WiMAX 有服務品質保證的公平資源分配機制

摘要

近十年來，由於無線網路的普及與人們對於即時服務的需求提高，導致人們迫切需要更好的服務品質，WiMAX 是其中最被看好的一種無線網路傳輸技術。但在 WiMAX 無線網路中，標準的規格中並未規範 connection admission control (CAC)、bandwidth request (BR)、bandwidth allocation、scheduling 等機制，在本篇論文中，我們將上述機制設計並實作於 MAC layer 中。

本論文首先探討在設計 connection admission control、bandwidth request、bandwidth allocation、scheduling 會遇到的相關參數及相關議題。並進一步提出一個有效的方法以改善目前大部分設計在 bandwidth allocation 的公平性 (Fairness)及 contention bandwidth request 等效率差的問題。我們將設計一個 MAC Layer co-function，稱之為 Dynamic Polling Interval function (DPI function)。利用 DPI function 設計 no contention bandwidth request 改善傳統 contention bandwidth request 的效率，以及利用 DPI function 的特性改善 bandwidth allocation 以及 scheduling 的公平性。最後我們將利用網路模擬器 NS-2 (Network Simulater version 2)與測試實驗架構作不同效能的驗證比較並評估所提方法的有效性。

Fairness of Resource Allocation with QoS Guarantee in WiMAX

Abstract

Over the past decade, wireless network access and real-time services have become more popular than ever. People are eager to have better quality of service. Among all, WiMAX is one of the best wireless communication technigues . However, WiMAX standard does not specify those mechanisms of connection admision control (CAC)、bandwidth request (BR)、bandwidth allocation and scheduling . In this thesis, we propose the above mechanisms and imcorporate them as MAC layer functions.

First, we discuss those related parameters and issues when designing connection admision control、bandwidth request、bandwidth allocation and scheduling. Second, we propose an efficient method to improve the fairness of bandwidth allocation and efficiency of contention bandwidth request. We design a MAC layer co-function called dynamic polling interval function (DPI function). We use the DPI function to design a no contention bandwidth request method to improve the efficiency of traditional bandwidth request method and use the features of DPI function to improve the fairness of bandwidth allocation and scheduling. At last , we use NS-2 (Network Simulator version 2) as our network simulator and compare the result of simulations to prove the efficiency of our proposed methods.