Virtual Network Embedding: Does Time Really Matter?

The efficient embedding of virtual networks is an integral part of future communication infrastructures such as 5G/6G. In order to gain the highest revenue from their infrastructure, operators need to solve the so-called virtual network embedding problem. As this problem combines variants of well-known optimization problems, e.g., the bin-packing problem and the set covering problem, the development of fast and efficient algorithms seems to be an endless endeavor. While research has proposed a countless number of algorithms, less attention has been paid to simple problem aspects. For instance, although most work focuses on algorithms for the online embedding problem, less attention has been paid to answering questions such as how and why online and offline embedding problem solutions differ at all. Hence, this thesis targets at the question of whether time really matters. How different or how equal do existing algorithms behave when faced with online or offline variants. This study should try to reveal potential similarities or diversities between the online and offline virtual network embedding problem. To achieve this, a simple offline embedding simulator should be developed in C++ and compared to an existing online embedding simulator. The offline embedding simulator should implement at least two state of the art algorithms and compare their performance with respect to online and offline use cases.

Prerequisites

Programming skills, interests in algorithms, strong motivation.

Advisors

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