SYMPHONY - A CONTROLLER FOR HYBRID SOFTWARE DEFINED NETWORKS

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Certificate of Original Authorship

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Abstract

Software Defined Networks (SDN) is currently an active area of research. As enterprises migrate to SDN, an inevitable network transitional state is a brownfield state, where both Software Defined and Legacy networks coexist. To achieve interoperability between legacy and Software Defined Networks and to leverage the existence of OpenFlow devices in the traditional network to improve existing network state, a Hybrid SDN controller is a desirable addition to any brownfield deployment of SDN.The thesis of this work aims to further the knowledge in the area of Hybrid Software Defined Networks by highlighting the requirements and challenges to be addressed while integrating legacy and Software Defined Networks. The requirements and challenges discussed in this thesis focus on path computation, packet forwarding, and centralised policy application. This is achieved by building a Hybrid SDN Controller. The main controller components - controller application that runs on POX, a route server to store legacy network information, a next-hop module, a path discovery module and a policy module. We also discuss three use cases of SYMPHONY hybrid SDN controller to demonstrate the controller's application and usefulness. We also perform few key tests to determine the efficiency of deploying a hybrid SDN controller in a network.

Publications Supporting this Thesis

The following is a list of publications resulting from this thesis.

Conferences

Fourth European Workshop on Software Defined Networks

1. Chemalamarri, V.D., Nanda, P. and Navarro, K.F., 2015, September. SYMPHONY—A Controller Architecture for Hybrid Software Defined Networks. In Software Defined Networks (EWSDN), 2015 Fourth European Workshop on (pp. 55-60). IEEE.

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