

論文名稱：無線網路安全機制傳輸效能之研究 總頁數：44

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論文提要內容：

近年來無線網路蓬勃發展，網路傳輸效能上的問題，也是企業關心的議題，如何在固定時間內傳輸最多的資料，或如何使傳輸速率更快都是重要的議題，由於無線網路的安全性較有線網路的安全性弱，且近年來網路駭客及各種病毒猖獗，如何使無線網路的安全性提升，也是近年重要的議題，國際標準組織 IEEE 及 Wi-Fi 聯盟便推出各種安全標準如 WEP、WPA 等。但也由於安全機制的增進，如加解密、驗證等會導致效能上的損失，因此本論文將研究安全機制對效能的影響力。

本研究採用現有的五種安全機制，安全強度從弱至強分別是(1)未加密(2)WEP 64 位元(3)WEP 128 位元(4)具 WEP128 位元之 802.1X (5)WPA，並訂定影響效能的參數及設定評估標準，來測試安全機制對效能的變化。根據實驗結果，當從較弱的安全機制到較強的安全機制時，有下列三個結論(1)在 802.11g 的網路中，整體效能隨安全機制的安全水準提升而逐漸下降(2)比較 802.11g 與 802.11b，在相同等級安全機制下 802.11g 的效能下降的幅度較 802.11b 大(3)在相同等級安全機制下，UDP 流通量較 TCP 者高。

關鍵字：無線網路(wireless networks)，效能(performance)，安全機制(security mechanism)，802.11g

A Study of the impact of various security mechanisms on  
transmission performance over wireless networks

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ABSTRACT

In recent years, wireless networks have grown up rapidly and performance of these networks has been concerned in research area. It is desirable to get better performance and higher data rate in data transmission. On the other hand, security is a problem, particularly for wireless network. There are many international standard organization, such as IEEE and Wi-Fi alliance announced security standards like WEP, WPA to improve the security of wireless networks. However, the overhead of these security mechanisms will be detrimental to the performance of the network.

This paper adopts five security mechanisms: 1. No encryption 2. WEP 64bit 3. WEP 128bit 4. 802.1x with WEP 128bit 5. WPA, with the level of security higher from the first to the last. Some parameters are chosen to test the impact of various security mechanisms on performance. Five security mechanisms are experimented in the order of their security level from the first to the fifth and the performance impact are observed. According to the results of experiments in this paper, some conclusions are made. First, the performance of 802.11g network will be decreased as the level of security increased. Second, as compared with 802.11b network, the performance of 802.11g network is decreased more quickly as security level increased. Third, the performance loss of UDP traffic is less than that of TCP traffic.

Key Words: wireless networks, performance, security mechanism, 802.11g