

Abstract

This thesis dissertation studies file distribution in wireless networks, analyzing different mechanisms that allow to optimize the transmission in terms of bandwidth and Quality of Experience. Specifically, the thesis focuses on file transmission in multicast channels. Multicast file transmission results appropriate in certain environments and has several applications, some of them are presented in this work.

The thesis analyzes in depth FLUTE (File Delivery over Unidirectional Transport), a protocol for the reliable delivery of files in unidirectional channels, and presents some proposals to improve the transmission through FLUTE. In this sense, one of the basis of this protocol is the use of a mechanism called File Delivery Table (FDT), used to describe the files transmitted. This dissertation assesses how the transmission of the FDT affects the performance of the FLUTE protocol, and provides a methodology to optimize the content delivery.

On the other hand, in multicast file transmission services reliability is an essential premise. Among the mechanisms used by FLUTE to provide reliability, this work mainly focuses on AL-FEC (Application Layer – Forward Error Correction) codes, which add redundancy to the transmission in order to minimize the effect of the channel losses. Specifically, LDPC (Low Density Parity Check) codes are studied. The thesis evaluates LDPC Staircase and LDPC Triangle codes, comparing their performance under several transmission conditions.

Furthermore, in the case of having a feedback channel, one of the main contributions of this thesis is the proposal of adaptive LDPC codes for file download services. In these codes, the content server changes dynamically the amount of FEC protection provided depending on the losses detected by the users. The evaluation proves the good performance of these codes for different environments.