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**Protocol Function Block Mapping of Software Defined Protocol for 5G Mobile Networks**

**Abstract:**

In this paper we propose software-defined protocol (SDP) technique to facilitate flexible service-oriented protocol stack deployment for providing high-throughput, low-latency and elastic mobile services based on platform virtualization and functionality modularization. We first elaborate the principle of SDP and then address one of the most important issues in SDP, namely SDP request mapping (SDPM), where an SDP request is fulfilled by mapping a set of required SDP function blocks and virtual links onto underlying SDP servers. We formulate the SDPM problem as a mixed integer programming (MIP). To address the NP-hardness and scalability of SDPM problem, we propose a decomposition algorithm which breaks down the SDPM problem into inter-block link and block mapping problems to accomplish the upper bound (UB) and lower bound (LB) of the MIP solution respectively. The optimality can be achieved when the UB and the LB converges by using iterations. We employ LTE Layer-2 data-plane processing as a benchmark for validating the effectiveness of the SDP technique and evaluate the performance of SDPM algorithm. Numerical results show that SDP is effective to provide elastic low-latency mobile services and the proposed SDPM algorithm significantly outperforms the benchmark in stack processing delay, mapping cost and resource utilization.

**Existing System:**

On the other hand, NFV is another trend being introduced as a part of the network evolution for increasing flexibility and reducing cost. In NFV both D-plane and C-plane functions are virtualized and instantiated in commodity servers where they can be scaled and shared by individual flows or operators. While SDN and NFV technologies have been well exploited in wired networks, it is naturally to apply SDN and NFV to 5G.

Thus far, there have been a number of proposals on SDN and NFV based 5G architecture. All these proposals share the same idea that 5G architecture should include modular network functions that could be deployed and scaled on demand, to accommodate various use cases in an agile and cost efficient manner. However, there are still outstanding problems to be resolved: how can we manage the virtualized modular network functions in shared infrastructures for different use cases and what.

**Proposed System:**

We propose SDP technology which enables flexible service-oriented protocol stack deployment under centralized network control.

\_ We address the fundamental problem in SDP technology, namely SDP request mapping, and propose an effective decomposition method to solve the optimal SDPR mapping problem.

\_ We provide an implementation framework of SDP technology including energy efficient SDP request mapping procedure, backward compatible implementation of SDP technology in the legacy LTE network and a use case of SDP technology for machine to- machine service.