針對即時傳輸特性之 MAC 層資源分配方法

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摘要

由 IEEE 802.15.3 工作小組所制定的超寬頻標準(Ultra Wide Band)是現今熱門的標準之一，主要目標為在短距離內支援高速高品質的影音傳輸。為了要對高品質影音傳輸提供更好的 QoS(quality of service)支援，並且為高速網路內不同類別的傳輸提供精準的傳輸順位設定，我們提出了一個以傳統 EDF 排程方法為基礎所修改的新排程演算法。本演算法根據各個傳輸連結到達 MAC 層的封包大小以及所要求的傳輸速率來調整此封包的傳輸期限(deadline)，對於同一個傳輸來說，此方法針對了各個傳輸的特性來提供精確的資源分配；對於不同傳輸來說，此方法也提供了不同的順位控制。另外，我們也提出了傳輸辨識器(traffic identifier)的架構來辨別個別傳輸的真正 QoS 需求。最後，為了要實現新演算法，我們修改了 802.15.3 標準中的架構。模擬結果顯示我們的新演算法和傳統的方法比較後，不但在我們所設定的高順位類型的傳輸模擬中有比較好的結果，對於低順位類型的傳輸，也有相同甚至更好的結果。最難得的是，我們所提出的方法相當簡單而且實用。

Priority-Based EDF Scheduling Algorithm for Real-time Service

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Abstract

The Ultra Wide Band (UWB) standard developed by IEEE 802.15.3 task group is one of the popular candidates to achieve the goal of short range connection and high quality video/audio wireless transmission. In order to provide better QoS support for high quality multimedia applications and precise priority setting for various traffic types in high-data-rate wireless networks, a priority-based EDF scheduling algorithm is proposed. By adjusting each traffic's deadline according to the frame size and required transmission rate, our proposed algorithm may provide precise resources for the same application according to traffic characteristics and different priority controls of different applications. At the same time, the traffic identifier is proposed. The main goal of the traffic identifier is to identify true QoS requirements. Finally we modified the MAC header and the superframe structure of standard MAC protocol in order to implement the proposed algorithm. Simulation results show that the proposed algorithm can not only guarantee a low error rate for high priority traffic, but also work better than other algorithms on low priority traffic. Most importantly, the proposed algorithm and modified MAC protocol are simple and realistic.

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