

عنوان مقاله:

A New Set Covering Controller Placement Problem Model for Large Scale SDNs

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خلاصه مقاله:

Software Defined Network (SDN) is an emerging architecture that can overcome the challenges facing traditional networks. SDN enables administrator/operator to build a simpler and manageable network. New SDN paradigms are encouraged to deploy multiple (rather than centralized) controllers to monitor the entire network. The controller placement problem is one of the key issues in SDN that affect all its aspects including scalability, convergence time, fault tolerance, and node to controller latency. Many researchers focus on solving this problem by trying to optimize the location of an arbitrary number of controllers. The related works in this area get less attention to two following important issues: i) Bidirectional end-to-end latency between the switch and its controller instead of propagation latency and ii) finding the minimal number of controllers, which is a prerequisite for locating them. In this paper, we propose a Set Covering Controller Placement Problem Model (SCCPPM) in order to find the least number of required controllers with respect to carrier-grade latency requirement. The proposed model is carried out on a set of 124 graphs from the Internet Topology Zoo and solve them with IBM ILOG CPLEX Optimization package. Our results indicate that the number of required controllers for high resilient network is dependent on topology and network size. Moreover, to achieve carrier-grade requirement, 86% of topologies must have more than one controller

کلمات کلیدی:

Software Defined Networks; Controller Placement Problem, Latency Constraint, Carrier-Grade Requirement

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