mesh networks. Network performances (average message latency and maximum throughput under a random pattern of traffic) have been obtained by simulations.