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ABSTRACT

INTERACTIVE DISTANCE LEARNING ENVIRONMENT WITH MULTICAST SUPPORT

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There are great demands on developing distance learning (DL) systems with the rapid growth of the Internet and Intranet technology. Many organizations are engaged in developing distance learning systems with interactive tools provided in the recent years. The thesis focuses on improvement of transmission efficiency and interaction for distance learning systems.

Transmission efficiency and quality of service for DL system and group communications are the critical research topics. Reliable IP Multicast is a new research area for improving group communication efficiency and quality. Reliable multicast protocol enables group communication applications to reduce network traffic comparing with reliable IP unicast supported by TCP. The thesis proposed an Interactive Distance Learning System (IDLS) based on DL requirements and technology available. The thesis focused on improving transmission efficiency by applying reliable multicast protocol. The Light-weight Reliable Multicast protocol (LRMP) has been adopted in IDLS.

Lack of interaction is the main constrains of most traditional distance learning systems. Improving interaction between teacher and students as well as among students is another critical issue of DL systems. The proposed system is an integrated multimedia system providing interactive conference tools with low cost and is easy to

be promoted.

The proposed system has been successfully designed and partially implemented in Java for platform independence. The technical issues in design and implementation of main models are discussed in detail, including multicast session control, enhanced whiteboard and remote pointer.