МІНІСТЕРСТВО ОСВІТИ І НАУКИ, МОЛОДІ ТА СПОРТУ УКРАЇНИ

НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ УКРАЇНИ

«КИЇВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ ІМЕНІ ІГОРЯ СІКОРСЬКОГО»

ФІЗИКО-ТЕХНІЧНИЙ ІНСТИТУТ

Кафедра Інформаційної Безпеки

Лабораторна робота №1

з предмету «Блокчейн та децентралізовані системи»

Виконав:

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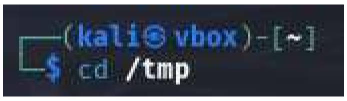
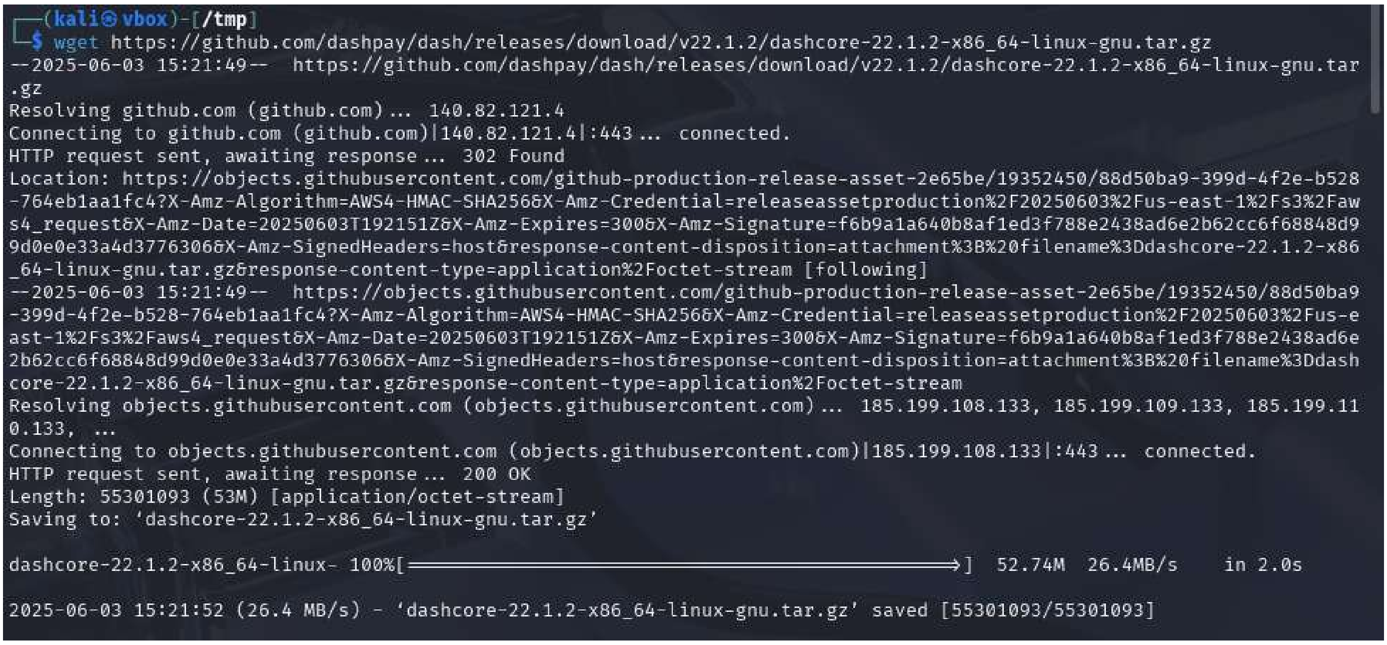
Київ 2025

Налаштування обраної системи та виконання тестових операцій в системі.

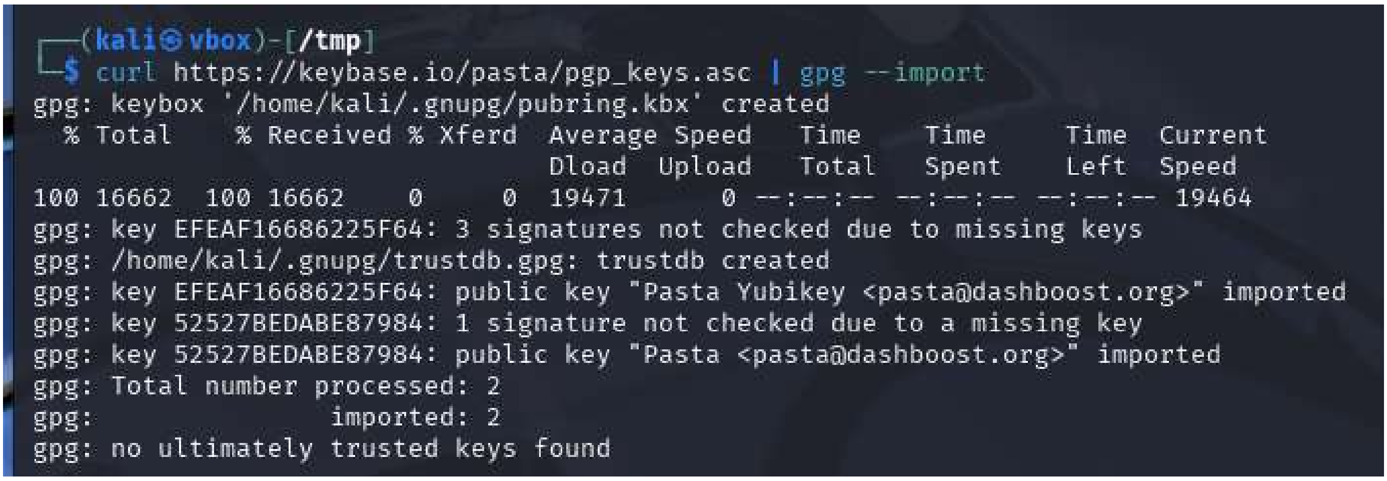
Dash система.



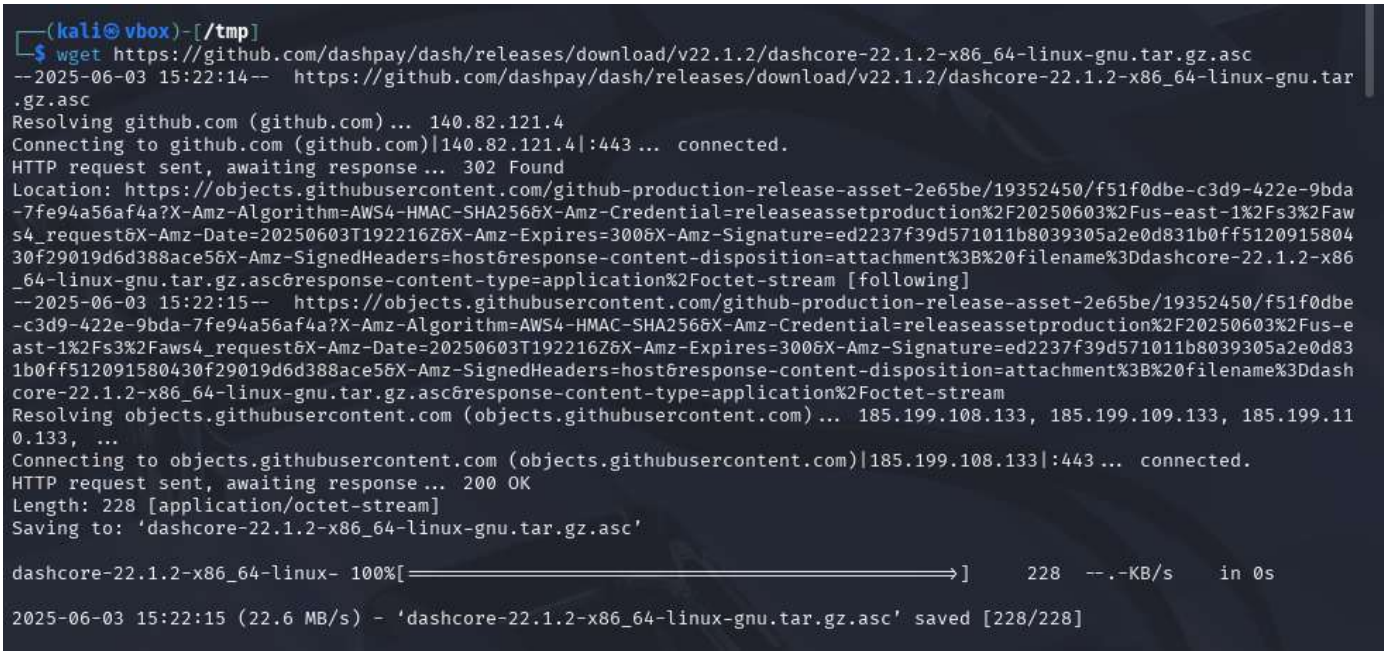
```
┌──(kali㉿vbox)-[~]
└─$ cd /tmp
```



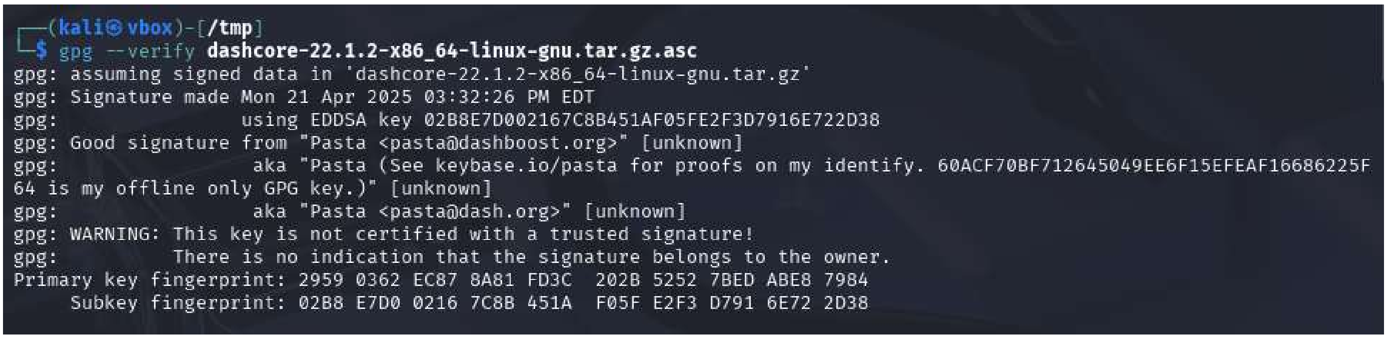
```
┌──(kali㉿vbox)-[/tmp]
└─$ wget https://github.com/dashpay/dash/releases/download/v22.1.2/dashcore-22.1.2-x86_64-linux-gnu.tar.gz
--2025-06-03 15:21:49--  https://github.com/dashpay/dash/releases/download/v22.1.2/dashcore-22.1.2-x86_64-linux-gnu.tar
.gz
Resolving github.com (github.com)... 140.82.121.4
Connecting to github.com (github.com)|140.82.121.4|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://objects.githubusercontent.com/github-production-release-asset-2e65be/19352450/88d50ba9-399d-4f2e-b528
-764eb1aa1fc4?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20250603%2Fus-east-1%2Fs3%2Faw
s4_request&X-Amz-Date=20250603T192151Z&X-Amz-Expires=300&X-Amz-Signature=f6b9a1a640b8af1ed3f788e2438ad6e2b62cc6f68848d9
9d0e0e33a4d3776306&X-Amz-SignedHeaders=host&response-content-disposition=attachment%3B%20filename%3Ddashcore-22.1.2-x86
_64-linux-gnu.tar.gz&response-content-type=application%2Foctet-stream [following]
--2025-06-03 15:21:49--  https://objects.githubusercontent.com/github-production-release-asset-2e65be/19352450/88d50ba9
-399d-4f2e-b528-764eb1aa1fc4?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20250603%2Fus-e
ast-1%2Fs3%2Faws4_request&X-Amz-Date=20250603T192151Z&X-Amz-Expires=300&X-Amz-Signature=f6b9a1a640b8af1ed3f788e2438ad6e
2b62cc6f68848d99d0e0e33a4d3776306&X-Amz-SignedHeaders=host&response-content-disposition=attachment%3B%20filename%3Ddash
core-22.1.2-x86_64-linux-gnu.tar.gz&response-content-type=application%2Foctet-stream
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.108.133, 185.199.109.133, 185.199.11
0.133, ...
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.108.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 55301093 (53M) [application/octet-stream]
Saving to: ‘dashcore-22.1.2-x86_64-linux-gnu.tar.gz’

dashcore-22.1.2-x86_64-linux- 100%[===================================================>]  52.74M  26.4MB/s    in 2.0s

2025-06-03 15:21:52 (26.4 MB/s) - ‘dashcore-22.1.2-x86_64-linux-gnu.tar.gz’ saved [55301093/55301093]
```



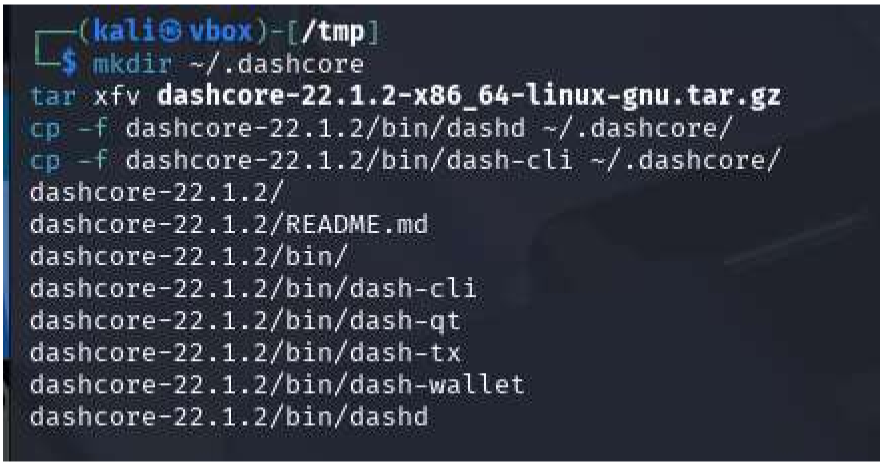
```
┌──(kali㉿vbox)-[/tmp]
└─$ curl https://keybase.io/pasta/pgp_keys.asc | gpg --import
gpg: keybox '/home/kali/.gnupg/pubring.kbx' created
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 16662  100 16662    0     0  19471      0 --:--:-- --:--:-- --:--:-- 19464
gpg: key EFEAF16686225F64: 3 signatures not checked due to missing keys
gpg: /home/kali/.gnupg/trustdb.gpg: trustdb created
gpg: key EFEAF16686225F64: public key "Pasta Yubikey <pasta@dashboost.org>" imported
gpg: key 52527BEDABE87984: 1 signature not checked due to a missing key
gpg: key 52527BEDABE87984: public key "Pasta <pasta@dashboost.org>" imported
gpg: Total number processed: 2
gpg:               imported: 2
gpg: no ultimately trusted keys found
```



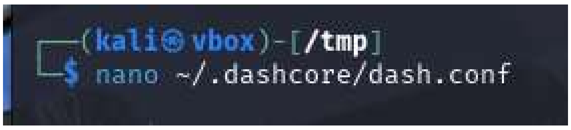
```
┌──(kali㉿vbox)-[/tmp]
└─$ wget https://github.com/dashpay/dash/releases/download/v22.1.2/dashcore-22.1.2-x86_64-linux-gnu.tar.gz.asc
--2025-06-03 15:22:14--  https://github.com/dashpay/dash/releases/download/v22.1.2/dashcore-22.1.2-x86_64-linux-gnu.tar
.gz.asc
Resolving github.com (github.com)... 140.82.121.4
Connecting to github.com (github.com)|140.82.121.4|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://objects.githubusercontent.com/github-production-release-asset-2e65be/19352450/f51f0dbe-c3d9-422e-9bda
-7fe94a56af4a?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20250603%2Fus-east-1%2Fs3%2Faw
s4_request&X-Amz-Date=20250603T192216Z&X-Amz-Expires=300&X-Amz-Signature=ed2237f39d571011b8039305a2e0d831b0ff5120915804
30f29019d6d388ace5&X-Amz-SignedHeaders=host&response-content-disposition=attachment%3B%20filename%3Ddashcore-22.1.2-x86
_64-linux-gnu.tar.gz.asc&response-content-type=application%2Foctet-stream [following]
--2025-06-03 15:22:15--  https://objects.githubusercontent.com/github-production-release-asset-2e65be/19352450/f51f0dbe
-c3d9-422e-9bda-7fe94a56af4a?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20250603%2Fus-e
ast-1%2Fs3%2Faws4_request&X-Amz-Date=20250603T192216Z&X-Amz-Expires=300&X-Amz-Signature=ed2237f39d571011b8039305a2e0d83
1b0ff512091580430f29019d6d388ace5&X-Amz-SignedHeaders=host&response-content-disposition=attachment%3B%20filename%3Ddash
core-22.1.2-x86_64-linux-gnu.tar.gz.asc&response-content-type=application%2Foctet-stream
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.108.133, 185.199.109.133, 185.199.11
0.133, ...
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.108.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 228 [application/octet-stream]
Saving to: ‘dashcore-22.1.2-x86_64-linux-gnu.tar.gz.asc’

dashcore-22.1.2-x86_64-linux- 100%[=================================================>]     228  --.-KB/s    in 0s

2025-06-03 15:22:15 (22.6 MB/s) - ‘dashcore-22.1.2-x86_64-linux-gnu.tar.gz.asc’ saved [228/228]
```



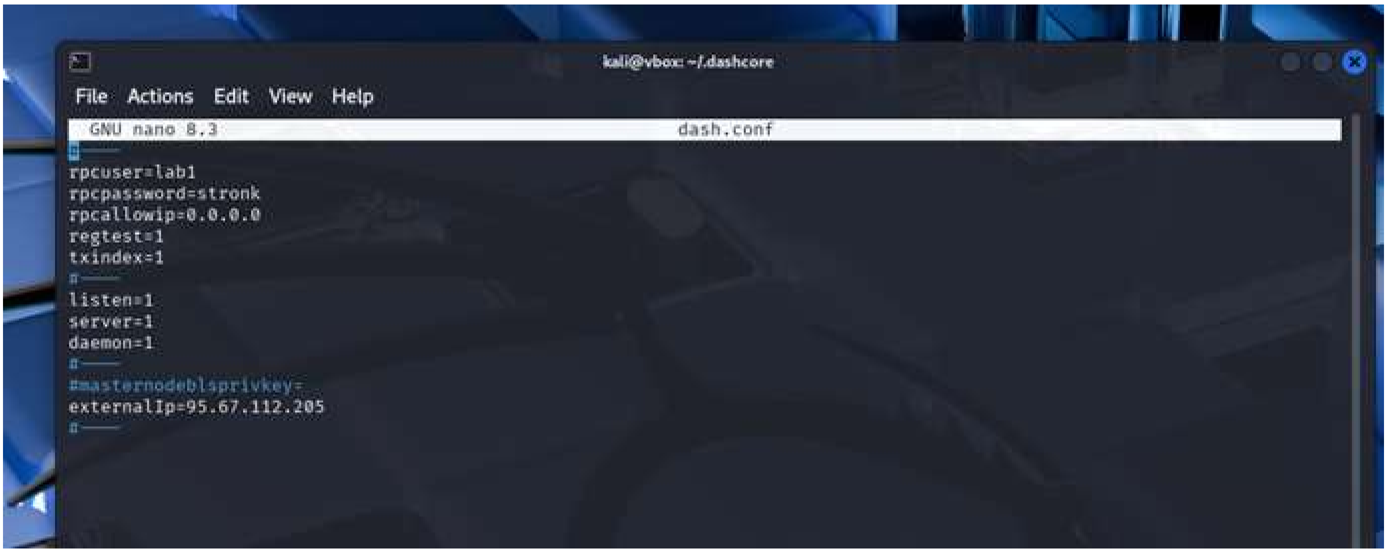
```
┌──(kali㉿vbox)-[/tmp]
└─$ gpg --verify dashcore-22.1.2-x86_64-linux-gnu.tar.gz.asc
gpg: assuming signed data in 'dashcore-22.1.2-x86_64-linux-gnu.tar.gz'
gpg: Signature made Mon 21 Apr 2025 03:32:26 PM EDT
gpg:                using EDDSA key 02B8E7D002167C8B451AF05FE2F3D7916E722D38
gpg: Good signature from "Pasta <pasta@dashboost.org>" [unknown]
gpg:                 aka "Pasta (See keybase.io/pasta for proofs on my identify. 60ACF70BF712645049EE6F15EFEAF16686225F
64 is my offline only GPG key.)" [unknown]
gpg:                 aka "Pasta <pasta@dash.org>" [unknown]
gpg: WARNING: This key is not certified with a trusted signature!
gpg:          There is no indication that the signature belongs to the owner.
Primary key fingerprint: 2959 0362 EC87 8A81 FD3C  202B 5252 7BED ABE8 7984
     Subkey fingerprint: 02B8 E7D0 0216 7C8B 451A  F05F E2F3 D791 6E72 2D38
```



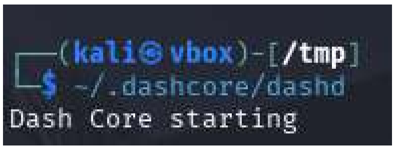
```
┌──(kali㉿vbox)-[/tmp]
└─$ mkdir ~/.dashcore
tar xfv dashcore-22.1.2-x86_64-linux-gnu.tar.gz
cp -f dashcore-22.1.2/bin/dashd ~/.dashcore/
cp -f dashcore-22.1.2/bin/dash-cli ~/.dashcore/
dashcore-22.1.2/
dashcore-22.1.2/README.md
dashcore-22.1.2/bin/
dashcore-22.1.2/bin/dash-cli
dashcore-22.1.2/bin/dash-qt
dashcore-22.1.2/bin/dash-tx
dashcore-22.1.2/bin/dash-wallet
dashcore-22.1.2/bin/dashd
```



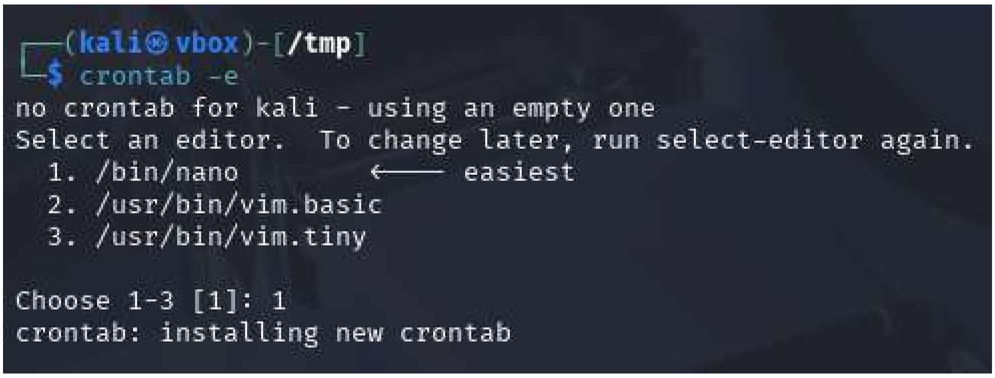
```
┌──(kali㉿vbox)-[/tmp]
└─$ nano ~/.dashcore/dash.conf
```



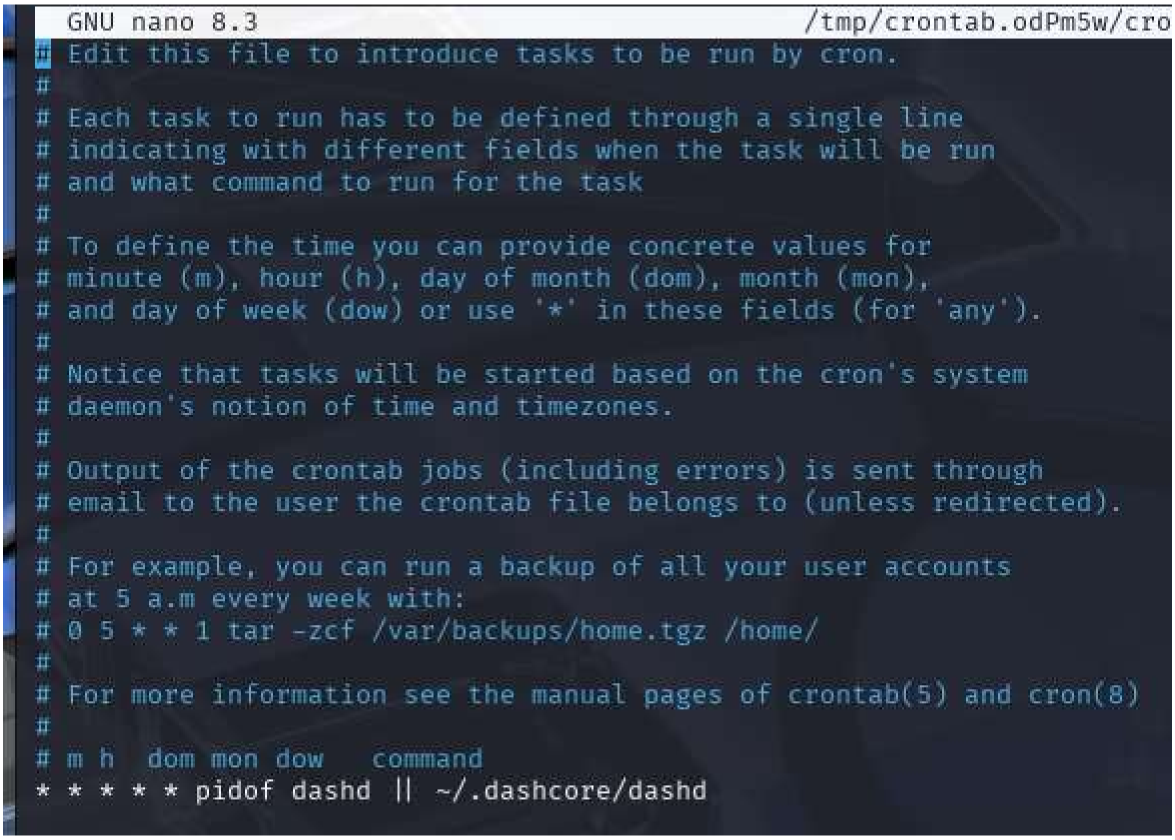
```
  GNU nano 8.3                                          dash.conf
#——
rpcuser=lab1
rpcpassword=stronk
rpcallowip=0.0.0.0
regtest=1
txindex=1
#——
listen=1
server=1
daemon=1
#——
#masternodeblsprivkey=
externalIp=95.67.112.205
#——
```



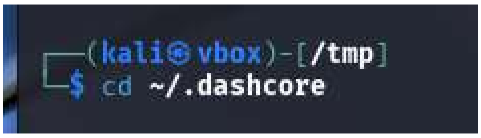
```
┌──(kali㉿vbox)-[/tmp]
└─$ ~/.dashcore/dashd
Dash Core starting
```



```
┌──(kali㉿vbox)-[/tmp]
└─$ crontab -e
no crontab for kali - using an empty one
Select an editor.  To change later, run select-editor again.
  1. /bin/nano        ←—— easiest
  2. /usr/bin/vim.basic
  3. /usr/bin/vim.tiny

Choose 1-3 [1]: 1
crontab: installing new crontab
```

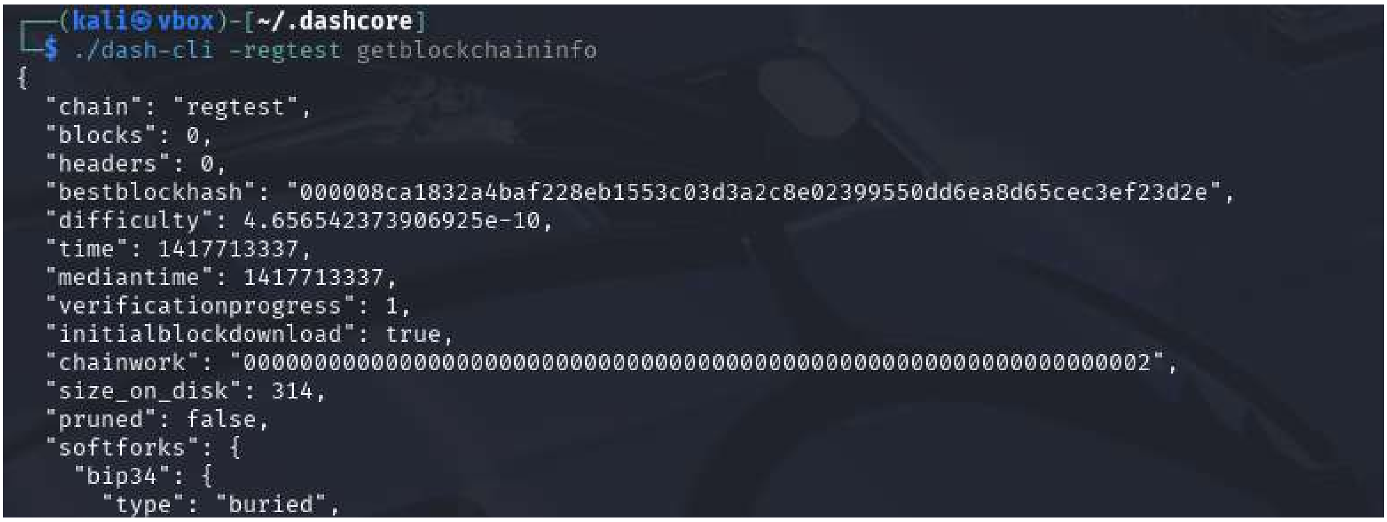


```
  GNU nano 8.3                          /tmp/crontab.odPm5w/cro
# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').
#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h  dom mon dow   command
* * * * * pidof dashd || ~/.dashcore/dashd
```



```
┌──(kali㉿vbox)-[/tmp]
└─$ cd ~/.dashcore
```

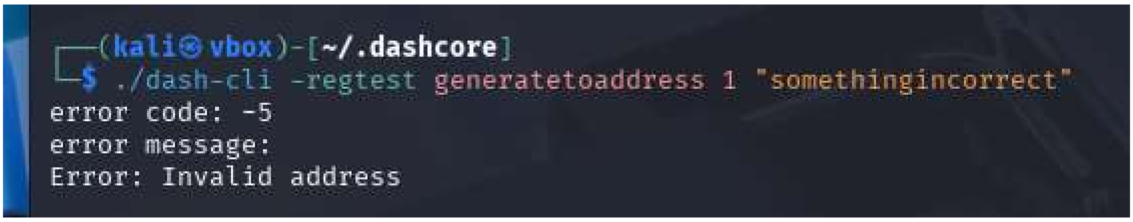
Налаштування завершене



```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest getblockchaininfo
{
  "chain": "regtest",
  "blocks": 0,
  "headers": 0,
  "bestblockhash": "000008ca1832a4baf228eb1553c03d3a2c8e02399550dd6ea8d65cec3ef23d2e",
  "difficulty": 4.656542373906925e-10,
  "time": 1417713337,
  "mediantime": 1417713337,
  "verificationprogress": 1,
  "initialblockdownload": true,
  "chainwork": "0000000000000000000000000000000000000000000000000000000000000002",
  "size_on_disk": 314,
  "pruned": false,
  "softforks": {
    "bip34": {
      "type": "buried",
```

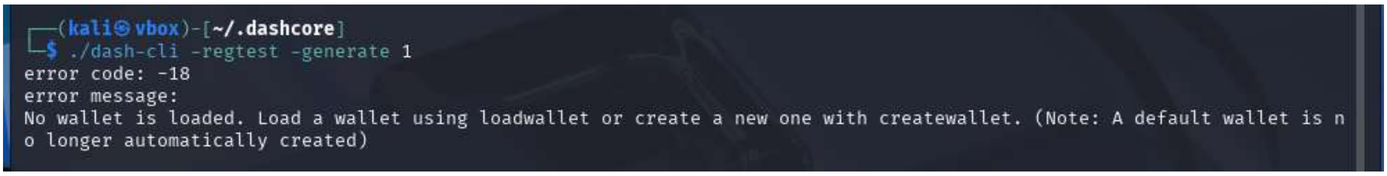
За замовчанням тестнет має мати 100 блоків підтверджень, і зі 101 блока валюта стане доступною для використання.

Спочатку спробуємо створити блок на неіснуючу адресу

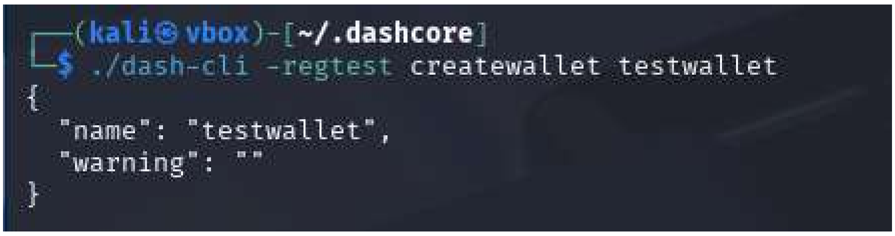


```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest generatetoaddress 1 "somethingincorrect"
error code: -5
error message:
Error: Invalid address
```

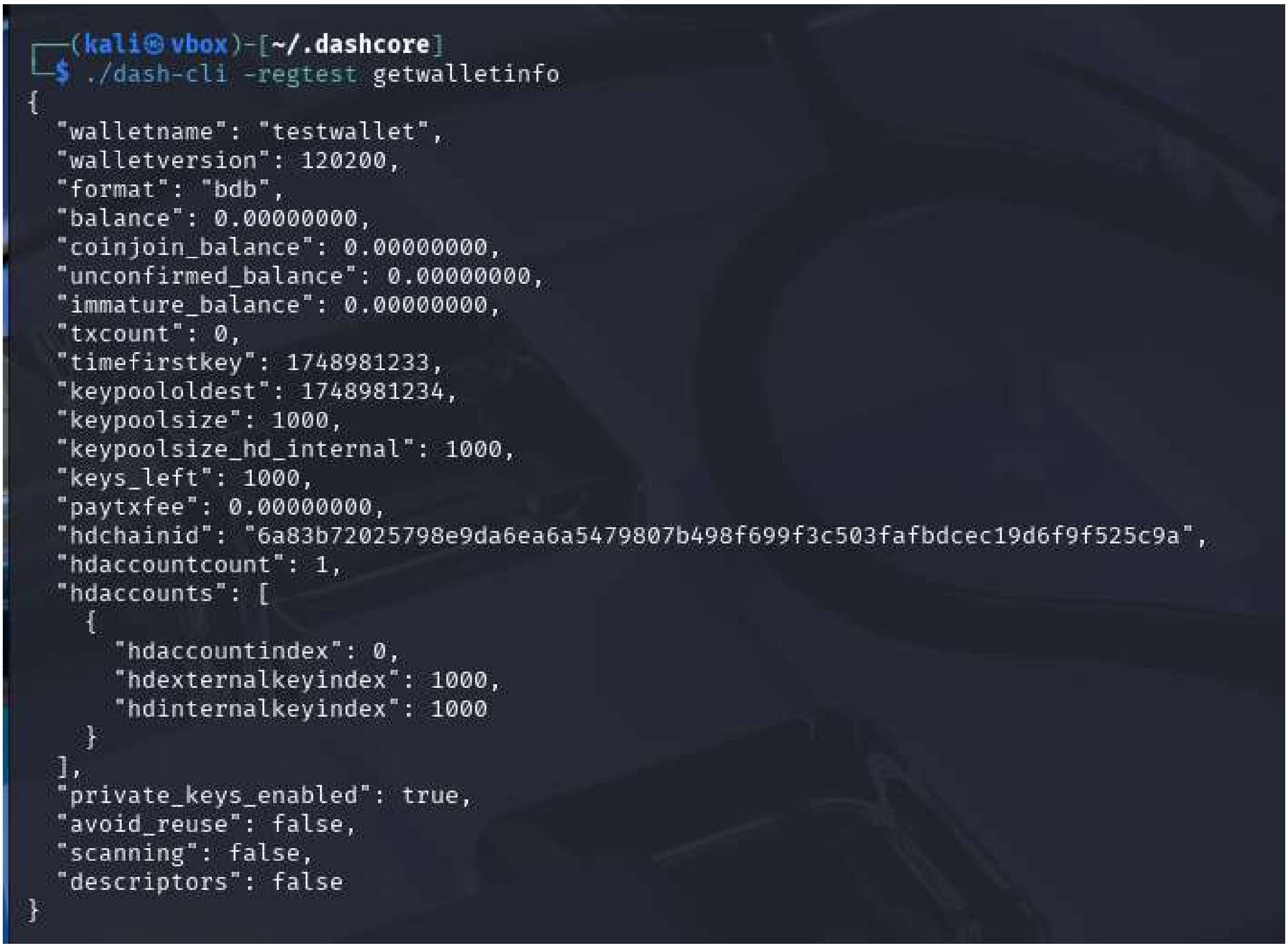
Якщо спробувати створити блок без параметрів, то консоль покаже що треба створити новий гаманець, бо створення нового автоматично вже не робиться.



```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest -generate 1
error code: -18
error message:
No wallet is loaded. Load a wallet using loadwallet or create a new one with createwallet. (Note: A default wallet is n
o longer automatically created)
```

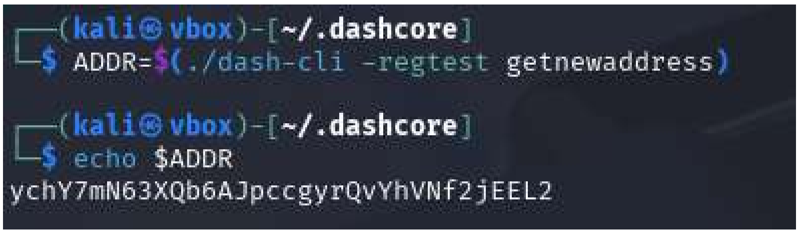


```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest createwallet testwallet
{
  "name": "testwallet",
  "warning": ""
}
```

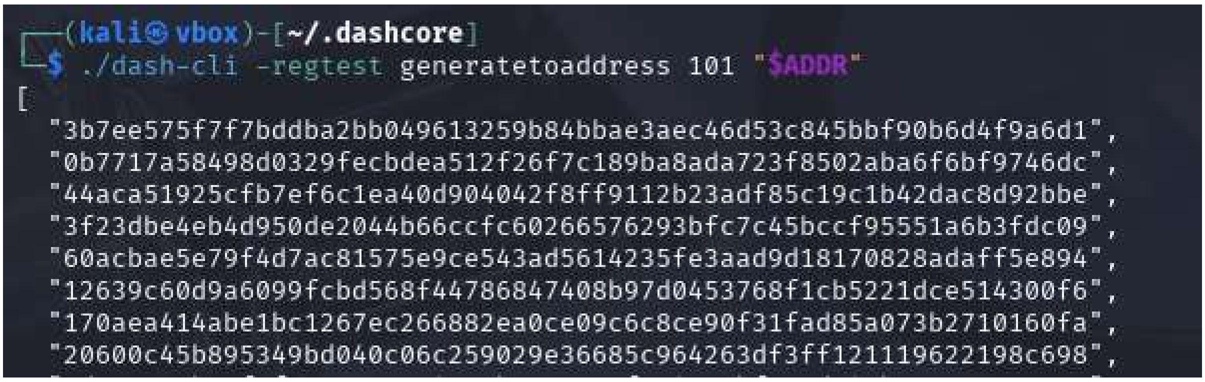


```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest getwalletinfo
{
  "walletname": "testwallet",
  "walletversion": 120200,
  "format": "bdb",
  "balance": 0.00000000,
  "coinjoin_balance": 0.00000000,
  "unconfirmed_balance": 0.00000000,
  "immature_balance": 0.00000000,
  "txcount": 0,
  "timefirstkey": 1748981233,
  "keypoololdest": 1748981234,
  "keypoolsize": 1000,
  "keypoolsize_hd_internal": 1000,
  "keys_left": 1000,
  "paytxfee": 0.00000000,
  "hdchainid": "6a83b72025798e9da6ea6a5479807b498f699f3c503fafbdcec19d6f9f525c9a",
  "hdaccountcount": 1,
  "hdaccounts": [
    {
      "hdaccountindex": 0,
      "hdexternalkeyindex": 1000,
      "hdinternalkeyindex": 1000
    }
  ],
  "private_keys_enabled": true,
  "avoid_reuse": false,
  "scanning": false,
  "descriptors": false
}
```

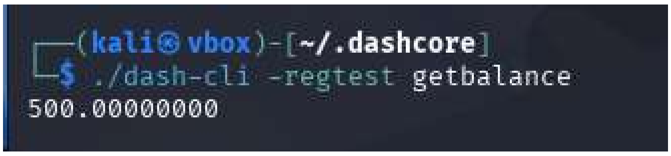
Генеруємо нову адресу, та додаємо туди 101 блок, щоби валюта з блока була доступна для проведення транзакцій.



```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ADDR=$(./dash-cli -regtest getnewaddress)

┌──(kali㉿vbox)-[~/.dashcore]
└─$ echo $ADDR
ychY7mN63XQb6AJpccgyrQvYhVNf2jEEL2
```



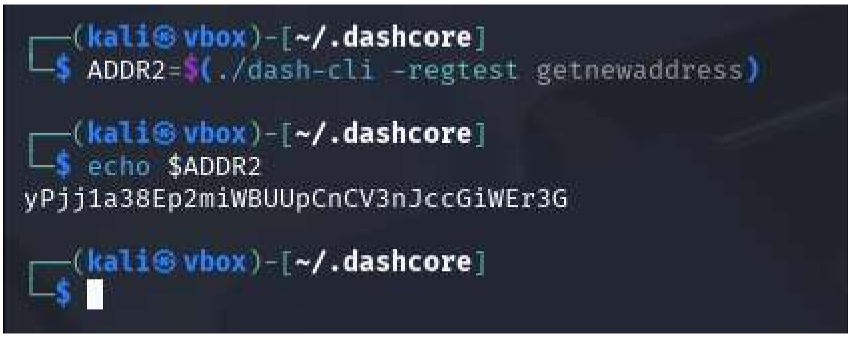
```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest generatetoaddress 101 "$ADDR"
[
  "3b7ee575f7f7bddba2bb049613259b84bbae3aec46d53c845bbf90b6d4f9a6d1",
  "0b7717a58498d0329fecbdea512f26f7c189ba8ada723f8502aba6f6bf9746dc",
  "44aca51925cfb7ef6c1ea40d904042f8ff9112b23adf85c19c1b42dac8d92bbe",
  "3f23dbe4eb4d950de2044b66ccfc60266576293bfc7c45bccf95551a6b3fdc09",
  "60acbae5e79f4d7ac81575e9ce543ad5614235fe3aad9d18170828adaff5e894",
  "12639c60d9a6099fcbd568f44786847408b97d0453768f1cb5221dce514300f6",
  "170aea414abe1bc1267ec266882ea0ce09c6c8ce90f31fad85a073b2710160fa",
  "20600c45b895349bd040c06c259029e36685c964263df3ff121119622198c698",
```



```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest getbalance
500.00000000
```

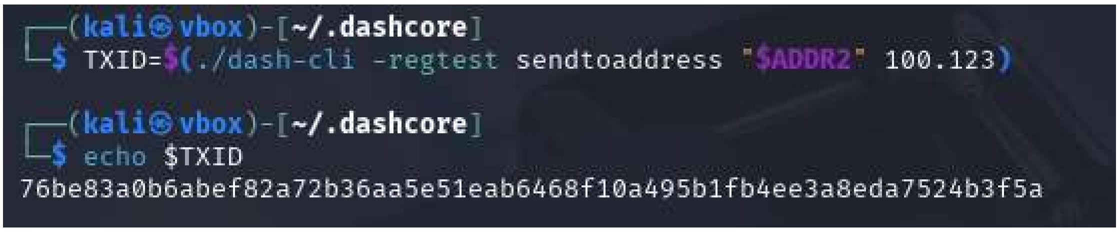
Один блок генерує 500 токенів

Створимо нову адресу для отримання коштів.



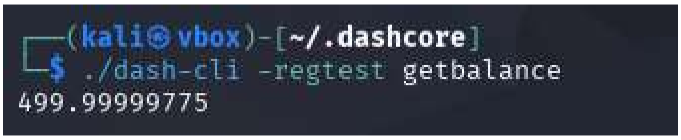
```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ADDR2=$(./dash-cli -regtest getnewaddress)

┌──(kali㉿vbox)-[~/.dashcore]
└─$ echo $ADDR2
yPjj1a38Ep2miWBUUpCnCV3nJccGiWEr3G

┌──(kali㉿vbox)-[~/.dashcore]
└─$ 
```

Зробимо переказ

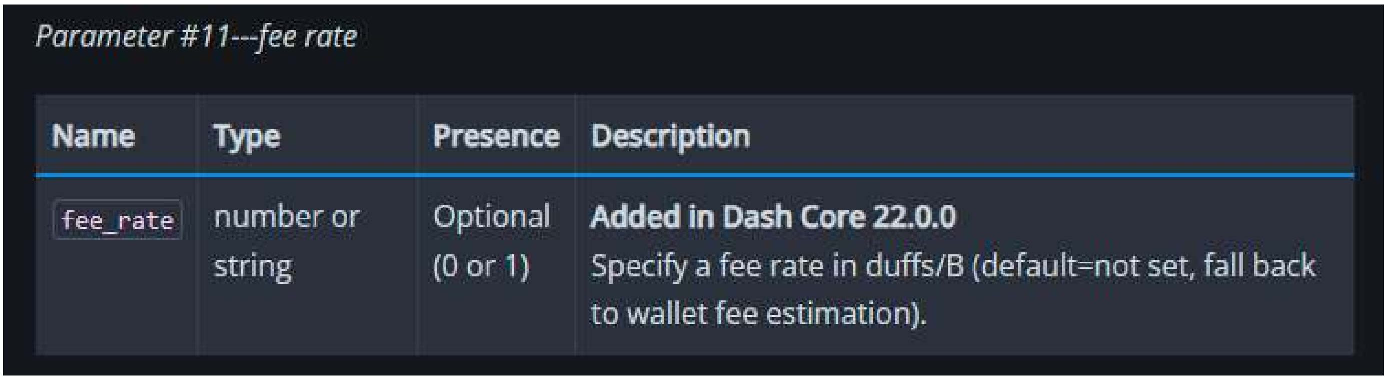


```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ TXID=$(./dash-cli -regtest sendtoaddress "$ADDR2" 100.123)

┌──(kali㉿vbox)-[~/.dashcore]
└─$ echo $TXID
76be83a0b6abef82a72b36aa5e51eab6468f10a495b1fb4ee3a8eda7524b3f5a
```

Не підтверджуючи транзакцію можна побачити, що сума зменшилась на кількість комісії за проведення транзакції. За допомогою додаткового параметра можна збільшувати комісію, щоби транзакція була швидше оброблена на реальній мережі.



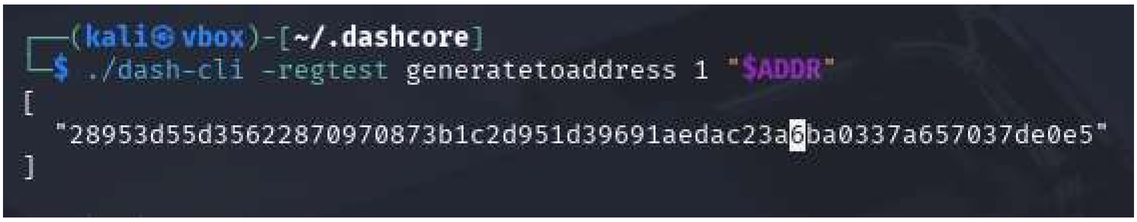
```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest getbalance
499.99999775
```



Parameter #11---fee rate

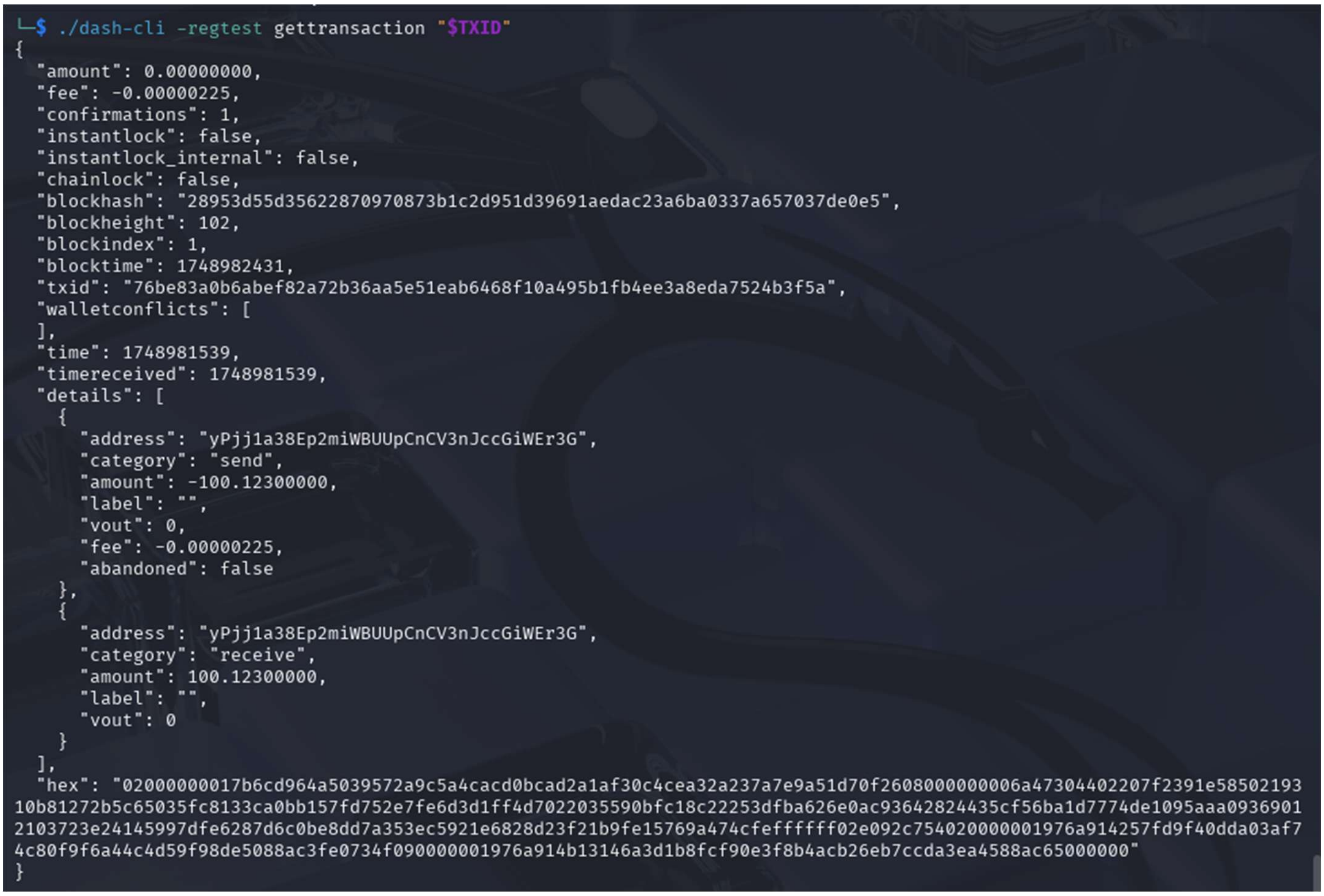
Name	Type	Presence	Description
`fee_rate`	number or string	Optional (0 or 1)	**Added in Dash Core 22.0.0** Specify a fee rate in duffs/B (default=not set, fall back to wallet fee estimation).

Підтвердимо транзакцію новим блоком



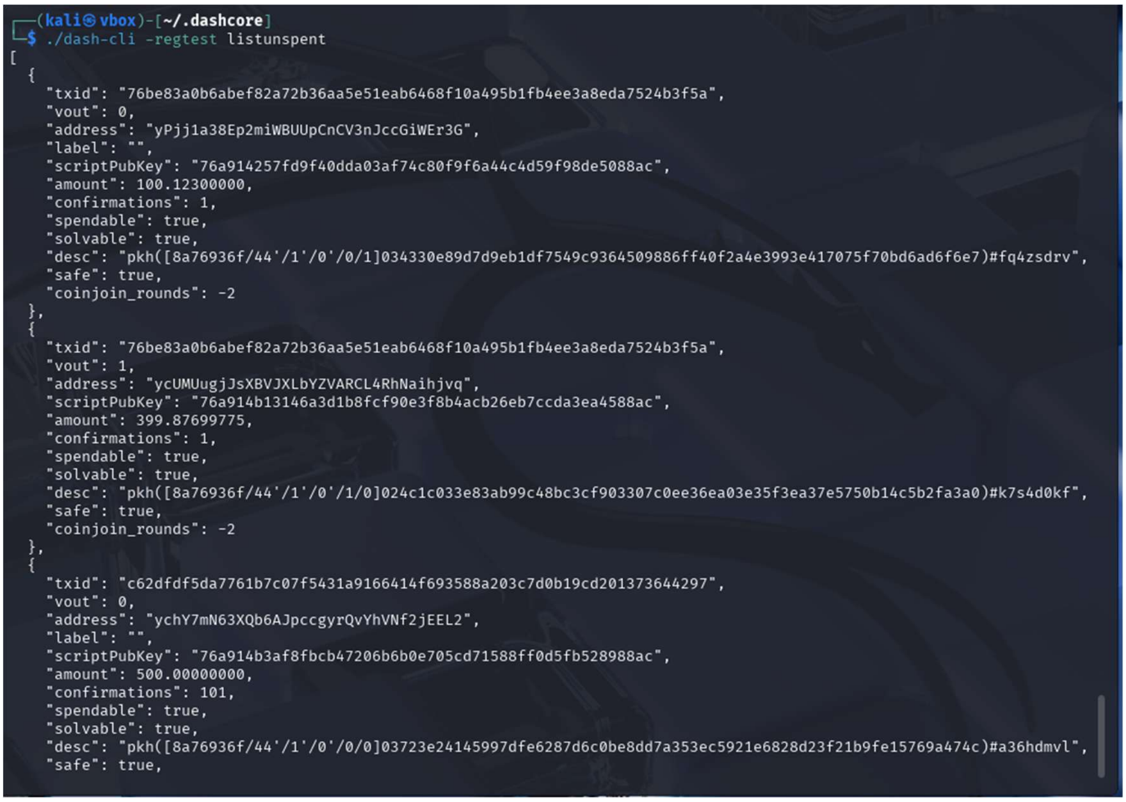
```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest generatetoaddress 1 "$ADDR"
[
  "28953d55d35622870970873b1c2d951d39691aedac23a6ba0337a657037de0e5"
]
```

Перевіримо транзакцію



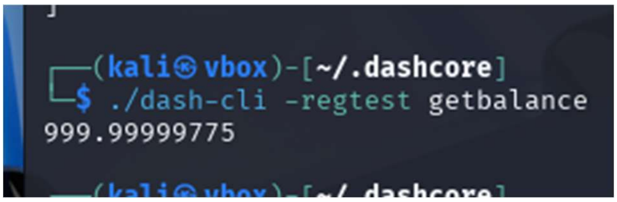
```
└─$ ./dash-cli -regtest gettransaction "$TXID"
{
  "amount": 0.00000000,
  "fee": -0.00000225,
  "confirmations": 1,
  "instantlock": false,
  "instantlock_internal": false,
  "chainlock": false,
  "blockhash": "28953d55d35622870970873b1c2d951d39691aedac23a6ba0337a657037de0e5",
  "blockheight": 102,
  "blockindex": 1,
  "blocktime": 1748982431,
  "txid": "76be83a0b6abef82a72b36aa5e51eab6468f10a495b1fb4ee3a8eda7524b3f5a",
  "walletconflicts": [
  ],
  "time": 1748981539,
  "timereceived": 1748981539,
  "details": [
    {
      "address": "yPjj1a38Ep2miWBUUpCnCV3nJccGiWEr3G",
      "category": "send",
      "amount": -100.12300000,
      "label": "",
      "vout": 0,
      "fee": -0.00000225,
      "abandoned": false
    },
    {
      "address": "yPjj1a38Ep2miWBUUpCnCV3nJccGiWEr3G",
      "category": "receive",
      "amount": 100.12300000,
      "label": "",
      "vout": 0
    }
  ],
  "hex": "02000000017b6cd964a5039572a9c5a4cacd0bcad2a1af30c4cea32a237a7e9a51d70f2608000000006a47304402207f2391e58502193
10b81272b5c65035fc8133ca0bb157fd752e7fe6d3d1ff4d7022035590bfc18c22253dfba626e0ac93642824435cf56ba1d7774de1095aaa0936901
2103723e24145997dfe6287d6c0be8dd7a353ec5921e6828d23f21b9fe15769a474cfeffffff02e092c754020000001976a914257fd9f40dda03af7
4c80f9f6a44c4d59f98de5088ac3fe0734f090000001976a914b13146a3d1b8fcf90e3f8b4acb26eb7ccda3ea4588ac65000000"
}
```

Дивимось безпосередньо транзакції



```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest listunspent
[
  {
    "txid": "76be83a0b6abef82a72b36aa5e51eab6468f10a495b1fb4ee3a8eda7524b3f5a",
    "vout": 0,
    "address": "yPjj1a38Ep2miWBUUpCnCV3nJccGiWEr3G",
    "label": "",
    "scriptPubKey": "76a914257fd9f40dda03af74c80f9f6a44c4d59f98de5088ac",
    "amount": 100.12300000,
    "confirmations": 1,
    "spendable": true,
    "solvable": true,
    "desc": "pkh([8a76936f/44'/1'/0'/0/1]034330e89d7d9eb1df7549c9364509886ff40f2a4e3993e417075f70bd6ad6f6e7)#fq4zsdrv",
    "safe": true,
    "coinjoin_rounds": -2
  },
  {
    "txid": "76be83a0b6abef82a72b36aa5e51eab6468f10a495b1fb4ee3a8eda7524b3f5a",
    "vout": 1,
    "address": "ycUMUugjJsXBVJXLbYZVARCL4RhNaihjvq",
    "scriptPubKey": "76a914b13146a3d1b8fcf90e3f8b4acb26eb7ccda3ea4588ac",
    "amount": 399.87699775,
    "confirmations": 1,
    "spendable": true,
    "solvable": true,
    "desc": "pkh([8a76936f/44'/1'/0'/1/0]024c1c033e83ab99c48bc3cf903307c0ee36ea03e35f3ea37e5750b14c5b2fa3a0)#k7s4d0kf",
    "safe": true,
    "coinjoin_rounds": -2
  },
  {
    "txid": "c62dfdf5da7761b7c07f5431a9166414f693588a203c7d0b19cd201373644297",
    "vout": 0,
    "address": "ychY7mN63XQb6AJpccgyrQvYhVNf2jEEL2",
    "label": "",
    "scriptPubKey": "76a914b3af8fbcb47206b6b0e705cd71588ff0d5fb528988ac",
    "amount": 500.00000000,
    "confirmations": 101,
    "spendable": true,
    "solvable": true,
    "desc": "pkh([8a76936f/44'/1'/0'/0/0]03723e24145997dfe6287d6c0be8dd7a353ec5921e6828d23f21b9fe15769a474c)#a36hdmvl",
    "safe": true,
```

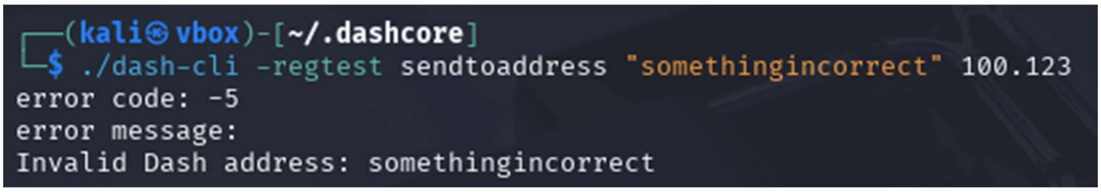
Ефективна сума 500 (початкова) – 0.00000225 + 500 (з нового блоку)



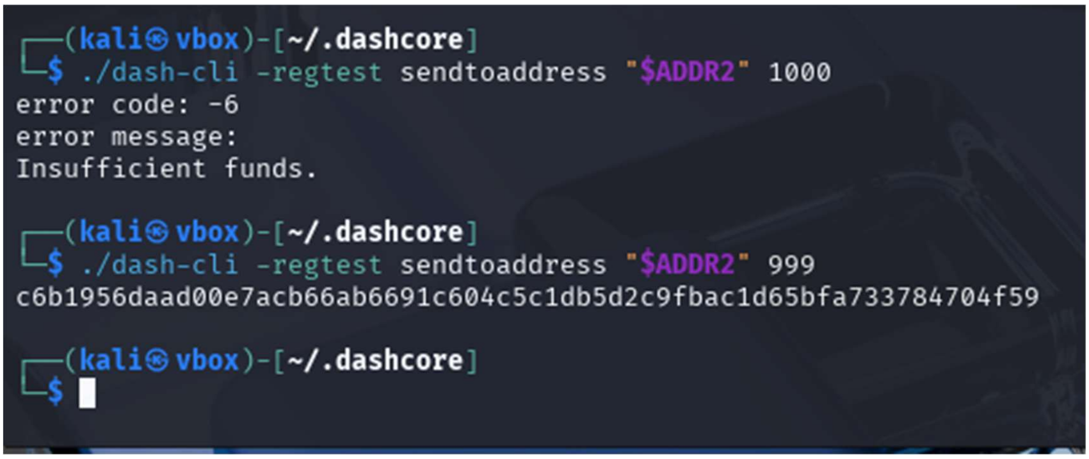
```
]

┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest getbalance
999.99999775

┌──(kali㉿vbox)-[~/.dashcore]
```

Ефективно, транзакція була зроблена самому собі.

Інші перевірки помилкових ситуацій

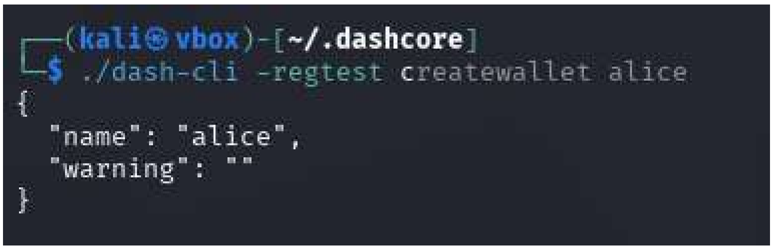


```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest sendtoaddress "somethingincorrect" 100.123
error code: -5
error message:
Invalid Dash address: somethingincorrect
```

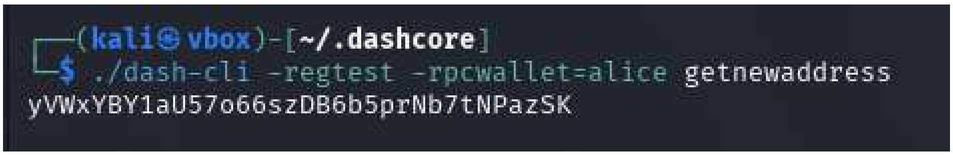


```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest sendtoaddress "$ADDR2" 1000
error code: -6
error message:
Insufficient funds.

┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest sendtoaddress "$ADDR2" 999
c6b1956daad00e7acb66ab6691c604c5c1db5d2c9fbac1d65bfa733784704f59

┌──(kali㉿vbox)-[~/.dashcore]
└─$ █
```

Створимо ще один гаманець

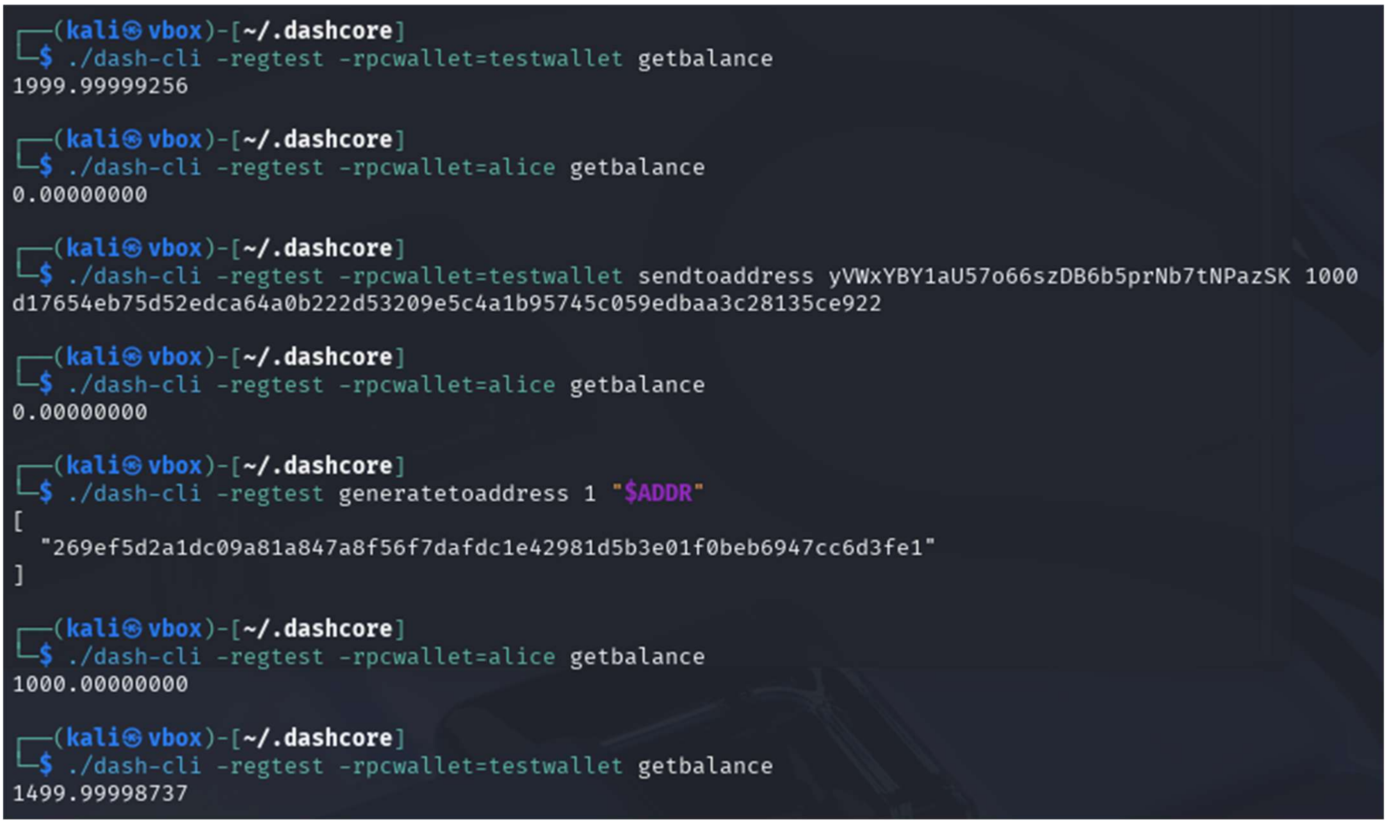


```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest createwallet alice
{
  "name": "alice",
  "warning": ""
}
```



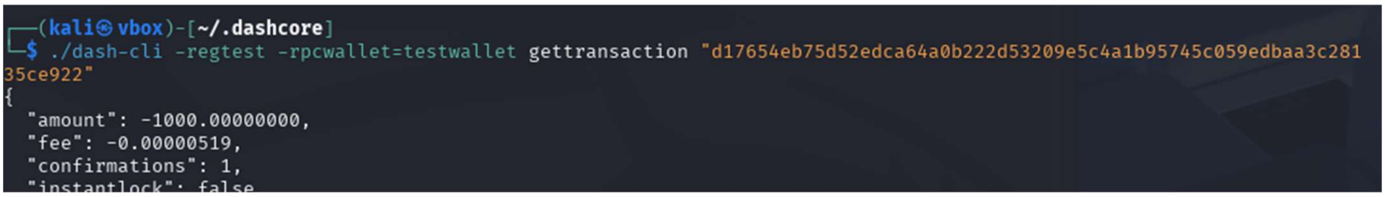
```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest -rpcwallet=alice getnewaddress
yVWxYBY1aU57o66szDB6b5prNb7tNPazSK
```

Зробимо транзакцію та підтвердимо її



```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest -rpcwallet=testwallet getbalance
1999.99999256

┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest -rpcwallet=alice getbalance
0.00000000

┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest -rpcwallet=testwallet sendtoaddress yVWxYBY1aU57o66szDB6b5prNb7tNPazSK 1000
d17654eb75d52edca64a0b222d53209e5c4a1b95745c059edbaa3c28135ce922

┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest -rpcwallet=alice getbalance
0.00000000

┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest generatetoaddress 1 "$ADDR"
[
  "269ef5d2a1dc09a81a847a8f56f7dafdc1e42981d5b3e01f0beb6947cc6d3fe1"
]

┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest -rpcwallet=alice getbalance
1000.00000000

┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest -rpcwallet=testwallet getbalance
1499.99998737
```

Сума комісії змінилась.



```
┌──(kali㉿vbox)-[~/.dashcore]
└─$ ./dash-cli -regtest -rpcwallet=testwallet gettransaction "d17654eb75d52edca64a0b222d53209e5c4a1b95745c059edbaa3c281
35ce922"
{
  "amount": -1000.00000000,
  "fee": -0.00000519,
  "confirmations": 1,
  "instantlock": false
```

Висновок: в ході лабораторної роботи було розгорнуто тестову блокчейн-мережу Dash, проведено базові операції зі створення нових адрес, проведення транзакцій, операції переказу на інші гаманці. Також, проведено дослідження концепції coin-based maturity, яка не дозволяла проводити операції над валютою у перших 100 блоках ланцюжку.