

A Clustering Approach to Reduce the Available Bandwidth Estimation Error

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Abstract

The estimation of the available bandwidth (AB) in an end-to-end manner can be used in several network applications to improve their performance. Several tools send pairs of packets from one end to the other and measure the packets' dispersion to infer the value of the AB. Given the fractal nature of Internet traffic, these measurements have significant errors that affect the accuracy of the estimation. This article presents the application of a clustering technique to reduce the estimation error of the available bandwidth in an end-to-end path. The clustering technique used is K-means which is applied to a tool called Traceband that is originally based on a Hidden Markov Model to perform the estimation. It is shown that using K-means in Traceband can improve its accuracy in 67.45% when the cross traffic is about 70% of the end-to-end capacity.

keywords

Available Bandwidth Estimation; Clustering; K-Means; Traceband.