

# Optimizing Video P2P Streaming over Wireless Mesh Networks

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## Abstract

P2P overlay networks are large-scale distributed systems. They are used mainly for data sharing and content distribution and can be more efficient than the traditional client-server data models. The traffic produced by this type of overlay network is now dominant in the Internet. The emergence of P2P networks can be seen as a response to the inefficiency of the traditional server-client model, incapable of meeting the demands of a global network that grows at an increasing pace, where clients can have processing power similar to those of servers. Particularly, Video-over-IP traffic is rising in recent years as the number of Internet users interested in this type of media is increasing. On the other hand, emerging Wireless Mesh Networks (WMN) are effective solutions for ubiquitous broadband access. High throughput, cost-effectiveness, and ease of deployment are key features of these networks.

The main topic of this work is on the Video P2P Streaming over Wireless Mesh Networks. Both systems need to form multiple shortest path trees in order to transfer data and the joint optimization of these systems, using a cross layer approach, promises good gains in terms of data throughput and fairness. Typically, the closest path is defined at the application layer, which can lead to suboptimal paths at the network layer, resulting in lower throughputs and higher delays. Furthermore, the particular case of Video P2P has more restrictions, when comparing with the traditional file-sharing, such as the delay and jitter tolerance, or the priority of the data chunks.

In order to improve the performance of Video P2P Streaming, we argue that we can explore and take advantage of the characteristics of the underlying physical network. In the case of the global Internet, it seems difficult to match the physical and overlay network topologies, due to the static links available between most of the nodes. However, in scenarios where most of the overlay network peers are interconnected through the same underlying physical mesh network, the previously mentioned limitations cease to exist. WMN have a set of features that can potentially improve P2P performance such as routing behavior similar to P2P, nodes often appearing and disappearing like in P2P applications and in some situations, most of the nodes within the mesh may have to run P2P applications. This makes easier to map both overlay and physical topologies, providing a better performance to the overall communications system.

In this presentation, we show the progress of our work by showing the issues addressed during the past year, and our proposed solutions. Moreover, we present the scenarios and initial results obtained from the implementation of our proposed solutions. Finally, we draw some conclusion and point out the future work.