THEGREENBOW

Linux
VPN Client 2.0
Ubuntu

User Guide

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1 Overview

1.1 Introduction

Thank you for downloading our Linux VPN Client 2.0 software for Ubuntu.

The Linux VPN Client has been thoughtfully designed to address the needs of major corporations, critical market operators, as well as civil and government bodies. It provides a high level of communication security and is also easy to deploy, integrate, and use.

Users of the Linux VPN Client also benefit from highly personal support that goes from customer-specific follow-up to the integration of customized developments.

It does not require the existing key management infrastructure (KMI) to be reconsidered and it is designed to be transparently integrated into the IKEv2 gateways that have been set up.

The Linux VPN Client is marketed on the basis of an annual subscription. The subscription includes customer-specific support and software maintenance.

1.2 Secure

Specifically designed for nomadic work practices, the Linux VPN Client is an IKEv2 IPsec VPN client software for Linux workstations that enables users to establish perfectly secure connections to the company's information system over the internet. It implements a broad range of encryption and hashing algorithms, as well as various strong authentication methods.

1.3 Ergonomic

Easy to install, easy to configure and deploy, perfectly transparent to the user, the Linux VPN Client is widely recognized today for its unparalleled ergonomics.

1.4 Simple

Our configuration guides make integration and deployment tasks painless by speeding up the implementation of an end-to-end VPN solution.

1.5 Universal

The Linux VPN Client runs on Ubuntu 20.04. The software is compatible with a great number of IPsec gateways available on the market. The constantly growing list of gateways that have been tested in our laboratory is available on our website.

1.6 Features

- IPsec network driver and IKE module developed by TheGreenBow
- IPsec module integrated in kernel mode
- Support for the IKEv2 protocol
- Interoperable with all IKEv2 compatible VPN routers
- Cryptography: AES CBC, AES CTR, AES GCM 128/192/256
- Hashing: SHA2 256/384/512
- DH groups: 14-21
- X.509 certificate management: PEM, PFX, PKCS #12
- Authentication: preshared key, certificates, EAP, two-factor authentication (certificate + EAP)
- Certificate authentication using:
    - Method 1: RSA Digital Signature [RFC7296]
    - Method 9: ECDSA with SHA-256 [RFC4754]
    - Method 14: Digital Signature Authentication RSA [RFC7427]
- IP fragmentation
- “All traffic through the VPN tunnel” mode
- Dead Peer Detection (DPD)
- Redundant gateway
- CP mode
- Automatic negotiation of algorithms with gateway
- IKE fragmentation
- Automatic NAT-Traversal mode
- Remote ID, Local ID
- Import VPN configurations generated using TheGreenBow Windows and macOS VPN clients
- Control from the command line or using the graphical interface
- Activation using a license key
- Support for syslog event log format and protocol
- Compiled for Ubuntu 20.04 64-bit
- Integration in the Ubuntu system menu (systray)

2 Downloading and verifying the software

2.1 Introduction

The Linux VPN Client is available for download from our website: https://www.thegreenbow.fr/vpn_linux.html. You can download the software package after having filled in the form displayed when you click the **Download** link corresponding to the desired distribution on the **Download** tab.

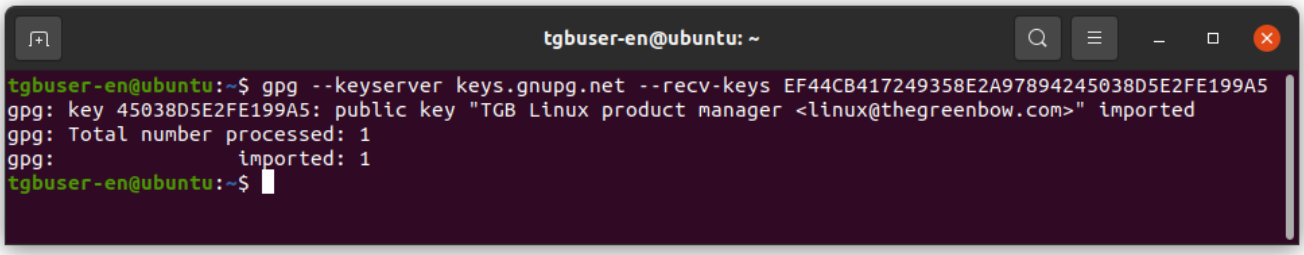
Prior to installing the Linux VPN Client, it is essential to verify the authenticity of the software package downloaded from our website in order to confirm that it has indeed been signed by TheGreenBow and that it has not been altered in any way.

2.2 Verification procedure

To verify the authenticity of the package, follow the steps below:

1. Open a terminal window (Ctrl + Alt + T).
2. Run the following command to download the public key and import it into the local GPG key store:

```
gpg --keyserver keys.gnupg.net --recv-keys
EF44CB417249358E2A97894245038D5E2FE199A5
```



3. If this has not already been done, install the `dpkg` package manager by running the following command:

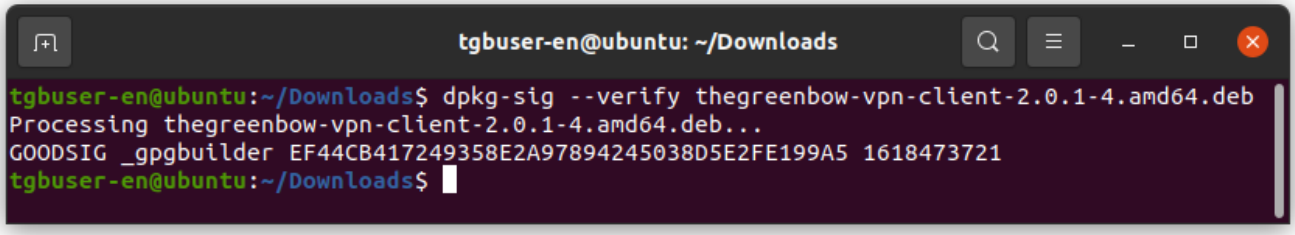
```
sudo apt install dpkg-sig
```

4. Verify the software package by running the following command in the directory where the package is located (replace the x with the current build number of the software package):

```
dpkg-sig --verify thegreenbow-vpn-client-2.0.1-x.amd64.deb
```

5. Make sure that the output data is as follows:

```
Processing thegreenbow-vpn-client-2.0.1-x.amd64.deb...
GOODSIG _gpgbuilder EF44CB417249358E2A97894245038D5E2FE199A5
1618473721
```



If this is not the case, contact customer support: https://www.thegreenbow.com/form.html?lang=en.

2.3 Technical information

The Ubuntu package is signed with a 4096-bit RSA key. The corresponding public key is available here: http://keys.gnupg.net/pks/lookup?op=get&search=0x45038D5E2FE199A5.

Key ID: `EF44 CB41 7249 358E 2A97 8942 4503 8D5E 2FE1 99A5`.

Key fingerprint: `2FE199A5`.

Run the following command to delete the public key from the local GPG key store:

```
gpg --delete-key EF44CB417249358E2A97894245038D5E2FE199A5
```

3 Installing the software

3.1 Introduction

After having downloaded the Linux VPN Client from the TheGreenBow website and having verified its authenticity (see section 2 Downloading and verifying the software), you can install the program by double-clicking its icon and then proceeding with the command line.

You can also install the product using the command line only, which allows you to create scripts to automate the process.

3.2 Installation conditions

To install the Linux VPN Client you must have superuser privileges (or root access) on the machine.

In addition, you will need to create a configuration file for the Linux workstation using the Windows or macOS VPN client.

3.3 Dependencies

When you install the Linux VPN Client, the following dependencies will also be installed:

- dkms

3.4 Package contents

When you install the Linux VPN Client, the following directories and files will be added to the workstation:

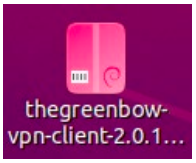
- `/usr/bin/tgbtray`: program that manages the Linux VPN Client's icon in the system menu (systray)
- `/usr/bin/tgbctl`: command used to control the Linux VPN Client from the command line
- `/usr/sbin/tgbiked`: Linux VPN Client daemon running in the background
- `/lib/systemd/system/tgbiked.service`: daemon configuration file
- `/etc/tgb/conf.tgb`: configuration file for the VPN security policy, including a TheGreenBow test tunnel
- `/usr/share/doc/thegreenbow/CLUF_VPN_TheGreenBow_vFR3.51.pdf`: document containing TheGreenBow's End User License Agreement (currently only available in French)
- `/usr/share/icons/thegreenbow`: folder containing the icons used by `tgbtray`
- `/usr/share/applications/thegreenbow.desktop`: application launcher
- `/usr/src/tgbtun-1.0`: folder containing the source files for dynamic kernel module support (DKMS)

3.5 Interactive installation

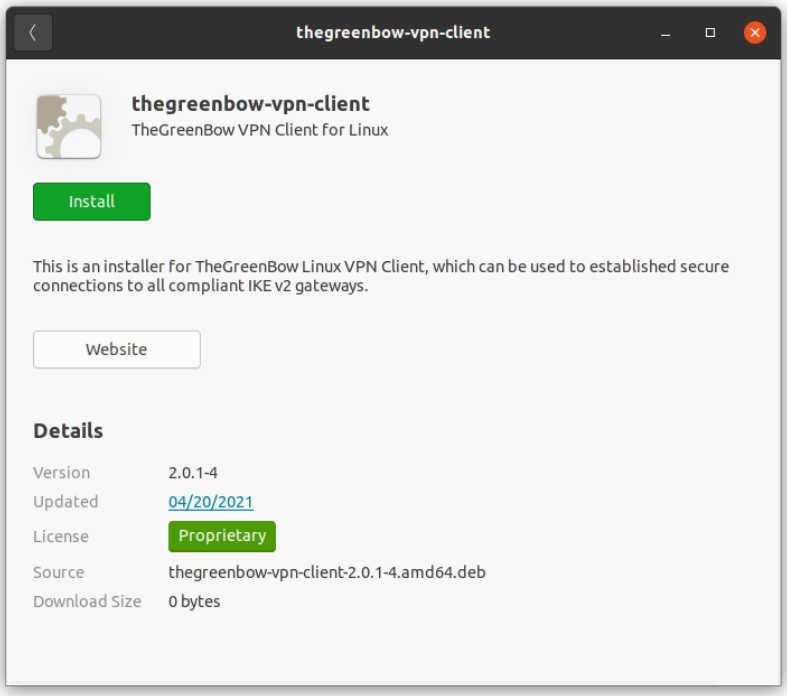
To install the Linux VPN Client, proceed as follows:

1. If you downloaded the software package on a machine other than the one on which the Linux VPN Client is to be installed, copy it to the destination machine.

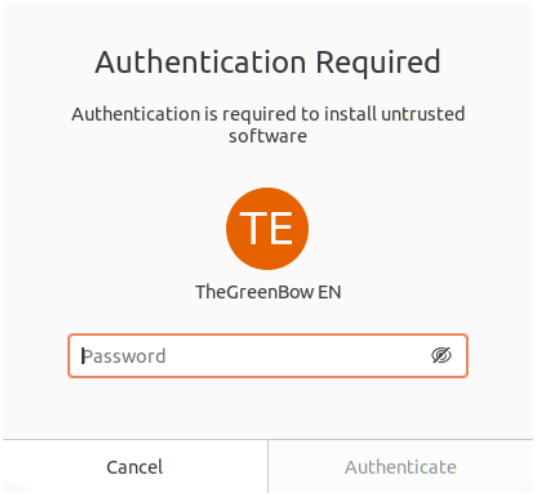
2. Double-click the icon of the downloaded software package:



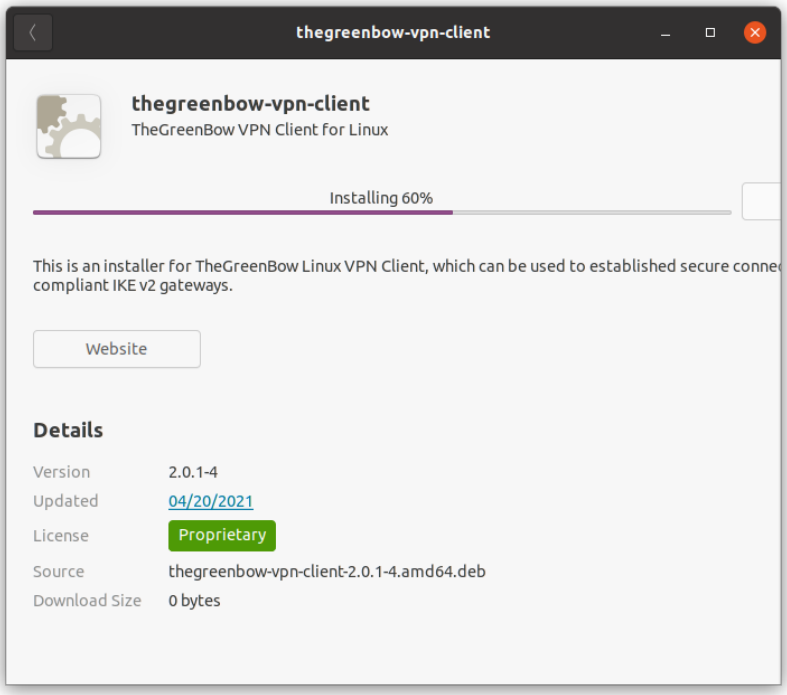
3. The installation of the program starts and the following window is displayed:



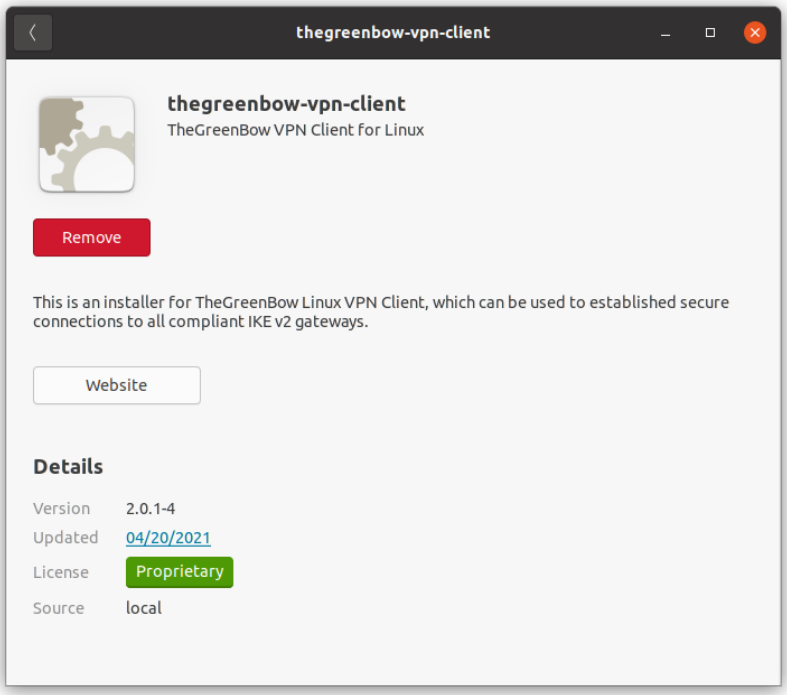
4. Click **Install**. The installation program asks you to authenticate:



5. Enter the password to authenticate. The actual installation of the software begins:

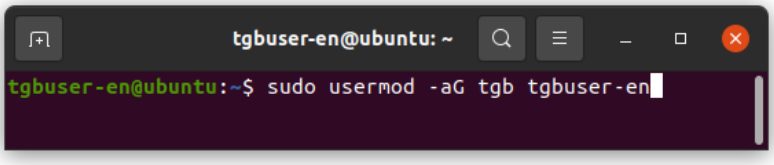


6. If the installation is successful, the following screen is displayed:

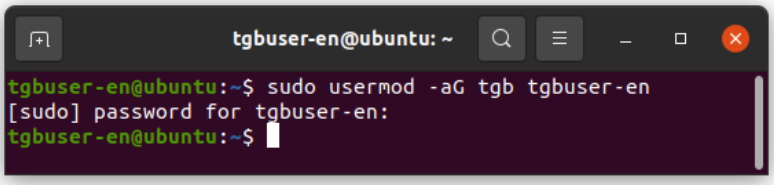


7. Open a terminal window (Ctrl + Alt + T).
8. Add the VPN users to the `tgb` group by running the following command:

```
sudo usermod -aG tgb [user_name]
```



9. Enter the administrator's password and press Enter.



10. Activate the product (see section 4 Activating the software).

3.6 Installing from the command line

The Linux VPN Client can be installed from the command line. To this, proceed as follows:

1. If you downloaded the software package on a machine other than the one on which the Linux VPN Client is to be installed, copy it to the destination machine.
2. Open a terminal window (Ctrl + Alt + T).
3. Access the folder containing the `thegreenbow-vpn-client-2.0.1-x.amd64.deb` (where x is the build number of the software package).
4. Run the following installation command:

```
sudo apt install ./ thegreenbow-vpn-client-2.0.1-x.amd64.deb
```

5. Add the VPN users to the `tgb` group by running the following command:

```
sudo usermod -aG tgb [user_name]
```

6. Enter the administrator's password and press Enter.
7. Activate the product (see section 4 Activating the software).

4 Activating the software

4.1 Introduction

You must activate the Linux VPN Client before being able to use it.

Licenses are available on a subscription basis. Visit the Linux VPN Client page on our website for further details: https://www.thegreenbow.fr/vpn_linux.html.

If you want to test the software before purchasing it, you can benefit from a trial version. Download the software from our website, install it and follow the trial license activation procedure described below in section 4.4 Trial period.

To activate the Linux VPN Client you must have superuser privileges (or root access) on the machine. You must also create a license file named `vpnsetup.ini` as described below.

4.2 Format and content of the vpnsetup.ini file

The data allowing you to activate the Linux VPN Client must be entered into a text file named `vpnsetup.ini` in ASCII format.

To do this, enter the license number you have received and the user's email address in an Activation section as follows:

```
[Activation]
License=123456-789012-345678-901234
Email=user@domain.com
```

4.3 Activation procedure

4.3.1 Activation steps

To activate the Linux VPN Client, follow the steps described below:

1. Move or copy the `vpnsetup.ini` file to the `/etc/tgb` folder.
2. Run the following command to restart the service:

```
sudo systemctl restart tgbiked.service
```

3. Run the following command to generate a log:

```
journalctl -r -t tgbiked
```

4. Check that the following message "Activation succeeded with license number 123456-789012-345678-901234" is in the log. For information on how to display the log, refer to section 10 Logs.

4.3.2 Activation errors

If the log contains the message “Cancel starting UI Thread, product not activated” and/or “Activation failed: no activation parameters”, activation has failed. The Linux VPN Client stops immediately.

4.4 Trial period

You can use a fully functional version of the Linux VPN Client for free of charge during a 30-day trial period.

To do this, install the software normally and generate a `vpnsetup.ini` license file as described above (see section 4.2 Format and content of the vpnsetup.ini file) making sure to insert 000000-000000-000000-000000 (24 zeros) instead of the license number.

The license will expire at the end of the 30-day trial period, and you will no longer be able to use the software unless you purchase a license.

Our activation server stores your machine ID. You will only be eligible for a trial license once.

5 Uninstalling the software

When you no longer wish to use the Linux VPN Client, you can uninstall it from the command line as follows:

1. Open a terminal window (Ctrl + Alt + T).
2. Run one of the following commands:

   ```
   sudo apt remove thegreenbow-vpn-client
   ```

   This command only deletes the files that were added during installation, but not the configuration files added later, e. g. `config.tgb`, if it has been modified, nor any of the dependent packages added during installation.

   Or:

   ```
   sudo apt purge thegreenbow-vpn-client
   ```

   This command deletes the files added during installation as well as the configuration files added later, e. g. `config.tgb`, if it has been modified. Any other packages added during installation will not be deleted.

3. When appropriate, run the follwing command:

   ```
   sudo apt autoremove
   ```

   This command deletes the packages added during installation and that are no longer used.

The Linux VPN Client has been uninstalled.

6 Using the test tunnel

A VPN security policy containing a test VPN tunnel called “TgbTest” is provided in the `conf.tgb` file located in the `/etc/tgb/` directory.

It is imported by default and allows you to test the Linux VPN Client by connecting to a test gateway.

The test configuration can be used to check whether the Linux VPN Client is operational.

Once the tunnel is open, you should be able to send a ping request to IP address 192.168.175.50 or open the http://192.168.175.50/ web page in your browser.

7 Command line

7.1 Introduction

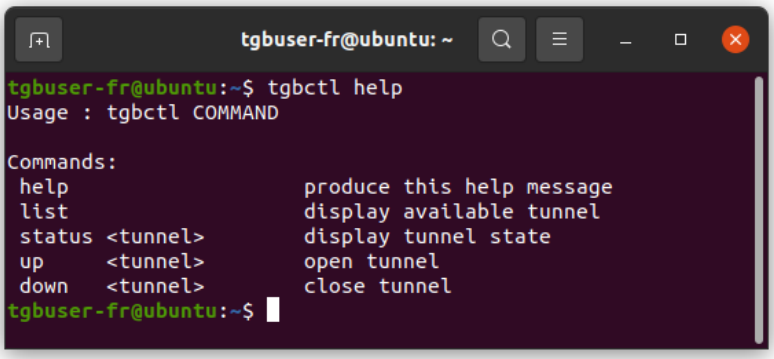
The Linux VPN Client provides a command line interface that enables you to carry out the following operations:

- Display help
- List configured tunnels
- Open a tunnel
- Close a tunnel
- Display the tunnel status

7.2 Displaying help

To display the help, open a terminal window and run the following command:

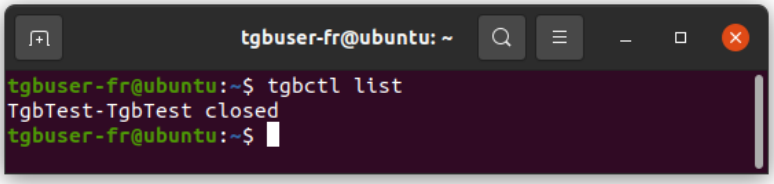
```
tgbctl help
```



7.3 Listing configured tunnels

To list configured tunnels, open a terminal window and run the following command:

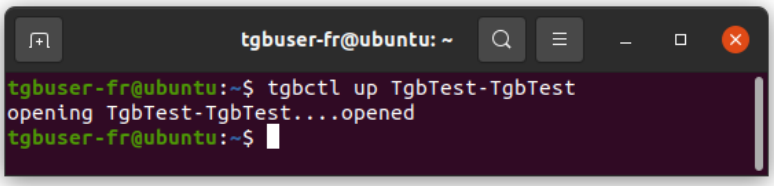
```
tgbctl list
```



7.4 Opening a tunnel

To open a tunnel, open a terminal window and run the following command:

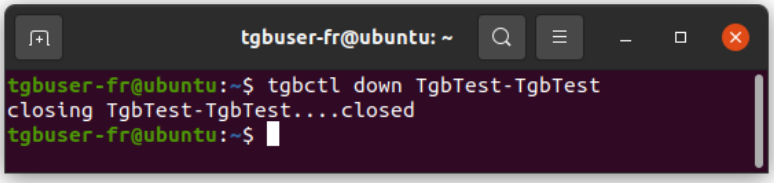
```
tgbctl up [tunnel_name]
```



7.5 Closing a tunnel

To close a tunnel, open a terminal window and run the following command:

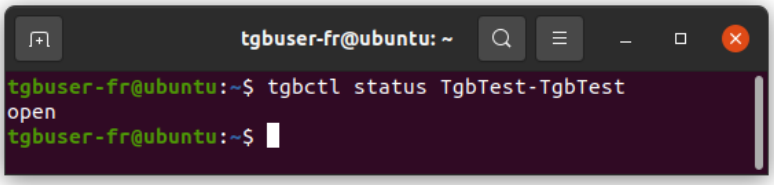
```
tgbctl down [tunnel_name]
```



7.6 Displaying the tunnel status

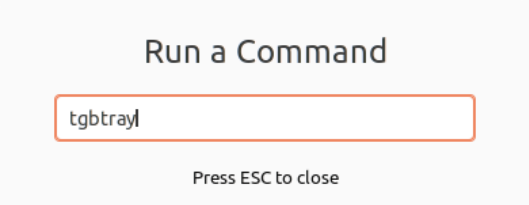
To display the status of a tunnel, open a terminal window and run the following command:

```
tgbctl status [tunnel_name]
```

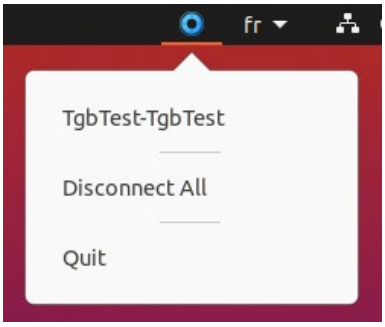


8 Adding an icon to the Ubuntu system menu

The Linux VPN Client allows you to display an icon in the system menu (systray). To use it, click the TheGreenBow icon in the application list or press Alt + F2 to open the **Run a Command** dialog and run the `tgbtray` command.

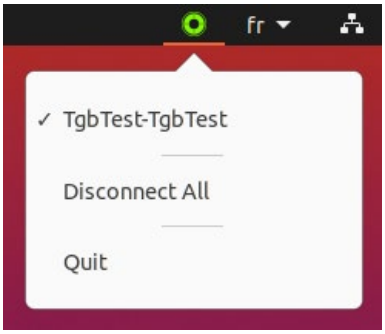


The icon is blue as long as no VPN connection is active.



Select a tunnel from the list to enable it. You can only select one tunnel at a time.

The icon turns green as soon as a VPN connection is active.



9 Configuring VPN tunnels

9.1 Introduction

TheGreenBow VPN clients rely on a VPN security policy that defines the list of tunnels that the administrator makes available to the workstation user. This file is also called a configuration file and its extension is `.conf`.

The Linux VPN Client does not provide an HMI to build or modify the VPN configuration.

This feature is available in our Windows or macOS VPN Client products (see the corresponding Deployment Guide, you will find links to these documents in section 14 Related reference documents).

If you are an administrator, you must use one of these products to generate a VPN security policy as described in section 9.3 Updating the VPN security policy.

9.2 Protecting the VPN security policy

The Linux VPN Client relies on the Linux operating system to protect the configuration. The configuration file is only accessible to users with superuser privileges.

No other user can modify the configuration file or inject a new one, which guarantees its authenticity and integrity.

The VPN configuration file is stored in the `conf.tgb` file under the `/etc/tgb/` directory.

The rights to this file are `-rw-------, owner root`. A standard user therefore cannot gain read or write access to the VPN configuration.

9.3 Updating the VPN security policy

To modify the configuration of your Linux VPN Client, proceed as follows:

1. Generate the configuration in Windows or macOS.
2. Export the configuration in TGB format, without any password-protection, and name it `conf.tgb`.
3. Replace the `conf.tgb` file in the `/etc/tgb/` directory on the machine on which you want to import the configuration.

10 Logs

10.1 Introduction

The logs of the IKE daemon are stored using the log management provided by `systemd`.

To display the logs of the IKE daemon, run the following command in a terminal window:

```
journalctl -t tgbiked
```

10.2 Exporting in text format

To export the contents of the log in text format, run the following command in a terminal window:

```
journalctl -t tgbiked > [my_log_file.log]
```

Customer support is based on this file.

Should the support team ask you for the log file, make sure to also provide the following details in order for the support staff to have all the information it requires at hand:

- Version of the binary package used
- Version of the Linux distribution
- Version of the Linux kernel
- Version of the GNU C library (glibc)

To get information concerning the distribution and kernel, run the following command in a terminal window:

```
uname -a
```

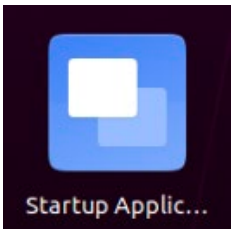
To get information concerning the `glibc` library, run the following command in a terminal window:

```
ldd --version
```

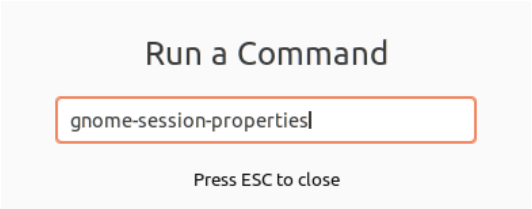
11 Running the application at startup

The Linux VPN Client allows you to automatically run the application when the system starts up. To do this, you can use the **Startup Applications Preferences** by following the steps below:

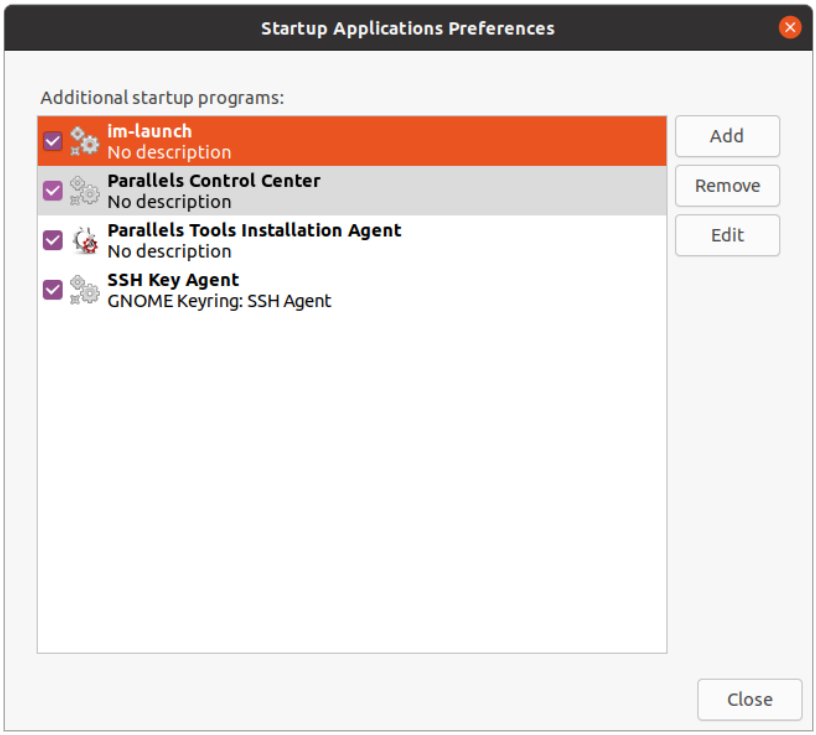
1. Open the application list by clicking the **Show Applications** button in the lower-left corner of your screen, and then click the **Startup Applications Preferences** icon.



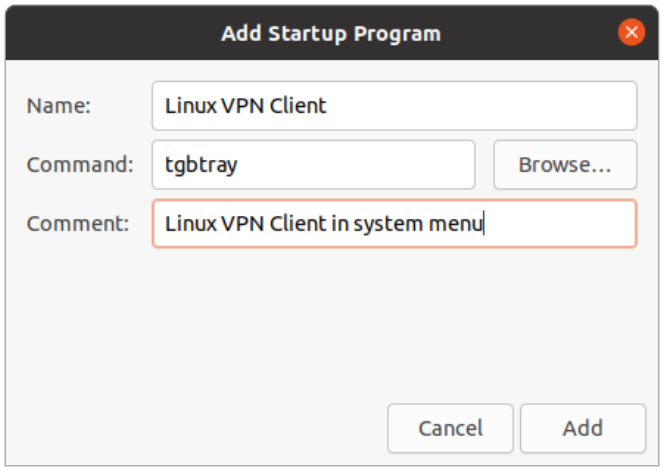
Alternative: Press Alt + F2 to open the **Run a Command** dialog and run the `gnome-session-properties` command.



The **Startup Applications Preferences** window is displayed.



2. Click **Add**. The **Add Startup Program** window is displayed.



3. Enter a name, e.g. Linux VPN Client.
4. Enter the tgbtray command.
5. Add a comment, e.g. Linux VPN Client icon in system menu.
6. Click **Add**.

The next time you log in, the Linux VPN Client will start automatically and its icon will be shown in the system menu.

12 Current limitations

The current version of the Linux VPN Client has the following limitations:

- No encrypted configurations can be imported.
- No smart cards or tokens can be used.
- Only a single VPN connection can be open at a time.
- The DH group 21 is not yet available.

13 Managing errors

13.1 User must belong to “tgb” group

If you have not added the current user to the `tgb` user group, the following error message is displayed when you run commands:

```
ERROR: User must belong to "tgb" group
```

To add the user to the `tgb` group, open a terminal window and run the following command:

```
sudo usermod -aG tgb [nom_utilisateur]
```

You must log out and log back in for Ubuntu to take into account this command. In some cases, you even need to restart the system. We recommend that you restart the system in all cases.

13.2 Cannot get tunnel list

When running the `tgbctl up [tunnel-name]` command, the following error may be displayed:

```
Error : Can’t get tunnel list, check if tgbiked
service is started
can’t be open: check status
```

To check whether the user has been added to the `tgb` group, open a terminal window and run the following command:

```
id
```

If the `tgb` group is not in the list, restart the machine in order for the group you’ve added to be taken into account.

13.3 Tunnel opening failed

When the Linux VPN Client fails to open a tunnel, the following error message is displayed:

```
Opening [tunnel_name] ..... failed
```

When opening a tunnel has failed, open a terminal window and run the following command:

```
journalctl -r -t tgbiked
```

You can analyze the log yourself (see section 10 Logs) or contact the support team: https://www.thegreenbow.com/form.html?subject=vpn&lang=en.

13.4 Non-root users must not be able to access the configuration file

When the Linux VPN Client is unable to open a tunnel after having replaced the `/etc/tgb/conf.tgb` file with a new configuration, check the log to see whether it contains the following message: “Non-root users must not be able have access to file /etc/tgb/conf.tgb”. Users other than superusers should not be able to access the configuration file.

If this is the case, run the following command:

```
sudo chmod 600 /etc/tgb/conf.tgb
```

13.5 Checking drivers

Run the following command to check whether the driver is loaded:

```
lsmod | grep tgb
```

The command must return the following message:

```
tgbtun        [ID] 0
```

If this is not the case, please contact the support team to understand what happened: https://www.thegreenbow.com/form.html?subject=vpn&lang=en.

13.6 IKE daemon is unresponsive

If the IKE daemon becomes unresponsive, which may happen after a network interface change or after disconnecting and reconnecting the network cable, run the following command to restart it:

```
sudo kill -9 $(pidof tgbiked)
```

14 Related reference documents

To find out how to generate the configuration file to be used with the Linux VPN Client, please refer to the following user guides:

- Windows Enterprise VPN Client
- TheGreenBow macOS VPN Client

You will find a list of compatible VPN routers and the corresponding configuration guides on our website: https://www.thegreenbow.com/vpn_gateway.html.

You can download a demo configuration and open a test tunnel by following the instructions on our website: https://www.thegreenbow.com/support_flow.html?page=122&product=vpn&lang=en.

You will find more information about TheGreenBow products on our website: https://www.thegreenbow.com.

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