







峰值信噪比和吞吐量的仿真结果如图4和图5所示。结果证明了视频服务质量有明显改善, 并且能有效利用带宽。

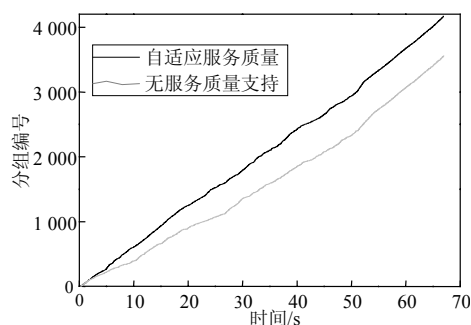


图5 自适应的服务质量框架和传统机制的吞吐量性能比较

## 4 结论

本文提出了一个异构无线网络中视频传输的网络感知自适应的服务质量框架。整个框架包括带宽估计模块, 可以估计瓶颈链路的带宽; 服务质量映射模块, 将自适应错误和拥塞控制机制的数据包和冗余包的数目翻译成失真减小的量; 可伸缩视频编码模块, 能够适应网络和终端用户的异构性; 自适应的错误和拥塞机制模块, 能够根据丢包率和带宽, 以及视频的重要性自适应分配视频数据包和冗余数据包的数目。通过各个模块的共同作用, 自适应服务质量算法总是能够提供与网络条件最匹配的用户感知服务质量。

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## 参考文献

- [1] JOHANSON M. Adaptive forward error correction for real-time internet video[C]//In: Proceedings 13th Packet Video Workshop. Nantes France: [S.1.], 2003.
- [2] MAYER P K, LE L, CARLE G. An MPEG performance model and its application to adaptive forward error correction[C]//In: Proceedings of ACM Multimedia. New York: ACM Press, 2002.
- [3] WU H, CLAYPOOL M, KINICKI R. A model for MPEG with forward error correction and TCP-friendly bandwidth[C]//In: Proceedings of the Workshop on Network and Operating Systems Support for Digital Audio and Video (NOSSDAV). New York: ACM Press, 2003.
- [4] HANDLEY M, FLOYD S, PADHYE J, et al. TCP-friendly rate control (TFRC): Protocol specification, request for Comments[S]. IETF, RFC 3448, 2003.
- [5] JAEY P, YOON KIM, KYUNG H J, et al. Wireless measurement based resource allocation for QoS provisioning over IEEE 802.11 wireless LAN[J]. IEEE Transactions on Consumer Electronics, 2003, 49(3): 614-620.
- [6] KUMWILAISAK W, HOU Y T, QIAN Zhang, et al. A cross-layer quality-of-service mapping framework for video delivery in wireless networks[J]. IEEE J Select Areas Commun, 2003, 21: 1685-1698.
- [7] WANG H, MOAYERI N. Finite state Markov channel-A useful model for radio communication channels[J]. IEEE Trans Veh Technol, 1995, 44: 163-171.
- [8] Information Sciences Institute. The ns-2 simulator[EB/OL]. [2006-10-28]. <http://www.isi.edu/nsnam/ns/>.
- [9] LAJOS H, PETER J C, STREIT J. Wireless video communications, digital & mobile communications[M]. Piscataway: IEEE Press, 2001.
- [10] MARTYN J R, IAIN E G R. Digital video communications[M]. Norwood: Artech House, 1997.

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