P.O.Box 8718, Beijing 100080, China	Journal of Software, September 2007,18(9):2259-2270
E-mail: jos@iscas.ac.cn	ISSN 1000-9825, CODEN RUXUEW, CN 11-2560/TP
http://www.jos.org.cn	Copyright © 2007 by *Journal of Software*

IEEE 802.16竞争解决方案的性能分析

陆文彦, 贾维嘉, 杜文峰, 张历卓

陆文彦1, 贾维嘉1,2, 杜文峰3, 张历卓1,2
1(中南大学 信息科学与工程学院,湖南 长沙 410083)
2(香港城市大学 计算机科学系,香港 九龙)
3(深圳大学 信息工程学院,广东 深圳 518060)
作者简介:
陆文彦(1973－),男,湖南岳阳人,博士生,主要研究领域为无线城域网络,接入控制,SIP协议.贾维嘉(1957－),男,博士,教授,博士生导师,CCF高级会员,主要研究领域为组播,选播,路由,无线宽带网络,移动多媒体通信,分布式系统.杜文峰(1977－),男,博士,主要研究领域为无线网络,Handoff,带宽调度算法.张历卓(1974－),男,博士生,主要研究领域为多媒体通信.
联系人: 陆文彦 Phn: +86-731-8877711, E-mail: luwenyan@gmail.com, http://www.csu.edu.cn

Received 2006-04-04; Accepted 2006-06-30

Abstract
At present, the mandatory contention resolution that shall be supported by IEEE 802.16 is based on truncated binary exponential backoff algorithm. In this paper, the differences of contention mechanism between IEEE 802.16 and IEEE 802.11 are analyzed. The calculations of performance metrics such as the utilization of transmission opportunity u, the delay of bandwidth request d and the drop probability of bandwidth request pd are presented. Based on simulation results, the effects of contention parameters such as the initial window W, the number of subscriber station n and the number of transmission opportunity Nto are discussed. Some policies to adjust the parameters are also provided. These policies are useful for BS to schedule its uplink bandwidth resource.

Lu WY, Jia WJ, Du WF, Zhang LZ. Performance analysis of the contention resolution scheme in IEEE 802.16. *Journal of Software*, 2007,18(9):2259-2270.
DOI: 10.1360/jos182259
http://www.jos.org.cn/1000-9825/18/2259.htm

摘要
目前,IEEE 802.16标准推荐采用基于截断二进制指数回退算法的竞争解决方案.分析了该方案同IEEE 802.11竞争机制的区别,给出了传送机会利用率u、带宽请求延时d以及带宽请求丢失率pd等性能指标的计算方法.通过性能模拟,讨论了初始化回退窗口W、用户站数目n以及单位时间帧内传送机会数目Nto等参数对性能指标的影响,进而得出基站调整性能参数的一般策略.这些策略对于基站进行上行带宽资源的分配具有指导意义.

基金项目：Supported by the National Basic Research Program of China under Grant No.2003CB317003 (国家重点基础研究发展计划(973)); the Strategy Grant of City University of Hong Kong of China under Grant Nos.7001709, 7001777 (香港城市大学战略发展计划)

References:

[1] Ghosh A, Wolter DR, Andrews JG, Chen RH. Broadband wireless access with WiMax/802.16: Current performance benchmarks and future potential. IEEE Communications Magazine, 2005,43(2):129-136.

[2] IEEE 802.16-2004 IEEE Standard for Local and Metropolitan Area Networks Part 16: Air Interface for Fixed Broadband Wireless Access Systems. IEEE Press, 2004.

[3] Bianchi G. Performance analysis of the IEEE 802.11 distributed coordination function. IEEE Journal on Selected, Areas in Communications, 2000,18(3):535-547.

[4] Wu H, Pang Y, Long K, Cheng S, Ma J. Performance of reliable transport protocol over IEEE 802.11 wireless LAN: Analysis and enhancement. In: Kermani P, Bauer F, Morreale P, eds. Proc. of the 21st Annual Joint Conf. of the IEEE Computer and Communications Societies (INFOCOM 2002). New York: IEEE Press, 2002. 599-607.

[5] Lin LD, Fu HH, Jia WJ. An efficient admission control for IEEE 802.11 networks based on throughput analyses of (un)saturated channel. Proc. of the IEEE Globecom, 2005,1(5):3017-3021.

[6] Peng Y, Cheng SD. A self-adaptive wireless LAN protocol. Journal of Software, 2004,15(4):604-615 (in Chinese with English abstract). http://www.jos.org.cn/1000-9825/15/604.htm

[7] Kwak BJ, Song NO, Miller LE. Performance analysis of exponential backoff. IEEE/ACM Trans. on Networking, 2005,13(2): 343-355.

[8] Wieselthier JE, Ephremides A, Michales LA. An exact analysis and performance evaluation of framed ALOHA with capture. IEEE Trans. on Communications, 1989,37(2):125-137.

[9] Oh SM, Kim JH. The analysis of the optimal contention period for broadband wireless access network. In: Proc. of the the 3rd Int'l Conf. on Pervasive Computing and Communications Workshop. 2005. 215-219.

[10] Cao M, Ma WC, Zhang Q, Wang XD, Zhu WW. Modeling and performance analysis of the distributed scheduler in IEEE 802.16 mesh mode. In: Proc. of the Int'l Symp. on Mobile Ad Hoc Networking and Computing. 2005. 78-89.

附中文参考文献:

[6] 彭泳,程时端.一种自适应无线局域网协议.软件学报,2004,15(4):604-615. http://www.jos.org.cn/1000-9825/15/604.htm