

A Distributed Peer-to-Peer Platform for Synchronized Group Collaboration and Knowledge Sharing

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ABSTRACT

This paper presents new research and development of an integrated peer-to-peer (P2P) platform comprising of a network of distributed and decentralized peer devices connected directly with one another in an ad-hoc virtual group manner. The platform is built upon an extended version of the Sun Microsystem's Project JXTA and the Jabber's XMPP (Extensible Messaging and Presence Protocol) protocols. The proposed P2P platform has a comprehensive set of application programming interfaces (APIs) that provide a high-level encapsulation of many core P2P platform services, security control and policies, online presence management, data management and transfer, etc. to the application layer. By using these platform APIs, we have developed a number of essential tools targeting distributed e-Education and e-Collaboration environments, such as integrated secure chat, digital asset management, sharing, searching and retrieval, synchronized calendaring and contacts management, and scalable multimedia communications. The core vision and strategy here is to enable a truly distributed means for multiparty communications and collaboration in an ad-hoc peer group eco-system without the need for centralized systems, file servers, databases and corporate networks setup (such as extranets and virtual private networks). The platform's flexible plug-in and XML web services architecture allows easy development and integration of many new applications and services modules. By employing a 100% Java implementation, the platform is OS-independent and has been shown to work well on Windows, Macintosh, and Linux.

Keywords: Distributed peer-to-peer infrastructure, distributed database, multimedia, and scalable compression, presence management, synchronized group e-Collaboration, Project JXTA, XML Web Services.

* This work was supported in part by the InfoComm and InfoTech Initiative (ICITI) project grants.