Steps to flash and configure your Router to work with MESHdesk

These are the steps to take to get your system working on Meshdesk:

1. Buy a supported router. The list of supported routers is here- Supported hardware
2. Download the latest firmware for your router from sourceforge.net here- https://sourceforge.net/projects/radiusdesk/files/MESHdesk/
3. Start-up Your router in fail-safe mode.
4. Flash the latest MESHdesk firmware onto your router.
5. Download the latest Meshdesk Node Config Utility from here- https://sourceforge.net/projects/radiusdesk/files/MESHdesk/
6. Configure the router with the MESHdesk Node Config Utility.

- Each type of hardware has a unique way to get the firmware *installed* onto the device.

Hardware	Instructions
Dragino	http://wiki.dragino.com/index.php?title=Web_FailSafe_Uboot
OpenMesh OM2P	http://help.cloudtrax.com/hc/en-us/articles/202210960-How-to-manually-flash-firmware-on-a-CloudTrax-enabled-access-point
Ubiquity PicoStation HP	http://www.radiusdesk.com/user_guide/chilli/ubiquity_basic#flashing_openwrt_onto_the_picostation2

How to Flash and Configure a ZBT WE2026

Start-up your router in fail-safe mode

To start-up the ZBT we2026 in fail-safe mode:

- Hold in the reset button.

- While holding in the reset button, plug in the power cable.

- While the power cable is plugged in, release the reset button.

- The LED's will flash quickly to indicate that the device is in fail-safe mode.

Set your Ethernet port to 192.168.1.11 to flash

To be able to connect to your router:

- Plug in the Yellow Ethernet cable from your pc to the router.

- Right-click on the Wifi icon (this works on Windows 8).

- Open your computer's **Network and Sharing Center**.

- Click on **Change adapter settings**.

- Click on the **Ethernet** port.

- Right-click and select **Properties**.

- Scroll down to **Internet Protocol Version 4 (TCP/IP4)** and click on **Properties**.

- In the Properties window type in 192.168.1.11 to change the IP to this address.

- Click OK and **Close** all the windows before continuing to the next step.
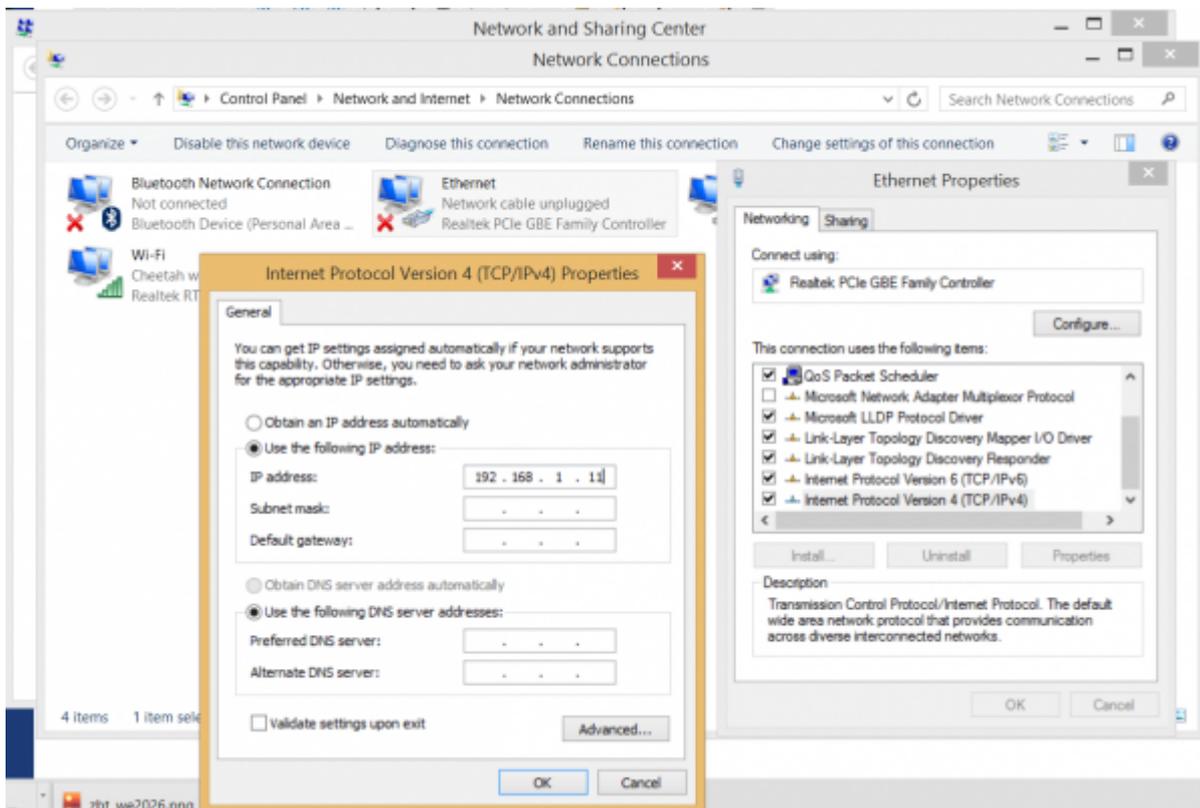
Flash the latest MESHdesk firmware onto your router

- Open your web browser and type 192.168.1.1 into the url window.

- The router front end opens.

## Set your Ethernet port to 192.168.255.20 to Configure

- Click Choose file and get the Meshdesk-ZBT firmware sysupgrade.bin file you downloaded from sourceforge.net. In this case we use the file openwrt-ramips-mt7620-zbt-wr8305rt-squashfs-sysupgrade.bin

- Click Submit and wait 100 seconds.

- Wait until the router LED's stop flashing, then you are done with flashing your router.

Set your Ethernet port to 192.168.255.20 to Configure

To be able to connect to the MESHdesk Config Utiility:

- Plug in the Yellow Ethernet cable from your pc to the router.

- Right-click on the Wifi icon (this works on Windows 8).

- Open your computer's **Network and Sharing Center**.

- Click on **Change adapter settings**.

- Click on the **Ethernet** port.

- Right-click and select **Properties**.

- Scroll down to **Internet Protocol Version 4 (TCP/IP4)** and click on **Properties**.

- In the Properties window type in 192.168.255.20 to change the IP to this address.

- Click OK and **Close** all the windows before continuing to the next step.
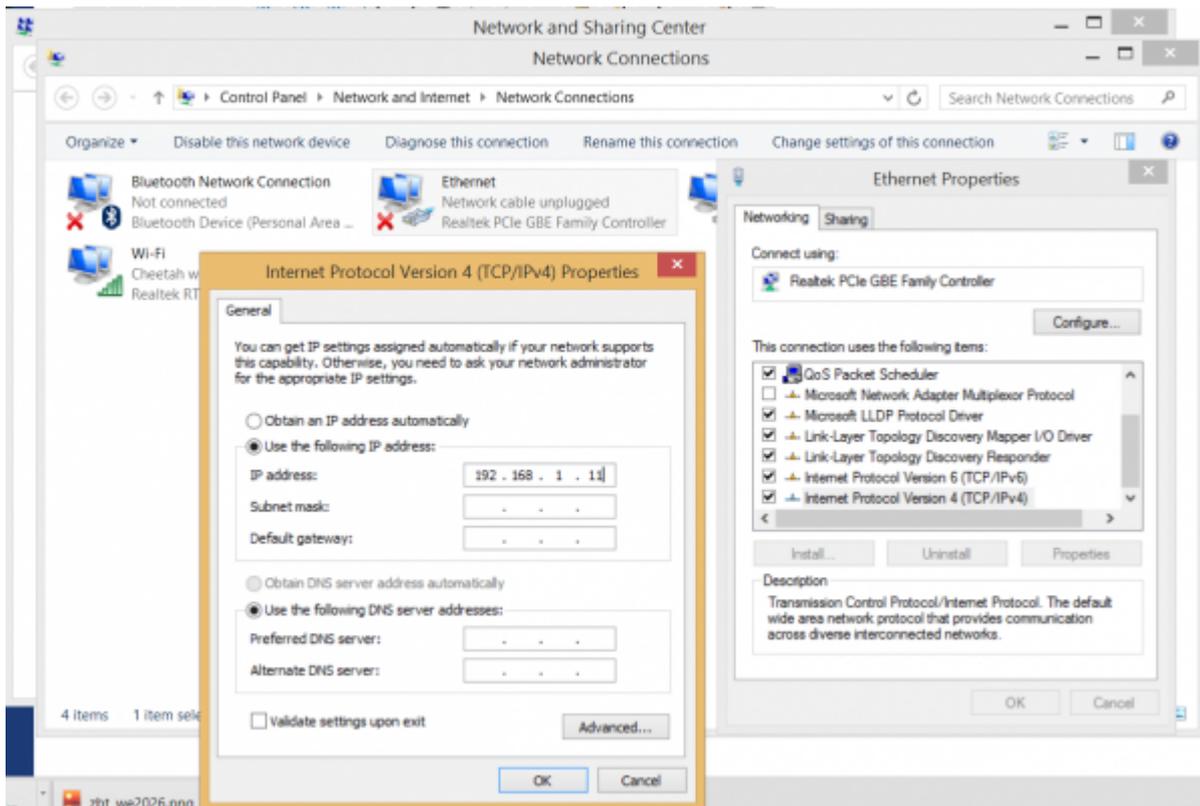
Determine your RADIUSdesk Server IP

- Open Command Prompt in Windows.

- Next to the arrow, type the word "ping" followed by your RADIUSdesk server URL. We used www.radiusdesk.com as a sample.
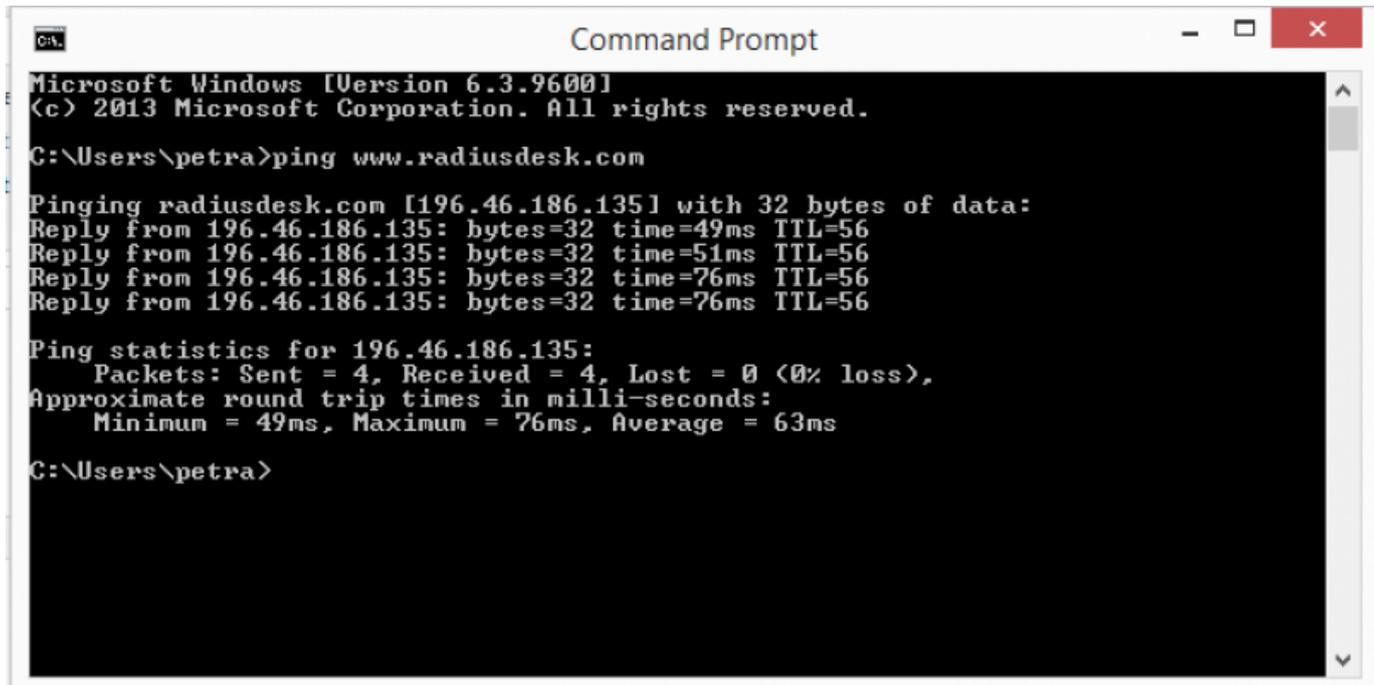
```
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\petra>ping www.radiusdesk.com

Pinging radiusdesk.com [196.46.186.135] with 32 bytes of data:
Reply from 196.46.186.135: bytes=32 time=49ms TTL=56
Reply from 196.46.186.135: bytes=32 time=51ms TTL=56
Reply from 196.46.186.135: bytes=32 time=76ms TTL=56
Reply from 196.46.186.135: bytes=32 time=76ms TTL=56

Ping statistics for 196.46.186.135:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 49ms, Maximum = 76ms, Average = 63ms

C:\Users\petra>
```

- The server replies with it's IP address, in this case 196.46.186.135.

- Use this four-part IP address in the * New node setting- Server IP in the Meshdesk Node Config Utility.

Configure the router with the MESHdesk Node Config Utility

(Please note, the Mesh Node Config Utility has been upgraded and the following info will also be updated soon.)

- Plug the yellow ethernet cable into your pc and the router. Leave the router power cable unplugged at first.

- **Run** the Meshdesk Node Config Utility by clicking on the application file you downloaded from sourceforge.net.
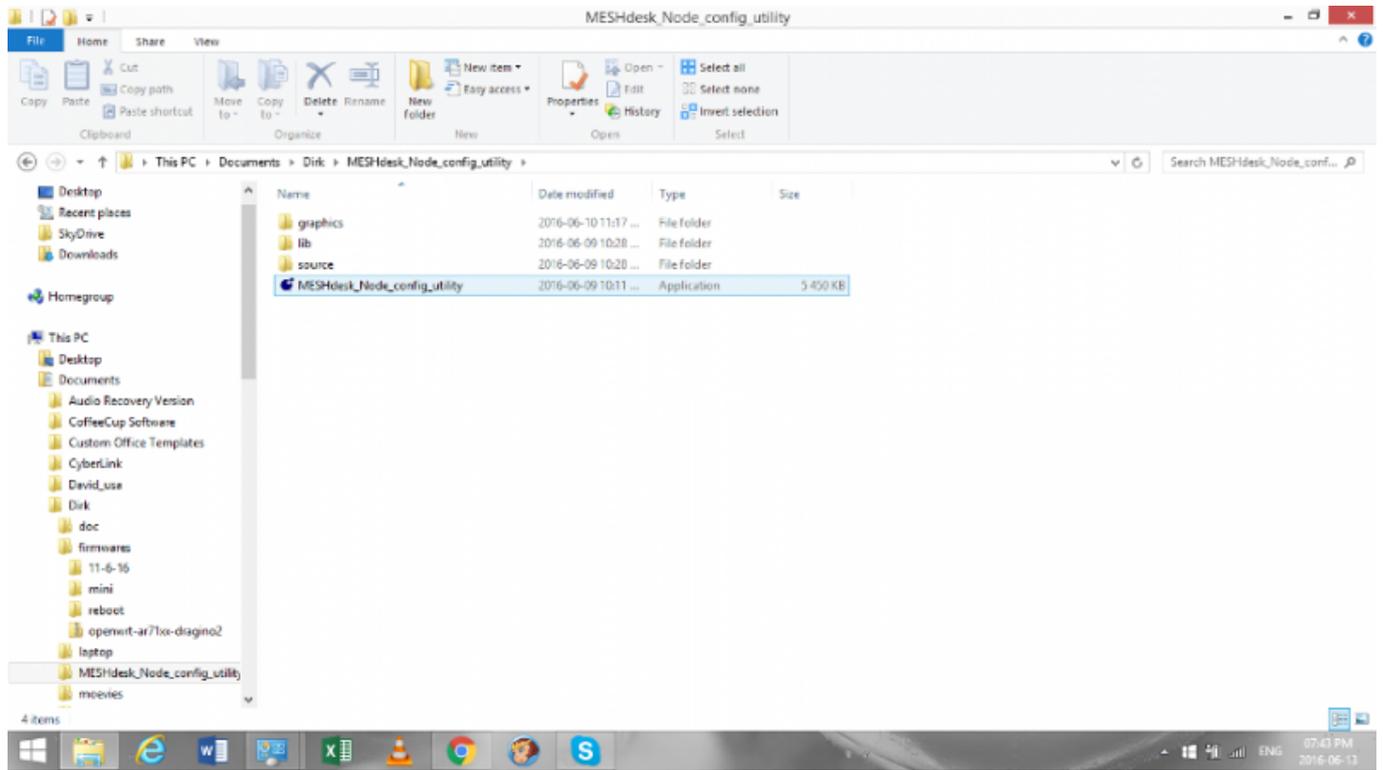
- This opens the Mesh Node Config Utility.
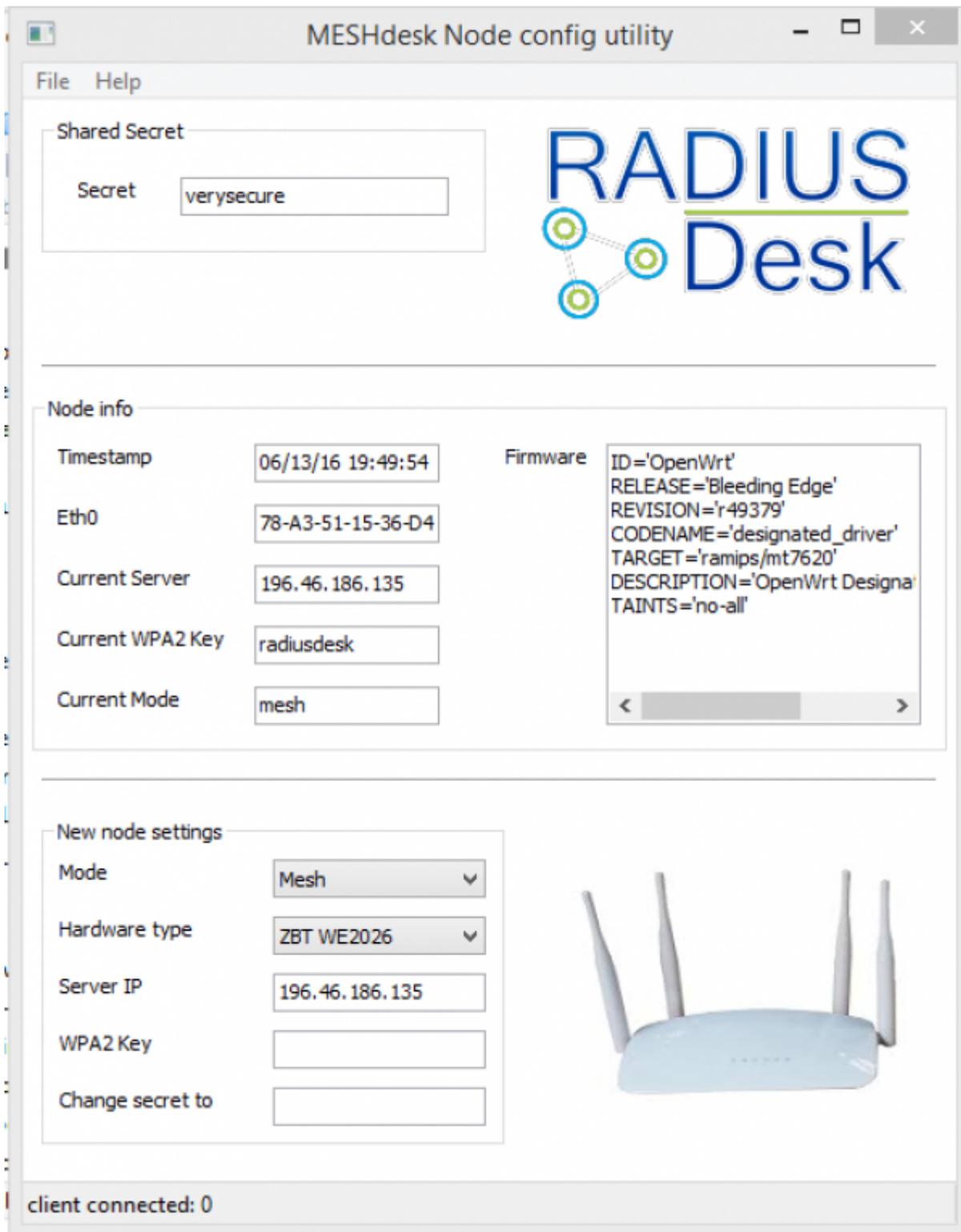
- Under **New Node Settings**, Select the **Mode** (Mesh or AP.. in this case Mesh) for the router.

- Select the **Hardware type** (In this case ZBT WE2026) from the drop-down list.

- Fill in the **IP Address** of the server you want the router to point to into the **Server IP** field.

- Now **plug in** the router **power cable** to restart the router.

- Wait about 30 seconds and watch as the **Node Info** is automatically filled in and the bottom bar flashes green once.

- You can **unplug and plug in** the router power cable once again to check that the node took

the latest settings from the **New Node Settings** fields.

You are ready to plug in your routers on site and see them come up in MESHdesk.

MESHdesk Node Config Utility

- As of October 2016 we have released a fresh version of the **MESHdesk Node Config Utility** to include new features not supported yet in the industry.
- This page will discuss the new **MESHdesk Node Config Utility**. We will divide the discussion into segments similar to the tabs of the **MESHdesk Node Config Utility**.
- Before we go into the various tabs let us first discover how to use the **MESHdesk Node Config Utility** (here after simply called the utility) in the correct manner.

Overview

- The utility is used to configure the hardware which runs the MESHdesk firmware.
- Since the RADIUSdesk project is Open Source and available to tweak and install you can install your own cloud controller (RADIUSdesk and MESHdesk + APdesk).
- For the hardware to be controlled by controller you have to point them to the controller.
- This is where we use the utility.
- Another purpose for the utility is to 'prime' the hardware for an Internet connection.
- We took the lead and added extra functionality to our firmware which does not enforce an Ethernet (LAN) connection for Internet connectivity.
- We now support the following types of Internet connections.
  - Ethernet (LAN) which require a DHCP server and Internet connection on the LAN the hardware connects to. This is the same as other cloud based controlled hardware like OpenMesh, Meraki, or IgniteNet.
  - **3G/4G dongle** support. For this you simply need hardware with a USB port. You then use the utility to preset the hardware with settings to obtain an Internet connection through the dongle. This is a first when compared to what is available today and will probably be first for a while since not many commercial cloud controlled hardware includes a USB port.
  - **WiFi Client** support. No need for extra hardware, we can simply use one of the existing radios to connect as a client to a WiFi network and distribute the connection from there. Again a first especially on meshes, since this is done in the firmware the commercial guys might have more success also implementing this.

- With **3G/4G dongle** and **WiFi Client** support we can really say goodbye LAN cables on our meshes and access points!
- 3G / Mobile support for APdesk and MESHdesk
- Support for WiFi Client as an Internet connection

Installing and running the MESHdesk Node config utility

- The utility is a windows .exe file which you simply double click to start up.
- Download the MESHdesk_Node_config_utility.<version>.zip from this URL:
  http://sourceforge.net/projects/radiusdesk/files/MESHdesk/NodeConfigUtility/
- Unzip it.
- Double click MESHdesk_Node_config_utility.exe to launch the program.
- The node expects the utility to be listening on 192.168.255.20 / TCP port 3000
- The node will set it's own address to 192.168.255.200 before trying to contact the machine running the utility.
- Be sure to allow this through on the Windows Firewall.

> ⚠ Failing to set the IP Address on you local machine to 192.168.255.20 will render the utility useless

> 💡 You can change the IP Address which the node will contact by changing the value specified in **/etc/config/meshdesk** on the node.

# Operating instruction for MESHdesk Node config utility

- Configure the Windows machine to have IP Address 192.168.255.20 in the **Ethernet port**.
- Ensure the Windows Firewall allow incoming connections on TCP port 3000 or disable it for the duration that you will be using the program.
- Connect the **Ethernet port** of your node to the same network where Windows machine's Ethernet port is connected and power it up.
- When the node contacts the utility, the status bar will turn green, the node's detail will be filled in the text fields and after that the node will disconnect resulting in the status bar to turn from green to grey.

> ❌
> - If it is the **first time** after a firmware flash that you boot the node please allow the device to stay on for **at least two minutes** after it contacted the MESHdesk Node config utility.
> - The reason for this is that OpenWrt needs time to prepare the file system during the very first boot.
> - If you switch the node off before the filesystem is prepared all changes will be lost.

- Next we'll go through the various tabs of the utility and explain the function of each.

Current Settings
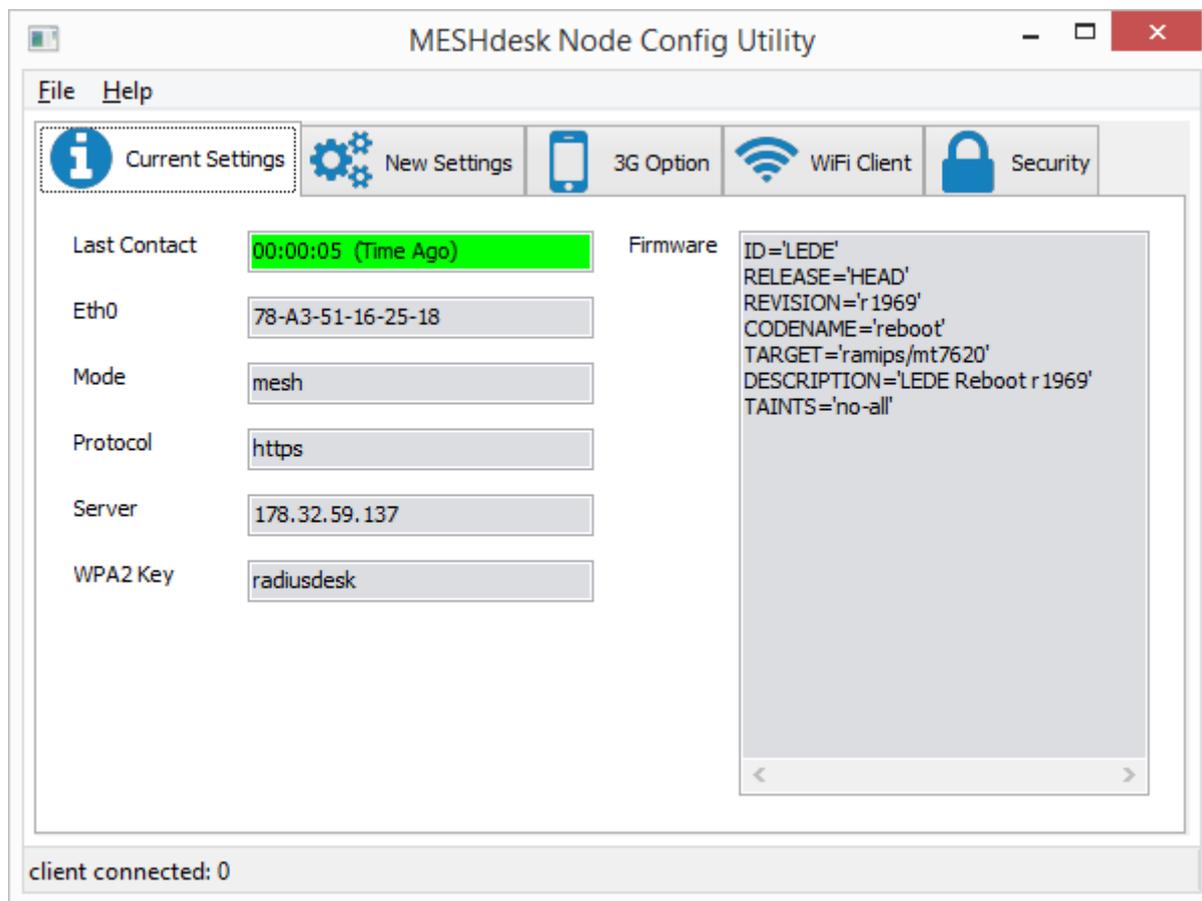
- The current settings tab will reflect the settings of the device when it was powered up.
- The following table lists the various fields with comments where necessary.

| Item	Typical Value	Comment
Last Contact	Just Now	This will initially state "Never Before" during start-up. When the hardware contacts the utility, the background turns green with a counter. After 30 seconds since the last contact the background turns blue
Eth0	78-A3-51-15-25-18	This is the MAC Address of Eth0 interface and used as a unique identifier to the back-end
Mode	mesh	In mesh mode it is controlled by **MESHdesk** and in ap mode it is controlled by **APdesk**
Protocol	http	Can be either **http** or **https**
Server	178.32.59.137	The IP Address of the RADIUSdesk server
WPA2 Key	radiusdesk	the WPA2 Key for the hidden ssid **meshdesk_config**
Firmware	ID=LEDE....	

New Settings
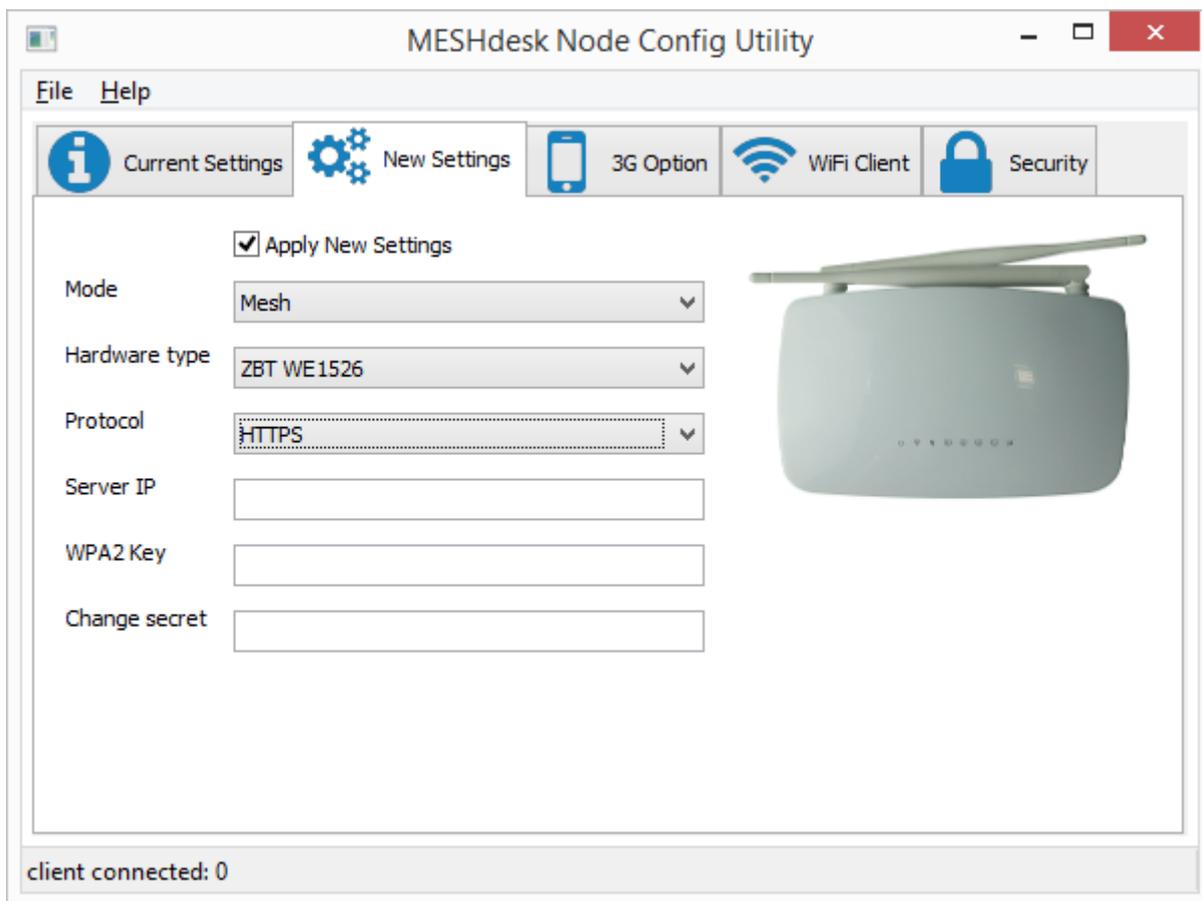
- To apply new settings you have to check the **Apply New Setting** checkbox.
- The settings are automatically applied as the hardware contacts the utility.
- Empty values will be ignored.
- The hardware type selection is important to ensure the LEDs are correctly assigned.
- You will typically leave **WPA2 Key** and **Change secret** empty.

> No need to save anything to the device. The new values are committed on the fly as soon as the device makes contact with the utility.

3G Option
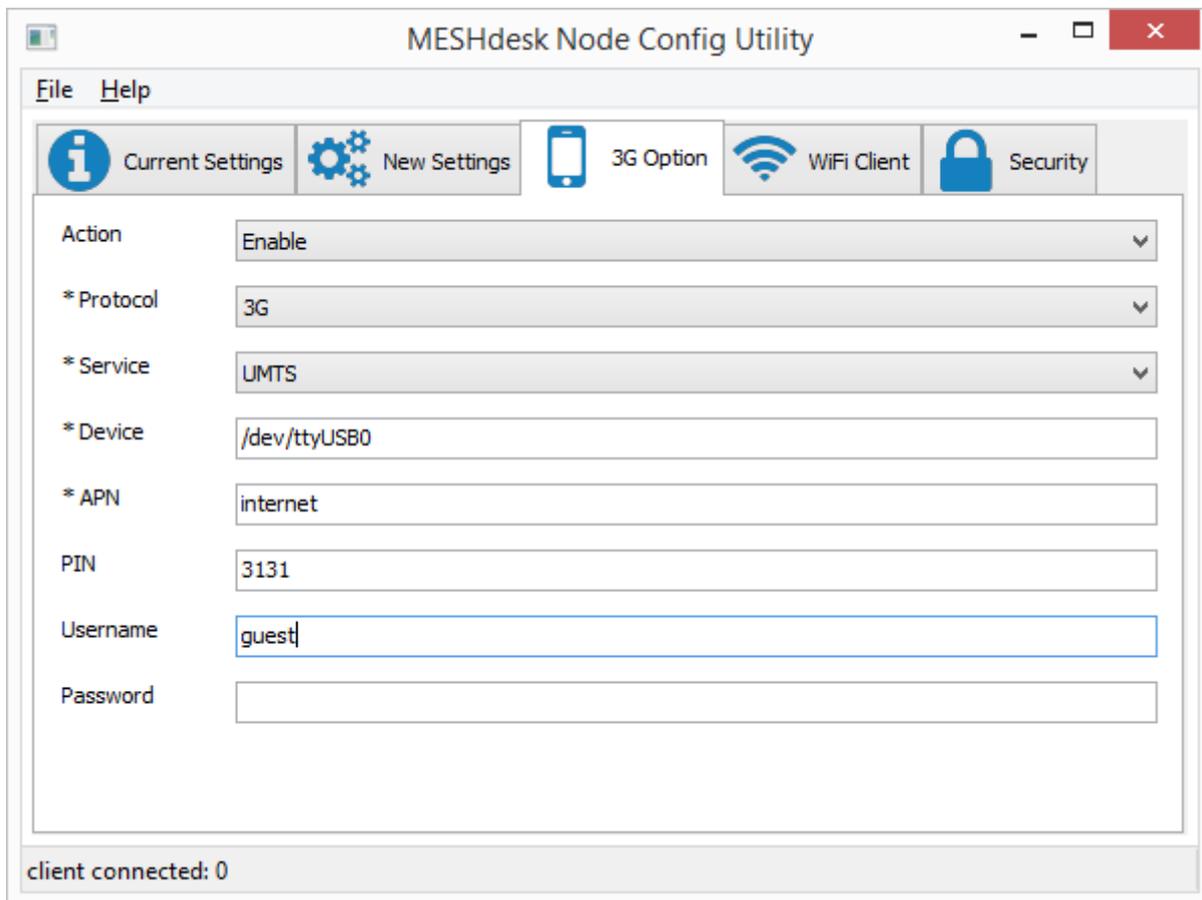
- The **3G Option** offers an alternative way to configure the device for obtaining an Internet connection.
- Be sure the device has either an on-board 3G/4G module or an USB port with the required packages included with the firmware for 3G/4G dongle support.
- The default value of **Action** is not to change any existing setup.
- If you select **Enable** the other fields becomes available to configure.
- Normally there are two things that require setting up. They are the **APN** and **PIN**.
- The value of the **APN** depends on the mobile provider and may also include an optional **Username**.
- The PIN is specific to the SIM card which you use for connecting to the mobile network and may be disabled. Simply leave the field blank if the PIN is disabled.
- If you wish to disable an existing 3G setup, simply change the **Action** to **Disable** and ensure the device re-contacts the utility (power cycle the device) to commit those changes.

WiFi Client
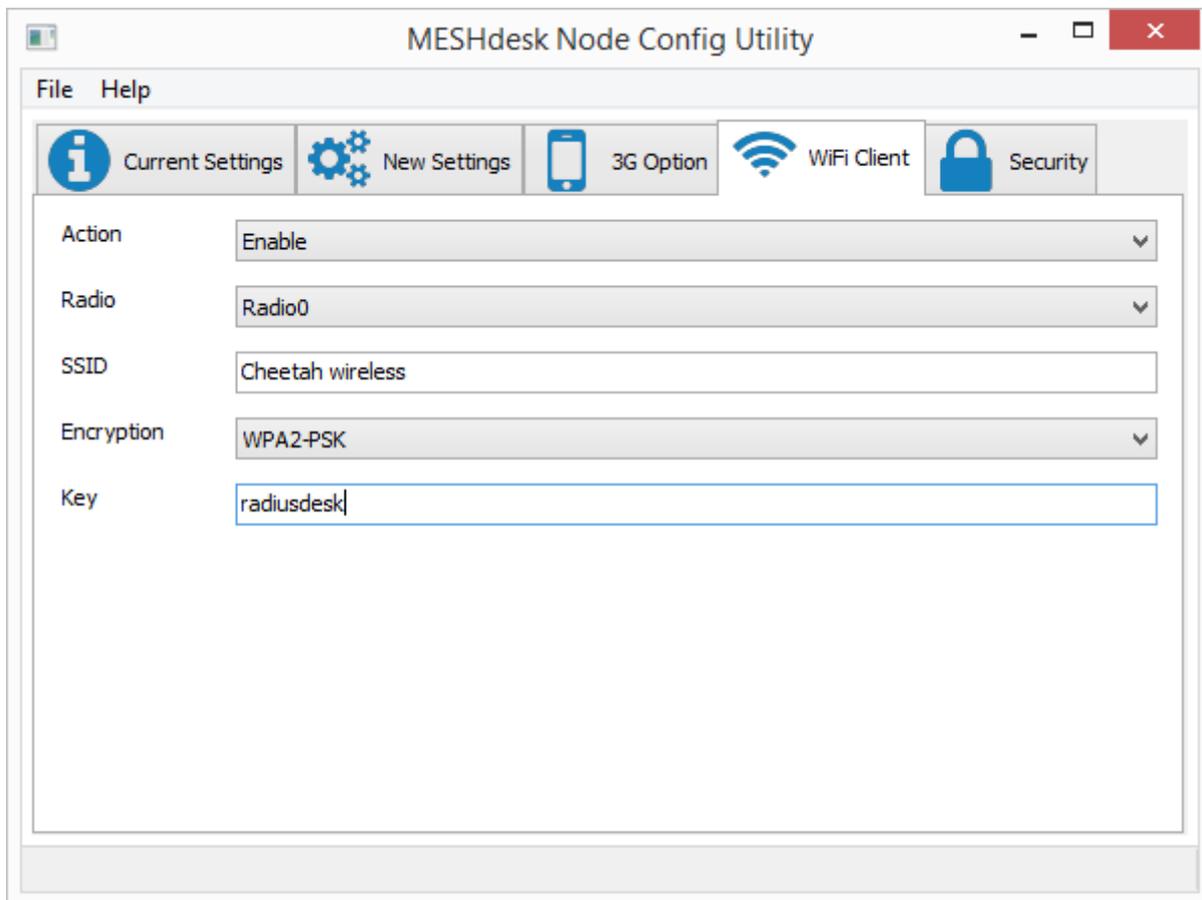
- The **WiFi Client** offers an alternative way to configure the device for obtaining an Internet connection.
- For this option we do not need any additional hardware and make use of the radio in client (station) mode to provide also Internet connectivity. Be sure though that the firmware includes the **relayd** package for this option to work.
- The default value of **Action** is not to change any existing setup.
- If you select **Enable** the other fields becomes available to configure.
- Normally there are three things that require setting up. They are the **SSID**, **Encryption** and **Key**.
- If you have a dual radio device, you can also opt for selection one of the two radios. For single radio devices, leave the default of **Radio 0**.
- If you wish to disable an existing WiFi Client setup, simply change the **Action** to **Disable** and ensure the device re-contacts the utility (power cycle the device) to commit those changes.

- The MediaTek and Atheros ath9k WiFi drivers allow the radio to support multiple modes simultaneously.
- This enable us to offer this option while also using the same radio to do Mesh and Access Point at the same time.
- Remember though there will be a performance drop.
- If speed is an issue consider using dual radio hardware instead or connecting through the LAN port

Security
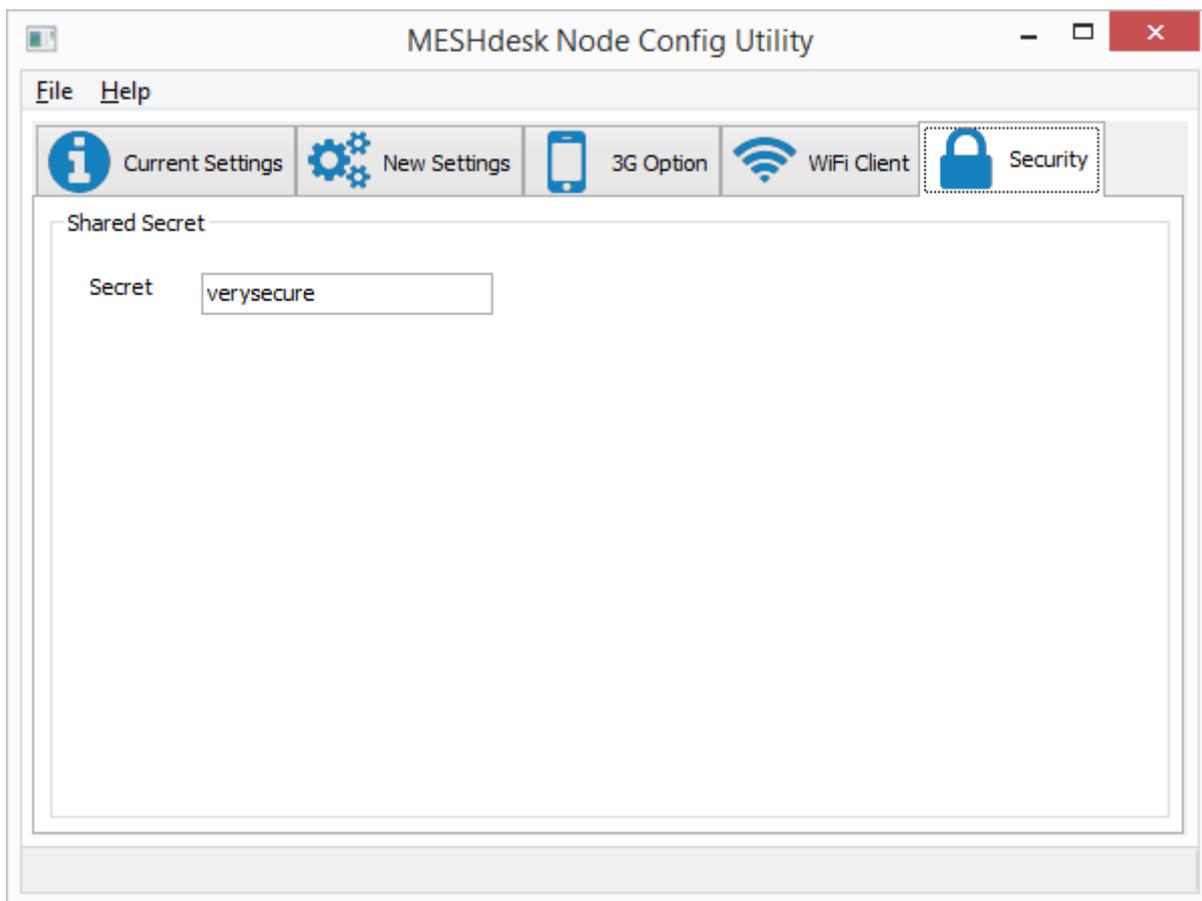
- This is an advanced setting. Leave it untouched unless you know what you're doing.