Multicast-unicast data delivery method in wireless IPv6 networks

Abstract

Multicast IPv6 is an efficient way of transmitting data simultaneously to a group of IPv6 users. It has the advantage of reducing the required bandwidth of IPv6 data delivery compared to unicast transmission. The data rate of multicast transmission over WLAN is confined by the user with the lowest rate in the multicast group, which is called the fixed base rate problem. This paper proposes a delivery method that incorporates both multicast and unicast transmissions to solve the fixed base rate problem. The proposed method divides the IPv6 network into two levels: multicast mode for the upper level of the network [IPv6 server to Access Point (AP)], and unicast mode for the lower level (AP to mobile nodes). To maintain the end-to-end multicast transmission, the AP is responsible for converting multicast packets to unicast packets. Such a combination enables the proposed method to inherit the advantages of both multicast and unicast transmissions. The performance of our proposed method is evaluated in a test-bed environment that considers the transmission of real-time video application. The proposed multicast-unicast is able to improve the throughput and video quality experienced by the end user, with low packet loss and transmission delay.