Deep Reinforcement Learning based QoS aware secure routing in SDN-IoT

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Outline

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Introduction

- Internet of Things (IoT).
- Why SDN-IoT ?

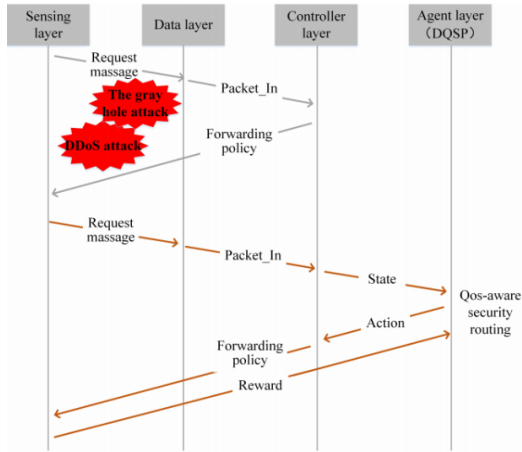# Packet forwarding in Traditional protocol vs proposed DQSP

Figure 1: Workflow of traditional vs DQSP [Guo+19].

Basic Definitions

- State
- Action
- Reward

$$R(t) = \frac{1}{|M|} \sum_{i \in M} (\alpha R_{v_i}^{attack}(t) + \beta R_{v_i}^{qos}(t)) \tag{1}$$

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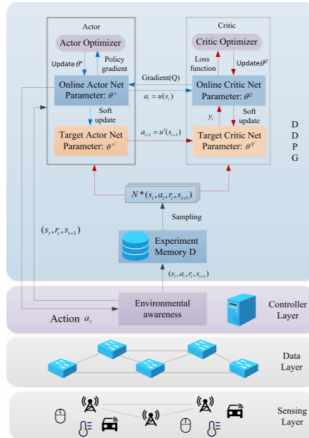# DDPG algorithm(Deep Deterministic Policy Gradient)

Figure 2: DDPG process in a DQSP Architecture [Guo+19].

Results

- Experimental Setup
  - Tensor flow.
  - A network with 10 switch nodes.
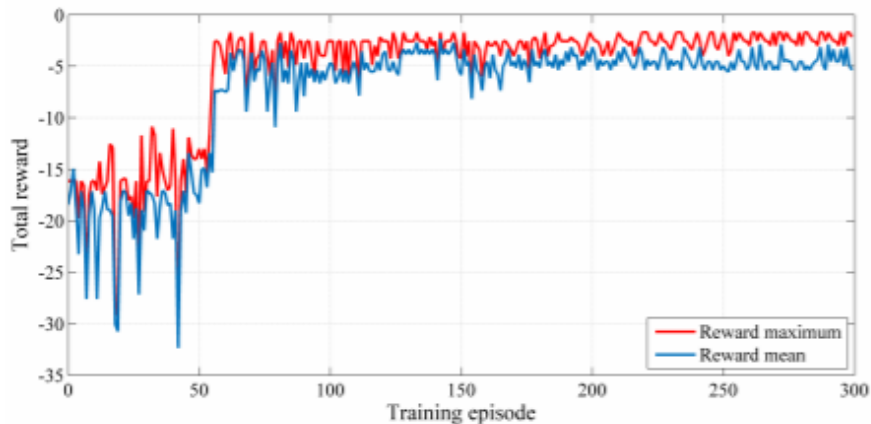 - Training process involved 300 episodes.

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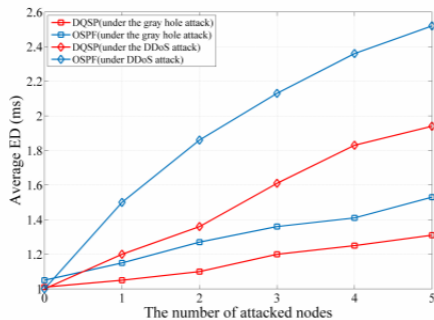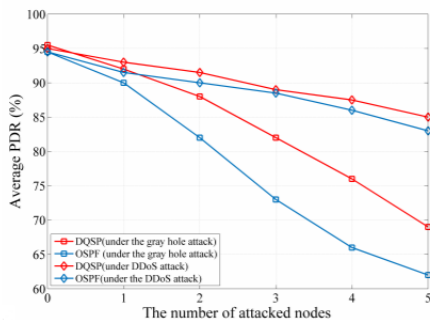Figure 3: Total Rewards obtained by training episode [Guo+19]

Figure 4: PDR and End to End delay in an attacked environment [Guo+19].

Conclusion

- DQSP is capable of creating secure routing strategies with DDPG.
- It contributed to the overall QoS of network.

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References

X. Guo et al. "Deep Reinforcement Learning based QoS-aware Secure Routing for SDN-IoT". In: *IEEE Internet of Things Journal* (2019), pp. 1–1.