TD2

1-Install dependencies

To run the BTCPayServer you will need to install **.NET Core SDK**, NBXplorer and PostgreSQL.

.NET Core SDK (installation)
wget -q https://packages.microsoft.com/config/ubuntu/18.04/packages-microsoft-prod.deb
sudo dpkg -i packages-microsoft-prod.deb
sudo apt-get install apt-transport-https
sudo apt-get update
sudo apt-get install -y dotnet-sdk-3.1

.NET Core SDK (check)
dotnet --info

```
administrateur1@MESIFI590421-0005:~$ ls
NBXplorer  btcpayserver  iptables.txt
administrateur1@MESIFI590421-0005:~$ dotnet --info
.NET Core SDK (reflecting any global.json):
 Version:   3.1.413
 Commit:    8387734958

Runtime Environment:
 OS Name:     ubuntu
 OS Version:  18.04
 OS Platform: Linux
 RID:         ubuntu.18.04-x64
 Base Path:   /usr/share/dotnet/sdk/3.1.413/

Host (useful for support):
  Version: 3.1.19
  Commit:  aae002469c

.NET Core SDKs installed:
  3.1.413 [/usr/share/dotnet/sdk]

.NET Core runtimes installed:
  Microsoft.AspNetCore.App 3.1.19 [/usr/share/dotnet/shared/Microsoft.AspNetCore
.App]
  Microsoft.NETCore.App 3.1.19 [/usr/share/dotnet/shared/Microsoft.NETCore.App]

To install additional .NET Core runtimes or SDKs:
  https://aka.ms/dotnet-download
administrateur1@MESIFI590421-0005:~$
```

PostgreSQL (installation)
sudo apt install postgresql postgresql-contrib

PostgreSQL (check)
psql --version
sudo systemctl status postgresql
sudo -u postgres psql

```
administrateur1@MESIFI590421-0005:~$ psql -V
psql (PostgreSQL) 10.18 (Ubuntu 10.18-0ubuntu0.18.04.1)
administrateur1@MESIFI590421-0005:~$
```

NBXplorer (installation)
cd ~
git clone https://github.com/dgarage/NBXplorer
cd NBXplorer
git checkout latest

./build.sh

```
NBXplorer   btcpayserver   iptables.txt
administrateur1@MESIFI590421-0005:~$ cd NBXplorer
administrateur1@MESIFI590421-0005:~/NBXplorer$ ls
Dockerfile.linuxamd64      NBXplorer.Tests            docs
Dockerfile.linuxarm32v7    NBXplorer.sln              elements-cli.ps1
Dockerfile.linuxarm64v8    README.md                  publish-docker.ps1
Examples                   appveyor.yml               run-docker.cmd
LICENSE                    build.ps1                  run.ps1
NBXplorer                  build.sh                   run.sh
NBXplorer.Client           docker-compose.regtest.yml
administrateur1@MESIFI590421-0005:~/NBXplorer$ touch settings.config
administrateur1@MESIFI590421-0005:~/NBXplorer$ ./build.sh
Microsoft (R) Build Engine version 16.7.2+b60ddb6f4 for .NET
Copyright (C) Microsoft Corporation. All rights reserved.

  Determining projects to restore...
  All projects are up-to-date for restore.
  NBXplorer.Client -> /home/administrateur1/NBXplorer/NBXplorer.Client/bin/Relea
se/netstandard2.1/NBXplorer.Client.dll
  NBXplorer -> /home/administrateur1/NBXplorer/NBXplorer/bin/Release/netcoreapp3
.1/NBXplorer.dll

Build succeeded.
    0 Warning(s)
```

2-Adapt UFW config

Installation => sudo apt install ufw

Mode admin => sudo su

Acceptation des ports => ufw allow #port comment #LeNom

Reboot => ufw enable / systemctl enable ufw

Checker les ports => ufw status

```
Rule added (v6)
root@MESIFI590421-0005:/home/administrateur1# sudo ufw status
Status: active

To                         Action      From
--                         ------      ----
22                         ALLOW       Anywhere
50002                      ALLOW       Anywhere                    # allow Electrum SSL
80                         ALLOW       Anywhere                    # BTCPAY HTTP
443                        ALLOW       Anywhere                    # BTCPay HTTPS
8333                       ALLOW       Anywhere                    # Bitcoind P2P
9375                       ALLOW       Anywhere                    # Lightning P2P
9050                       ALLOW       Anywhere                    # Tor1
9051                       ALLOW       Anywhere                    # Tor2
18333                      ALLOW       Anywhere                    # node
9735                       ALLOW       Anywhere                    # lnd
24445                      ALLOW       Anywhere                    # NBXplorer
23001                      ALLOW       Anywhere                    # BTCPayServer
22 (v6)                    ALLOW       Anywhere (v6)
50002 (v6)                 ALLOW       Anywhere (v6)               # allow Electrum SSL
80 (v6)                    ALLOW       Anywhere (v6)               # BTCPAY HTTP
443 (v6)                   ALLOW       Anywhere (v6)               # BTCPay HTTPS
8333 (v6)                  ALLOW       Anywhere (v6)               # Bitcoind P2P
9375 (v6)                  ALLOW       Anywhere (v6)               # Lightning P2P
9050 (v6)                  ALLOW       Anywhere (v6)               # Tor1
9051 (v6)                  ALLOW       Anywhere (v6)               # Tor2
18333 (v6)                 ALLOW       Anywhere (v6)               # node
9735 (v6)                  ALLOW       Anywhere (v6)               # lnd
24445 (v6)                 ALLOW       Anywhere (v6)               # NBXplorer
23001 (v6)                 ALLOW       Anywhere (v6)               # BTCPayServer

root@MESIFI590421-0005:/home/administrateur1#
```

Quitter => exit

3-Adapt SSH config
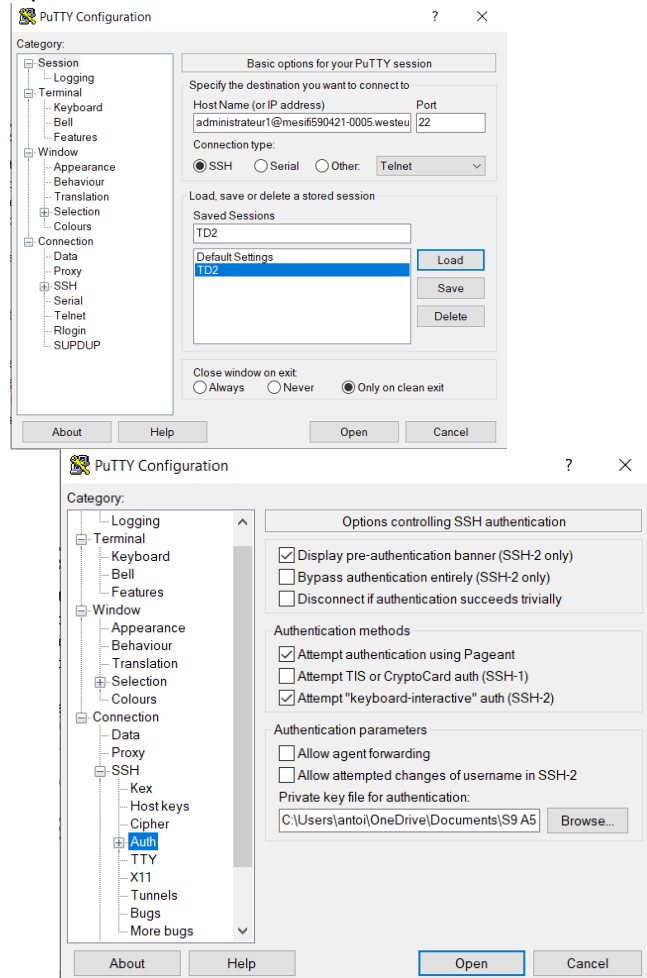
Put host name or IP
(Connection type) SSH
saved Sessions -> load -> save
connection -> SSH -> Auth -> put private_key was generated by Puttygen
save
Open Session

On the Virtual Machine

$ sudo nano /etc/ssh/sshd_config
We paste our ssh-rsa pubkey in the file
We can then Restart the SSH daemon, then exit and log in again.
$ sudo systemctl restart sshd
$ exit

4-Install BTC Pay server

BTCPayServer(Installation)

cd ~
git clone https://github.com/btcpayserver/btcpayserver.git
cd btcpayserver
git checkout latest
./build.sh
```
./run.sh -h
```

Configuration de Bitcoin testnet

```
sudo adduser bitcoin
sudo adduser administrateur1
sudo su - bitcoin
nvim ~/.bitcoin/bitcoin.conf => insérer
[
daemon=1
testnet=1
server=1
txindex=1
whitelist=127.0.0.1 #pour NBXplorer
listen=1
listenonion=1

rpcuser= #nom utilisateur
rpcpassword= #mot de passe
zmqpubrawblock=tcp://127.0.0.1:28332
zmqpubrawtx=tcp://127.0.0.1:28332
]
```

Bitcoind (lancer le réseau)


```
bitcoin@MESIFI590421-0005:~$ bitcoin-cli getblockchaininfo
{
  "chain": "test",
  "blocks": 1079536,
  "headers": 2096700,
  "bestblockhash": "000000000003bf96dd315cf041440e3a51e6ca5f2daf2419a4628a954e9dd123",
  "difficulty": 16384,
  "mediantime": 1484338334,
  "verificationprogress": 0.2082012337788151,
  "initialblockdownload": true,
  "chainwork": "00000000000000000000000000000000000000000001dd0075c2512c56519",
  "size_on_disk": 1074256560,
  "pruned": false,
  "softforks": {
    "bip34": {
      "type": "buried",
      "active": true,
      "height": 21111
    },
    "bip66": {
      "type": "buried",
      "active": true,
      "height": 330776
    },
    "bip65": {
      "type": "buried",
      "active": true,
      "height": 581885
    },
    "csv": {
      "type": "buried",
      "active": true,
      "height": 770112
    },
    "segwit": {
      "type": "buried",
      "active": true,
      "height": 834624
    }
  },
  "warnings": ""
}
bitcoin@MESIFI590421-0005:~$ bitcoin-cli getbalance*
error code: -32601
error message:
Method not found
bitcoin@MESIFI590421-0005:~$ bitcoin-cli getbalance
0.00000000
bitcoin@MESIFI590421-0005:~$
```

Vérification du wallet


```
*** System restart required ***
Last login: Tue Sep 28 14:04:20 2021 from 89.30.29.68
administrateur1@MESIFI590421-0005:~$ sudo su - bitcoin
bitcoin@MESIFI590421-0005:~$ nvim ~/.bitcoin/bitcoin.conf
bitcoin@MESIFI590421-0005:~$ nvim ~/.bitcoin/bitcoin.conf
bitcoin@MESIFI590421-0005:~$ bitcoin-cli getnewaddress
2N345zy6NnZLcNkLdt99Sa2MRhZmefTpY6z
bitcoin@MESIFI590421-0005:~$  bitcoin-cli getbalance
0.00010000
bitcoin@MESIFI590421-0005:~$
```

Wallet address : 2N345zy6NnZLcNkLdt99Sa2MRhZmefTpY6z

⇨ https://live.blockcypher.com/btc-
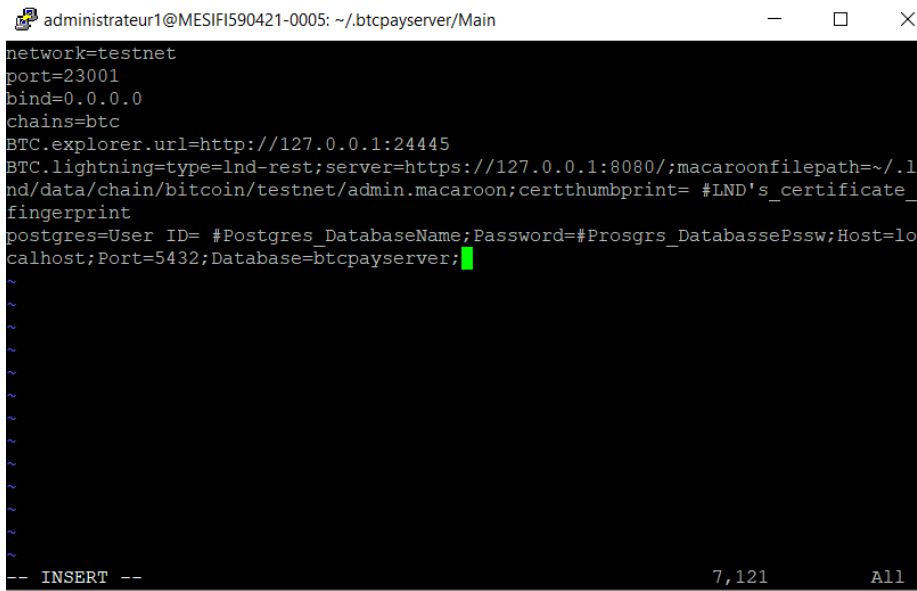testnet/address/2N345zy6NnZLcNkLdt99Sa2MRhZmefTpY6z/

5-Configure your BTC Pay server

Deployments with bitcoind

Cd ~/NBXplorer
./run.sh –network=testnet
Cd ~/btcpayserver
./run.sh --port 8080 -- bind 0.0.0.0 – network testnet

Configuration du BTCPayServeur with PostgreSQL and LND

Mkdir -p ~/.btcpayserveur/Main
Cd ~/.btcpayserver/Main
Sudo vi settings.config => insérer
[
network=testnet
port=23001
bind=0.0.0.0
chains=btc
BTC.explorer.url=http://127.0.0.1:24445
BTC.lightning=type=lnd-
rest;server=https://127.0.0.1:8080/;macaroonfilepath=~/.lnd/data/chain/bitcoin/testnet/admin.
macaroon;certthumbprint= #LND's_certificate_fingerprint
postgres=User ID + User Pssw
#Postgres_DatabaseName;Password=#Prosgrs_DatabassePssw;Host=localhost;Port=5432;Databa
se=btcpayserver;
]

```
administrateur1@MESIFI590421-0005: ~/.btcpayserver/Main          —    □    ×
network=testnet
port=23001
bind=0.0.0.0
chains=btc
BTC.explorer.url=http://127.0.0.1:24445
BTC.lightning=type=lnd-rest;server=https://127.0.0.1:8080/;macaroonfilepath=~/.l
nd/data/chain/bitcoin/testnet/admin.macaroon;certthumbprint= #LND's_certificate_
fingerprint
postgres=User ID= #Postgres_DatabaseName;Password=#Prosgrs_DatabassePssw;Host=lo
calhost;Port=5432;Database=btcpayserver;
~
~
~
~
~
~
~
~
~
~
~
-- INSERT --                                                    7,121        All
```

Get LND fingerprint => openssl x509 -noout -fingerprint -sha256 -inform pem -in ~/.lnd/tls.cert

Get Database Postgres => DatabaseName + DatabasePssw

```
Shall the new role be allowed to create databases? (y/n) y
Shall the new role be allowed to create more new roles? (y/n) n
createuser: could not connect to database template1: FATAL:  role "administrateu
r1" does not exist
administrateur1@MESIFI590421-0005:~$ sudo apt install postgresql postgresql-cont
rib
Reading package lists... Done
Building dependency tree
Reading state information... Done
postgresql is already the newest version (10+190ubuntu0.1).
postgresql-contrib is already the newest version (10+190ubuntu0.1).
0 upgraded, 0 newly installed, 0 to remove and 6 not upgraded.
administrateur1@MESIFI590421-0005:~$ sudo -i -u postgres
postgres@MESIFI590421-0005:~$ createuser --pwprompt --interactive
Enter name of role to add: administrateur1
Enter password for new role:
Enter it again:
Shall the new role be a superuser? (y/n) n
Shall the new role be allowed to create databases? (y/n) y
Shall the new role be allowed to create more new roles? (y/n) n
postgres@MESIFI590421-0005:~$ createdb -O administrateur1 btcpayserver
postgres@MESIFI590421-0005:~$ exit
logout
administrateur1@MESIFI590421-0005:~$
```

Config nbxplorer.service =>

[
Description=NBXplorer daemon
Requires=bitcoind.service
After=bitcoind.service

[Service]
WorkingDirectory=/home/admin/src/NBXplorer
ExecStart=/home/admin/src/NBXplorer/run.sh
User=bitcoin
Group=bitcoin
Type=simple
PIDFile=/run/nbxplorer/nbxplorer.pid
Restart=on-failure

[Install]
WantedBy=multi-user.target
]


```
[Unit]
Description=NBXplorer daemon
Requires=bitcoind.service
After=bitcoind.service

[Service]
WorkingDirectory=/home/admin/src/NBXplorer
ExecStart=/home/admin/src/NBXplorer/run.sh
User=bitcoin
Group=bitcoin
Type=simple
PIDFile=/run/nbxplorer/nbxplorer.pid
Restart=on-failure

[Install]
WantedBy=multi-user.target

~
~
~
```

Config btcpayserver.service =>

[
Requires=nbxplorer.service
After=nbxplorer.service

[Service]
WorkingDirectory=/home/admin/src/btcpayserver
Environment=BTCPAY_BTCEXTERNALRTL="server=https://testnet.demo.btcpayserver.org/rtl;cookiefile=/var/lib/rtl/.cookie"
ExecStart=/home/admin/src/btcpayserver/run.sh --conf=/etc/btcpay/btcpay.config
User=bitcoin
Group=bitcoin
Type=simple
PIDFile=/run/btcpayserver/btcpayserver.pid
Restart=on-failure

[Install]
WantedBy=multi-user.target
]

Activate these services

sudo cp btcpayserver.service /etc/systemd/system (nbxplorer.service /etc/systemd/system)
sudo systemctl enable --now btcpayserver (nbxplorer)

Check Configuration => usr/bin/dotnet run -p
~i/source/btcpayserver/BTCPayServer/BTCPayServer.csproj -c ~/.btcpayserver/Main/settings.config --network=testnet

Lauch BTCPayServer =>
sudo systemctl enable btcpayserver.service
sudo service btcpayserver start
sudo service btcpayserver status

6-<ins>Install website / Wordpress</ins>

Install PHP and Apache =>

sudo apt update
sudo apt install apache2 \
        ghostscript \
        libapache2-mod-php \
        mysql-server \
        php \
        php-bcmath \
            php-curl \
        php-imagick \
        php-intl \
        php-json \

```
        php-mbstring \
        php-mysql \
        php-xml \
        php-zip
```

then install Wordpress =>

```
sudo mkdir -p /srv/www
sudo chown www-data: /srv/www
curl https://wordpress.org/latest.tar.gz | sudo -u www-data tar zx -C /srv/www
```

**To Link WordPress with PostgreSQL database =>**

```
$ cd wp-content
$ git clone https://github.com/kevinoid/postgresql-for-wordpress.git
$ mv postgresql-for-wordpress/pg4wp Pg4wp
$ rm -rf postgresql-for-wordpress
$ cp Pg4wp/db.php db.php
$cd /var/www/html/test-with-postgres cp -rp wp-config-sample.php wp-config.php

#[wp-config.php]
/** DbName */
define('DB_NAME', #DbName(btcpayserver));
/** Username */
define('DB_USER', #Username(administrateur1));
/** Password */
define('DB_PASSWORD', #Password);
/** Hostname */
define('DB_HOST', 'localhost'(127.0.0.1:8080));
```

Delete those then replace with the content of https://api.wordpress.org/secret-key/1.1/salt/.

Save and close the configuration file by typing ctrl+x followed by y then enter

Open your server url and follow instruction to configure the wordpress website. We can modify the website thanks to the dashboard
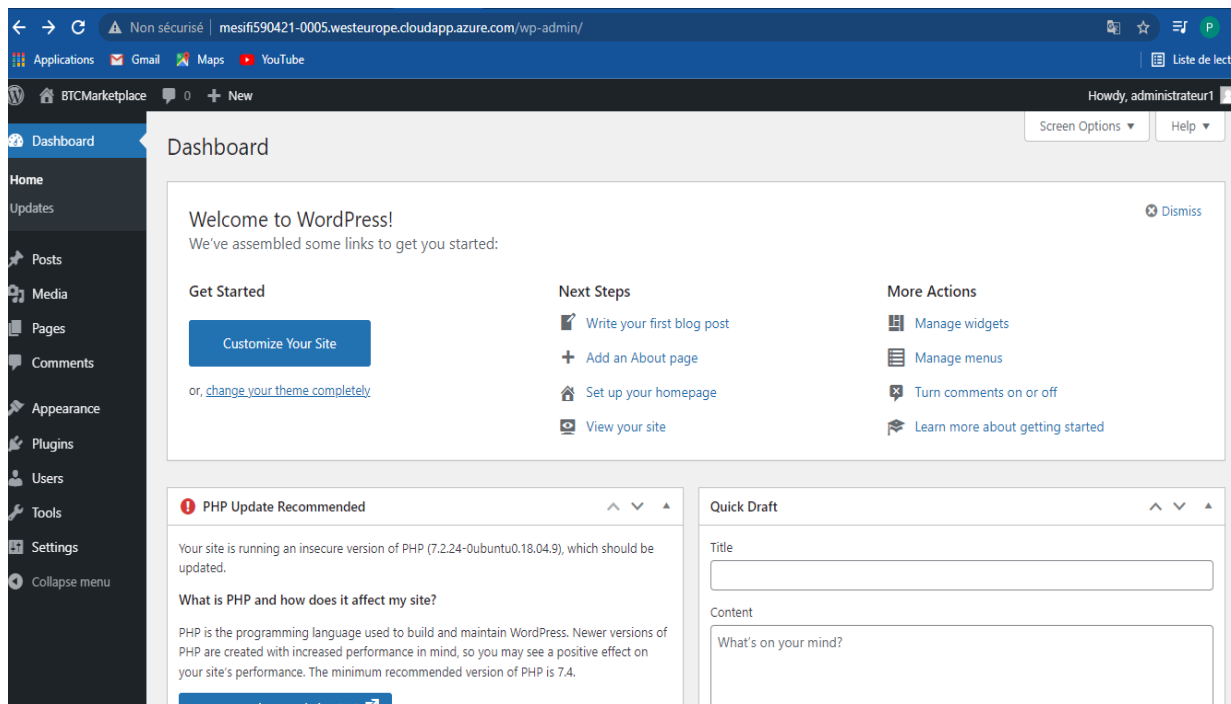
7-Create a button to pay with tBTC

Create account
https://testnet.demo.btcpayserver.org/
my wallet address cannot match with the pattern, you can create another by this:
https://iancoleman.io/bip39/

example:
mnemonic:
source fox trap attack aerobic bargain auto erosion feature prosper depart outside appear disease resist
public key:
xpub6CryqUqYW9kxbwZSoTppGrWqgvZwWpRvKSK3CH2swd9RHCUeAjDaqvLAk2T1DhgDuJg orwdk3pUFfgZLdT8kg7tFuda95RfQdSoZ8QEpLmP
private key:
xprv9ysdRyJefnCfPTUyhSHouia78tjT7Mi4xDPSPtdGPHcSQQ9VdBuLJ81gtmfVvA5pDvfp38t5o oPsp5s2Rt5unjnYoTd9zW3Pr2ngE5G14SC
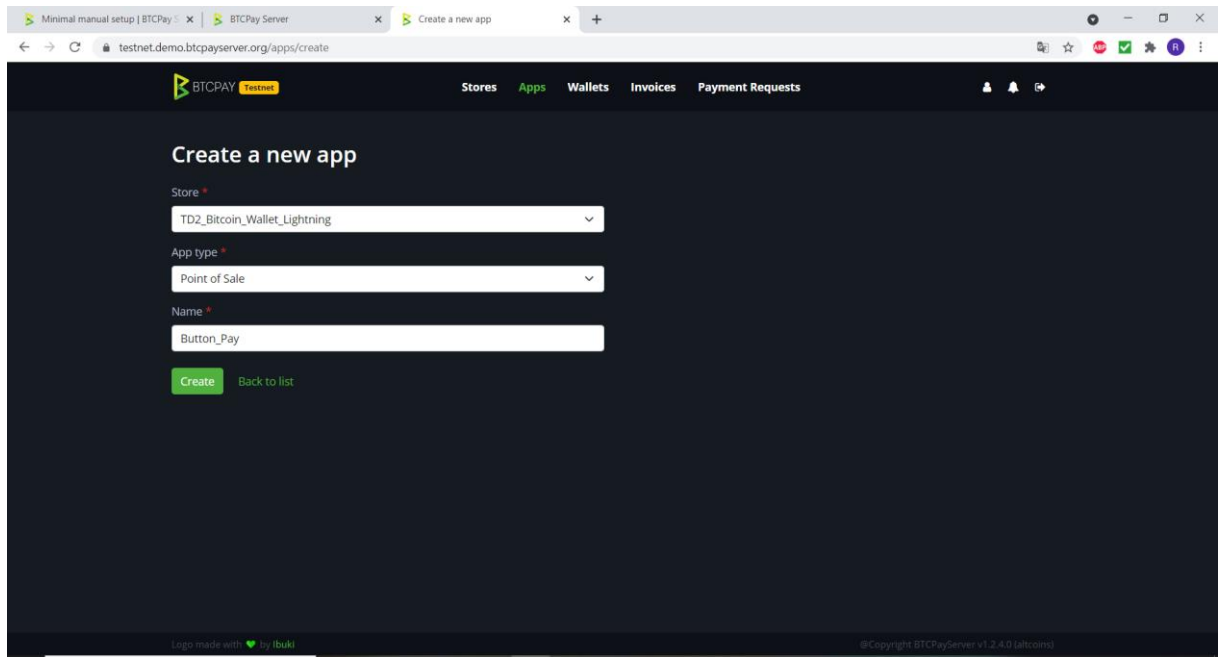an address:
tb1q6654eak053mz2tl4ms6mlj8vw8zf2jxldx96hy

⇨ https://live.blockcypher.com/btc-testnet/address/tb1q6654eak053mz2tl4ms6mlj8vw8zf2jxldx96hy/

Follow Stores (Configuration: wallet, temps de payment)> Invoices (permet de voir les appels API+ créer une facture avec un montant)> Apps(permet d'avoir l'API, et configurer les paramètres)
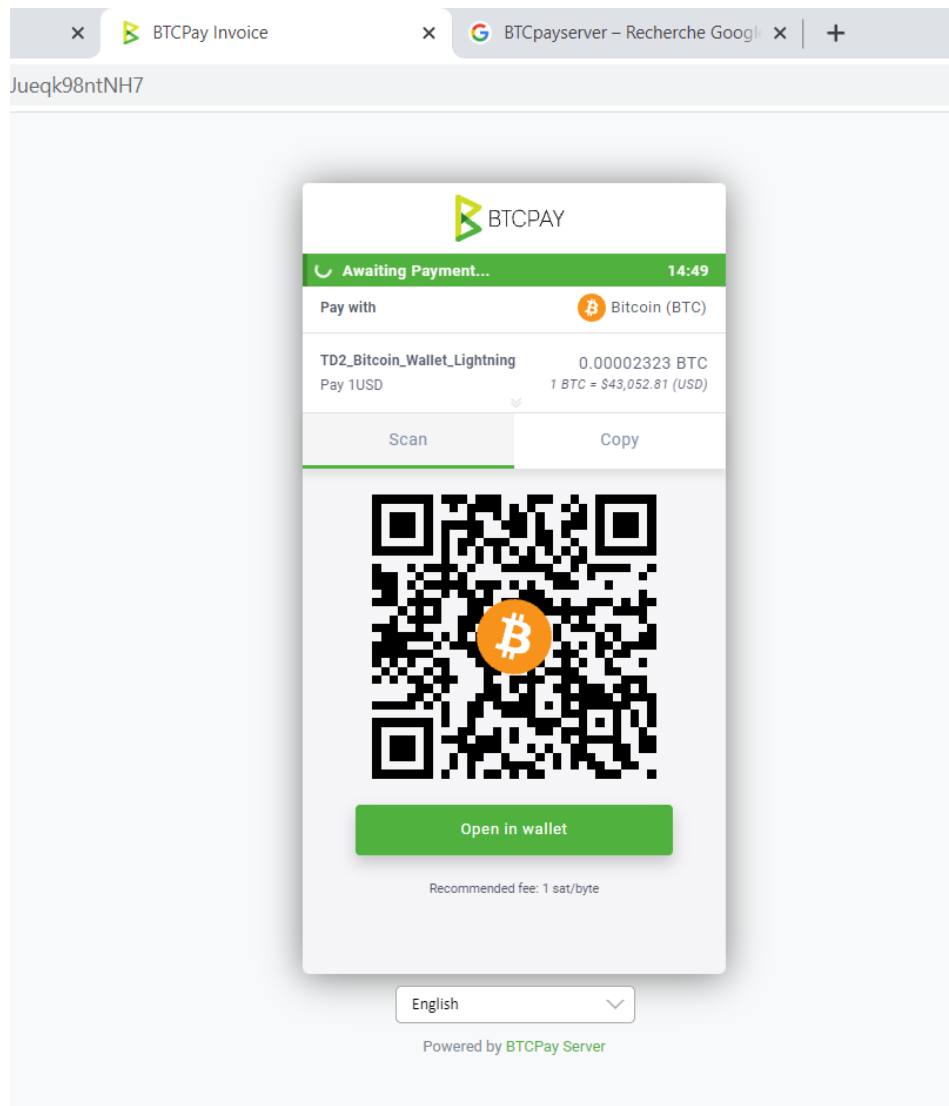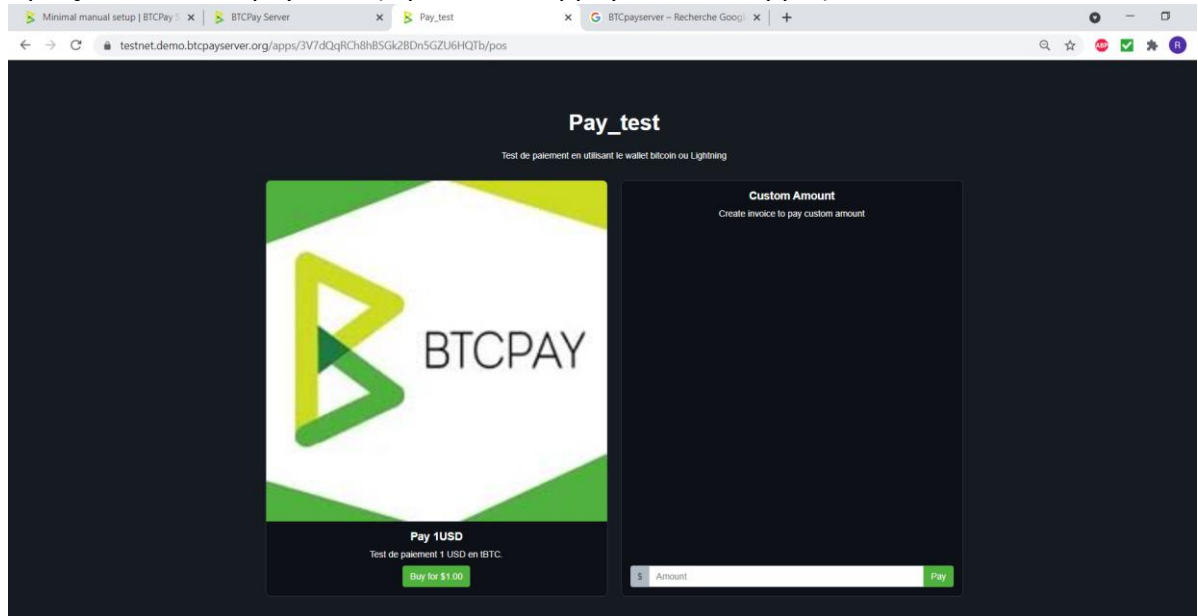
TD2_Bitcoin_Wallet_Lightning

BTCPAY Testnet

Stores · Apps · Wallets · Invoices · Payment Requests

General settings
Rates
Checkout experience
Access Tokens
Users
Pay Button
Integrations
Webhooks

Wallet

BTC	tpubDD...NaNyJA	Manage Wallet	Enabled	Modify
LTC				Setup

Lightning

A connection to a Lightning node is required to receive Lightning payments.

BTC	Setup
LTC	Setup

General

Store ID

```
DspbFpENfUPMfWJnmSQwcPoGLMWvjsAb4HI23WMp3FmE
```

Store Name

```
TD2_Bitcoin_Wallet_Lightning
```

Store Website

Payment

○ Allow anyone to create invoice ⓘ

Add additional fee (network fee) to invoice ... ⓘ

... only if the customer makes more than one payment for the invoice ▾

Invoice expires if the full amount has not been paid after ... ⓘ

15	minutes

Payment invalid if transactions fails to confirm ... after invoice expiration ⓘ

1440	minutes

Consider the invoice paid even if the paid amount is ... % less than expected ⓘ

0	percent

Consider the invoice confirmed when the payment transaction ... ⓘ

Has at least 1 confirmation ▾

Description template of the lightning invoice

```
Paid to {StoreName} (Order ID: {OrderId})
```

Available placeholders: **{StoreName} {ItemDescription} {OrderId}**

Save Store Settings

← → C 🔒 testnet.demo.btcpayserver.org/invoices

BTCPAY Testnet

Stores · Apps · Wallets · **Invoices** · Payment Requests

> Invoice LDjqL5NKUUAEuB6oCDWmf4 just created! ✕

Invoices ⓘ

+ Create an invoice

Actions ▾   Export ▾ ⓘ

🔍 Search ▾

☐	Date ⓘ	OrderId	InvoiceId	Status	Amount	Actions
☐	30/09/2021 10:33:21		LDjqL5NKUUAEuB6oCDWmf4	new ▾	$1.00 (USD)	Checkout [^] Details ▾

Logo made with ♥ by Ibuki

©Copyright BTCPayServer v1.2.4.0 (altcoins)

Stores   Apps   Wallets   Invoices   Payment Requests

App successfully created   ×

Update Point of Sale

Title *
Pay_test

Currency *
USD

Description

Test de paiement en utilisant le wallet bitcoin ou Lightning

Products

BTCPAY

Pay 1USD
Edit   🗑

+ Add   Toggle raw editor

Template

Pay:
  price: 1
  title: Pay 1USD
  description: "Test de paiement 1 USD en tBTC."
  image:
data:image/jpeg;base64,/9j/4AAQSkZJRgABAQAAAQABAAD/2wCEAAkGBw0QEADODg8NDQ8PDgQDhAPEABQDg8NIRIWI1xJRI1fMYHTQsGBsxHRMW1TQfVfTUxMTbFx8uOIMuQygtDpcRCgoKDgOGaAQGy0IHyVNp1Mi4uKrcvMC0uL1g4NzU3NzU3Msor1zA3Kzc1NTU1LgvL1crKyvLLSOrfyDrfU/AAB1IAMgAyAMBIIgACEQE0EQH/xAAbAAEAAgMBAQAAAAAAAAAAAAAAQYDBAUHAxEAAEIQAeJCAgtAggHIAAAAAEAAgVEEQUfdHxxQVE1IgSYXGBeIQIM4 M1JzoEeB8IQj01SSIRzI2H4Ki4fAkNVNDxr1C/BQAGwelBAAIDAQEAAAAAAAAAAAQIAQIDBgfxAAsEQACAgEgQfIBAMAAAAAAAQIDBBEHMUEFE.IJBEyl0UYJCYXGRIW4H9I/buADAMBAAIRAxE

Appearance

Point of Sale Style *
Item list only   ▼
Choose the point of sale style for your customers.

Text to display on each button for items with a specific price *
Buy for {0}

Discounts

☑ User can input discount in %
Not recommended for customer self-checkout.

Custom Payments

◉ User can input custom amount

Text to display on buttons allowing the user to enter a custom amount *
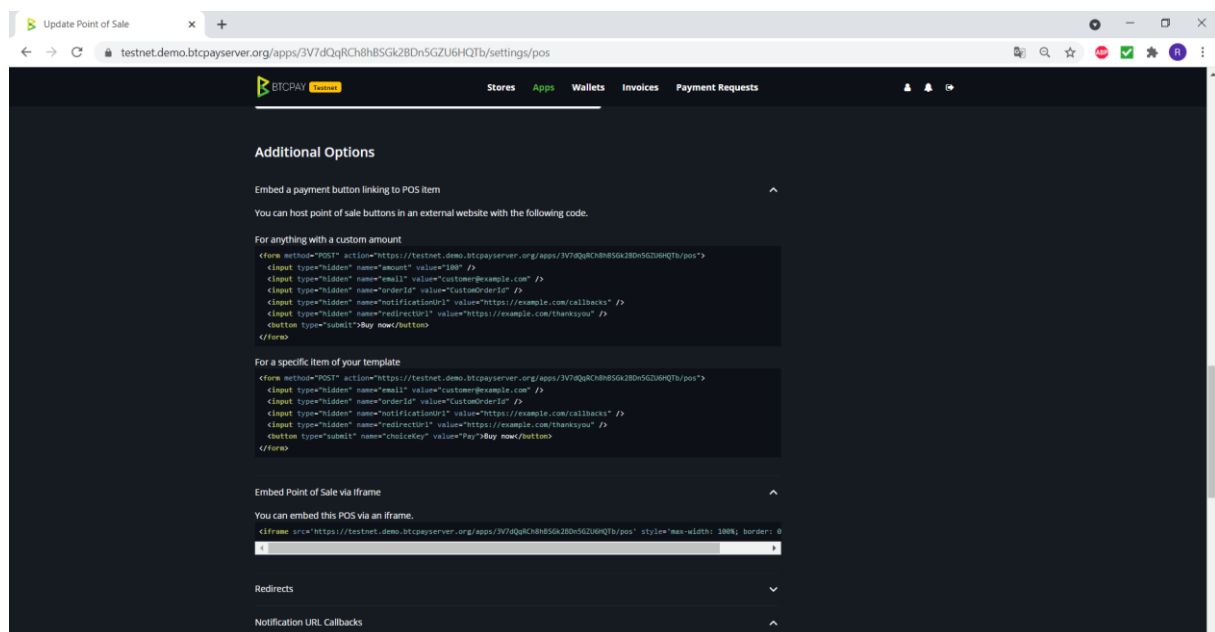Pay

Aperçu du bouton payment (après avoir appuyer « view app »)

Button for paying with Bitcoin Testnet Wallet.

Every request can be check in "Invoices Dashboard" (Chaque user peut donner 1USD en tBTC, cela déclenche un invoice de 15 min pour payer)

Export the API To WordPress:

PayServer

https://testnet.demo.btcpayserver.org/apps/3V7dQqRCh8hBSGk2BDn5GZU6HQTb/pos

Method 1

```
<form method="POST"
action="https://testnet.demo.btcpayserver.org/apps/3V7dQqRCh8hBSGk2BDn5GZU6HQTb/
pos">

  <input type="hidden" name="amount" value="100" />
  <button type="submit">Buy now</button>
</form>
```
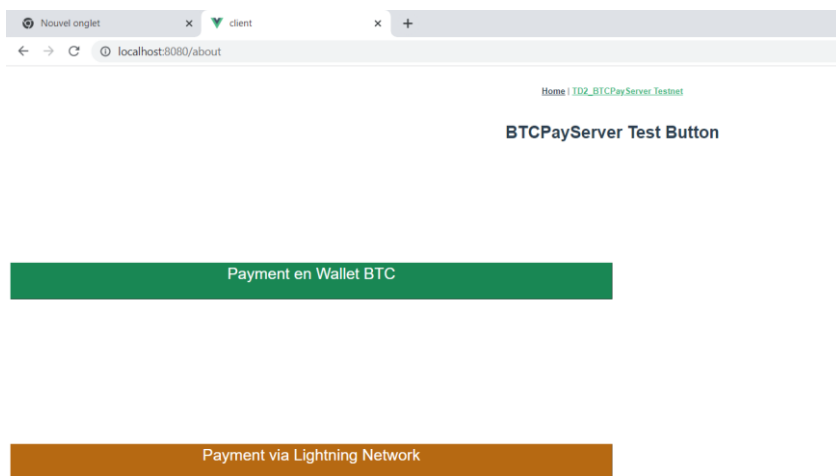
Method2

```
<iframe
src='https://testnet.demo.btcpayserver.org/apps/3V7dQqRCh8hBSGk2BDn5GZU6HQTb/pos'
style='max-width: 100%; border: 0;'></iframe>
```

8- Create a button to pay with lightning

On avait commencé avec WordPress. Mais Vuejs semble plus simple.

Documentation

https://stadicus.github.io/RaspiBolt

https://docs.btcpayserver.org/ManualDeployment/

https://freedomnode.com/blog/how-to-setup-btc-and-lightning-payment-gateway-with-btcpayserver-on-linux-manual-install/

https://ubuntu.com/tutorials/install-and-configure-wordpress#1-overview
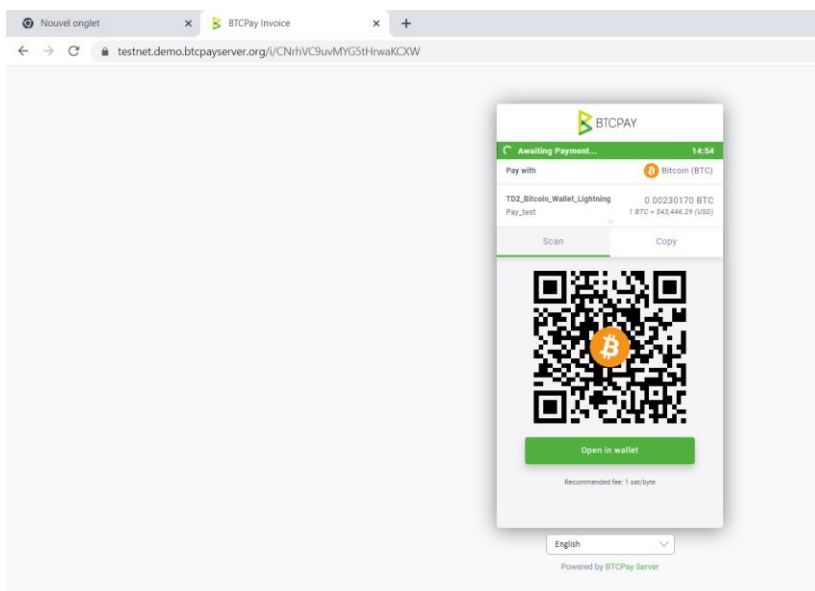
https://medium.com/@shoaibhassan_/install-wordpress-with-postgresql-using-apache-in-5-min-a26078d496fb