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A CROSS-LAYER APPROACH OF MULTIMEDIA UP-STREAMING TO ENSURE QOS IN WIMAX

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Abstract. *In recent years, many Internet video platforms, such as YouTube and MySpaceTV, are developed for users to share their videos with others. However, they are unable to do that wirelessly in a real-time fashion due to the insufficient network bandwidth or transmission quality. In this paper, we proposed a system model for mobile users to perform the up-streaming of their videos. The users can upstream their real-time videos through their mobile devices and wireless network technology. Due to the various network conditions and video quality, we proposed the multiple profiles upstream function. We provided adaptive forward error correction (AFEC) codes, automatic repeat request (ARQ) and unequal loss protection (ULP) for selection base on the hardware capability and the network states to ensure the quality of service (QoS). Finally, we used NS-2 as simulation tool to verify our scheme.*
Keywords: WiMAX, QoS, AFEC, ARQ, ULP

1. **Introduction.** H.264 has great advantages of coding efficiency compared with the successful prior coding standards. However, the high coding efficiency is acquired by heavy computation. The high coding complexity limits the application of H.264 in the domain of real time video communication.

The new WiMAX radio technology – worldwide interoperability for microwave access is based on wireless transmission methods defined by the IEEE 802.16 standard. WiMAX has been developed to replace broadband cable networks such as DSL and enable mobile broadband wireless access. The integration of 802.11 and 3G into wireless networks is a major new potential revenue stream for service providers. For residential broadband access, WiMAX has higher potential, as compared to 802.11 based Wi-Fi technology, due to both range and bandwidth.

Nowadays, users do not use broadband Internet just for connectivity and web surfing. Services like video on demand are becoming popular in the last mile. The widespread use and bandwidth demands of these multimedia applications are far exceeding the capacity of current 3G and wireless LAN technologies. Moreover, most access technologies do not have the option to differentiate specific application demands or user needs. WiMAX is envisioned as a solution to the outdoor broadband wireless access that is capable of delivering high-speed streaming data. WiMAX offers some flexible features that can potentially be exploited for delivering real-time services.

With the rapid development of wireless technologies, transmitting video streaming over wireless channel has received much attention over the last few years. IPTV is very popular as it delivers the content to users whenever they want. The next step is to deliver this