



## **Master of Information Security**

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**Study Number – 05 – Cryptocurrency - Bitcoin**

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## Problem

Instruction given for the setup own private bitcoin testnet with three node (Node names are A, B, C) using ***bitcoind Regtest Mode***

## Approach

First approach was to setup the network in ubuntu VM and it was not success as network port error occurred. After that used below github link and setup the network. Used to demonstrate and answer the given scenarios.

Used sample project from github:

<https://github.com/freewil/bitcoin-testnet-box>

The screenshot shows the GitHub repository page for 'freewil / bitcoin-testnet-box'. The repository has 62 commits, 1 branch, 1 release, and 7 contributors. The code tab is selected. The README file contains instructions to 'Create your own private bitcoin testnet' and lists dependencies: 'bitcoin', 'testnet', and 'docker'. The commit history shows several recent changes, including updates to 'bitcoind' and 'Dockerfile'.

Cloning the github project in to local machine

```
[AngryBird:project Dilanka$ git clone https://github.com/freewil/bitcoin-testnet-box.git
Cloning into 'bitcoin-testnet-box'...
remote: Enumerating objects: 384, done.
remote: Total 384 (delta 0), reused 0 (delta 0), pack-reused 384
Receiving objects: 100% (384/384), 44.96 MiB | 813.00 KiB/s, done.
Resolving deltas: 100% (129/129), done.
AngryBird:project Dilanka$ ]
```

Installing docker node to the local machine.

```
[AngryBird:bitcoin-testnet-box Dilanka$ docker pull freewil/bitcoin-testnet-box
Using default tag: latest
latest: Pulling from freewil/bitcoin-testnet-box
8284e13a281d: Pull complete
26e1916a9297: Pull complete
4102fc66d4ab: Pull complete
lcf2b01777b2: Pull complete
7f7a2d5e04ed: Pull complete
a6116c4b4366: Pull complete
2efdc2352f9b: Pull complete
b967683b465f: Pull complete
3f9bf3d962e5: Pull complete
163993830471: Pull complete
Digest: sha256:541a136e0f41b5fe434552aeb5148103271ba63524158f53af955ac08387390a
Status: Downloaded newer image for freewil/bitcoin-testnet-box:latest
[AngryBird:bitcoin-testnet-box Dilanka$]
[AngryBird:bitcoin-testnet-box Dilanka$]
[AngryBird:bitcoin-testnet-box Dilanka$]
[AngryBird:bitcoin-testnet-box Dilanka$]
```

Starting the docker node

```
[AngryBird:bitcoin-testnet-box Dilanka$ docker run -t -i --name bitcoind -P -p 49020:19000 freewil/bitcoin-testnet-box
tester@1d876678cd1d ~]$
```

See the running docker nodes.

```
/users/dilanka
[AngryBird:~ Dilanka$ docker ps
CONTAINER ID        IMAGE               COMMAND       CREATED
           STATUS        PORTS             NAMES
1d876678cd1d        freewil/bitcoin-testnet-box   "/bin/bash"   About a
minute ago   Up About a minute    0.0.0.0:49020->19000/tcp, 0.0.0.0:32769->1900
1/tcp, 0.0.0.0:32768->19011/tcp   bitcoind
AngryBird:~ Dilanka$ ]
```

Inspecting bitcoin.conf files.

```
[tester@1d876678cd1d ~/bitcoin-testnet-box/1$ cat bitcoin.conf
# testnet-box functionality
regtest=1
dnsseed=0
upnp=0

# listen on different ports than default testnet
port=19000
rpcport=19001

# always run a server, even with bitcoin-qt
server=1

# enable SSL for RPC server
#rpccssl=1

rpcallowip=0.0.0.0/0

rpcuser=admin1
rpcpassword=123
tester@1d876678cd1d ~/bitcoin-testnet-box/1$ ]
```

```
[tester@ld876678cd1d ~/bitcoin-testnet-box/2$ cat bitcoin.conf
# testnet-box functionality
regtest=1
dnsseed=0
upnp=0

# don't listen on a port, just connect to node 1
listen=0
connect=127.0.0.1:19000

# listen on different ports than default testnet
port=19010
rpcport=19011

# always run a server, even with bitcoin-qt
server=1

# enable SSL for RPC server
#rpcssl=1

rpcallowip=0.0.0.0/0

rpcuser=admin2
rpcpassword=123
tester@ld876678cd1d ~/bitcoin-testnet-box/2$ ]
```

```
[tester@ld876678cd1d ~/bitcoin-testnet-box/3$ cat bitcoin.conf
# testnet-box functionality
regtest=1
dnsseed=0
upnp=0

# don't listen on a port, just connect to node 1
listen=0
connect=127.0.0.1:19000

# listen on different ports than default testnet
port=19020
rpcport=19021

# always run a server, even with bitcoin-qt
server=1

# enable SSL for RPC server
#rpcssl=1

rpcallowip=0.0.0.0/0

rpcuser=admin2
rpcpassword=123
tester@ld876678cd1d ~/bitcoin-testnet-box/3$ ]
```

Inspecting the Make file which automated the bitcoin related commands for our given scenarios.

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ ls
. .. .git .gitignore 1 2 Dockerfile LICENSE Makefile README.md
[tester@1d876678cd1d ~/bitcoin-testnet-box$ cat Makefile
BITCOIND=bitcoind
BITCOINGUI=bitcoin-qt
BITCOINCLI=bitcoin-cli
B1_FLAGS=
B2_FLAGS=
B1=-datadir=1 $(B1_FLAGS)
B2=-datadir=2 $(B2_FLAGS)
BLOCKS=1
ADDRESS=
AMOUNT=
ACCOUNT=
start:
    $(BITCOIND) $(B1) -daemon
    $(BITCOIND) $(B2) -daemon

start-gui:
    $(BITCOINGUI) $(B1) &
    $(BITCOINGUI) $(B2) &

generate:
    $(BITCOINCLI) $(B1) generate $(BLOCKS)

getinfo:
    $(BITCOINCLI) $(B1) -getinfo
    $(BITCOINCLI) $(B2) -getinfo

sendfrom1:
    $(BITCOINCLI) $(B1) sendtoaddress $(ADDRESS) $(AMOUNT)

sendfrom2:
    $(BITCOINCLI) $(B2) sendtoaddress $(ADDRESS) $(AMOUNT)

address1:
    $(BITCOINCLI) $(B1) getnewaddress $(ACCOUNT)

address2:
    $(BITCOINCLI) $(B2) getnewaddress $(ACCOUNT)

stop:
    $(BITCOINCLI) $(B1) stop
    $(BITCOINCLI) $(B2) stop

clean:
    find 1/regtest/* -not -name 'server.*' -delete
    find 2/regtest/* -not -name 'server.*' -delete
tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

Modifying the make file and add new node Node 3 to the network.

```
tester@1d876678cd1d ~/bitcoin-testnet-box$ vi Makefile
tester@1d876678cd1d ~/bitcoin-testnet-box$ cat Makefile
BITCOIND=bitcoind
BITCOINGUI=bitcoin-qt
BITCOINCLI=bitcoin-cli
B1_FLAGS=
B2_FLAGS=
B3_FLAGS=
B1=-datadir=1 $(B1_FLAGS)
B2=-datadir=2 $(B2_FLAGS)
B2=-datadir=3 $(B2_FLAGS)
BLOCKS=1
ADDRESS=
AMOUNT=
ACCOUNT=

start:
    $(BITCOIND) $(B1) -daemon
    $(BITCOIND) $(B2) -daemon
    $(BITCOIND) $(B3) -daemon

start-gui:
    $(BITCOINGUI) $(B1) &
    $(BITCOINGUI) $(B2) &
    $(BITCOINGUI) $(B3) &

generate:
    $(BITCOINCLI) $(B1) generate $(BLOCKS)

getinfo:
    $(BITCOINCLI) $(B1) -getinfo
    $(BITCOINCLI) $(B2) -getinfo
    $(BITCOINCLI) $(B3) -getinfo

sendfrom1:
    $(BITCOINCLI) $(B1) sendtoaddress $(ADDRESS) $(AMOUNT)

sendfrom2:
    $(BITCOINCLI) $(B2) sendtoaddress $(ADDRESS) $(AMOUNT)

sendfrom3:
    $(BITCOINCLI) $(B3) sendtoaddress $(ADDRESS) $(AMOUNT)

address1:
    $(BITCOINCLI) $(B1) getnewaddress $(ACCOUNT)

address2:
    $(BITCOINCLI) $(B2) getnewaddress $(ACCOUNT)

stop:
    $(BITCOINCLI) $(B1) stop
    $(BITCOINCLI) $(B2) stop
    $(BITCOINCLI) $(B3) stop

clean:
    find 1/regtest/* -not -name 'server.*' -delete
    find 2/regtest/* -not -name 'server.*' -delete
tester@1d876678cd1d ~/bitcoin-testnet-box$
```

Start all nodes in the bitcoin network

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make start
bitcoind -datadir=1 -daemon
Bitcoin server starting
bitcoind -datadir=3 -daemon
Bitcoin server starting
bitcoind -daemon
Bitcoin server starting
tester@1d876678cd1d ~/bitcoin-testnet-box$
```

See the information (Balance, blocks) of the all bitcoin nodes.

```
Bitcoin server starting
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make getinfo
bitcoin-cli -datadir=1 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 0,
    "timeoffset": 0,
    "connections": 2,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsiz": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 0,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871805,
    "keypoolsiz": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 0,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsiz": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

3. Generate first block for your private bitcoin testnet.

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make generate
bitcoin-cli -datadir=1 generate 1
[
    "73bbda9b8bde7e223d001540a6ef6dfef9178cc153ffb534feb904af402ed5e6"
]
[tester@1d876678cd1d ~/bitcoin-testnet-box$
```

4. Again show the each node balance information.

```
tester@1d876678cd1d ~/bitcoin-testnet-box$ make getinfo
bitcoin-cli -datadir=1 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 1,
    "timeoffset": 0,
    "connections": 2,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsize": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 1,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871805,
    "keypoolsize": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 1,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsize": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
tester@1d876678cd1d ~/bitcoin-testnet-box$
```

5. Generate blocks for your private bitcoin testnet to get first 50 bitcoins.

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make generate BLOCKS=10
bitcoin-cli -datadir=1 generate 10
[
  "47d47e527a8b346143a2f435bfc935e9c205c36842d74213b92e8140da714c80",
  "367b1ee1db41bf4386150fa002621404f6f1a9d3385e0dcbaafc7373fde56131",
  "167392dbe505b953017996ebd97703d6b5d786d9b8125c6e5019dac0da93883a",
  "6d05b6313829cd1d99c2fd559857239542382bd2ce1e568f21e2c5913189c8b7",
  "61aff314c3983db22d55e4b4e1cacefa0f6d1f8ab97f41ae9f8e7e6c741c70a9",
  "2592b82d699ed8eef952b99680a7f4d4d02778b021fc17d4117bf934cce0a394",
  "7bffd4945c627236c192707151852e8a754defca21e45e52c58dd446cc72d66e",
  "52567765e2f5d21a565b498022ae5a9ec15c24a76d185231245d9bcc2c738036",
  "4c676194e474dc87cca9d10d3868ef094bc9906bfed746857fa9b2a57cbc22d7",
  "4fc9ae02ec91f5e49b4ddefaec62cda6c06bc0b907640698ed2b7985cb38ee9e"
]
[tester@1d876678cd1d ~/bitcoin-testnet-box$
```

6. Again show the each node balance information.

```
[tester@ld876678cd1d ~/bitcoin-testnet-box$  
[tester@ld876678cd1d ~/bitcoin-testnet-box$ make getinfo  
bitcoin-cli -datadir=1 -getinfo  
{  
    "version": 160200,  
    "protocolversion": 70015,  
    "walletversion": 159900,  
    "balance": 0.00000000,  
    "blocks": 11,  
    "timeoffset": 0,  
    "connections": 2,  
    "proxy": "",  
    "difficulty": 4.656542373906925e-10,  
    "testnet": false,  
    "keypoololdest": 1544871092,  
    "keypoolsiz": 999,  
    "paytxfee": 0.00000000,  
    "relayfee": 0.00001000,  
    "warnings": ""  
}  
bitcoin-cli -datadir=2 -getinfo  
{  
    "version": 160200,  
    "protocolversion": 70015,  
    "walletversion": 159900,  
    "balance": 0.00000000,  
    "blocks": 11,  
    "timeoffset": 0,  
    "connections": 1,  
    "proxy": "",  
    "difficulty": 4.656542373906925e-10,  
    "testnet": false,  
    "keypoololdest": 1544871805,  
    "keypoolsiz": 1000,  
    "paytxfee": 0.00000000,  
    "relayfee": 0.00001000,  
    "warnings": ""  
}  
bitcoin-cli -datadir=3 -getinfo  
{  
    "version": 160200,  
    "protocolversion": 70015,  
    "walletversion": 159900,  
    "balance": 0.00000000,  
    "blocks": 11,  
    "timeoffset": 0,  
    "connections": 1,  
    "proxy": "",  
    "difficulty": 4.656542373906925e-10,  
    "testnet": false,  
    "keypoololdest": 1544871092,  
    "keypoolsiz": 1000,  
    "paytxfee": 0.00000000,  
    "relayfee": 0.00001000,  
    "warnings": ""  
}  
tester@ld876678cd1d ~/bitcoin-testnet-box$ □
```

7. Generate blocks for your private bitcoin testnet until the balance is 6000

Generated 150 blocks

```
[tester@ld876678cd1d ~/bitcoin-testnet-box$ make generate BLOCKS=150
bitcoin-cli -datadir=1 generate 150
[
    "27629e657d96e867ca9521b9e48c3361474b02e3caf5eea84e2951e251cb45f9",
    "59bb48c671d9cb50fbad4f9756a40e0f8054666aafb59a93b78cac1bd207b2b3",
    "4fa431163a88d1c7d210e6f1f44e1b93b9367eac391b8d3867256c9015af78ad",
    "37017161b6c33744a2cc3a473dcba7ed54b5a2347611bbd4d8c22c21aa12bbe6",
    "2169d1024affaa79427db74ff202adc1f0f39faa586c2528a85e8fa5b45b8bc7",
    "2836741160c3f0e62c275fd77275244ccff6980318da27ca267f3f54a6ad079a",
    "5df919cb7273304bf4dfec8fd6b7e927a146e2027de23ba24b2821a59f980dc5",
    "4464afdfdf8c8acf8c06efe2b8a7e72216b6646ca45bf1660d0e17703f6e71bd",
    "6cf68d8467beb40329dd6cf9634eb8a4d15dcble9c4ada29302cc2bccf06104",
    "581ed229ec9f092c05428bb24ed34405104744800ad6630372524d68117513a5",
    "20736409fb1b876a77a54e638ea190bc1849e6cf8f019d6efa647be0eb2d1cf0",
    "37e41690784032fc3af0dee5ad56dc7dcf8267fc8329ae582be613db29b75b99",
    "648a74644a632ff040181a7851e1692cc8d84a56b4979ebefdc2e8ff5f91d68f",
    "7b818eedfaefe0917ebc5f8195055f7a8d65c9afdb0d27043d869dad6fa84377",
    "5e3f6f82d02ff31528032c26af8aa71a91b84cc55d3fd74f8a8a3c62e1f781a5",
    "2d784e12fb79ad4f9151edae8c3ed616c557a8dca354d4bfca87557a4ca53c96",
    "347951164082b2b59ba0574bd303fde5c422e545270620c03f6413672843a31f",
    "1bb8be381be27be440665164f40586c5d4eb57b5a7ac4f778388639d125e8504",
    "04bcd9150b3b88f0822942715a320349bdaf153029527479da87b4984a8f0720",
    "46057e7ef75dfa303d5c2936841d2d0ac8d6f69dc5f9be60e1f78341cf110530",
    "2b58f6dbe14d9d5ad93f62b71a6881a1fc2adfde50b0a8e313dd45f99929a7f0",
    "6708137be5e79166a6e2f66f87b6ed02b307856b7c8118becb59a54785ff2cbc",
    "5b9f13541880a74d15e97416334e1a03cc5cc71a66f1657daa687b0cc7f899ba",
    "2765d06d6edc02f2cf569b168199bbc8edd866ba89ed718893e698c41d23f014",
    "72b5d83c4222734868beba36e480f3fd7072960863780dbb187b60eb79c26ee2",
    "3934818a3158873ec265c551f78359bffc5f68ed5bb3d8368b1a7f669d716284",
    "414282c56fa2d26a6c5871b368d096d5fcacda644dec17e483b2776cf5f7a2ca",
    "3d092ee5645bce8c2166a1c58862c5eb3181d68c02b3abbd0221b8e9c9fb7ebd",
    "53006c6bcd44cbdbbe951d10698b2dedbfba0e7a3bf8cea2ee6572756747ec9c",
    "6e1fa2c5e3cca51e2dba22dale261fb3b25e7b3a58e8410cea5d08f0e6c8ce06",
    "4fc8fd0398db726e6759d3f8b6714c8b8cc3202c8f7f1b65799cedf5add6ef6",
    "17e17b5082e1b1a88d7d0993f15afa8d26cf8e39773039ebc7f5bf0ecee7932",
    "6859b6d5fe580339b558080fd4e809fce0b45fb67d31403b97c6e6ba2e868e0c",
    "70fe87350ec97e519e04165ac306a29cb25d538d6b7b17b5fc384d02f7e4982a"
]
```

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make getinfo
bitcoin-cli -datadir=1 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 3050.00000000,
    "blocks": 161,
    "timeoffset": 0,
    "connections": 2,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsiz": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 161,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871805,
    "keypoolsiz": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 161,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsiz": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

```
[tester@ld876678cd1d ~/bitcoin-testnet-box$ make generate BLOCKS=90
bitcoin-cli -datadir=1 generate 90
[
    "3aa322a5321837ca182cee15baf15de15969e82eef6dbe0818a3067e39629487",
    "73009f81363c73886a64d8c9d721a0a25f1938fba0b279009fab9d8e9ala4c63",
    "64feed241f28a339cf8eb4828f0a4a7139568629440fd637330f6c2ca2c7638",
    "3ce7488151e1bfff651b92c8b4967c7657a0dbc068218b3110d43c1b1f2c9e41e",
    "14ed594a632f8b148ab758278a340b034c41edc59b798d065e0f4798c00c5d12",
    "19b1a48434f73bebb8562844feeb6eff02da8ebc9c004f4f431a0bb1e7f060",
    "07ba78b3c1e4bcc4f87cfdb393a4a8ca7c16118aa191b23e6f47ae643e2f4aa3",
    "6d91fe06afb3f2dda42988bbc0a0417594e8d4cc404e20d94f298d78a986bc85",
    "672b08bffff8306c8af01b005c20132a8f4dec9c954e3e4f547b0f873868d4c7",
    "6e467cc1667c0416f75bb865a8c0da7d92ed8bbf051d6dc8948e4ad1ebc4676f",
    "4261e2146a43a5524643df8a4612b820a05b8ee7f92ed8430d1ale6a5129fc82",
    "7eeba6804c9467452b1542ec406e6f6bcf84f64def06c8c34cc10770996f5006",
    "1077c1779b04c22cfc33a3f01f2307eb4d14e7654e2df3f42b4dff3087673b93",
    "0d8e8062ee0ed31fdb15294cff6661a7097609c332716e9b533505ca45386c5",
    "6d537355c2777e4767aaa294d6b0b7a05ebe8d4cd042622f527ad9c5a77710c3",
    "6b5b087c7e7d3164cd38df0766ed2e39fea3ef89e76bfe218ab3d1fd26b42c93",
    "2b32d48ad78a22225da9e6fe4ce554b4a88cbfe55abf33793d206e9b2afb4891",
    "14af5c6d33f547aa28518f2e42597cd3489036e49506df38f479578c5d090fc0",
    "32dd688006fd41edab6ae63180a48b8667cc4900ec89b0f5adb27f14e58699c6",
    "0a27ff83f5165c0b76acf0fcddde786aebd749687529832120c3492263e6b7c7e",
    "4b3c9097903ae8bdb70215b2900b7ebb33a5c0fac06ff1ca63d852c77d46be44",
    "3cf96f1ed2baceacf9d05db58ba7a8f4c7c2021df7cd808229a99205d51f43c5",
    "33d33e0df43760354ea66f92e9bd2c86a02780f2144e1c9a56d8db6d1824c431",
    ...
]
```

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make getinfo
bitcoin-cli -datadir=1 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 7500.00000000,
    "blocks": 251,
    "timeoffset": 0,
    "connections": 2,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsiz": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 251,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871805,
    "keypoolsiz": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 251,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsiz": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

8. Again show the each node balance information.

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make getinfo
bitcoin-cli -datadir=1 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 7500.00000000,
    "blocks": 251,
    "timeoffset": 0,
    "connections": 2,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsize": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 251,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871805,
    "keypoolsize": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 251,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsize": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

9. Generate a wallet address for each bitcoin node (A, B, C)

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make address1
 bitcoin-cli -datadir=1 getnewaddress
 2N3nmS7ZLbSa9mGNB8ZJKw23EDABBjWLtRP
[tester@1d876678cd1d ~/bitcoin-testnet-box$ 
[tester@1d876678cd1d ~/bitcoin-testnet-box$ 
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make address2
 bitcoin-cli -datadir=2 getnewaddress
 2MxaHKxYA1RLS36ZJGhTEtDKgjq1kK4wWEQ
[tester@1d876678cd1d ~/bitcoin-testnet-box$ 
[tester@1d876678cd1d ~/bitcoin-testnet-box$ 
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make address3
 bitcoin-cli -datadir=3 getnewaddress
 2MuxtCMXLPUN35HV8RNKvMyZtUb8xEVDVZm
[tester@1d876678cd1d ~/bitcoin-testnet-box$ 
[tester@1d876678cd1d ~/bitcoin-testnet-box$ 
tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

10. Send 2000 bitcoin from Node A wallet to Node B wallet.

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ 
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make sendfrom1 ADDRESS=2MxaHKxYA1RLS36ZJGhTEtDKgjq1kK4wWEQ AMOUNT=2000
 bitcoin-cli -datadir=1 sendtoaddress 2MxaHKxYA1RLS36ZJGhTEtDKgjq1kK4wWEQ 2000
 e7dd0317b7a1745fa3f27e3324625fc44513bf82c207e7fda2e8f53a1dd8c12
[tester@1d876678cd1d ~/bitcoin-testnet-box$ 
[tester@1d876678cd1d ~/bitcoin-testnet-box$ 
[tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

11. Again show the each node balance information.

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make generate BLOCKS=150
 bitcoin-cli -datadir=1 generate 150
 [
  "583118476adb416c9af6bb54d763cd3ef4778a67382d5a54fbaff0867a5669c5",
  "71321ffdfc8600efabafa629adbeb9808b5e0dce46241f819d9303e8bc4a759f",
  "3a5f96835f633553c1bdd279819fe530079a5f87f3c3ae2d05fd67b022622607",
  "14ee34822afc3ab740db78ed8c0f3866ff58f6f7a24c1ce963fb18e2acf426bd",
  "6b1b5aeeef1b386d22152546d21c4be6f7b4c1f6ee14cb0d5316eb5bd18c1dea8",
  "6a66ad27ef62b551456e79d5eea3e032ce54e14319de2862b29347637b465d48",
  "1df7c7e8329f9a5b9781e5c191312401bfa71d1f4601875f1b4ee7cc44e43229",
  "4972705146d50ad09af0fa05c1a4911343504e528a82a875c5d1a0a67ccadb6c",
  "40e575445353f06abda29388b2cfeld3a6395441a384ad836940cc0425302c13",
  "27352a244cccc5629f912640fafafa483dc661314e5377425612995542d189728",
  "2041e476108963fe9492fbdf296130ceff072c179b9e7eca0ba3e7982d7fe795",
  "237d5d734eec08a23fec505c23cd9b67df0247912bba0d1bcd461e1c761dd7ea",
  "6d954e3d9840c841451cd1792efe816af41955a8f2247c2d31701d8bb31a3119",
  "7b7ef109a5724f07aa8cf5b7a26b20ea51973c76f9181da5fd2ac7aaaf77905a0",
  "2a114df4a4401bacf149eb133caede5212dade5d1a9071a532576b86d06c4cf5",
  "3b34a2dc05da683b8372dc0100630a4dc36eef4af91c1d325cc3bc8263090b14",
  "75f1134880823dad2daab325340cf2eb1c689dabd79d78baad2241a25a2669a",
  "4a2b42e2d22010df5442d5ffb23fb11685fd2ffce298d7213e1d2e1967a604e5",
  "5c2681be43fccecb285980c9df916d4426c1641238e3144c6f428c0ff443982d".
```

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make getinfo
bitcoin-cli -datadir=1 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 9225.00000000,
    "blocks": 401,
    "timeoffset": 0,
    "connections": 2,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsiz": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 2000.00000000,
    "blocks": 401,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871805,
    "keypoolsiz": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 0.00000000,
    "blocks": 401,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsiz": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

12. Send 3000 bitcoin from Node A wallet to Node C wallet.

```
[tester@ld876678cd1d ~/bitcoin-testnet-box$ tester@ld876678cd1d ~/bitcoin-testnet-box$ make sendfrom1 ADDRESS=2MuxtCMXLPU35HV8RNKvMyZtUb8xEVDVZm AMOUNT=3000
bitcoin-cli -datadir=1 sendtoaddress 2MuxtCMXLPU35HV8RNKvMyZtUb8xEVDVZm 3000
ee8cf7af4a174bc2442794673be85582964afcba0e26alb0f8ad908bb523c05
tester@ld876678cd1d ~/bitcoin-testnet-box$ tester@ld876678cd1d ~/bitcoin-testnet-box$ tester@ld876678cd1d ~/bitcoin-testnet-box$
```

13. Again show the each node balance information.

```
[tester@ld876678cd1d ~/bitcoin-testnet-box$ make generate BLOCKS=100
bitcoin-cli -datadir=1 generate 100
[
  "2ce22ff2c950e3e6a1bf23cc092e0784be1324df6315dc7052a96d76d8708837",
  "7bdb5b80825250daa4a64f708100b58b8e88756d7e84f710e5da2335f6bfd86a",
  "4cefac45273a4bca25dd889705c65cad2a04bed841370e579b1c79fee0d81d87",
  "718f81fde74f42e08969c6f80dd09d7f31a1983925698d400de42e81ed7c6ada",
  "47d393d833cda120f4bd929712139d7ee4e176769eca545d9a3adeb4ebd5ef6c",
  "56b9684b3b2e2c3acd8b983dab7e6fb2e76d6ed48221b5991bce5e9923cb6d97",
  "49d90e4764fb398b71d596bc86ff480cc830199a45271e91bb0e08caf45598f",
```

```

tester@1d876678cd1d ~/bitcoin-testnet-box$ make getinfo
bitcoin-cli -datadir=1 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 7474.99857160,
    "blocks": 501,
    "timeoffset": 0,
    "connections": 2,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsiz": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 2000.00000000,
    "blocks": 501,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871805,
    "keypoolsiz": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 3000.00000000,
    "blocks": 501,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsiz": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
tester@1d876678cd1d ~/bitcoin-testnet-box$ 

```

14. Send 1500 bitcoin from Node A wallet to Node C wallet.

```

tester@1d876678cd1d ~/bitcoin-testnet-box$ make sendfrom1 ADDRESS=2MuxtCMXLPUN35HV8RNKvMyZtUb8xEGDVZm AMOUNT=1500
bitcoin-cli -datadir=1 sendtoaddress 2MuxtCMXLPUN35HV8RNKvMyZtUb8xEGDVZm 1500
b9bae098ec6649b17ad7bdf6e65b45df3f32c12774c415818b290a4236b6b9ce
tester@1d876678cd1d ~/bitcoin-testnet-box$ 
tester@1d876678cd1d ~/bitcoin-testnet-box$ 

```

15. Again show the each node balance information.

```
[tester@id876678cd1d ~]$ bitcoin-testnet-box$ make generate BLOCKS=100
bitcoin-cli -datadir=1 generate 100
[
    "73f7563706c9d8d375898a29aef70f813152a3a255c610e079dfcf7e76dcf8a5",
    "61a87acf43461f76778b289d59d6764983a4e3f3469810df440f15454dc46e9b",
    "24dcb7aa238a11e03eead46aaf9f4c491d1897b13a446e15d2391799c5c294f3",
    "0e236490671480ad5eb58800bb63b9960b20cdc72e94c392764186d92ca6e69b",
    "33fede050d9df3b1779319e741724f9aa8a5273d083f10d2dc68572412129453",
    "59db3e1292fdddcb1705376c86326ada2472b0cfb686f11918d1b9c016841b2",
    "73b61616bb96a0d994c1b5d6683fb94b129b7ab113db5c7eb4bbc13e6dc97e2",
    "0f6bb136646e90a9ca4a86963af2d76893ab4a4266313e87ad8d37e93aee0268",
    "480dbafcc3d230fdbbe3473486de8d8c78e737e568571cc261a2b89d30ecf7dfa",
    "5a2e4aa5fc759097741de089dec24593a1e42784a0d71ed82d7f36089e9757e2"
]
```

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make getinfo
bitcoin-cli -datadir=1 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 6899.99921280,
    "blocks": 601,
    "timeoffset": 0,
    "connections": 2,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsize": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 2000.00000000,
    "blocks": 601,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871805,
    "keypoolsize": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 4500.00000000,
    "blocks": 601,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsize": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

16. Send 1500 bitcoin from Node B wallet to Node C wallet.

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make sendfrom2 ADDRESS=2MuxtCMXLPUN35HV8RNKvMyZtUb8xEGDVZm AMOUNT=1500  
bitcoin-cli -datadir=2 sendtoaddress 2MuxtCMXLPUN35HV8RNKvMyZtUb8xEGDVZm 1500  
7e86ef4f8f1084c473ebfed6313f2e9a900924f9d20597dbb3285c780eef48be  
[tester@1d876678cd1d ~/bitcoin-testnet-box$  
[tester@1d876678cd1d ~/bitcoin-testnet-box$
```

17. Again show the each node balance information.

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make generate BLOCKS=100  
bitcoin-cli -datadir=1 generate 100  
[  
  "2235a14d9f98471f7c9b09a9b127551b3f0546e3b479809c4b6e73fa88eec119",  
  "3021b3b33cf31e01dbda7796b2bd75bcfe6640f700d3dfd0a75e97ed0844e982",  
  "400b305285014ad382f5dad7c7c0eeda420d64a23191d9c4d6e460479a46bd98",  
  "623080a9a2e0809eaef16975c26779247fe70ec7015f97e43bea56b4248597fe3",  
  "55bd93d725567f87392f7fa875a2abafce7076304c580b94fe4b34eabe082ecb",  
  "4edcd062188a642aca0bf62ad911effe0c972f105a97c4fac87b2cb7b797f926",  
  "6befa6ede0b82b679c592aeee46808b95fd7a559a9a7a2cccf33e33f16312a9",  
  "2645ef96f9f0f07223042975b1cdde06b1f5d69574f0ee036da2190dc3c024fc",
```

```
[tester@1d876678cd1d ~/bitcoin-testnet-box]$ bitcoin-cli -datadir=1 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 7518.75000000,
    "blocks": 701,
    "timeoffset": 0,
    "connections": 2,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsize": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 499.99996680,
    "blocks": 701,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871805,
    "keypoolsize": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 6000.00000000,
    "blocks": 701,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsize": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
tester@1d876678cd1d ~/bitcoin-testnet-box$ 
```

18. Get some test coin to your testnet from following testnet bitcoin provider

1. TP's TestNet Faucet: <http://tpfaucet.appspot.com/>
2. <https://kuttler.eu/en/bitcoin/btc/faucet/>
3. <https://testnet.manu.backend.hamburg/faucet>

The screenshot shows a web browser window with the URL <https://kuttler.eu/en/bitcoin/btc/faucet/>. The page has a header with links for About, Blog, Code, Apps, Django, and Contact. On the left, there's a bio for Nicolas Kuttler and a Network section with a GitHub icon. The main content area is titled "Bitcoin Testnet Faucet" and contains instructions: "Please make only one request. Read about why [testnet coins will never be valuable](#). When you don't need the coins any more, please send them back." It also mentions that coins are sent manually and provides a testnet address: 2N3nmS7ZLbSa9mGNB. A CAPTCHA field is present with the message "Invalid CAPTCHA". Below it is a math problem: "Solve this math problem: 3 + 5 = 8".

The screenshot shows the same website after a coin request. The main content area now displays a "Success" message: "Coins are sent manually and sometimes it takes me a few days to do it." It also includes a link to "More cryptocurrency stuff".

```
{
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make generate BLOCKS=100
bitcoin-cli -datadir=1 generate 100
[
  "35208f82e3e6228383cf80e28535e639c476df826feebd21247159a3197376f",
  "43da2ab3fc6148edf38be206cac51ba9a2976314ad53adc1a15ed5d808d2277",
  "228ca225554880022411bdd520c0922f49c9cd4428c079e1798f3bf7d550d4af",
  "32653e629a8627ffcf3b080306f0a30f18a19163ca7e0eabb1e143ed370c2c9f",
  "4c3cb59957f6c92bf903224e87da09ab63c8281865e68a9847ad106510c72b6b",
  "6d01f7631ac139de5faef169c8182c052594cd4feb6bdbf0e0c9c322c9bc6fb8",
  "5a0518044300dbfd5991657ef2ba716bbaa3af5a39cea357295e748774833c25",
  "1ac41635acd5d2d51127c85b052c363d029da6707646aa8e22e1249402685e47",
  "0415ffa7b43df1e22a1af6e07fb98a76da6013344d7c8842bfdb89e7b4423ae3",
  "08e6b426eaa9ebdfdcdf4bdfcdb301dd0f9d452166d03383b447cd3f98790df"
]}
```

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make getinfo
bitcoin-cli -datadir=1 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 7831.25003320,
    "blocks": 801,
    "timeoffset": 0,
    "connections": 2,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsize": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 499.99996680,
    "blocks": 801,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871805,
    "keypoolsize": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 6000.00000000,
    "blocks": 801,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsize": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

19. Send 50 bitcoin from Node A wallet to Node C wallet.

```
[tester@ld876678cd1d ~/bitcoin-testnet-box]$ make sendfrom1 ADDRESS=2MuxtCMXLPUN35HV8RNKvMyZtUb8xEGDVZm AMOUNT=50
bitcoin-cli -datadir=1 sendtoaddress 2MuxtCMXLPUN35HV8RNKvMyZtUb8xEGDVZm 50
a9ee6cb62805fc738588c133ec61bb31dc5f56b15781b4d2a07bb38affc10e3f
tester@ld876678cd1d ~/bitcoin-testnet-box$
[tester@ld876678cd1d ~/bitcoin-testnet-box$
```

20. Again show the each node balance information.

```
[tester@ld876678cd1d ~/bitcoin-testnet-box$ make getinfo
bitcoin-cli -datadir=1 -getinfo
{
  "version": 160200,
  "protocolversion": 70015,
  "walletversion": 159900,
  "balance": 7781.24997280,
  "blocks": 801,
  "timeoffset": 0,
  "connections": 2,
  "proxy": "",
  "difficulty": 4.656542373906925e-10,
  "testnet": false,
  "keypoololdest": 1544871092,
  "keypoolsize": 1000,
  "paytxfee": 0.00000000,
  "relayfee": 0.00001000,
  "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
  "version": 160200,
  "protocolversion": 70015,
  "walletversion": 159900,
  "balance": 499.99996680,
  "blocks": 801,
  "timeoffset": 0,
  "connections": 1,
  "proxy": "",
  "difficulty": 4.656542373906925e-10,
  "testnet": false,
  "keypoololdest": 1544871805,
  "keypoolsize": 1000,
  "paytxfee": 0.00000000,
  "relayfee": 0.00001000,
  "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
  "version": 160200,
  "protocolversion": 70015,
  "walletversion": 159900,
  "balance": 6000.00000000,
  "blocks": 801,
  "timeoffset": 0,
  "connections": 1,
  "proxy": "",
  "difficulty": 4.656542373906925e-10,
  "testnet": false,
  "keypoololdest": 1544871092,
  "keypoolsize": 999,
  "paytxfee": 0.00000000,
  "relayfee": 0.00001000,
  "warnings": ""
}
tester@ld876678cd1d ~/bitcoin-testnet-box$ ]
```

21. Send 100 bitcoin from Node B wallet to Node C wallet.

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make sendfrom2 ADDRESS=2MuxtCMXLPUN35HV8RNKvMyZtUb8xEVDVZm AMOUNT=100
bitcoin-cli -datadir=2 sendtoaddress 2MuxtCMXLPUN35HV8RNKvMyZtUb8xEVDVZm 100
ab8979b91100c5dd40a0b416b66c445b8657f8877993e3c1dae836cc0630e434
tester@1d876678cd1d ~/bitcoin-testnet-box$ 
tester@1d876678cd1d ~/bitcoin-testnet-box$ 
tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

22. Again show the each node balance information.

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make generate BLOCKS=100
bitcoin-cli -datadir=1 generate 100
[
    "768f59ab27bfe8579363f2805272dce6bb0c5eef5079ff8d6682d94cb31fc9c6",
    "4e1f0a5b16df0e04bb46e651fd454c8fb6ec4b8d40c85ea73e8352e1b23300fe",
    "5df3fd824c015579c4641e1f82fc57cccc4cb3d465ffc12f3a720b69276431e9",
    "53b2c257d904fc761e2737bf33659b7fe0347299c7128e404d188c07f01c9eeb",
    "00bcd66ef4a3a3c70b997b8279b0223e6aa1fce6c0a47a78daf84e4abf6d524c",
    "3ab6ca53cd448eac163b8115400032af00fb8ae1570378e668bb8f9295a206ad",
    "6b7b1a4adb3670f6060a72ead9d490b8849e0bc11e39f8ea34f0a5d1b93fae53",
    "5c73b4f70d2122f4bfe81fd0543c14215bc0c859e9ac7d296fcec5c17e09b4f5",
    "3810f5ff0461cfa98e8a208a05ef2a0277f8bb0391137641b0abf64da0c1aa6e",
```

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make getinfo
bitcoin-cli -datadir=1 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 8012.49997280,
    "blocks": 901,
    "timeoffset": 0,
    "connections": 2,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsiz": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 399.99993360,
    "blocks": 901,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871805,
    "keypoolsiz": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 6150.00000000,
    "blocks": 901,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsiz": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

## 23. Return test coins to the your testnet bitcoin provider

https://kuttler.eu/en/bitcoin/btc/faucet/

Solve this math problem:

**Donate:**

**Need hosting?**  
Use my [Digitalocean referral link](#) to sign up!

**Bitcoin testnet**

Replenish the faucet:  
`mhqxLCErTiZuXmtrgk4FMYP5qBjQdGWrv7`



**Joinmarket Transactions**  
Faucet requests are sent through [joinmarket](#) when possible, here's a list of the latest that went through.

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make sendfrom1 ADDRESS=mhqxLCErTiZuXmtrgk4FMYP5qBjQdGWrv7 AMOUNT=500
bitcoin-cli -datadir=1 sendtoaddress mhqxLCErTiZuXmtrgk4FMYP5qBjQdGWrv7 500
2e1765d70c5842e0f158c24c4da74b5accdbffe2d7d8c14d0ff3221a11120d5
[tester@1d876678cd1d ~/bitcoin-testnet-box$
```

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make generate BLOCKS=100
bitcoin-cli -datadir=1 generate 100
[
  "70ac8bb0dc9805dddbfcbbd39cb4214836fc13540f1b98e93be002dfa01cf363",
  "71e004e3803e3147ff9e5c90e22df25f4f046b00694eb3cc25a37b4f23b02665",
  "7c0dc1bdca637ff3e562ed51b6ce76d9aec5f8afbe40465ca8d9bb5ed83264bd",
  "2117b3323ebe04f22cb2af69451a57d50a6e95d53eeb2f34edbc6eb8564ee87d",
  "1941908ff670ce693d855cf24825c5a3cd30b6fa4fc534bbaf32459975974488",
  "46434ddc6a9cf0ad42debdc35a22024186ac39563abb60169a9e28a5e4a1afd5",
  "0d4bfa3bb27aadf2d81e5a6170b455c6777936c4161e9555ae3812da1b16e3c6",
  "188829ffdc1b571ef4054ee0aff8a4e758cd7b55c5a44fe38c8b9bb843f2fb8",
  "027-0-7-0-215020-104402-10201725-10100-0-11141-0-16-722-0-555715-6"
```

```
[tester@1d876678cd1d ~/bitcoin-testnet-box$ make getinfo
bitcoin-cli -datadir=1 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 7667.18730040,
    "blocks": 1001,
    "timeoffset": 0,
    "connections": 2,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsize": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=2 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 399.99993360,
    "blocks": 1001,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871805,
    "keypoolsize": 1000,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
bitcoin-cli -datadir=3 -getinfo
{
    "version": 160200,
    "protocolversion": 70015,
    "walletversion": 159900,
    "balance": 6150.00000000,
    "blocks": 1001,
    "timeoffset": 0,
    "connections": 1,
    "proxy": "",
    "difficulty": 4.656542373906925e-10,
    "testnet": false,
    "keypoololdest": 1544871092,
    "keypoolsize": 999,
    "paytxfee": 0.00000000,
    "relayfee": 0.00001000,
    "warnings": ""
}
tester@1d876678cd1d ~/bitcoin-testnet-box$ ]
```

## **Conclusion**

Identified and understood the way that bitcoin/cryptocurrency network behave and simulated successfully.

\*\*\*\*\* End \*\*\*\*\*