

## FOUNTAIN CODE BASED VIRTUAL PATH FOR VIDEO TRANSMISSION OVER HETEROGENEOUS WIRELESS NETWORKS

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**ABSTRACT.** *In this paper, we propose an effective path virtualization system using Fountain code that provides the highest possible data rate with satisfactory delay and block loss rate constraints to enhance video quality. Basically, Fountain code and video codec H.264 are tightly coupled to efficiently use the path diversity over existing heterogeneous wireless networks. Finally, the proposed system is implemented and tested in real environments.*

**Keywords:** Path virtualization, Heterogeneous wireless networks, Fountain code, Video streaming

1. **Introduction.** Nowadays, various wireless networks with different characteristics are available to support diverse user applications. For example, UMTS (universal mobile telecommunications system) covers a wide area but supports a low transmission rate while WLAN (wireless local area network) covers a relatively small area but supports a high transmission rate. When multiple wireless networks are available, cooperation among networks is very important to provide seamless data service. Recently, fast vertical handoff and path diversity technologies have obtained a lot of interest for solving the aforementioned cooperation problem. First, vertical handoff is a switching technology between two different networks to support seamless service under the assumption that an MN (mobile node) can access only one network at a time. However, this approach needs sophisticated architecture, mutual agreement among various network service providers, and additional implementation costs and time. Furthermore, a short handoff time is unavoidable, which may degrade multimedia streaming services. Second, path diversity means that one MN establishes multiple paths over multiple wireless access networks. The barrier to this scenario is the fact that the MN has more than one network interface. There are already some types of MNs which are equipped with multiple network interfaces and in the near future they will become more common thanks to advanced radio technology, e.g. software defined radio [1]. So far, some effective algorithms exploiting path diversity have been proposed. Jurca et al. [2] proposed a path selection and source rate allocation scheme in order to optimize the media specific QoS (quality of service) in the streaming of stored video sequences on multipath networks. The result of this paper is very interesting because it insists that using only a few reliable paths gives better video quality. This is reasonable because the distortion caused by packet loss is more severe than smaller source