Session 4: Distributed Multimedia Systems

Chair: J.J. Garcia-Luna Aceves, SRI International

First paper: System Support for Efficiently Dynamically-Configurable Multi-Party Interactive Multimedia Applications, by Mark Moran and Riccardo Gusella

Second paper: Requirements for Network Delivery of Stored Interactive Multimedia, by Darren New, Jonathan Rosenberg, Gil Cruz, and Thomas H. Judd

Third paper: Multimedia Processing Model for a Distributed Multimedia I/O System, by Rusti Baker, Alan Downing, Kate Finn, Earl Rennison

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System Support for Efficient Dynamically-Configurable Multi-Party Interactive Multimedia Applications

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Abstract. An important new class of communication-oriented applications are described as multi-party interactive multimedia applications. In this paper, we examine the programming abstractions, system support and communication services required by these applications; evaluate existing support; and propose strategies for improving support by combining current systems with new designs. We have taken a holistic approach to this problem by considering the local system and communication architecture together in deciding where to implement each service, and in designing interfaces between components.

1 Introduction

Continuing advances in processing power, display capability, and communication capacity are enabling a class of demanding, communication-oriented applications that allow two or more geographically separated persons to interact as if they were at the same location. Escalating time and travel costs and the increasing need, in global markets, of personal and group communication, make these applications highly desirable. Applications that facilitate person-to-person collaboration by providing a variety of communication media—including video, voice, and shared drawing spaces—and support for shared applications—such as a spreadsheet, word processor, or designing tools—are classified as multi-party interactive multimedia (MIM) applications.

Current computer systems and communication architectures do not support MIM applications effectively for two major reasons: they do not provide abstractions and capabilities for MIM communication; and the device access, data copying, and data transport capabilities they do provide are inefficient and could potentially limit both the affordability and scalability of MIM applications. In this paper, we propose a holistic system approach to supporting MIM applications. The local computer system and the communication protocol stack are