Mini Project Report

GNS3 Web Configuration Tool

Yassine LATRECHE

ESI-SBA

1CS - 4th Group

28th June, 2022

Table of content:

Introduction:

GNS3 Web Configuration Tool aims to assist with building and managing GNS3 topologies as well as configuring routers, switches, and computers.

Project Goal:

The main goal of this project is to provide a simple and clean Web interface that helps its users apply basic configuration in GNS3, including:

- Creating and managing GNS3 projects.
- Viewing Current topology.
- Adding and managing devices.
- Creating and deleting links between devices.
- Starting, suspending, reloading and stopping devices.
- Checking Running and Startup configurations for each device.
- Viewing and creating Vlans.
- Setting IP addresses for devices (routers and PCs).
- Configuring Static Routes.
- Pinging other existing devices.

Used Technologies:

Python:

Python is a high-level, interpreted, general-purpose programming language. Its design philosophy emphasizes code readability with the use of significant indentation.

GNS3:

Graphical Network Simulator-3 is a network software emulator first released in 2008. It allows the combination of virtual and real devices, used to simulate complex networks. It uses Dynamips emulation software to simulate Cisco IOS.

Oracle VM VirtualBox:

Oracle VM VirtualBox is a type-2 hypervisor for x86 virtualization developed by Oracle Corporation. VirtualBox was originally created by Innotek GmbH, which was acquired by Sun Microsystems in 2008, which was in turn acquired by Oracle in 2010.

Django:

Django is a free and open-source, Python-based web framework that follows the model–template–views architectural pattern, and it is maintained by the Django Software Foundation.

Python telnetlib:

The telnetlib is a python module that provides a Telnet class that implements the Telnet protocol. In addition, it provides symbolic constants for the protocol characters, and for the telnet options.

Gns3fy:

Python wrapper around GNS3 Server API. Minimal GNS3 version is 2.2. Its main objective is to interact with the GNS3 server in a programmatic way, so it can be integrated with the likes of Ansible, docker and scripts. Ideal for network CI/CD pipeline tooling.

Netmiko:

netmiko is a multi-vendor SSH Python library that simplifies the process of connecting to network devices via SSH. This library adds vendor-specific logic to paramiko, which is the de-facto SSH library in Python.

It should be noted that Netmiko also supports Telnet.

D3.js:

D3.js is a JavaScript library for producing dynamic, interactive data visualizations in web browsers. It makes use of Scalable Vector Graphics, HTML5, and Cascading Style Sheets standards. It is the successor to the earlier Protovis framework.

Bootstrap Studio:

Bootstrap Studio is a proprietary web design and development application. It offers a large number of components for building responsive pages including headers, footers, galleries and slideshows along with basic elements such as spans and divs. The program can be used for building websites and prototypes.

The software was activated using the Github Student Hub license.

Installation:

- Clone the project source code from its Github repository:

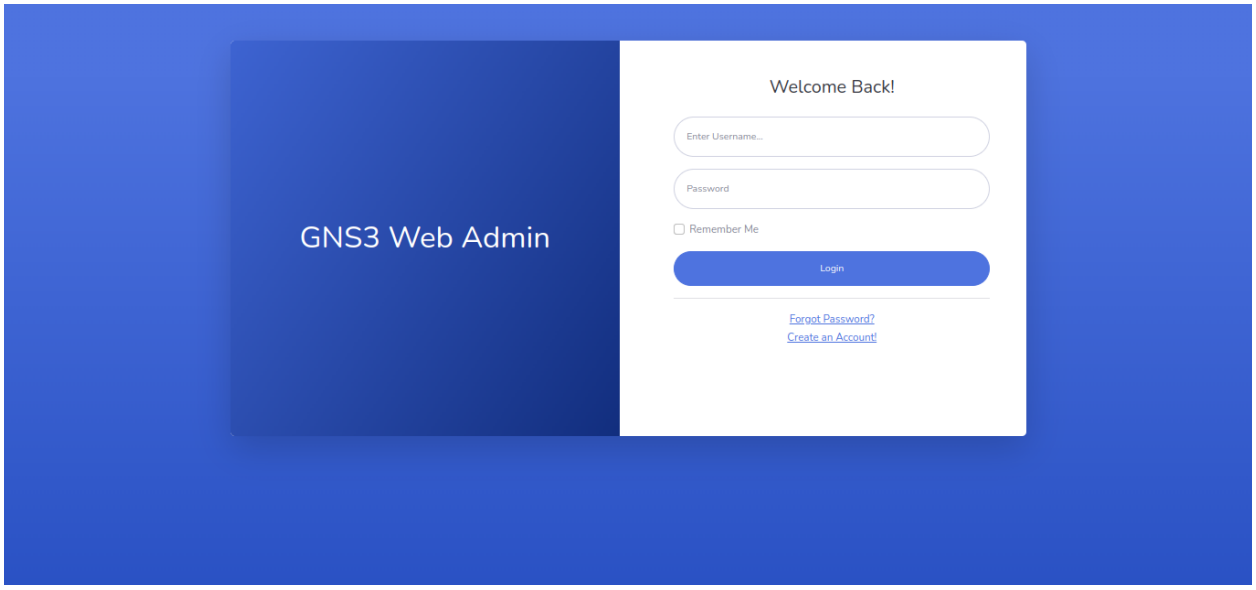
https://github.com/Yassine-Latreche/GNS3-Web-Configuration-Tool

- Create a Python virtual environment.
- Install requirements using requirements.txt file.
- Create an administrator account using Django manage.py script.
- Start the server.
- Install GNS3 and configure it.
- Login to your account.
- Create a connection to your GNS3 server.
- Select the connection and create a project.

Usage:

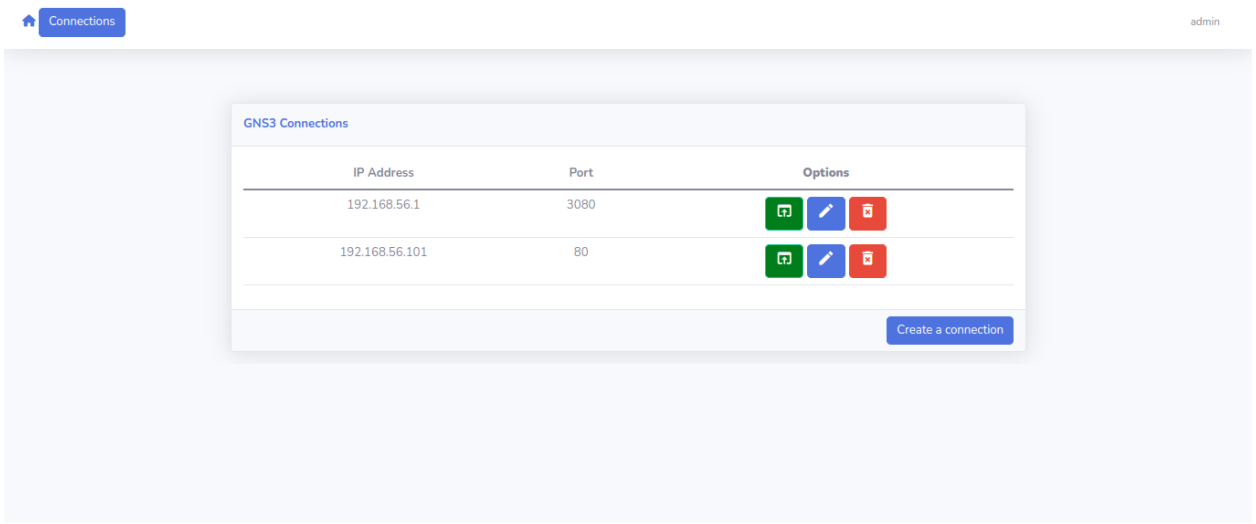
Connecting:

The application provides an authentication interface for each user.



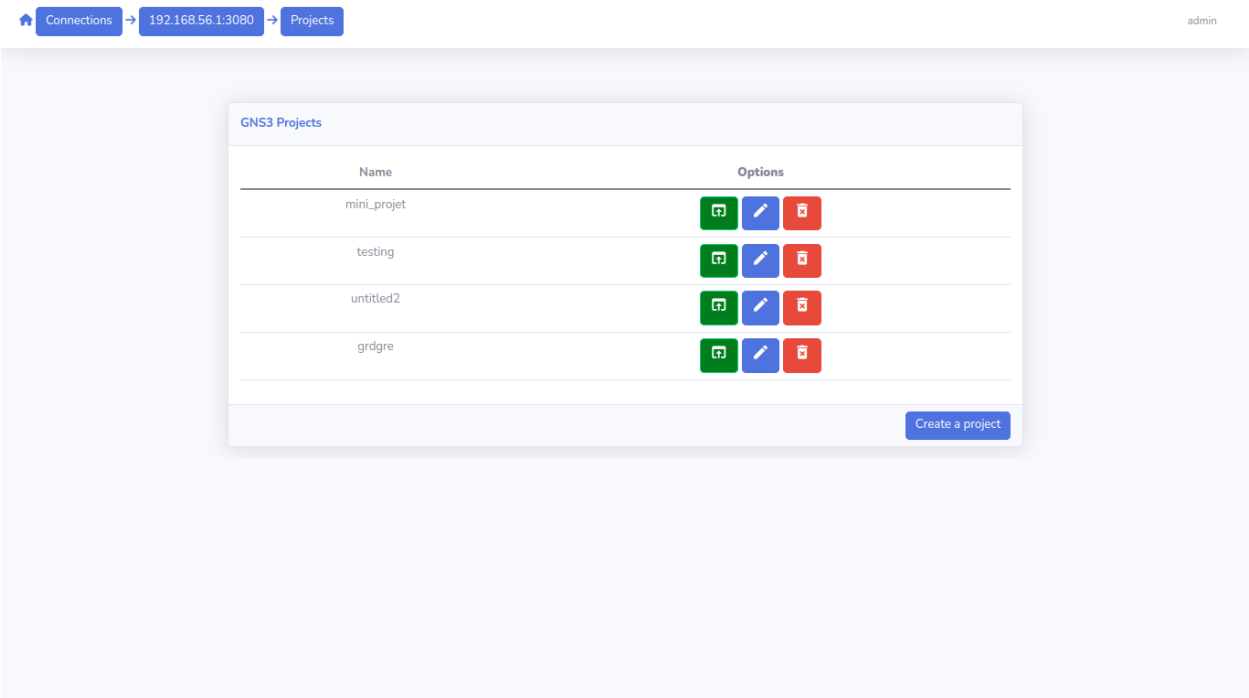
Connections:

After login in, the application shows all the GNS3 Server connections, with the ability to add, edit and delete existing connections.



Projects:

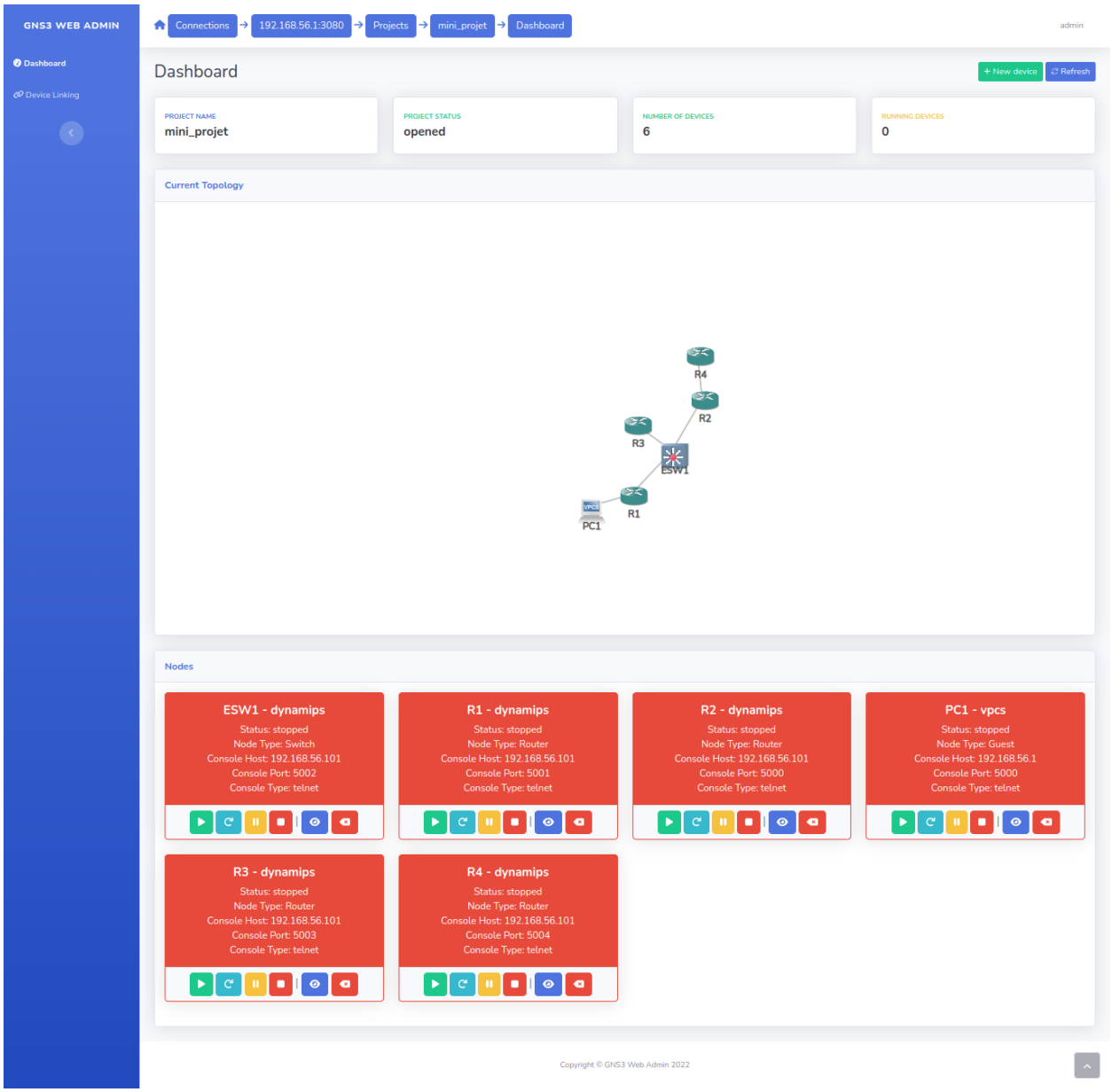
After choosing a connection, the application shows all the existing projects with the ability to create new ones, or edit and delete existing ones.



Project Main Page:

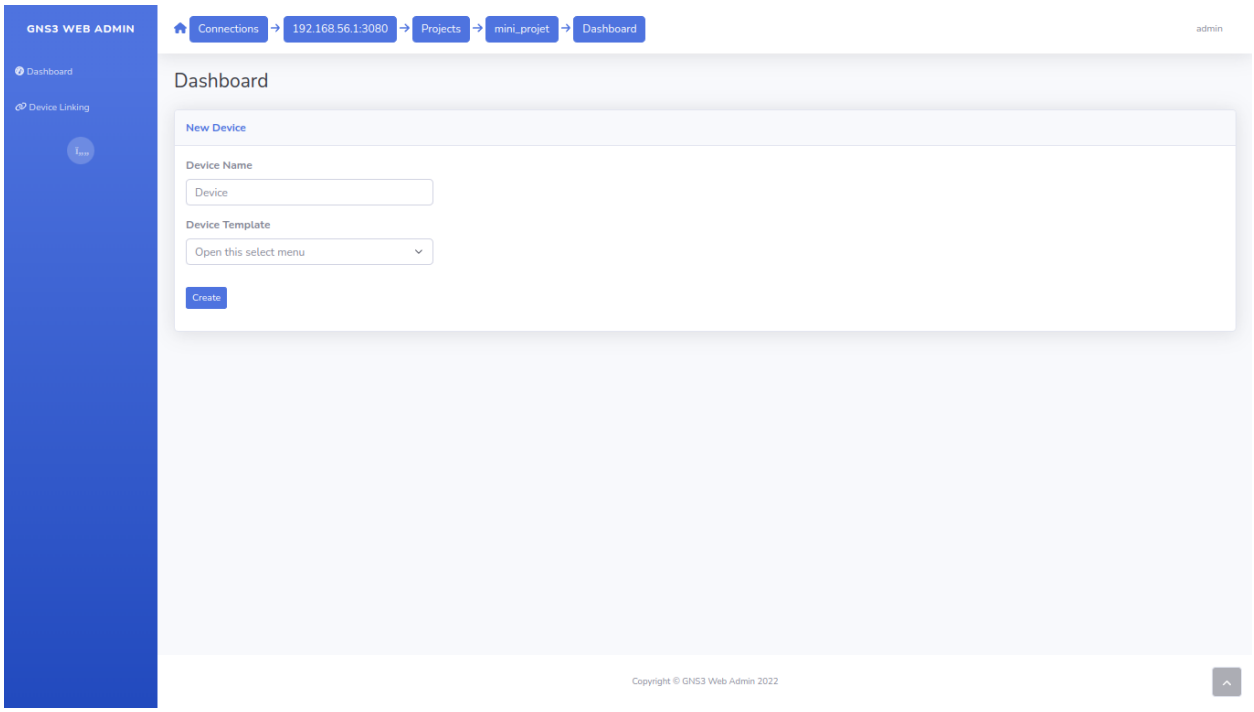
After choosing a project, the application shows basic information about it and it draws the current topology using D3.js.

A list of all the devices that are available is displayed at the bottom of the page, and we may do some simple operations on each one, such as turning it on, reloading it, suspending it, stopping it and deleting it.



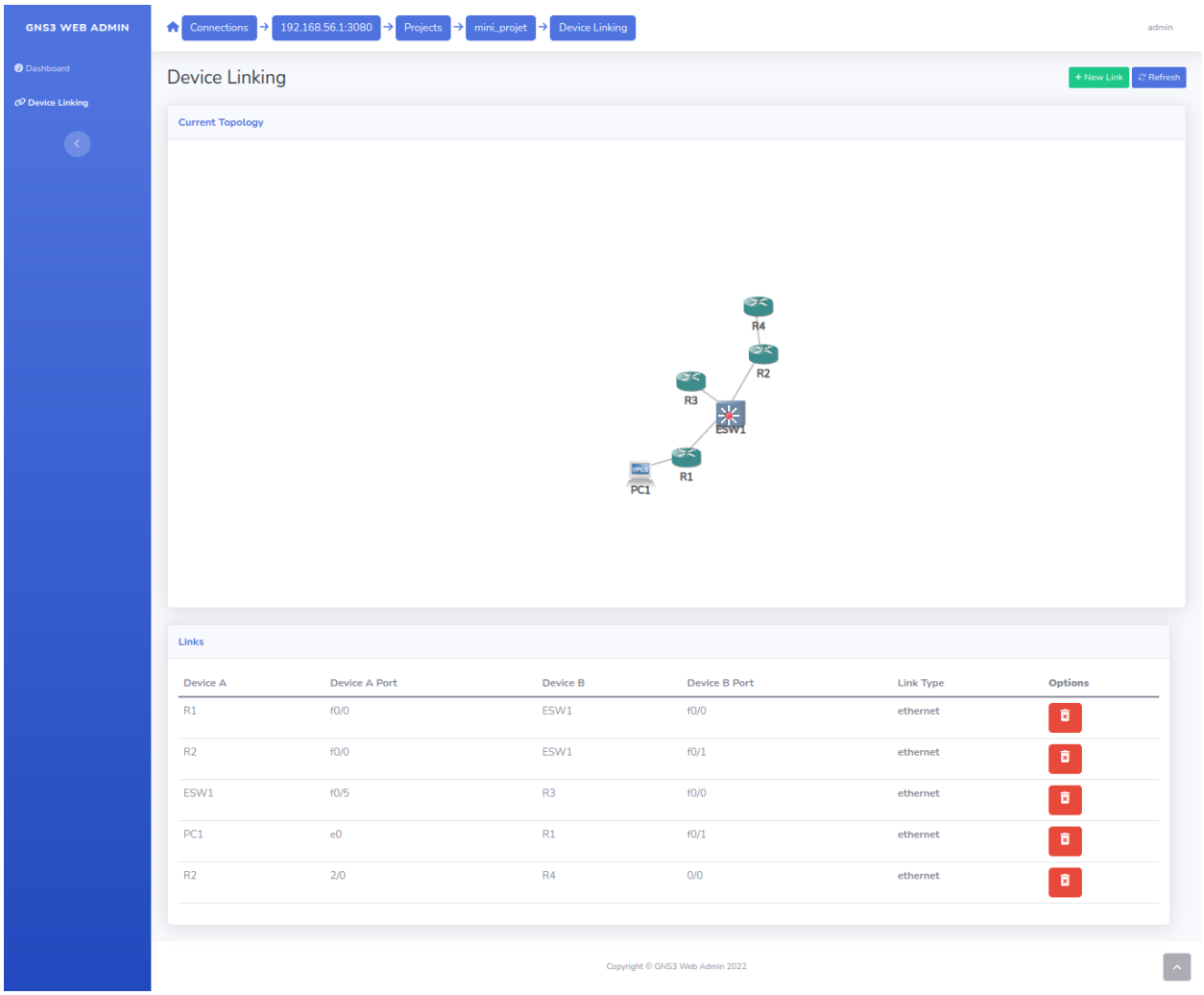
Creating a device:

A form with a text field for the device's name and a dropdown list for the device type is displayed when the "New device" button is clicked.



Device Linking:

The “Device Linking” page contains all the existing links between devices, with the ability to create new links and delete existing ones.

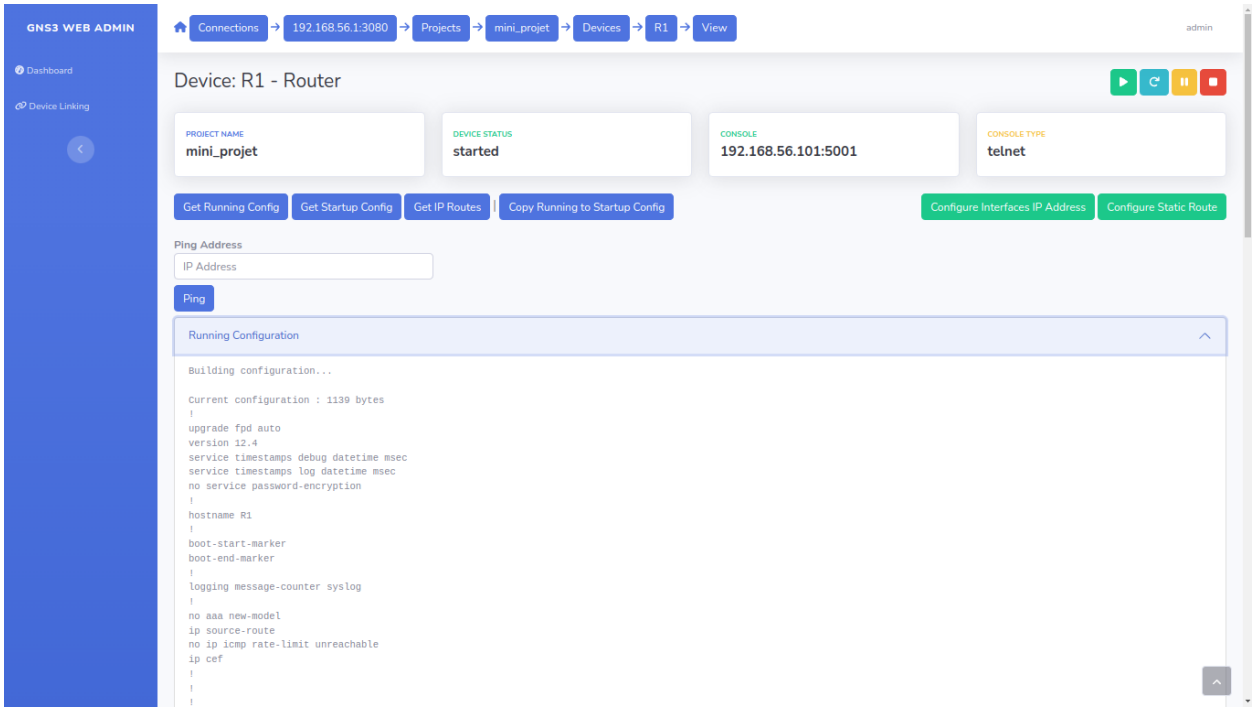


Device Configuration:

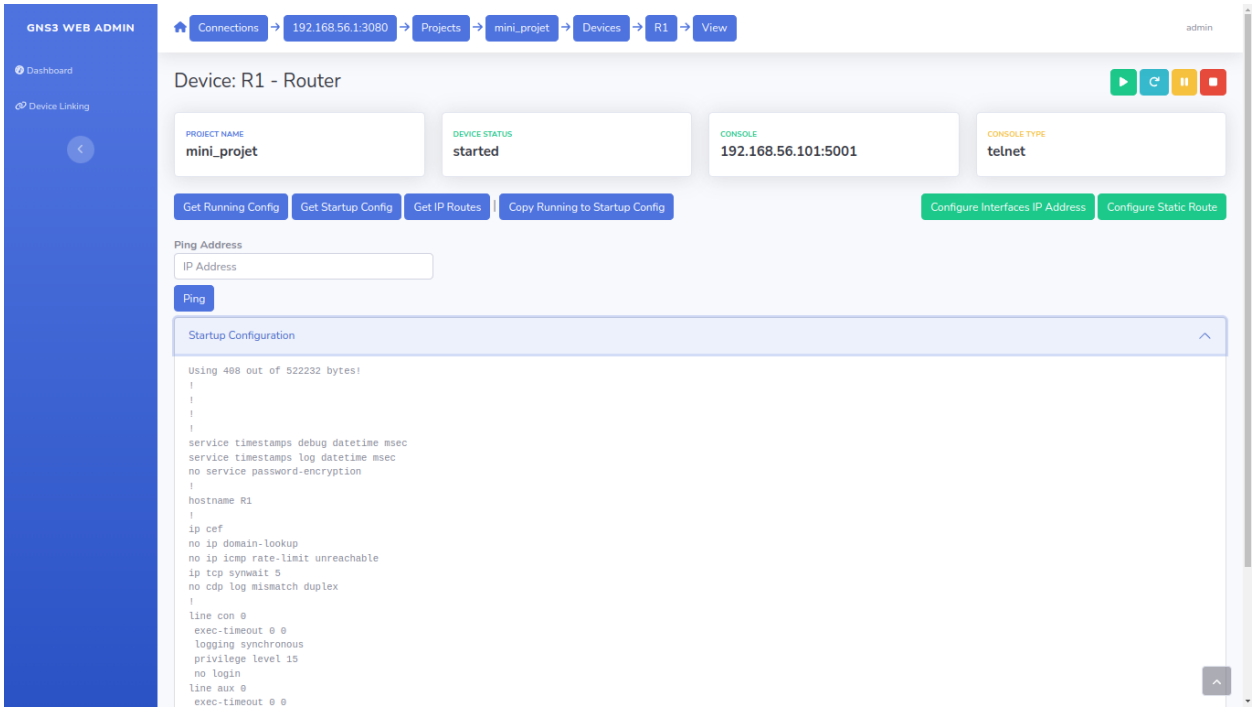
Routers:

A simple interface enables the user to:

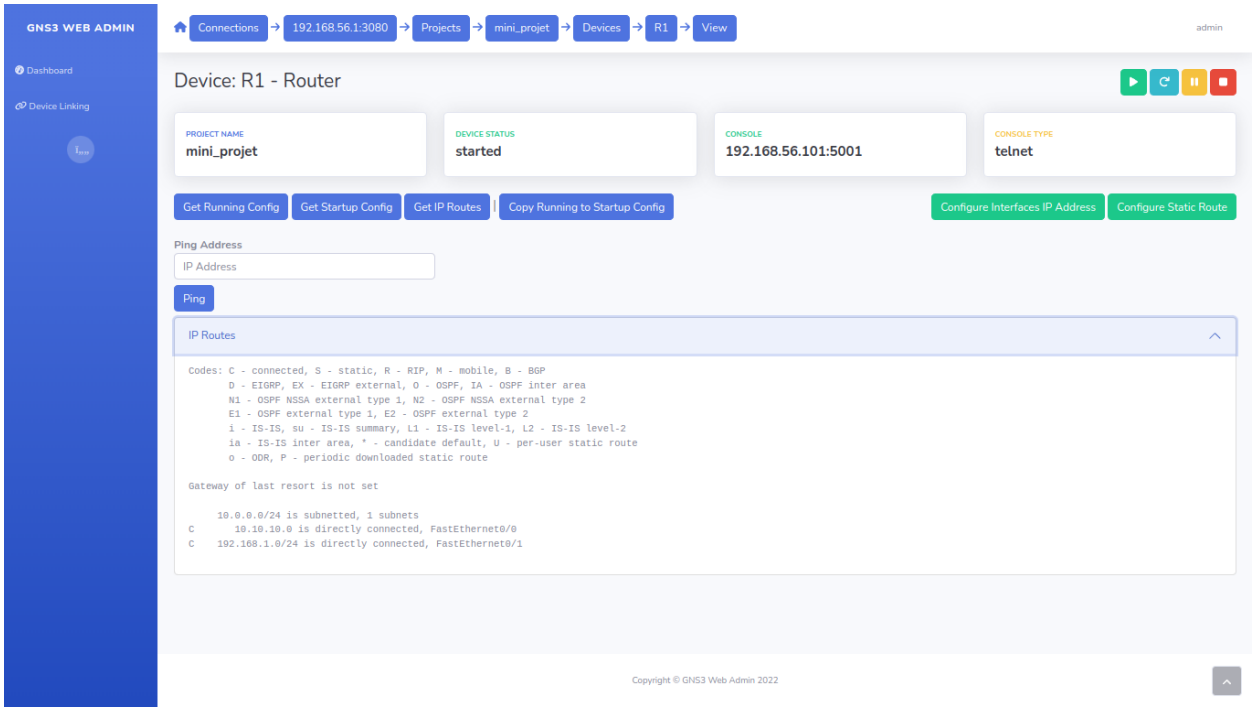
- Get Running Configuration.



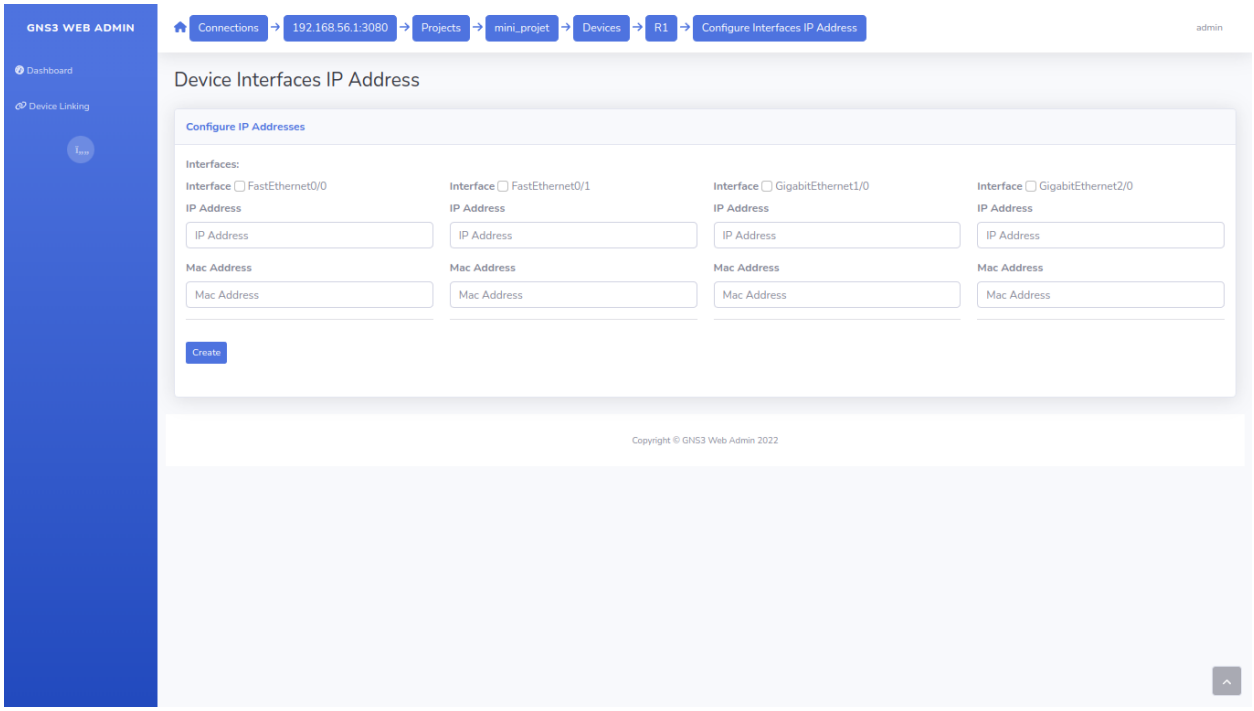
- Get Startup Configuration.



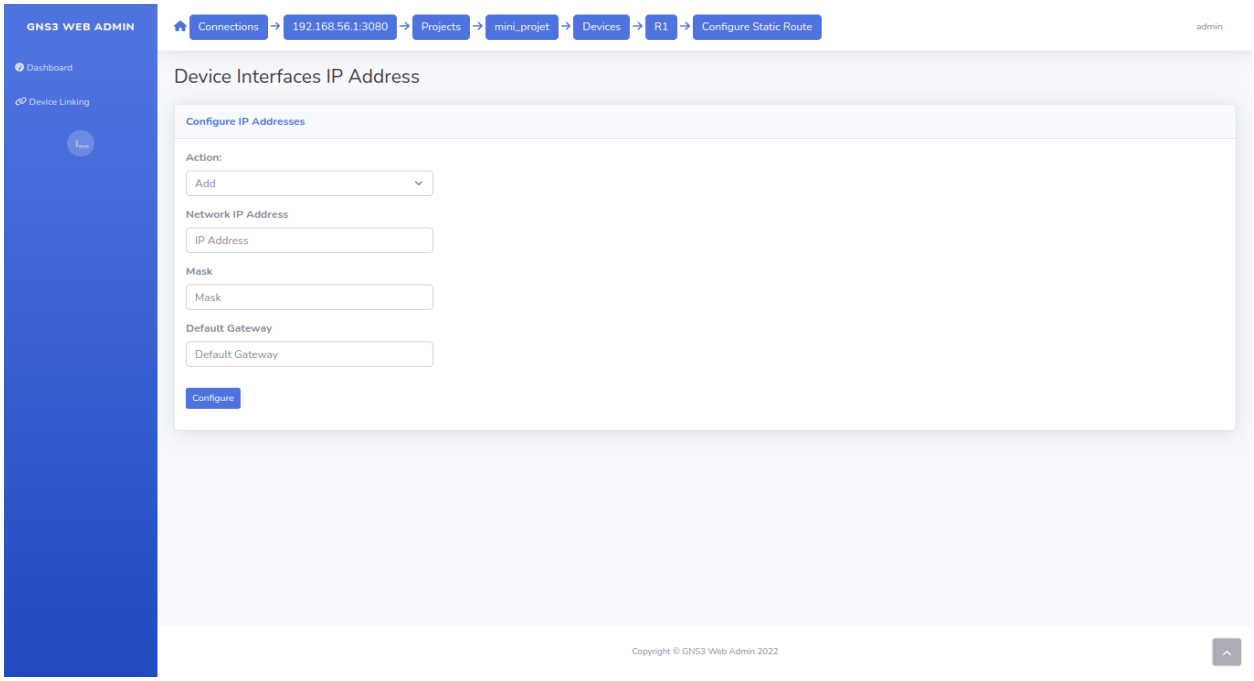
- Get IP Routes.



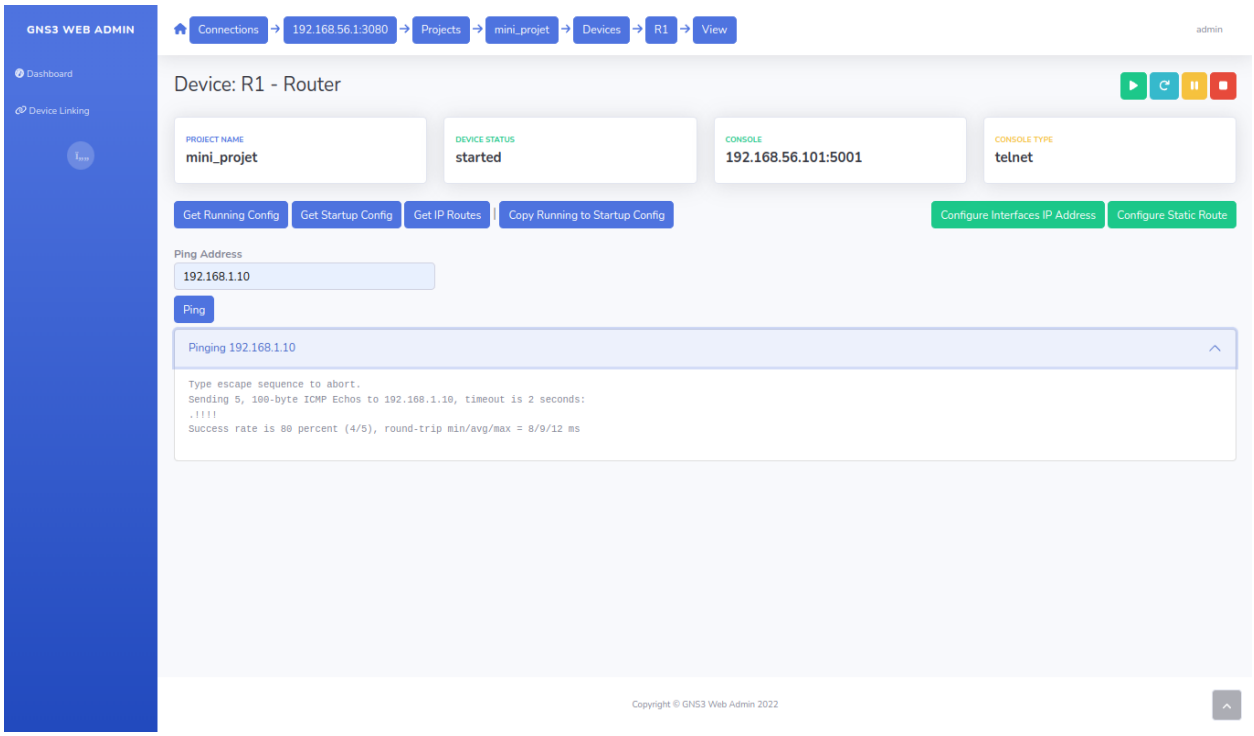
- Copy the startup configuration from running.
- Configure each interface's IP address.



- Configure Static Routes.



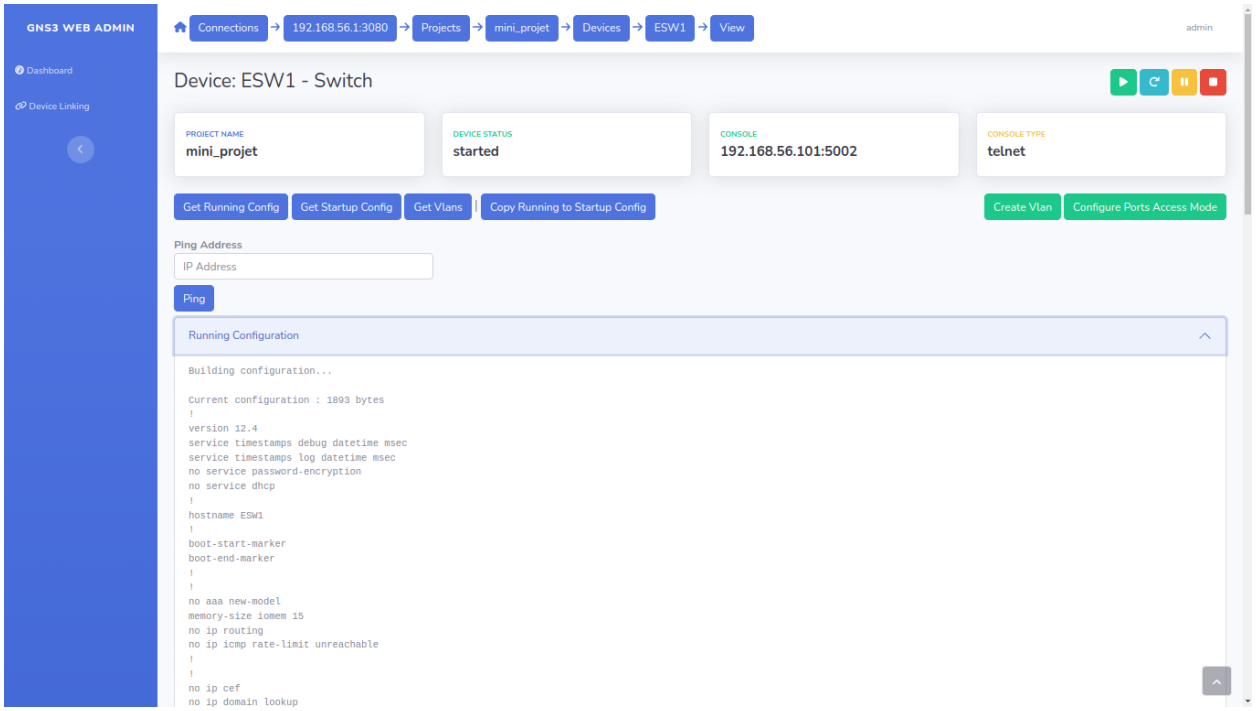
- Ping other devices in the network.



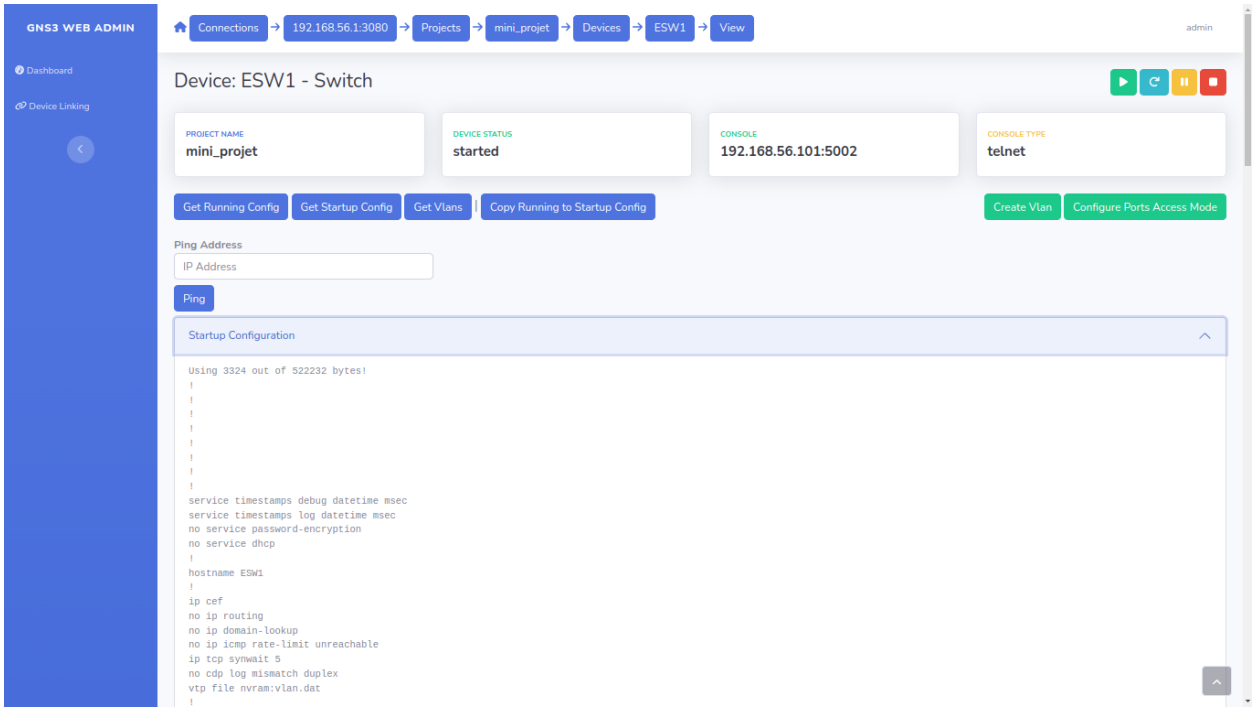
Switches:

Using this interface, the user is able to:

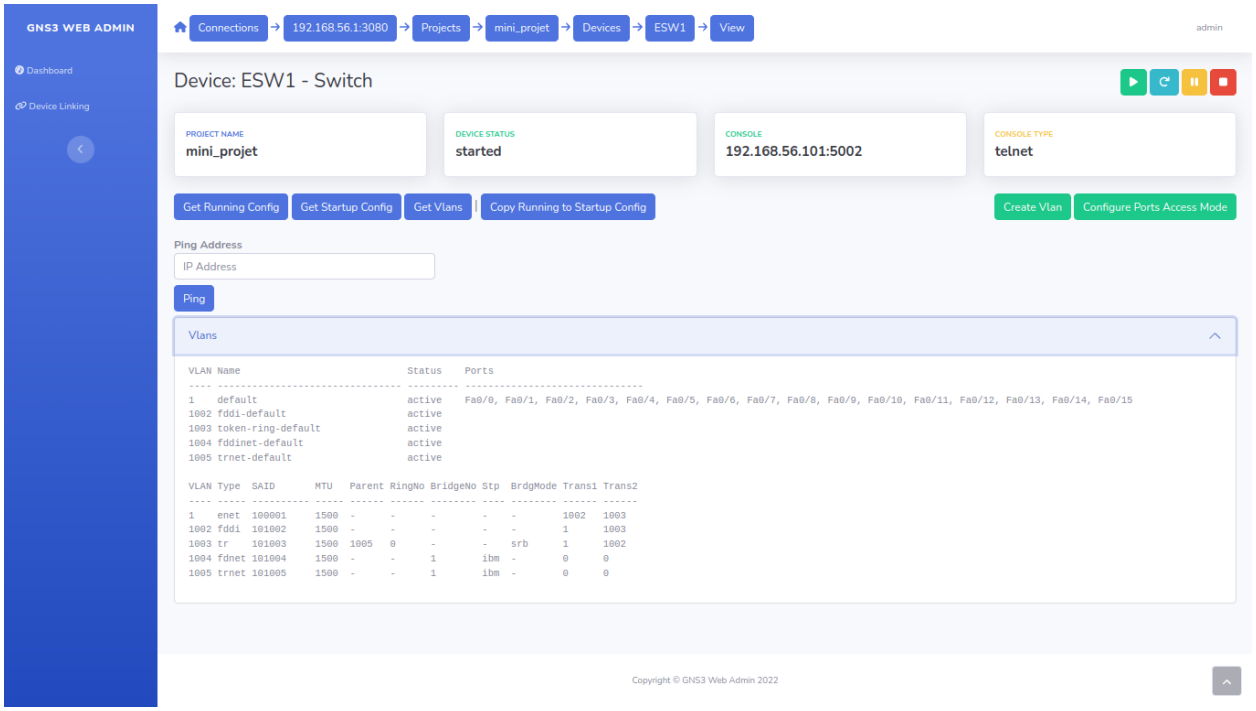
- Get Running Configuration.



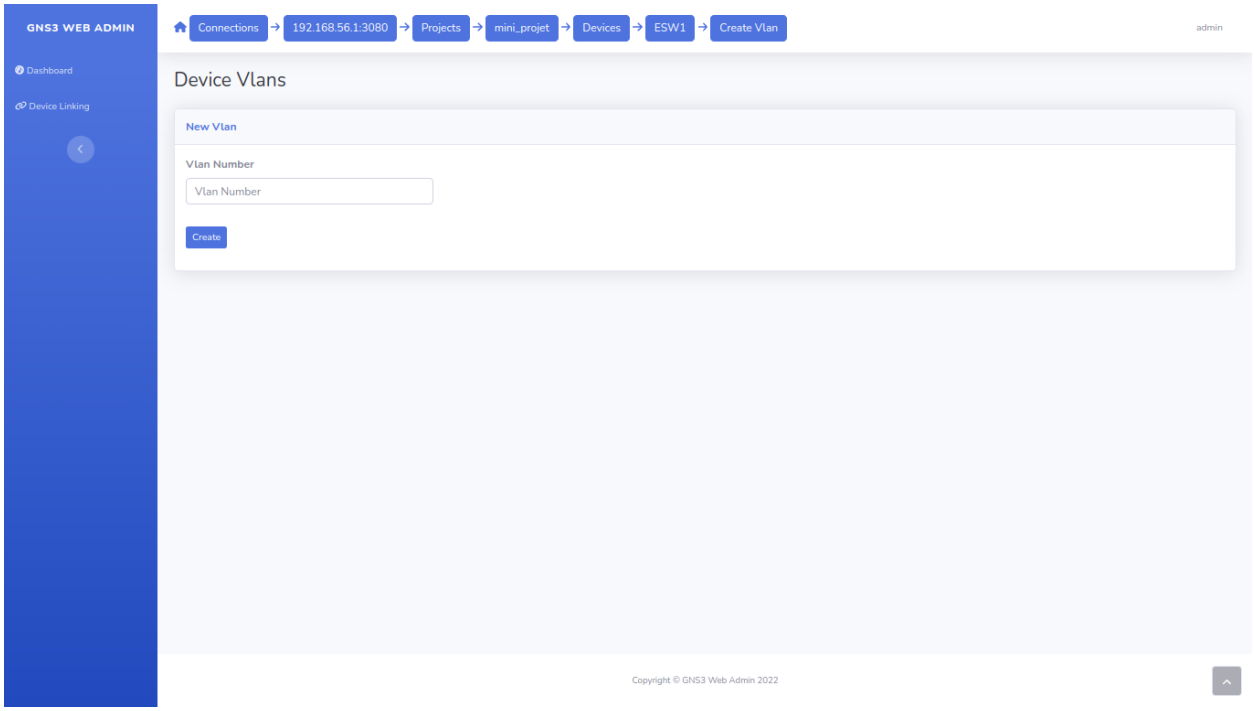
- Get Startup Configuration.



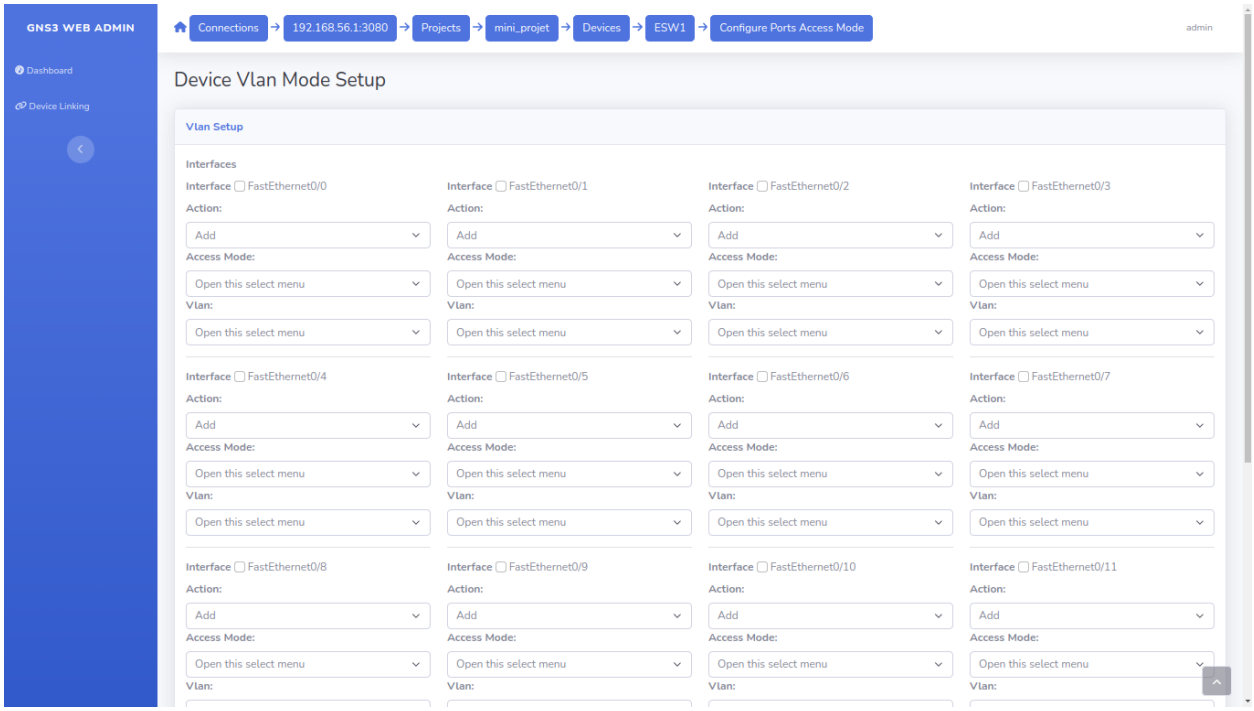
- Get Vlans.



- Copy the startup configuration from running.
- Create Vlan.



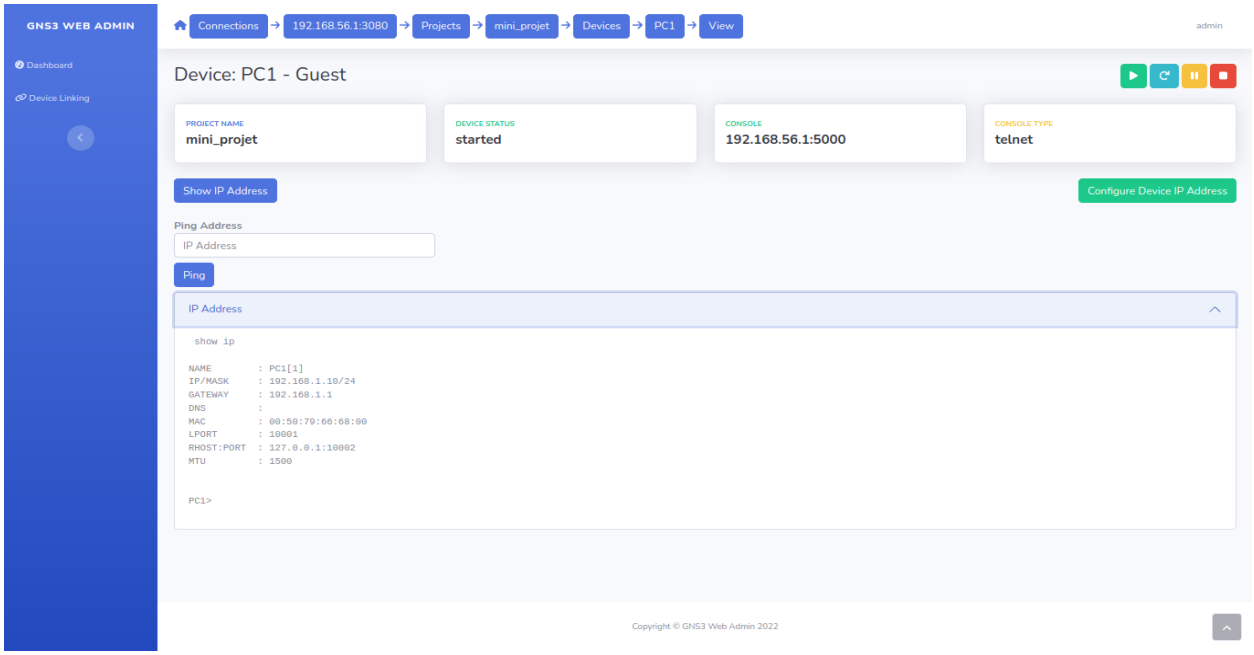
- Setup Switchport mode for each interface.



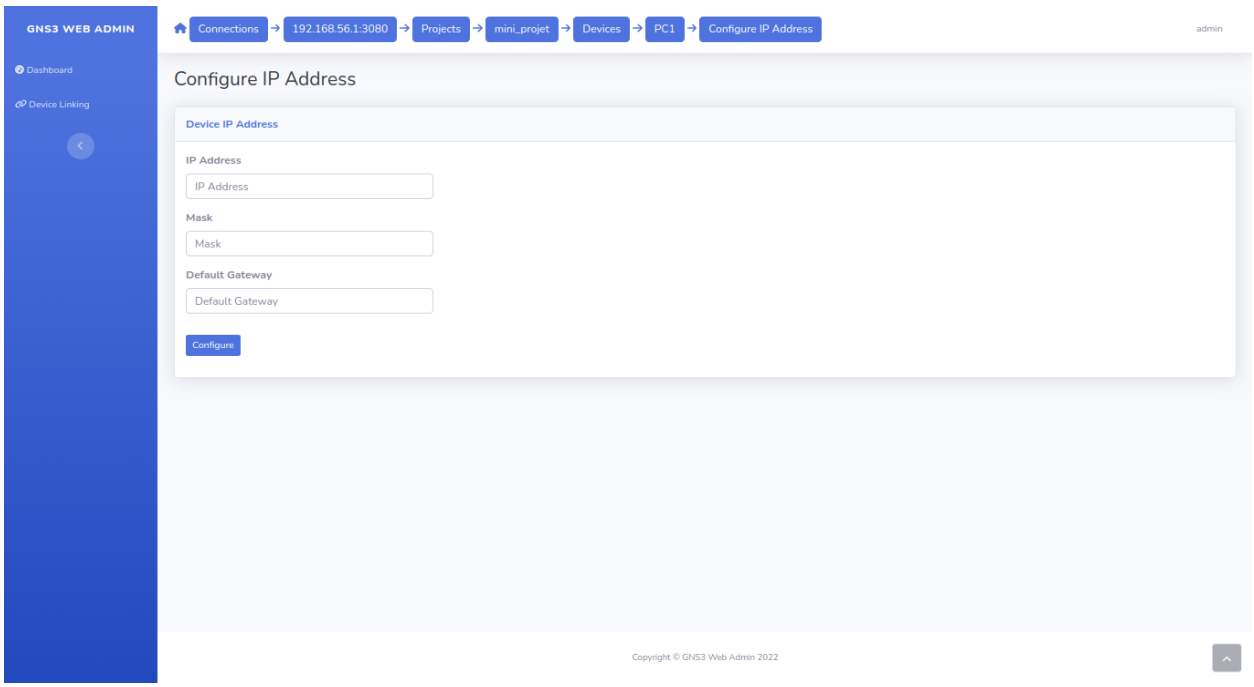
Guest (PC):

Using this interface, the user is able to:

- Show IP Address.



- Configure IP Address.



- Ping other devices in the network.