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通信与网络

一种基于优先级的卫星网络AQM算法

孙力娟[1,2,3], 谢慧婷[1], 肖甫[1,2,3], 叶晓国[1], 王汝传[1,2,3]

1. 南京邮电大学计算机学院, 江苏 南京 210003
2. 江苏省无线传感网高技术研究重点实验室, 江苏 南京 210003
3. 南京邮电大学计算机技术研究所, 江苏 南京 210003)

摘要：

针对卫星网络大带宽、长时延、高误码等特点,结合控制理论,提出了一种基于优先级的卫星网络主动队列管理（active queue management, AQM）算法。首先,借鉴控制理论中比例-积分-微分（propertional integral derivative, PID)控制器设计方法计算总的报文丢弃概率-然后,针对IN和OUT两种不同优先级报文定义不同的丢弃概率,以实现不同优先级业务流量的区分服务。仿真实验表明,相对于低优先级流量,高优先级业务在保持高吞吐量的同时具有较低的报文丢失率,且整体队列长度抖动小,从而实现高优先级流量报文的有效保护。

关键词： 卫星网络　主动队列管理　优先级　控制理论

Priority based active queue management algorithm for satellite networks

SUN Li-juan[1,2,3], XIE Hui-ting[1], XIAO Fu[1,2,3], YE Xiao-guo[1], WANG Ruchuan[1,2,3]

1. School of Computer Science and Technology, Nanjing University of Posts and Telecommunications, Nanjing 210003, China
2. Jiangsu High Technology Research Key Laboratory for Wireless Sensor Networks, Nanjing 210003, China
3. Institute of Computer Technology, Nanjing University of Posts and Telecommunications, Nanjing 210003, China

Abstract:

Aimming at the characteristics of high bandwidth, long delay and high bit error ratio in satellite networks, a satellite network active queue management (AQM) algorithm based on prioity, which is integrated with control theory, is proposed. Firistly, based on the designing of the propertional-integral-derivative (PID) controller in control theory, a total probability of dropped messages is defined. Then, to differentiate between IN and OUT flows with different priorities, different probabilities of dropped messages are designed as well. Simulation results show that, compared with the case of flow with low priority, the proposed algorithm can effectively protect high priority flow by means of achieving a higher throughput with smaller jitter and low probability of dropped messages.

Keywords: satellite network　active queue management (AQM)　priority　control theory

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