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算法研究

高空平台通信系统中切换性能受限的呼叫允许控制策略

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摘要：

本文分析了高空平台通信系统中利用地理位置信息的呼叫密度受限和切换间隔时间受限的CAC（Call Admission Control，CAC）策略。设计了切换性能受限的CAC策略，该策略利用地理位置信息在每次新呼叫到达时计算可能引起的切换失败的概率，并且通过设置切换性能门限来约束切换性能，在满足切换性能的同时，能够尽量提高新呼叫阻塞性能。仿真结果表明，在相同切换掉话概率门限要求情况下， 与新呼叫切换时间间隔受限的CAC策略相比，改进的切换时间间隔受限的CAC策略可提升新呼叫阻塞性能13.6%以上。在实际应用过程中，可以根据当前流量自适应地改变切换间隔时间门限，达到在满足切换性能的同时最小化新呼叫阻塞概率的目的。切换性能受限的CAC策略在业务量较高的条件下能够较好地保证了系统的切换掉话性能；比其它策略具有更好的呼叫阻塞性能，比呼叫密度受限的CAC至少提升25.3%，比切换时间间隔受限的CAC策略至少提升6.5%。

关键词： 高空平台；切换；呼叫允许控制

Handover Performance Restricted Call Admission Control Algorithm for HAP Communications Systems

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Abstract:

High altitude platform communications systems possess the advantages of both terrestrial wireless communications system and satellite communications system, and will play an important role in future communications infrastructure. In this paper, geographical information based call admission control (CAC) schemes are discussed. Call density restricted CAC (DR-CAC) scheme and handover time interval restricted CAC (TR-CAC) scheme are analyzed. We present a handover Performance Restricted CAC (PR-CAC) scheme, in which the handover dropping probability introduced by a new call arrival is calculated using the geographical information, and a handover performance threshold is set to restrict the handover performance and to improve the call blocking performance. Simulation results show that the call blocking probability for the modified TR-CAC scheme is 13.6% lower than that for the original scheme with a fixed threshold of handover dropping probability. In the application of the TR-CAC scheme, the handover interval time threshold can be adapted according to the current traffic to minimize the call blocking probability while meeting the handover dropping performance. The PR-CAC scheme can keep the handover dropping performance to a specific threshold. Moreover, the PR-CAC scheme can achieve better call blocking performance than the other schemes mentioned in this paper, with an improvement of 25.3% compared with time based channel reservation algorithm, and with an improvement of 6.5% compared with TR-CAC.

Keywords: high altitude platform handover call admission control

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