Intelligent VNF Orchestration and Flow Scheduling
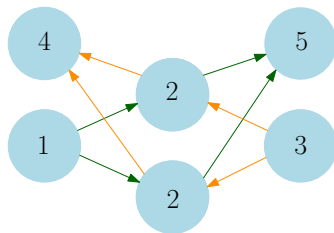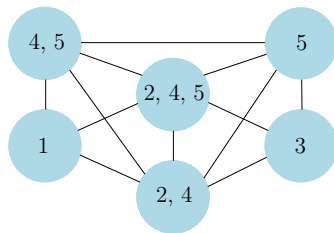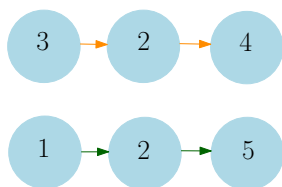
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Introduction

- Leasing resources from an infrastructure provider.
- Scenario: VNF Orchestration and Flow Scheduling [1].
  - Orchestration: Activation and deactivation of already deployed VNFs.
  - Flow Scheduling: Direct the traffic to one of the activated VNFs.

Model

Model

Arising cost:

- ▶ Setup cost.
- ▶ Cost to use the server.
- ▶ Communication cost.
- ▶ End to end delay.

Revenue: The payment.
Maximize the utility (revenue - costs).

DRL Framework

- Normal: agent explores action space and tuples (state, action, reward, next state) are created.
- Framework: At the beginning the tuples are created by a heuristic [1].

$\rightarrow$ Guide the agent instead of making random exploration.

Evaluation

- Faster.
- Better performance.
- When to switch from guidance to exploration?

Discussion

Can this framework be used for other DRL algorithms and environments?

📄 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.
IEEE Journal on Selected Areas in Communications,
38(2):279–291, 2020.