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Funding Source: NSF-REU Program in Home Networking Technologies

Efficient IP multicasting

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Unicast connections are a single connection between two computer hosts. While they may work well for one-to-one communication or non-real-time applications, these connections may not be as efficient for one-to-many or many-to-many communications. One alternative to this is IP Multicast, which allows efficient one-to-many and many-to-many communications. The focus of our research was IP Multicast, which is mainly used for one-to-many connections. One of IP multicast's weaknesses is its lack of reliability due to its use of the User Datagram Protocol (UDP) for data transmission. Our project focused on IP multicast in a wireless (802.11 b/g) local area network (WLAN) environment. We hoped to find more about reliably multicasting so to specifically address the problems with IP Multicast and possibly find the solution to such problems to ensure more efficient information exchange between computers using such programs as Classroom Presenter and ConferenceXP. Using Microsoft's .NET platform and the C# programming language, we wrote two programs; a server (sender) and a client (receiver), which uses IP Multicast to communicate simple strings of text with a pseudo-NACK implementation. Our test bed consisted of eight desktop computers which had the Microsoft Windows XP Professional operating system and Microsoft's .NET Framework version 2 installed. We ran simple performance tests on both wired (LAN) and wireless (802.11b/g) connections. While our final results are still pending on the final tests still needing implementation, small scale tests have shown that IP Multicasting is a stable and efficient way of transmitting data in such an environment. The problem with IP Multicast is the lack of feedback mechanism in the overall procedure. This creates reliability and scalability issues making it hard to ensure that data is properly transmitted from both ends. The use of extra protocols/algorithms is recommended when reliability is in need in an IP Multicast situation.