

# 支援無線多跳接網路服務品質之路徑頻寬計算

## 摘要

行動資訊服務環境的理想，是要提供一個無所不在的資訊環境，讓使用者可以在任何地方、任何時間，利用各種有線或無線的傳輸網路去存取可用資源。行動通訊與行動計算的飛越發展使得行動資訊服務的理想指日可待。而無線網路要支援一些即時多媒體通訊傳輸，服務品質便成為很重要的課題，頻寬計算更是其中最關鍵的議題。除了現有 IEEE 802.11 無法有效支援多跳接網路使之達到服務品質的保證外，也由於 Ad Hoc 網路移動性及流量多變性的特性，要在這樣的無線環境下支援服務品質便成為一個困難的挑戰。由於我們參考的論文皆在 TDMA 的環境下探討頻寬保證的問題，但是這在無線多跳接網路下十分複雜且受限制。因此我們針對此問題提出一個簡單的頻寬計算方法來估算網路現有頻寬，用於頻寬繞徑演算法上以支援無線網路服務品質。實驗結果顯示我們的方法比過去的頻寬計算方法更簡單、誤差少、適用於各種 MAC 層的通訊協定，也容易與現有頻寬繞徑演算法結合以執行允入控制機制。透過我們的方法，可以有效地支援無線多跳接網路服務品質。

# **Path Bandwidth Calculation for QoS Support in Wireless Multihop Networks**

## **Abstract**

The idea of mobile computing service is to provide a ubiquitous information environment. However, the present mobile ad hoc networks still can't support real-time transmission very effectively. In other words, the capability of supporting QoS guarantee has become a very important issue. IEEE 802.11 PCF adopts the polling scheme to provide time-bounded traffic services, which is not suitable in multi-hop networks. Moreover, due to mobility and traffic dynamics, the network resource management is more difficult. Thus, QoS support in such an environment is a challenge. Specifically, path bandwidth calculation is the first key element. All the bandwidth routing papers we referenced were using TDMA. However, they are restricted in TDMA systems and somehow complicated in path bandwidth calculation. We propose a simple path bandwidth calculation solution that can be used whatever MAC protocol is. It is also easy to implement call admission control and to combine with bandwidth routing algorithms. The simulation results illustrate that the statistical error rates of our path bandwidth calculation are within an acceptable range. By path bandwidth calculation, bandwidth routing algorithm is also developed to achieve the objective of supporting QoS in wireless multihop networks effectively.