

Research, simulation, and evaluation of some placement algorithms for virtualized network function chains in edge computing models

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Abstract: This study investigates, simulates, and evaluates algorithms for the placement of Virtual Network Function Chains (VNF-FC) within a Mobile Edge Computing (MEC) architecture. As network functions are virtualized and deployed at the network edge to support low-latency services, the optimal placement of these service function chains becomes a critical challenge. This research models the placement problem, considering constraints related to latency, resource capacity, and operational costs. A comparative analysis is conducted on several heuristic and metaheuristic algorithms, including greedy-based approaches and genetic algorithms. Through extensive simulations under varying network loads and resource conditions, the performance of each algorithm is assessed based on key metrics such as end-to-end delay, resource utilization, and acceptance rate. The results demonstrate the trade-offs between computational complexity and solution optimality, identifying the most effective strategies for different deployment scenarios. The findings provide valuable insights for the efficient orchestration of network services in edge computing environments.

Keywords: VNF placement, edge computing, network function virtualization, simulation