

User-Friendly Dynamic Network Topology Display and Congestion Control

Juan Salinas

Ryu, a component based Software-Defined Networking (SDN) controller, is an important tool that provides a platform for continuing innovation in the area of SDN. Ryu allows communication between controllers and switches on a network by using the southbound interface, OpenFlow. The software provides a user-friendly approach to creating applications that can dynamically change the functionality of a network as well as retrieve its real-time statistics. The purpose of this paper is to highlight two applications that can improve network performance. The first application, used for network troubleshooting, is a Graphical User Interface (GUI) that displays the network topology while also allowing for the viewing of individual switch statistics. The statistics included are ingress and egress traffic information. The GUI also allows access information related to the packet forwarding rules of each of the switches and displays the active paths specified by these rules. The other application created is for the avoidance of congestion in a network. The application takes advantage of the packet forwarding rules in switches and changes them according to the data rate needed for efficient host-to-host communication. Ryu and the OpenFlow protocol allow for these applications creation and implementation through Ryu's user-friendly application creation process and OpenFlow's switch manipulation capabilities.