

# 在無線網路下遮蔽節點問題之研究

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## 摘要

在目前隨意式無線網路的媒介擷取控制協定中，以IEEE 802.11 標準所規範頻寬共享形式的載波偵測多重擷取/ 碰撞避免 (CSMA/CA)機制最為使用。在探討CSMA/CA 對影響網路效能的相關研究中，以隱藏節點問題與伴隨而生的曝露節點問題最常被提及。IEEE 802.11 媒體擷取層協定以請求後發送/清除後發送 (RTS/CTS)交換機制解決了隱藏節點的問題，降低了碰撞干擾的發生，但是此種機制也造成了曝露節點的產生，進而降低網路使用率並且使得網路中部份通訊節點產生碰撞的情形。這是因為當曝露節點無法辨識控制訊框時，不適當的訊框傳送可能會影響相鄰節點資料的正確接收。對於這些無法辨識控制訊框的曝露節點，我們稱為遮蔽節點 (masked node)。由於遮蔽節點會造成資料碰撞，使得網路的資源浪費在重傳資料上。雖然在許多網路效能的相關研究中提出對曝露節點的解決方法，但也指出在真實的網路環境中，即使在干擾很小的環境下，由遮蔽節點造成的碰撞情況仍會發生。在本論文中我們研究如何辨識遮蔽節點，並且設計「遮蔽節點碰撞避免」的媒體擷取機制來解決由遮蔽節點所造成碰撞的問題。我們同時分析遮蔽節點引起的碰撞問題對無線網路效能的影響，例如訊框吞吐量、訊框碰撞比例、傳送延遲時間等效能參數，經評估發現本研究中所提出的解決方法是否能夠有效的改善遮蔽節點的碰撞問題。

關鍵詞：隨意式無線網路，碰撞，曝露節點，隱藏節點，遮蔽節點，RTS，CTS。

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