

PACKET SCHEDULING ALGORITHM FOR REALISTIC TRAFFIC MODEL OF REAL-TIME VIDEO STREAMING SERVICE IN OFDMA SYSTEM WITH INTEGRATED TRAFFIC SCENARIO

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ABSTRACT. *In this paper, the problem of packet scheduler design for the transmission of multiple real-time (RT) video streaming services over an orthogonal frequency division multiple access (OFDMA) system is addressed. A new sum of packet (SoP) scheme making the best use of an important characteristic of the RT video streaming service such as a regular length (in seconds) of de-jitter buffer window is introduced. As a result, this paper investigates the influence of the correlation between special traffic feature in realistic traffic model and packet scheduler design on performance improvement satisfying the quality of service (QoS) requirement in OFDMA system. Simulation results show that the packet scheduler design is closely connected with the traffic characteristic in realistic traffic model since the proposed scheme provides better performance than the existing scheme in terms of outage probability and average packet loss probability without loss of per-cell throughput.*

Keywords: Packet scheduler, Realistic traffic model, Real-time video traffic, De-jitter buffer window, Sum of packet

1. Introduction. The demand for multimedia transmission over wireless networks has become increasingly important. As a result, the transmission of multiple RT video streaming services over an OFDMA system, which has emerged as a strong candidate for 4G mobile communication system since it has high spectral efficiency and robustness multi-path channels [1], is becoming a key requirement. Therefore, the design of packet scheduler, which determines how many packets are handed to each user at a given time for the sake of allocating effectively limited radio resources satisfying the user's QoS requirement in OFDMA system, is becoming more and more critical issue for QoS provisioning of multiple RT video streaming services since wireless networks are affected by extremely error-prone and time-varying conditions [2]. Besides this QoS challenge, lower outage probability and average packet loss probability of RT video streaming services are imperative to enable the deployment of broadband wireless connectivity such as OFDMA system in highly efficient data transmission.

When packet scheduling algorithm is designed, the following two points need to be seriously considered. The first one is to consider realistic traffic model since a full buffer traffic model can't accurately reflect the impact of the traffic model and packet handling [3, 4, 5, 6, 7, 8]. In addition, for better packet scheduler design, it is useful to make the best use of the traffic feature in realistic traffic model. In this paper, in order to study the effect of mutual relation between packet scheduler design and special traffic feature in realistic traffic model, new packet scheduling scheme which is called the SoP/PF-coupled scheme is proposed. The proposed packet scheduling scheme adopts the sum of packet