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Group Support in Multimedia Communications Systems

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Abstract: Communication among multiple entities is becoming more and more widespread in computing and telecommunications. Although many existing communications protocols and services do offer some limited support for multicast or group communication, the new requirements of multipeer applications make it difficult to find efficient and *comprehensive* solutions. In this paper we discuss the required characteristics of group services and survey the extent of the support provided by today's services and protocols. In addition, a brief outline of standardisation efforts in this area within ISO and ITU is given and selected examples of research projects which deal with different aspects of group communication are presented.

1 Introduction

The use of computers for interpersonal communication among multiple users has provoked a new trend called *group communication*. Although group communication is also used for distributed file systems, distributed data bases, fault tolerant systems, etc., the main requirement for group communication support comes from *interactive multimedia group applications*. In general, the main characteristics of interactive multimedia group applications are heterogeneous end-systems and networks, multiple senders and receivers (which change over time), high data volumes, high data rates and time-dependent data values.

A number of communication protocols and networks (e.g. ethernet, DQDB, IP, XTP) currently offer multicast (1:N) data transmission. Although (1:N) data transmission is the fundamental basis for group communications, it is by no means sufficient for the support of multimedia group applications. New management protocols and service specifications are also required to fully support conferencing and group communication applications. Although such protocols and services are currently under development in an experimental context, it is still too early to evaluate the extent to which these developments actually fulfil real application needs. International standardisation organisations, viz. ISO and ITU, are also addressing these issues and are currently discussing how group communication should be accommodated in new and existing standards. Last, but not least, there are various universities and research institutes working on different aspects of multimedia group communication and its support in the communication sub-system.

The paper is organised in six sections. In section two we briefly discuss the required characteristics of group services. The purpose of this discussion is to provide some criteria according to which group communication protocols and services can be assessed. Section three then presents a survey of existing group communication