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**GRAPH: TRAFFIC-AWARE GRAPH PROCESSING**

**ABSTRACT**

Distributed graph processing systems such as Pregel, PowerGraph, or GraphX gained popularity due to their superior performance of data analytics on graph-structured data. These systems employ partitioning algorithms to parallelize graph analytics while minimizing inter-partition communication. Recent partitioning algorithms, however, unrealistically assume a uniform and constant amount of data exchanged between graph vertices (i.e., uniform vertex traffic) and homogeneous network costs between workers hosting the graph partitions. This leads to suboptimal partitioning decisions and inefficient graph processing. To this end, we developed Grapes, the first graph processing system using vertex-cut graph partitioning that considers both, diverse vertex traffic and heterogeneous network costs. The main idea is to avoid frequent communication over expensive network links using an adaptive edge migration strategy. Our evaluations show an improvement of 10 percent in graph processing latency and 60 percent in communication costs compared to state-of-the-art partitioning approaches.