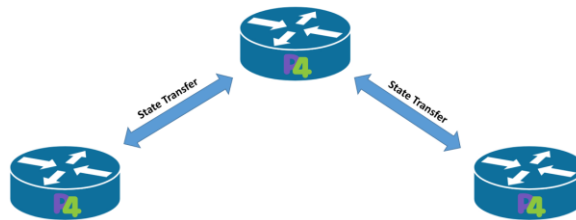




Task Description for Student/Diploma/Master Thesis

Topic: *Investigating State Transfer For Programmable Network Devices*



Description: Applications are classified into stateless and stateful. Stateless applications do not require acknowledging application states (i.e., historical processing values) to handle users' requests. Meanwhile, stateful applications rely on application states for proper processing. More importantly, application states are used to provide the fault tolerance and scalability of applications that require state transfer between applications. For instance, this [demo](#) shows how we used application states.

Existing studies have been proposed to utilize the states of applications deployed on general-purpose servers. Due to the emerge of latency-sensitive use cases such as autonomous driving and robots, there is a possibility to deploy applications directly on programmable network devices such as [Tofino switches](#), thus allowing applications to process users' requests at line rate and consequently reducing latency. While ensuring line-rate processing for applications, programmable network devices have to maintain application states, thus making fault tolerance and scalability challenging. This work aims to investigate a solution for the state transfer of applications deployed on programmable devices.

Tasks:

- Literature review
- Find a research problem (optional)
- Propose a solution
- Evaluate the proposed solution
- Write up a report

Requirements:

- Basic knowledge of computer networks
- Basic knowledge of Linux
- Programming languages: C and Python.

Language: English

Our offer that helps students focus on their work:

- Testbed
- Measurement tools and scripts

Keywords: state transfer, programmable switches, P4

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