**Network Tool Suite Documentation**

**Overview**

The Network Tool Suite is a comprehensive GUI application designed to facilitate network analysis tasks, including network mapping, reverse IP lookup, and port scanning. This tool integrates various functionalities into a single, user-friendly interface, making it accessible for both novice users and experienced network administrators.

**Installation**

**Dependencies**

Before running the Network Tool Suite, ensure the following dependencies are installed:

* Python 3.x
* Tkinter (usually comes with Python)
* nmap and python-nmap
* python-whois
* geoip2 and the GeoLite2-City database

**Installing Dependencies**

* **Python-nmap**: pip install python-nmap
* **Python-whois**: pip install python-whois
* **Geoip2**: pip install geoip2

Additionally, download the GeoLite2-City database from MaxMind and place it in a known directory.

**Running the Application**

Execute the script using Python:

bash

python network\_tool\_suite.py

**Features**

**Network Mapping**

The network mapping tab allows users to scan a specified IP range within their network to discover active devices. It utilizes nmap to perform a ping scan.

**Usage**

Enter the IP prefix (e.g., 192.168.1) and click "Start Scan". The results will display active hosts within the specified range.

**Reverse IP Lookup**

The Reverse IP Lookup tab provides detailed information about a given IP address, including the associated domain name, registrant information, and geolocation.

**Usage**

Enter a valid IP address and click "Lookup". The tool will display the domain name, registrant name (if available), and the geographical location based on the IP address.

**Port Scanner**

The Port Scanner tab scans the specified IP addresses for open ports and identifies running services on those ports.

**Usage**

Enter a single IP address or a range (e.g., 192.168.1.1-192.168.1.10), and click "Scan Ports". The tool will list open ports along with the services identified on each port.

**Technical Details**

**GUI Implementation**

The GUI is implemented using Tkinter, Python's standard GUI library. It features a tabbed interface for each of the main functionalities, with input fields, buttons, and output areas designed for ease of use.

**Threading**

To ensure the GUI remains responsive during long-running network operations, tasks are executed in separate threads. This prevents the UI from freezing and allows users to interact with the application while tasks are running.

**Error Handling**

The application includes basic error handling to manage exceptions such as invalid inputs, network errors, or issues with external dependencies. Error messages are displayed in the output area of the respective tab.

**Customization**

The script can be customized to include additional network analysis functionalities or to adjust existing features. Users with programming knowledge can modify the script to suit their specific requirements.

**Limitations**

* The application requires sudo privileges for certain nmap operations.
* The accuracy of geolocation and registrant information is dependent on external databases and may not always be up-to-date.

**Conclusion**

The Network Tool Suite is a versatile tool for network analysis tasks, combining several functionalities into a single, intuitive interface. It streamlines processes such as network mapping, reverse IP lookup, and port scanning, making them accessible to a wide range of users.