

## ABSTRACT

Increasing the number of Internet users is a challenge for researchers to maintain network performance. One way to maintain network performance is through the mechanism of routing. BGP is the routing protocol that functions linking all the autonomous systems (AS) in the Internet. The specific routing mechanism that is used to connect all ASes is external BGP (eBGP). Like other routing protocols, eBGP is running on traditional network devices, which control plane and forwarding plane are in a single device.

Software defined network (SDN) is a network paradigm to decouple control-plane into a separate device known as controllers. It results network devices (e.g routers, switches) only forward packets based on commands from the controller. This topic has attracted researchers to implement in various network protocols (e.g routing protocol).

This research simulates routing protocols eBGP on SDN, as well as analyzing its performance in terms of QoS parameters (delay, jitter, packet loss, throughput), convergence-delay, routing overhead and resource utilization. The result shows that eBGP protocol could be simulated on SDN with the Quality of Service parameter (delay, jitter, packet, throughput) meets the ITU-T standards, up to 75 Mbps background traffic. The convergence delay increases as the number of switches also increases. The BGP features (keepalive and holdtime) also affect the convergence delay. Number of switch and BGP feature (keepalive) also affect the number of routing overhead. The percentage of memory usage (resource utilization) increases with the number of switches, 8.2% (4 switches), 8.7% (6 switches) and 9.9% (9 switches).

Keyword: Software Defined Network, eBGP, Routing