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Performance Analysis of Retransmission Protocols in a Wireless Environment

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Automatic Repeat reQuest (ARQ) is a mechanism to ensure reliable data transmission over unreliable channels, by using error detection codes and retransmitting incorrectly received data packets. ARQ has found a widespread use e.g. in today's wireless telecommunication networks. Transmission over wireless channels is subject to fading and other effects which have a significant effect on the performance. Buffers are necessary in every ARQ design: at the sender side, to temporarily store packets while they may require a retransmission; and possibly a reordering buffer at the receiver side, for protocols that do not preserve the ordering of the packets. Our research is focused on the performance of these buffers, in the specific case of a time-varying wireless channel, where errors occur in a correlated manner. We want to find information on the distributions of buffer content and packet delay, by using techniques from discrete-time queueing theory.

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Towards an end-to-end QoS enabled overlay multicast platform

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Overlay networks are emerging as a platform to enhance the core network routing functionality. They form a new network layer on top of the Internet and offer a whole range of network enhancements, such as extra resilience, QoS support and overlay multicasting. This paper discusses how an overlay network is used to provide an end-to-end QoS enabled multicast network. It describes how transparent access can be realized and contains a description of an overlay network access component that pushes traffic to the overlay layer, transparent for application and user. In addition to this, a number of algorithms have been developed for dynamically maintaining the overlay topology and for building a bounded delay overlay distribution tree for multi-party multimedia applications. These algorithms are evaluated and we show that we can establish a resilient overlay network in a scalable way and build overlay distribution trees of a low cost.

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