

SSoT Based Network Service Deployment

Graduate



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Introduction: Network automation is a key aspect in modern-day networks, allowing for accurate, repeatable procedures. Single Source of Truth (SSoT) based network deployment is often the ultimate goal. However, many of the current open-source tools fall short in terms of features, usability, or quality. NetBox is one such tool that is excellent at documenting network infrastructure, but does not offer a way to automate the deployment of the documented network.

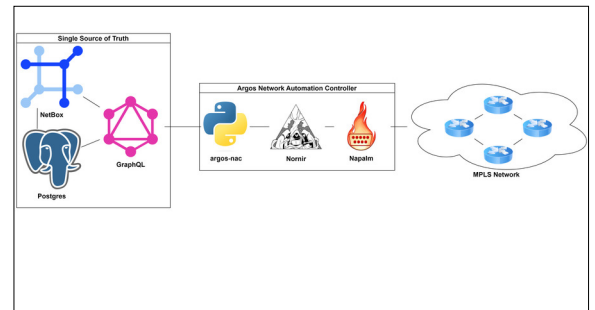
Approach: This project seeks to extend NetBox's functionality by adding support for network services and implementing a mechanism for automated configuration deployment.

We chose MPLS Layer 3 VPN as our target service, which builds upon the LDP, VRF, and BGP protocols, of which only VRF was previously supported. After comparing various tools for network device configuration, we decided to use Napalm for device interactions and configuration management, with Nornir serving as a parallelization layer. The focus throughout development was to ensure ease of extensibility and a straightforward deployment process, either interactively or as part of a script.

Result: The resulting software is comprised of two parts: the Argos-NetBox plugin, which extends NetBox and adds support for the aforementioned protocols, and Argos-NAC, which queries the necessary data from NetBox and handles the generation and deployment of the various device configurations. Argos-NetBox can be used standalone and is vendor-independent, making Argos-NAC an optional addition to it. The implemented protocols can be used separately and are designed to be interchangeable, should alternatives to them be added in the future.

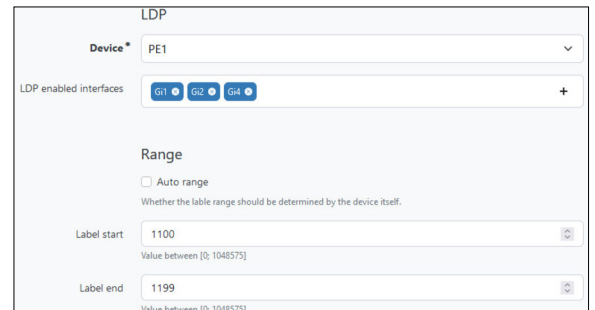
Component Overview

Own presentation



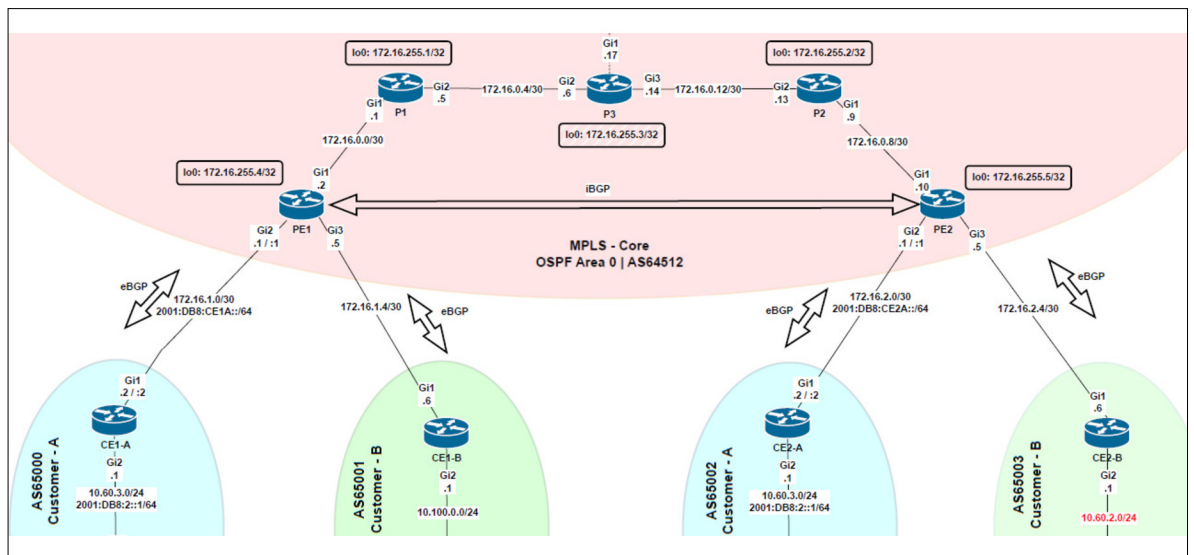
LDP NetBox Page

Own presentation



Overview MPLS L3 VPN Lab

by Institute for Network and Security



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Subject Area

Software