Intelligent VNF Orchestration and Flow Scheduling

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Abstract.

(The report has the same structure as the original paper [1]. I will write more or less every section from the original paper in my own words).

1 Introduction

(with abstract 1 page)

1. Introductory example: customized hardware for network functions (firewalls etc.) are not flexible, not scalable and costly -> virtualize them and i.e. rent computing resources.
   Lots of new problems: On which server should the VNF be. How mush VNF should be installed. In the case of service function chains: To which of multiple VNFs should you route the a upcoming flow.

2. Explaining the problem that has been solved in my reference paper [1]:
   What is orchestration and flow scheduling.
   Why is it novel: Heuristic solutions have simplified models (e.g. they take the end-to-end delay not into consideration), rely on knowledge and are not online.
   How do they approach it: DRL (problem: large running time, if there is a huge amount of actions) -> DRL with guidance.

2 Model

(1 page) I will NOT write a formal description of the model here (or at least I try it). Short overview about the costs that can occur. I will try to make some good pictures to explain the costs on example graphs.

3 Model-Assisted DRL Framework

(1 page) Also no formal description here. just a explanation/summary.

1. Explain the state, action and reward of the DRL.

2. Not making random actions to learn, guide the DRL.

3. Describe their 6 steps of training.

4. Explain the action generation algorithm shortly (just the idea) and how to schedule the algorithms.

4 Evaluation

(1/2 page) I think I will not use pictures here.

1. The setup (but without exact values for the variables - only what they have done roughly).

2. How good the algorithm performs compared to other algorithms.

3. How to tune the variables to get the best result.

5 Discussion

(with references 1/2 page, maybe less)

1. This method can be applied to other DRL algorithms.

References

[1] L. Gu, D. Zeng, W. Li, S. Guo, A. Y. Zomaya, and H. Jin. "Intelligent VNF Orchestration and Flow Scheduling via Model-Assisted Deep Reinforcement Learning". In: *IEEE Journal on Selected Areas in Communications* 38.2 (2020), pp. 279–291.