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Dynamic RB allocations using ARQ status reports for multimedia traffic in LTE networks

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This paper presents a dynamic resource blocks (RBs) allocation scheme for multimedia traffic in LTE networks by utilizing automatic repeated request (ARQ) status report, in which an user equipment (UE) reports erroneous packets to an evolved-node base station (eNodeB). From the status report, eNodeB will compute the amount of successfully received packets per unit time for each UE. Therefore, eNodeB can properly allocate RBs which is exactly the requirement of each UE. Moreover, we consider three different multimedia traffic types (audio, video, and data) with different priorities. Our proposed scheme can alter the modulation determined by automatic modulation and coding (AMC) scheme such that the utilization of an orthogonal frequency division multiplexing access (OFDMA) frame can be substantially increased. To prevent the starvation of data traffic which has the lowest priority, we set an upper bound of employed RBs for audio and video traffic. At last, we perform NS-3 simulation to demonstrate the superiority of the proposed scheme. The simulation results show that our proposed scheme can perform much better than the traditional AMC scheme in terms of RBs utilization, blocking rate of UEs, and the number of successfully connected UEs. Particularly, when in a high noise environment and a large number of UE under an eNodeB, the proposed scheme can achieve relatively smaller blocking rates for QoS-guaranteed multimedia traffic, such as video and audio.
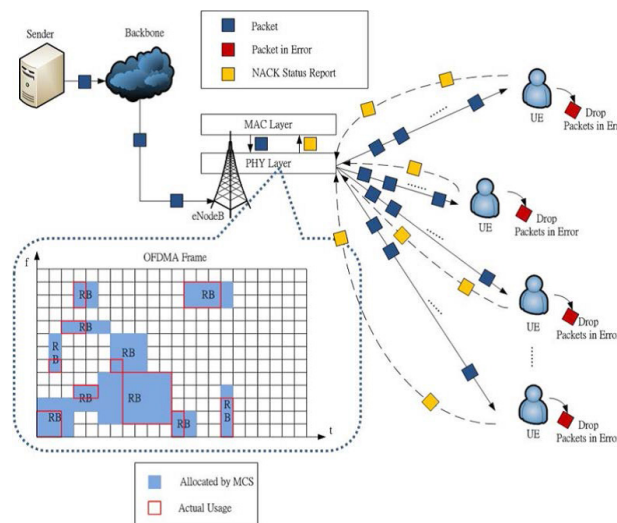
Biography

Tsang-Ling Sheu completed his PhD in Computer Engineering in Department of Electrical and Computer Engineering at Penn State University, University Park, Pennsylvania, USA, in 1989. From September 1989 to July 1995, he worked with IBM Corporation at Research Triangle Park, North Carolina, USA. In August 1995, he became an Associate Professor, and was promoted to Full Professor in January 2006 in Department of Electrical Engineering at National Sun Yat-Sen University, Kaohsiung, Taiwan. His research interests include Wireless Networks, Mobile Communications, and Multimedia Networking.

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