

Developing a Cost-Effective OpenFlow Testbed for Small-Scale Software Defined Networking

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Abstract—These OpenFlow is the first standard interface for realizing Software-Defined Networking (SDN) that can decouple the data and control plane to provide scalable network management. To validate the performance and features of the OpenFlow standard, many researchers have utilized specialized hardware network devices such as NetFPGA. However, these devices are not suitable for implementing a small-scale SDN testbed due to high cost, complexity, and specialized programming languages. The well-known SDN emulator, Mininet[1], is also widely utilized but it is not enough to support network dynamicity and the performance of the virtualized hosts. In this paper, we suggest a more cost-effective alternative of implementing SDN testbed with Open vSwitch (OVS), based on the Raspberry-Pi that is a low-cost embedded Linux machine. We validate our testbed with the OpenFlow specification 1.0 and prove that its maximum network throughput shows almost the same performance compared to the NetFPGA-1G.

Keyword— Software Defined Networking; OpenFlow; Open Vswitch; Raspberry-Pi



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