

INTRODUCTION

This project aims to create a MiniPod that can automate device setups for legacy devices, which are a barrier to implementing network automation.

The project's main objectives are to research router and switch configurations, develop an automation tool for legacy devices, and compare its speed to manual configuration.

Existing automation Technologies



Implementation

The MiniPod was developed in Python using the Netmiko library. The tool will connect to the device and will send the network configurations and fully set up the device.

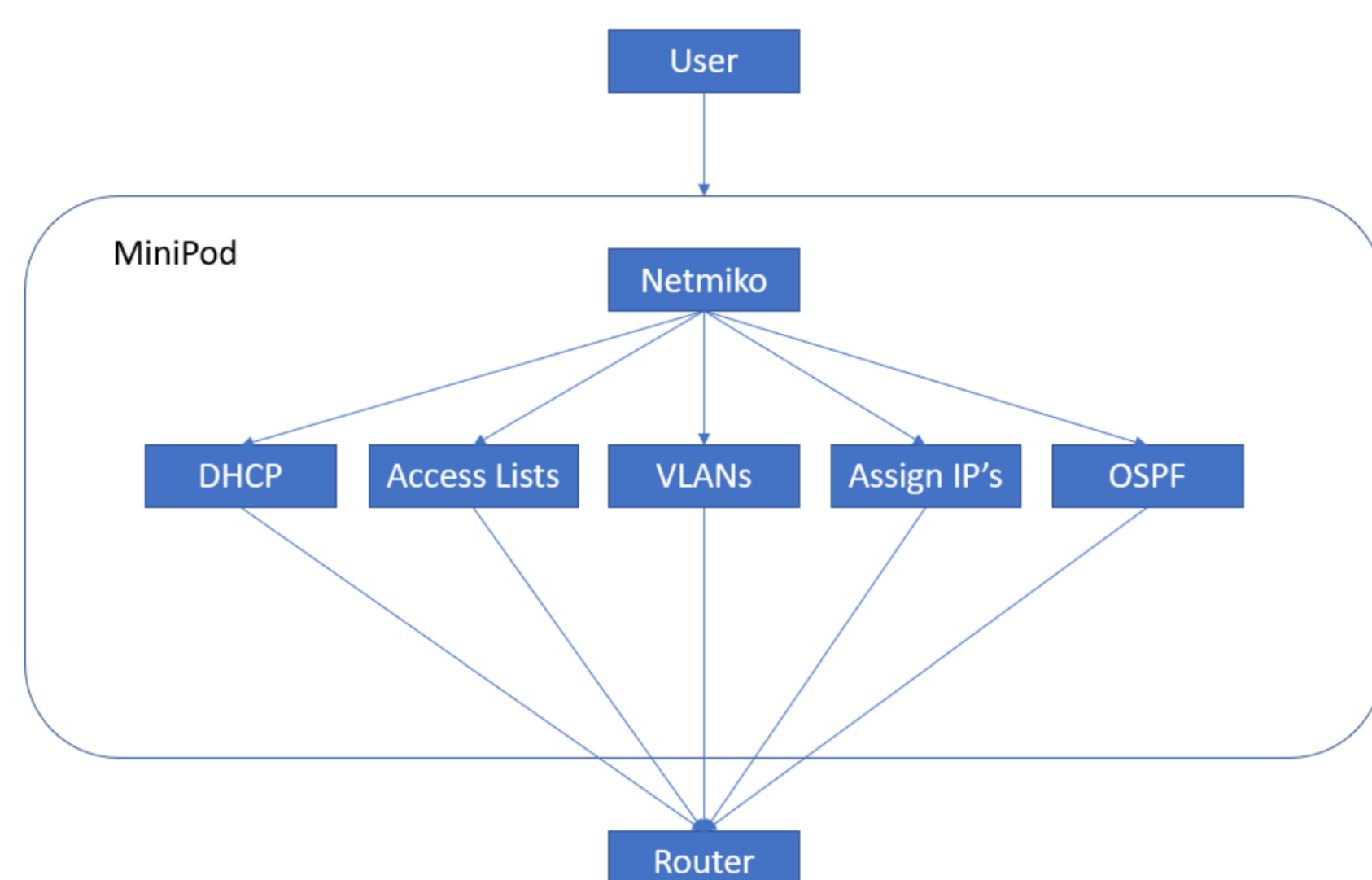


Figure 1. MiniPod Software Overview

The network configurations that were automated included assigning IP addresses to interfaces, configuring OSPF routing protocol, configuring ACLs, configuring DHCP and configuring VLANs (router-on-a-stick).

Self-Evaluation

Using a network virtualisation tool (GNS3) to run the tool, a simple spine and leaf network topology was created and a new spine is added to the network and this spine device would need to be configured. MiniPod vs manual configuration was evaluated for the time to configure all the different network configurations.

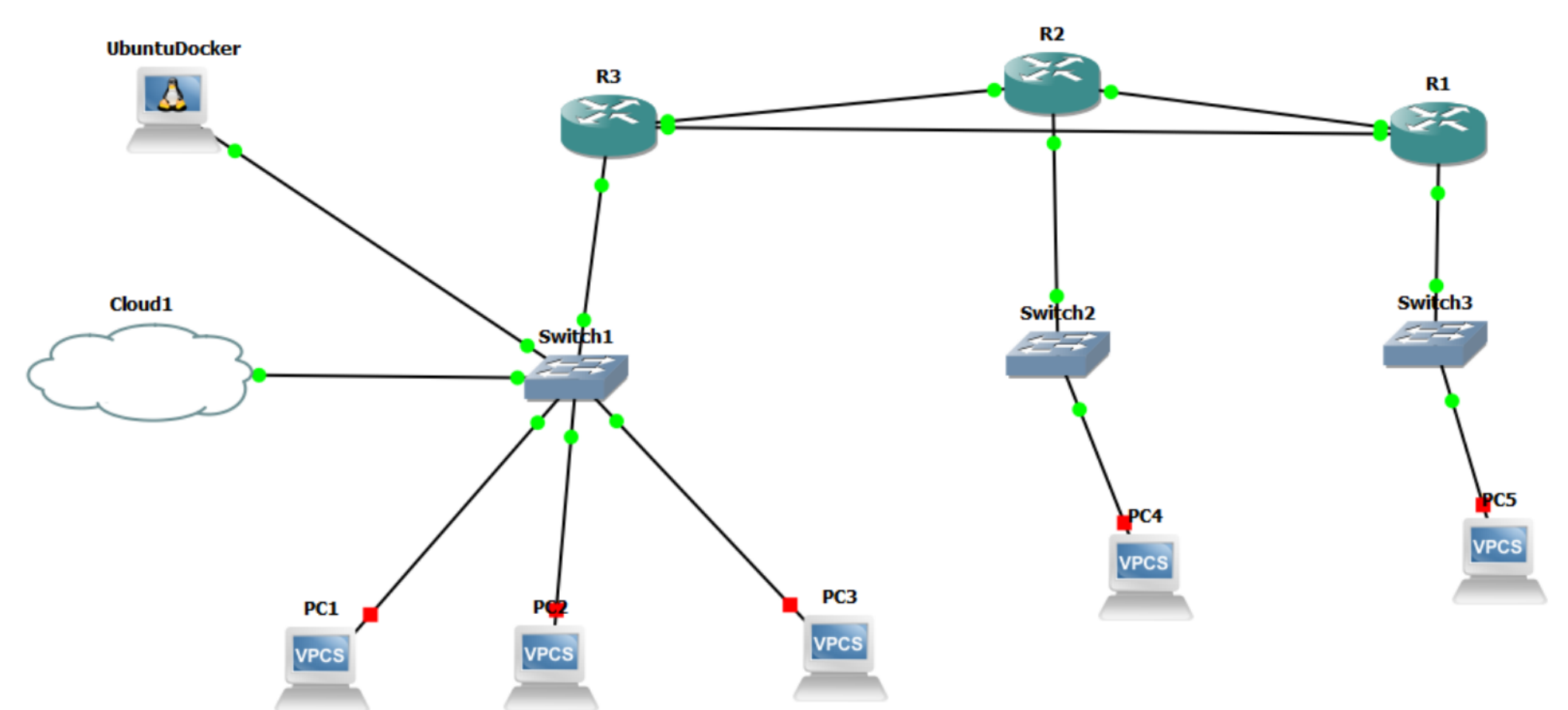


Figure 2. 2-tier spine and leaf Network Topology Used for self evaluation (R3 configs automated)

	Run 1	Run 2	Run 3	Average
Manual	4 min 54 s	6 min 2 s	5 min 7 s	5 min 21s
MiniPod	22s	22s	22s	22s

Results show MiniPod significantly faster in setting up configurations

Conclusion

Successfully achieved goals by researching common network configurations and existing network automation technologies, creating the MiniPod with Python and Netmiko library, and successfully implementing most important requirements such as setting up interfaces with IP addresses, OSPF, DHCP, access lists, and VLANs. Testing on GNS3 showed the MiniPod outperforming manual configuration in a 2-tier spine and leaf topology. Limitations include MiniPod not assigning an IP to an unconnected interface and issues with configuring VLANs through user input.