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Department of Computer Science
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# [Virtual Private Network]

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# Table of Contents:

## 1. Introduction

In recent years, online security has become a significant concern as more people conduct sensitive transactions online. A Virtual Private Network (VPN) provides a secure, encrypted connection between a device and the internet, offering privacy and protection from cyber threats. This report describes the implementation of a VPN using Windscribe and the blocking of specific websites using R.O.B.E.R.T. The report provides an overview of the background, problem statement, objectives, and scope of the project.

### Background

The internet is a vast network of interconnected computers that facilitates the exchange of information worldwide. With the rise of the internet, cyber threats have also increased, such as hacking, identity theft, and surveillance. To counter these threats, VPNs have become an essential tool for online security and privacy.

### Problem Statement

The problem statement for this project is to implement a VPN using Windscribe and block specific websites as required. The aim is to provide a secure and private connection between a device and the internet, preventing cyber threats such as hacking, surveillance, and identity theft.

### Objectives

The objectives of this project are as follows:

1. To implement a VPN using Windscribe
2. To block specific websites as required using the R.O.B.E.R.T feature

### Scope

This project focuses on implementing a VPN using Windscribe and blocking specific websites using R.O.B.E.R.T. The project uses Ubuntu as the operating system and Visual Studio Code as the development environment.

## 2. Literature Review

This section provides an overview of VPNs, Windscribe VPN, and the R.O.B.E.R.T feature.

### Overview of VPNs

A VPN creates a secure, encrypted tunnel between a device and the internet, providing privacy and security. VPNs work by encrypting all data that is transmitted over the internet, protecting it from cyber threats such as hacking, surveillance, and identity theft. VPNs also mask the IP address of a device, providing anonymity and preventing websites from tracking a user's online activity.

### Windscribe VPN

Windscribe VPN is a VPN service provider that offers secure and private internet browsing. Windscribe VPN uses AES-256 encryption to protect user data, and the service has a no-logs policy, ensuring that user data is not stored on Windscribe servers. Windscribe VPN also provides a range of advanced features such as a kill switch, split tunneling, and the R.O.B.E.R.T feature.

### R.O.B.E.R.T Feature

The R.O.B.E.R.T feature is a customizable firewall that can block specific websites and applications. R.O.B.E.R.T can be accessed via the Windscribe website, and users can create custom rules to block specific websites, domains, IP addresses, and even keywords. This feature is beneficial for preventing access to websites that may contain malware or inappropriate content.

## 3. Methodology

This section describes the research design, data collection, and data analysis methods used in this project.

### Research Design

The research design for this project is a case study. The case study involves the implementation of a VPN using Windscribe and the blocking of specific websites using R.O.B.E.R.T. The case study involves the use of Ubuntu as the operating system and Visual Studio Code as the development environment.

**Data Collection**
Data for this project was collected through online research and experimentation (mainly from Youtube, GitHub and Python Code Support). Online research involved gathering information about VPNs, Windscribe VPN, and the R.O.B.E.R.T feature. Experimentation involved installing the Windscribe VPN client on Ubuntu and testing the VPN's functionality via Linux Terminal.

**Data Analysis**
Data analysis for this project involved testing the Windscribe VPN client's functionality, including the connection process, IP address change, and website blocking.

**4. Results and Analysis**
This section presents the results of the project and the analysis of the data collected.

**Implementation Process**
The implementation process for the project involved the following steps:

1. Downloading the Windscribe VPN Debian package for Ubuntu.
2. Importing the required library in Visual Studio Code.
3. Creating a driver code to run the library.
4. Creating an account on the Windscribe official website.
5. Running the driver code in the Ubuntu terminal and entering user credentials.

**Connection and IP Address Change**
After implementing the Windscribe VPN, the connection process was successful, and the IP address was changed, as verified in the Ubuntu terminal. The VPN provided a secure and encrypted connection between the device and the internet, preventing cyber threats such as hacking and identity theft.

**Website Blocking**
The R.O.B.E.R.T feature was used to block specific websites, including those containing inappropriate content and malware. The feature was effective in preventing access to the blocked websites, providing an additional layer of security.

## 5. Discussion

This section discusses the effectiveness of Windscribe VPN, a comparison with other VPN services, and the limitations and future work of the project.

### Effectiveness of Windscribe VPN

Windscribe VPN was effective in providing online security and privacy. The VPN provided a secure, encrypted connection between the device and the internet, preventing cyber threats such as hacking and identity theft. The VPN also masked the IP address of the device, providing anonymity and preventing websites from tracking online activity.

### Comparison with other VPN Services

Windscribe VPN was compared with other VPN services, including ExpressVPN and NordVPN. Windscribe VPN provided comparable security features, such as AES-256 encryption and a no-logs policy. Windscribe VPN also provided additional features such as the R.O.B.E.R.T feature, which were not available in other VPN services.

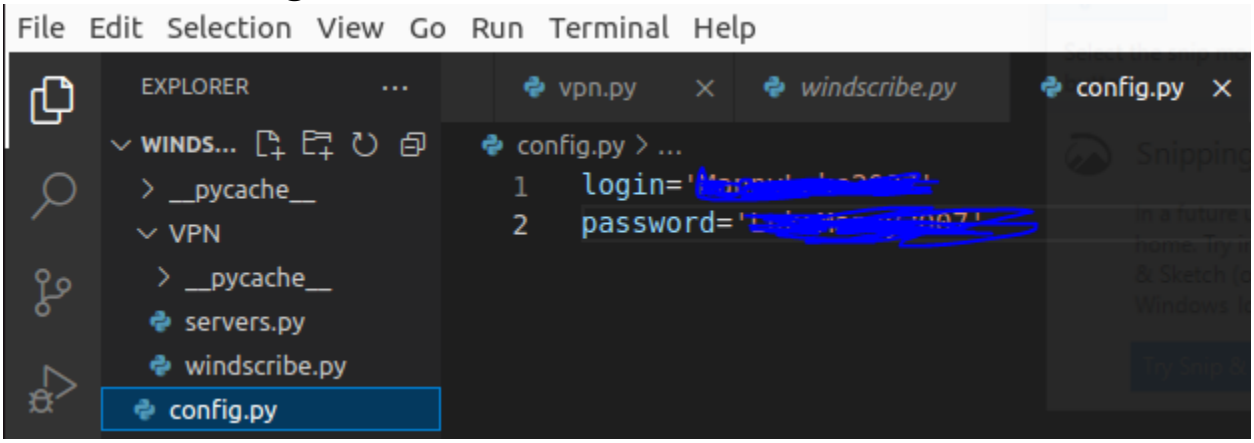
### Limitations and Future Work

The limitations of this project include the use of Ubuntu as the operating system, limiting the generalizability of the results. Future work could involve testing the Windscribe VPN client on other operating systems, such as Windows or macOS. The project could also involve testing the Windscribe VPN client on different devices, such as smartphones or tablets.

## 6. Appendix

This section provides additional information related to the project, including the Windscribe VPN client code and the driver code used to run the VPN.

### Windscribe Config Code:




### VPN Client Code

```
class Windscribe:
    def __init__(self, user, password):
        """loads server list and logs into Windscribe"""
        self.login(user,password)

    def login(self, user, password):
        """logs into Windscribe using provided credentials"""
        commands = ["windscribe", "login"]
        proc = subprocess.Popen(commands,
        universal_newlines=True, stdin=subprocess.PIPE,
        stdout=subprocess.PIPE, stderr=subprocess.PIPE)
        proc.stdin.write(user)
        proc.stdin.write(password)

    def locations(self):
        """prints the locations available to connect to in
        the shell"""
        # os.system("windscribe locations")
        print("\n".join(servers.server_free))
```

```python
def connect(self, server=None, rand=False):
    """connects to given server, best available server
    if no server given, or random server"""

    if rand:
        choice = random.choice(servers.server_free)
        os.system(f'windscribe connect "{choice}"')
    elif server != None:
        os.system(f'windscribe connect "{server}"')
    else:
        os.system("windscribe connect")


def disconnect(self):
    """disconnect from the current server"""
    os.system("windscribe disconnect")

def logout(self):
    """logout of windscribe"""
    os.system("windscribe logout")
```

**Driver Code**

vpn.py > ...

```python
from config import *
from VPN.windscribe import Windscribe


windscribe=Windscribe(login,password)
while 1:
    windscribe.connect(rand=True)
    input("connnect to next...")

```

**Steps to follow for VPN connection**

1) Login with Windscribe

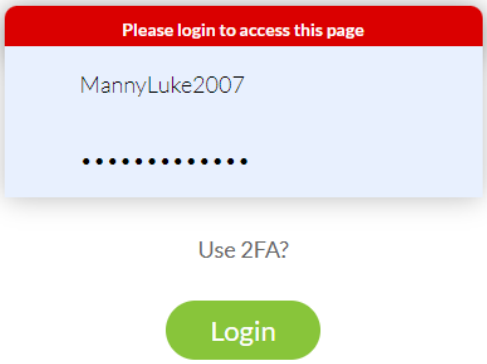
```
root@ammar-VirtualBox:/home/ammar/Downloads# windscribe login
Windscribe Username: MannyLuke2007
Windscribe Password:
Logged In
```

2) Run the Driver Code

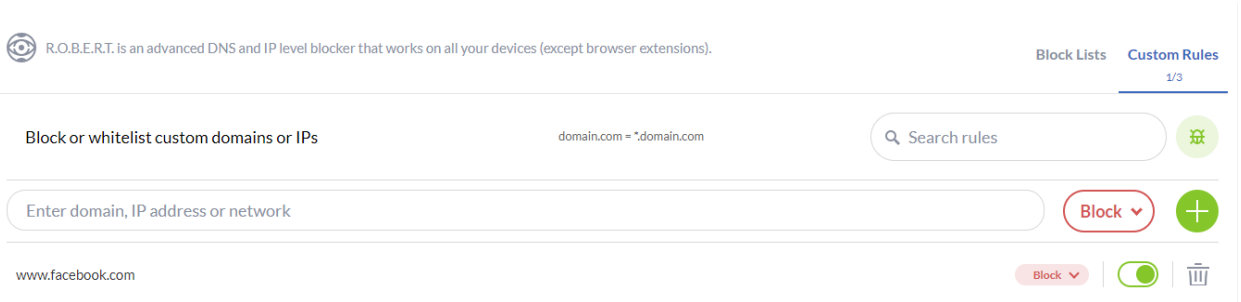
```
ammar@ammar-VirtualBox:~/Downloads/windscribe-vpn-main$ ls
config.py  LICENSE  __pycache__  VPN  vpn.py
ammar@ammar-VirtualBox:~/Downloads/windscribe-vpn-main$ python3 vpn.py
Connecting to Canada West Vancouver Granville (UDP:443)
Firewall Enabled
Connected to Canada West Vancouver Granville
Your IP changed from 111.88.32.19 to 71.19.252.157
connnect to next...
```

**Steps for Website Blocking:**

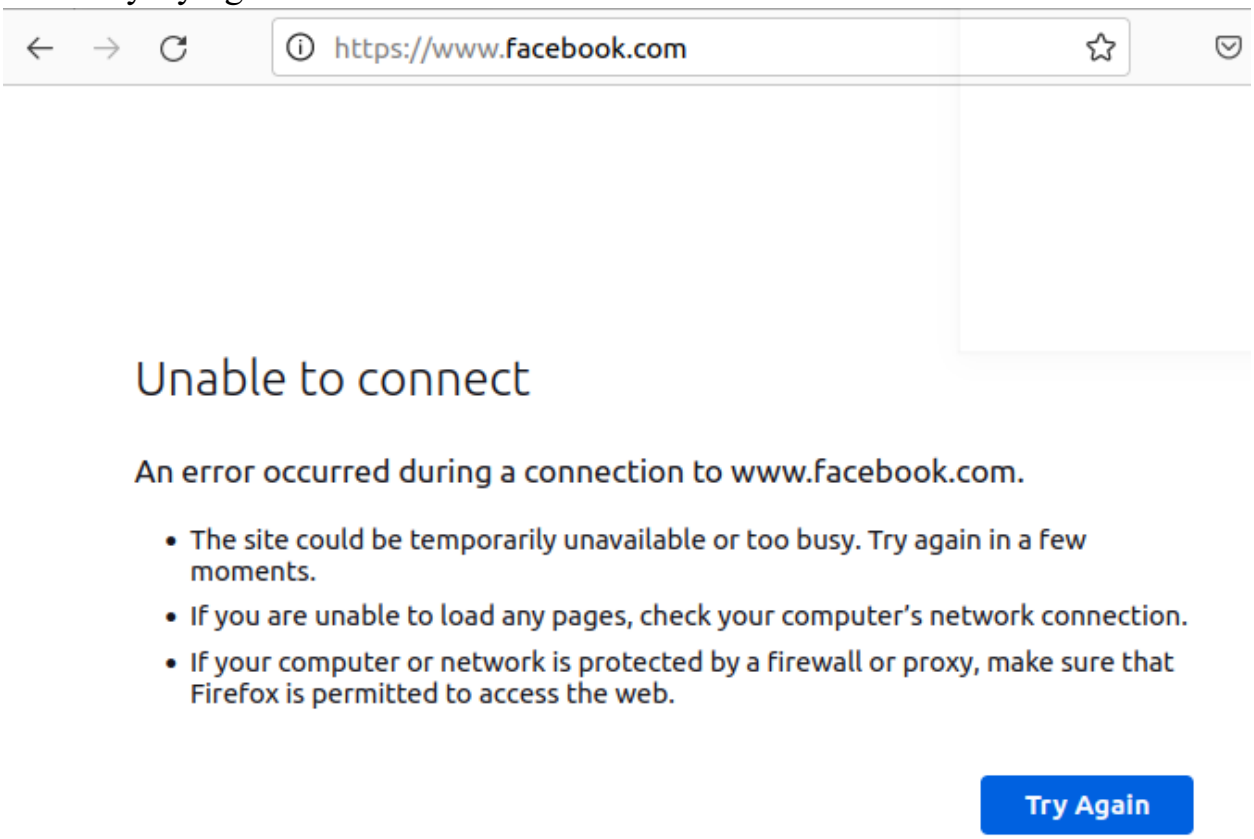
1) Login windcribe account via windscribe.com




2) Access R.O.B.E.R.T/ custom rules and enter domain that needs to be blocked.



3) Check by trying to access the blocked domain on browser




## 6. Conclusion

This project successfully implemented a VPN using Windscribe and blocked specific websites using the R.O.B.E.R.T feature. The VPN provided a secure and encrypted connection between the device and the internet, preventing cyber threats such as hacking and identity theft. The R.O.B.E.R.T feature was effective in blocking specific websites, providing an additional layer of security.

## 7. References


https://windscribe.com/

https://www.youtube.com/watch?v=gs2qqrjF1oo&t=1s&ab_channel=Aeroxer

https://github.com/Aero25x/windscribe-vpn

https://windscribe.com/guides/linux

https://myiplocation.org/