

Abstract

In the current digital era, the increasingly complex and rapidly evolving use of computer networks has led network administrators to contemplate more efficient network management approaches. Consequently, network management through automation has emerged as a solution that emphasizes the efficiency of network administration while reducing human errors and potential impacts on network performance. Within this context, there are several network automation methods available, including Python Paramiko automation and Ansible automation. The objective of this study is to analyze, compare, and enhance the performance of these two network automation approaches by automating the configuration of the routing protocol EIGRP. EIGRP is chosen due to its superior performance in convergence duration. Python Paramiko automation is 4.9 times faster in delivering EIGRP configuration scripts to routers compared to Ansible automation, with a time difference of 185.89 seconds. This discrepancy arises from Ansible automation involving inventory host and playbook setup prior to SSH protocol communication. By altering the Ansible automation strategy and employing the execution strategy of the Mitogen extension, the delivery time of EIGRP configuration scripts can be accelerated by 1.3 times, resulting in a reduction of 64.7 seconds. Utilizing the Python Multi-Thread module, the delivery time for EIGRP configuration scripts using Python Paramiko automation can be further expedited by 3.9 times, resulting in a reduction of 34.92 seconds. The EIGRP routing protocol has proven to be accurate in identifying the best path and swiftly transitioning to backup paths when the best path fails, achieving a failover convergence time of 26.41 seconds.

Keywords : Ansible Automation, Python Paramiko Automation, Network Automation, Multi-Threading Modul, Mitogen Extension.