

# TUTORIAL v 1.41 12/07/2017

## How to install a TOR Node for the decentralized BitcoinZ Blockchain Network?

### 1. Install Ubuntu v17.10

Download latest Ubuntu installation file from <https://www.ubuntu.com/download/desktop> and install it. Installation of Ubuntu v17.10 works fine for BTCZ TOR node service.

**PLEASE NOTE! Before you start with the further installation of the Tor node change the Power settings in your Ubuntu. Go to SETTINGS => POWER => set 'Dim screen when inactive' to OFF and set 'Blank screen' to 'Never'. These adaptations prevent that the blockchain download in point 2 of the tutorial will abort before the download is successfully completed.**

### 2. Install manually a Linux Command Line Wallet

- Install packages of Command Line Wallet for Linux

```
sudo apt update
sudo apt-get install libc6-dev g++-multilib python p7zip-full pwgen
```

- Download BitcoinZ Command Line Wallet zip file of latest version [here recent version v1.1.1]

```
cd ~
wget https://github.com/bitcoinz-pod/bitcoinz/releases/download/1.1.1/bitcoinz1_1_1_x64.zip
```

- Extract BitcoinZ Command Line Wallet package which will be saved in the folder 'Home' as directory **bitcoinz-pkg**

```
7z x bitcoinz1_1_1_x64.zip
```

- Change in the terminal the directory & fetch parameters of BitcoinZ package

```
cd ~/bitcoinz-pkg
./fetch-params.sh
```

- Create the config file of BitcoinZ eWallet for Linux x64

```
mkdir -p ~/.bitcoinz
echo "rpcuser=rpc`pwgen 15 1`" > ~/.bitcoinz/bitcoinz.conf
echo "rpcpassword=rpc`pwgen 15 1`" >> ~/.bitcoinz/bitcoinz.conf
```

- Run full node and wait for download all blocks. Full node should be running. Don't kill the process before all blocks are downloaded (100% synchronization is finished).

```
cd ~/bitcoinz-pkg
./zcashd -exportdir=.
```

**PLEASE NOTE! You will see in the terminal the update of Block Height of the BitcoinZ blockchain. Wait with further installation until the block height has been reached the recent block height number regarding the BitcoinZ explorer.**

As soon as the block height is updated press CTRL+C to exit running zcashd. Close this terminal.

### 3. Setup BitcoinZ as a Service for Current User

- Open a new terminal and run following command lines:

```
wget https://raw.githubusercontent.com/bitcoinz-pod/bitcoinz/master/zcutil/setup-bitcoinz-service.sh -O setup-bitcoinz-service.sh
chmod +x setup-bitcoinz-service.sh
sudo ./setup-bitcoinz-service.sh $USER
```

For example in your terminal you see coin\_magician@NUC7i3BNH so replace in the last command line for **\$User** your user name **coin\_magician**.

- Check the Service Status:

```
systemctl status bitcoinz
```

## 4. First Running of Linux Command Line eWallet

- Open a terminal and change the directory to 'bitcoinz-pkg' in the 'Home' directory of Ubuntu:

```
cd ~/bitcoinz-pkg
```

- Get your Public Address (transparent address or t1 address) of your BitcoinZ Command Line Wallet:

```
./zcash-cli listreceivedbyaddress 0 true
```

Press ENTER key and you will get in the terminal this result:

```
[
  {
    "address": "t1xxxabcdefghijklmnopqrstuvwxyxxx",
    "account": "",
    "amount": 0.00000000,
    "confirmations": 0,
    "txids": [
    ]
  }
]
```

Save your Public Address printed on a paper (as an example here):

```
*****
*
*   Public Address:      t1xxxabcdefghijklmnopqrstuvwxyxxx   *
*   -----
*
*
*****
```

- Get your Private Key of your BitcoinZ Command Line Wallet:

```
sudo ./zcash-cli dumpprivkey [your Public Address here without square brackets]
```

Press ENTER key and you will get in the terminal the Private Key::

L7jkfeMwk3ldfk2gErhn4l9igjv0kG3d9HjKFg4cHWqY2hGtPtDs ( as an **example** here, not mine ☺ )

Save your Private Key printed on a paper. DO NOT SAVE THE PRIVATE KEY AS A TXT FILE ON YOUR PC!

```
*****  
*  
* Private Key: L7jkfeMwk3ldfk2gErhn4l9igjv0kG3d9HjKFg4cHWqY2hGtPtDs *  
* ----- *  
* *  
*****
```

Search for more BitcoinZ commands to control the Command Line Linux Wallet at

<https://github.com/bitcoinz-pod/bitcoinz/wiki/Quick-guide-for-beginners> .

## 5. Install TOR from Official Repository

- First add the TOR repository to your package sources:

```
sudo su -c "echo 'deb http://deb.torproject.org/torproject.org '$(lsb_release -c | cut -f2)' main' > /etc/apt/sources.list.d/torproject.List"
gpg --keyserver keys.gnupg.net --recv A3C4F0F979CAA22CDBA8F512EE8CBC9E886DDD89
gpg --export A3C4F0F979CAA22CDBA8F512EE8CBC9E886DDD89 | sudo apt-key add -
```

- and install it:

```
sudo apt-get update
sudo apt-get install tor deb.torproject.org-keyring
```

- Then add your current user to the **debian-tor** group to be able to use cookie authentication:

```
sudo usermod -a -G debian-tor $USER
```

**\$USER** is the same user name as upside mentioned your eample user name **coin\_magician**.

- Reboot the machine:

```
reboot
```

- After rebooting of your machine open again a terminal to edit `/etc/tor/torrc` to enable the control port, enable cookie authentication and make the auth file group readable.

```
sudo sed -i 's/#ControlPort 9051/ControlPort 9051/g' /etc/tor/torrc
sudo sed -i 's/#CookieAuthentication 1/CookieAuthentication 1/g' /etc/tor/torrc
sudo su -c "echo 'CookieAuthFileGroupReadable 1' >> /etc/tor/torrc"
sudo su -c "echo 'LongLivedPorts 9033' >> /etc/tor/torrc"
```

- Reboot once again the machine:

*reboot*

- After rebooting of your machine the BitcoinZ Tor Service runs automatically by starting with the service file **bitcoinz.service**. The service file **bitcoinz.service** you can find at **/etc/systemd/system**.

## 6. Activate the Hidden Service of Tor node

- Open a terminal and change the directory:

```
cd /etc/tor
```

- Install the simple editor `nano` if not done yet:

```
sudo apt-get install nano
```

- Open the config file 'torrc' with an editor:

```
sudo nano torrc
```

- If you configure your Tor system accordingly, it is possible to make your node also reachable from the Tor network. Add these **BOLD** lines to your `/etc/tor/torrc` in the section of Location-Hidden Services:

```
#HiddenServiceDir /var/lib/tor/hidden_service/  
#HiddenServicePort 80 127.0.0.1:80  
  
HiddenServiceDir /var/lib/tor/zcash-service/  
HiddenServicePort 8233 127.0.0.1:8233  
HiddenServicePort 18233 127.0.0.1:18233  
  
#HiddenServiceDir /var/lib/tor/other_hidden_service/  
#HiddenServicePort 80 127.0.0.1:80  
#HiddenServicePort 22 127.0.0.1:22
```

- Save the edited file 'torrc' before closing the editor and reboot once again the machine:

```
reboot
```

## 7. Find the Tor node address

- Open a terminal for checking the Network Info of your ZCash Client to get the Tor node address:

```
cd ~/bitcoinz-pkg
./zcash-cli getnetworkinfo
```

Press the ENTER key and you should see that your Tor node address of BitcoinZ node is reachable as a Hidden Service like so:

```
{
  "version": 1010150,
  "subversion": "/KSC:1.1.1/",
  "protocolversion": 170002,
  "localservices": "0000000000000001",
  "timeoffset": 0,
  "connections": 8,
  "networks": [
    {
      "name": "ipv4",
      "limited": false,
      "reachable": true,
      "proxy": "",
      "proxy_randomize_credentials": false
    },
    {
      "name": "ipv6",
      "limited": false,
      "reachable": true,
      "proxy": "",
      "proxy_randomize_credentials": false
    },
    {
      "name": "onion",
      "limited": false,
      "reachable": true,
      "proxy": "127.0.0.1:9050",
      "proxy_randomize_credentials": true
    }
  ]
}
```

```
"relayfee": 0.00000100,  
"localaddresses": [  
  {  
    "address": "2b02:112b:b7ef:c414:6110:94a5:45e1:4f83",  
    "port": 1989,  
    "score": 1  
  },  
  {  
    "address": "2b02:112b:b7ef:c414:a0d8:d34a:dcc8:80a3",  
    "port": 1989,  
    "score": 1  
  },  
  {  
    "address": "lbfuusf2bg5e2t3j.onion",  
    "port": 1989,  
    "score": 4  
  }  
],  
"warnings": ""  
}
```

You can now give out your publicly reachable \*.onion address **lbfuusf2bg5e2t3j.onion** (as an example here), all Tor nodes will then be able to connect world wide to it.

**DO NOT REBOOT HERE !**

Save the gotten Tor node address **lbfuusf2bg5e2t3j.onion** for next step – point 8.

If you can't copy-paste the address in the terminal so write it by hand on a white paper.

## 8. Specify your own public Tor node address **lbfuusf2bg5e2t3j.onion** gotten from installation process to your BitcoinZ standard Tor address independent of rebooting the Linux machine

- Open a terminal and change the directory `/etc/systemd/system/` to justify the service file '**bitcoinz.service**':

```
cd /etc/systemd/system
```

- Open the config file '`bitcoinz.service`' with the nano editor:

```
sudo nano bitcoinz.service
```

- Justify following line of section [Service] with adding the green/cyan highlighted part:

```
[Service]
ExecStart=/home/$User/bitcoinz-pkg/zcashd -proxy=127.0.0.1:9050 -externalip=lbfuusf2bg5e2t3j.onion -listen
User=$User
Restart=always
```

**\$USER** is the same user name as upside mentioned your eample user name **coin\_magician**.

- Save the edited file '`bitcoinz.service`' before closing the editor.
- Reboot the machine:

```
reboot
```

- After rebooting of your machine your BitcoinZ Tor node will permanently reachable under the saved onion address.

## 9. Connect to Tor nodes only

- Open a terminal and change the directory to '**.bitcoinz**' in the Home directory of Ubuntu:

```
cd ~/.bitcoinz
```

- Open the config file 'bitcoinz.conf' with the nano editor:

```
nano bitcoinz.conf
```

- Add following lines:

```
proxy=127.0.0.1:9050  
onlynet=tor  
#1st Tor node address:  
addnode=sp6lvLurevy4fpLr.onion  
#2nd Tor node address:  
addnode=xiv7crijwn4i4hwj.onion  
#add further Tor node addresses:  
addnode=xyzxyzxyzxyzxyz.onion
```

- Save the edited file 'bitcoinz.conf' before closing the editor.

Search for more existing Tor nodes at the end of post #1 in the topic <https://bitcointalk.org/index.php?topic=2166510.0>

- Reboot the machine:

```
reboot
```

- After rebooting of your machine your BitcoinZ Tor node will officially be hidden.

## 10. Final check of your Tor node address:

- Finally open a terminal for checking once again the Network Info of your BitcoinZ Tor node to check the local addresses after editing the files 'bitcoinz.service' and 'bitcoinz.conf':

```
cd ~/bitcoinz-pkg
./zcash-cli getnetworkinfo
```

Press the ENTER key and you should see that your Tor node address of BitcoinZ node is reachable as a Hidden Service only via \*.onion address. IPv4 and IPv6 addresses are disabled now.

```
{
  "version": 1010150,
  "subversion": "/KSC:1.1.1/",
  "protocolversion": 170002,
  "localservices": "0000000000000001",
  "timeoffset": 0,
  "connections": 1,
  "networks": [
    {
      "name": "ipv4",
      "limited": true,
      "reachable": false,
      "proxy": "",
      "proxy_randomize_credentials": false
    },
    {
      "name": "ipv6",
      "limited": true,
      "reachable": false,
      "proxy": "",
      "proxy_randomize_credentials": false
    },
    {
      "name": "onion",
      "limited": false,
      "reachable": true,
      "proxy": "127.0.0.1:9050",
      "proxy_randomize_credentials": true
    }
  ]
}
```

*//only '1' connection here, because only two Tor nodes are active now*

```
],
"relayfee": 0.00000100,
"localaddresses": [
  {
    "address": "lbfuuf2bg5e2t3j.onion",
    "port": 1989,
    "score": 4
  }
],
"warnings": ""
}
```

Now your Tor node works explicitly with the onion address **lbfuuf2bg5e2t3j.onion** (as an example here).

Congratulations!

You are now part of the anonymous Tor node network to support the decentralized worldwide BitcoinZ blockchain network.

After rebooting your Ubuntu machine your Tor node works with same address.

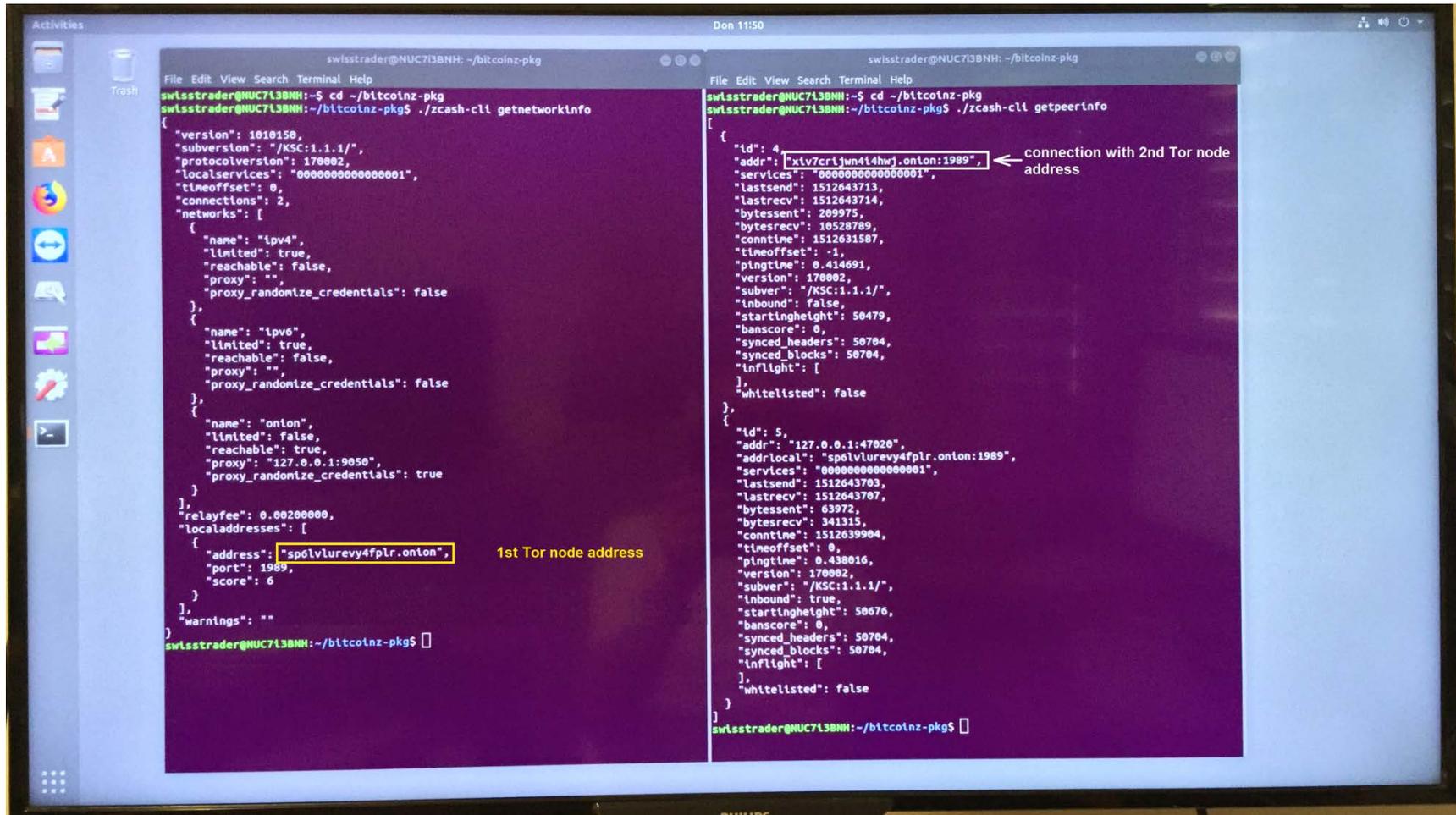
## 11. Final check of your Tor node address:

- Finally open a terminal for checking the peer to peer connections:

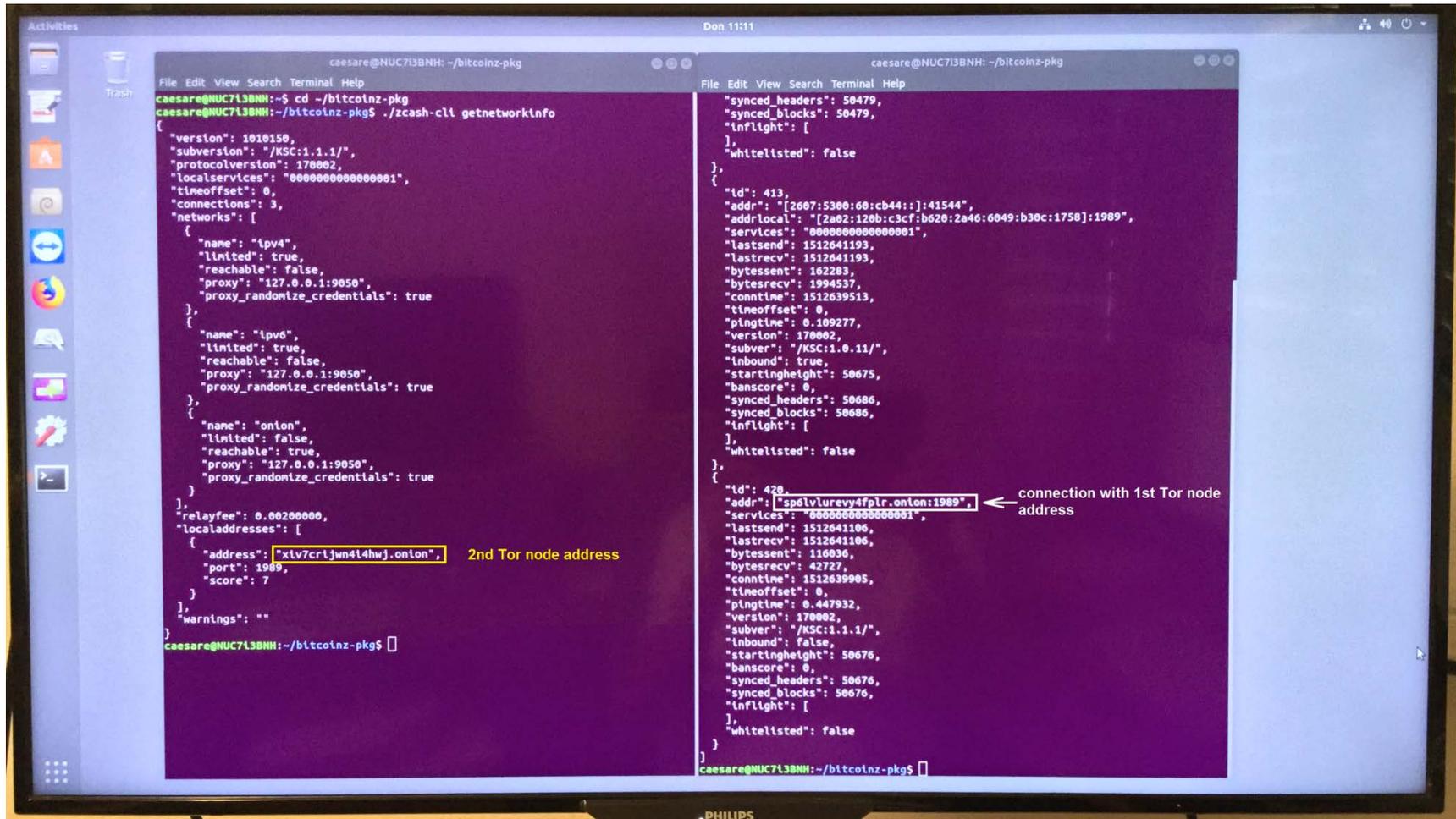
```
cd ~/bitcoinz-pkg
./zcash-cli getpeerinfo
```

Press the ENTER key and you should see the information about connections in the worldwide BitcoinZ Tor node network.

First Tor node with address **sp6lv lurevy4fplr.onion** connected to second Tor node with address **xiv7crijwn4i4hwj.onion** :



Second Tor node with address **xiv7crijwn4i4hwj.onion** connected to first Tor node with address **sp6lvlurevy4fplr.onion** :



Check BitcoinZ status with command line:

```
systemctl status bitcoinz
```

Press ENTER key and you will get in the terminal the status information **Active: active (running) since ...**

