

论文

无线实时流媒体传输性能的跨层优化设计

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摘要:

提出一种用于无线实时流媒体传输的优化设计策略,以提高接收方的播放质量。该策略采用跨层设计的方法,利用泊松过程分析链路层数据帧的丢失,同时把链路层最大重传次数映射到端到端时延和丢包率的计算中,自适应地调整MPEG视频帧的发送速率,在视频源数据和冗余数据之间动态分配网络带宽。仿真实验结果表明,该策略能使接收方获得最大的可播放帧率,有效提高流媒体传输的可靠性和实时性。

关键词: 无线流媒体传输性能 跨层设计 泊松过程 自适应前向纠错

Cross-layer optimization for wireless real-time media streaming

Abstract:

A strategy for performance optimization in wireless real time media streaming was presented, i.e. EAFEC, in the hope that the media could be played on receivers with high quality. First of all, we used a Poisson process to analyze data loss process at the data link layer. And then, the maximum retransmission time of the data link layer was mapped to the calculation of the end to end delay and data loss. On this basis, the strategy, using the cross layer optimization design methodology, adjusted the sending rate of MPEG video frame adaptively and allocated the network bandwidth resource between the MPEG video source data and redundant data dynamically. Our mathematical analyses and simulation results demonstrate that the EAFEC mechanism achieves better quality of media streaming compared with original FEC, in terms of playable frame rate, reliability and real time performance on the receiver side.

Keywords: wireless media streaming performance cross-layer design Poisson process adaptive FEC

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