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# Trinity Documentation

*Release 0.2*

**Trinity**

**Sep 03, 2018**



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## 1.1 Trinity Network Configuration Guide

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note Trinity routing nodes require the configuration environment be no less than python3.6. As Trinity develops, this file may not apply to the new version. This file was tested on Ubuntu 16.04 desktop.

### 1.1.1 Trinity Runtime Environment Preparation

Install system library and system tools

```
sudo apt-get install screen git libleveldb-dev libssl-dev g++
```

Install mongodb and launch the service

```
sudo apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv 2930ADAE8CAF5059EE73BB4B58712A2291FA4AD5

echo "deb [ arch=amd64,arm64 ] http://repo.mongodb.org/apt/ubuntu xenial/mongodb-org/3.6 multiverse" | sudo tee /etc/apt/sources.list.d/mongodb-org-3.6.list

sudo apt-get update

sudo apt-get install mongodb-org

sudo service mongod start
```

Ref mongodb configuration details, please visit: <https://docs.mongodb.com/manual/tutorial/install-mongodb-on-ubuntu/>

Configure python3.6

```
sudo apt-get install software-properties-common

sudo add-apt-repository ppa:jonathonf/python-3.6

sudo apt-get update

sudo apt-get install python3.6 python3.6-dev
```

### Install pip3.6

```
sudo wget https://bootstrap.pypa.io/get-pip.py

sudo python3.6 get-pip.py
```

### Install virtualenv

```
sudo pip3.6 install virtualenv
```

## 1.1.2 Get Trinity Source Code

```
git clone https://github.com/trinity-project/trinity.git /home
```

### Open trinity source code catalo

```
cd /home/trinity
```

### Create and activate virtual environment

```
virtualenv -p /usr/bin/python3.6 venv

source venv/bin/activate
```

### Install trinity node requirement package

```
pip install -r requirements
```

## 1.1.3 Install Trinity Routing Node Gateway

### Open gateway configuration file

```
vi gateway/config.py
```

Find'cg\_public\_ip\_port = "localhost:8089"' and Put user's public ip address at the localhost

egcg\_public\_ip\_port = "8.8.8.8:8089"

### Create a new session window

```
screen -S TrinityGateway #TrinityGateway:
```

### Enter virtual environment

```
source venv/bin/activate
```

### Run the Gateway service

```
python start.py
```

The code below indicates the Gateway successfully started

```
##### Trinity Gateway Start Successfully! #####
```

Use ctrl+a+d to close current TrinityGateway session window

Note: call the function below to re-open the existing TrinityGateway session window

```
screen -r TrinityGateway
```

## 1.1.4 Install Trinity Routing Node Wallet

Revise configuration file

```
vi wallet/configure.py
```

The default configure file applies to the testnet, for which `configure_testnet.py` and `configure_mainnet.py` co-exist in the wallet catalog. For the mainnet, simply copy `configure_mainnet.py` and paste it to `configure.py`.

Please refer to notes for configuration details.

Create a new session window

```
screen -S TrinityWallet
```

Activate python3.6 virtualenv

```
source venv/bin/activate
```

Run the Gateway service Enter trinity/ wallet source code catalog)

- Mainnet Wallet

```
python3.6 prompt.py -m
```

- Testnet Wallet

```
python3.6 prompt.py
```

close or reopen the gateway session please refer to the details of ‘run the gateway service’

## 1.1.5 Channel Nodes Interworking

After trinity CLI wallet running, the subsequent channel and wallet operations can be performed on the wallet console.

Input help to the wallet console to view all trinity CLI wallet commands.

Here are a few channel-related commands:

1. Use create wallet command to create an address before using state channels.

```
trinity> create wallet /root/test/test.json # /root/test/test.json is the path of
↪ wallet
```

2. Use open wallet command to open existing wallet. Note: open a wallet with channel function, or the function will be restricted.

```
trinity> open wallet /root/test/test.json
```

Note:After creating or re-opening a wallet, the wallet will automatically connect to the gateway and enable channel function. If channel function was not enabled within 30s, please call channel function to open it manually

3. Use channel enable command to activate channel function before operating on state channels.

```
trinity> channel enable
```

4.channel show uri

```
trinity> channel show uri
```

## 5. Use channel create

```
trinity> channel create xxxxxxxxxxxxxx@xx.xx.xx.xx:xxxx TNC 80000
```

Note:TNC deposit is calculated on \$800 USD, which means 800 TNC is required if TNC current price is \$1 USD. The command below will tell how much TNC is needed currently for deposit. This is only valid for TNC channel.

6.Call channel depoist\_limit to check the minimum TNC deposit

```
trinity> channel depoist_limit
```

7. Call channel tx to execute off-chain transactions. tx parameters supports pymentlink code, or use uri + asset + value

[illegible]

or

[illegible]

8.Call channel payment to generate payment code

```
trinity> channel payment TNC 10 "mytest"
```

9.Call channel close to complete settlement and close the channel

```
trinity> channel close xxxxxxxxxxxxxxxxx
```

10.channel peer is for peer node review

```
trinity> channel peer
```

## 1.2 Trinity-Eth Network Configuration Guide

noteTrinity routing nodes require the configuration environment be no less than python3.6.As Trinity develops, this file may not apply to the new version. This file was tested on Ubuntu16.04 desktop.

### 1.2.1 Trinity Runtime Environment Preparation

## Install system library and system tools



```
sudo apt-get install screen git libleveldb-dev libssl-dev g++
```

### Install mongodb and launch the service

```
sudo apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv_
↪2930ADAE8CAF5059EE73BB4B58712A2291FA4AD5

echo "deb [ arch=amd64,arm64 ] http://repo.mongodb.org/apt/ubuntu xenial/mongodb-org/
↪3.6 multiverse" | sudo tee /etc/apt/sources.list.d/mongodb-org-3.6.list

sudo apt-get update

sudo apt-get install mongodb-org

sudo service mongod start
```

*Refmongodb configuration details, please visit: <https://docs.mongodb.com/manual/tutorial/install-mongodb-on-ubuntu/>*

### Configure python3.6

```
sudo apt-get install software-properties-common

sudo add-apt-repository ppa:jonathonf/python-3.6

sudo apt-get update

sudo apt-get install python3.6 python3.6-dev
```

### Install pip3.6

```
sudo wget https://bootstrap.pypa.io/get-pip.py

sudo python3.6 get-pip.py
```

### Install virtualenv

```
sudo pip3.6 install virtualenv
```

## 1.2.2 Get Trinity Source Code

```
git clone https://github.com/trinity-project/trinity-eth.git /home ##clone wallet_
↪source code
git clone https://github.com/trinity-project/trinity-gateway.git /home ##clone_
↪gateway source code
```

### Open trinity-eth source code catalog

```
cd /home/trinity-eth
```

### Create and activate virtual environment

```
virtualenv -p /usr/bin/python3.6 venv

source venv/bin/activate
```

Install gateway node requirement package

```
pip install -r requirements
```

Open gateway source code catalog

```
cd /home/gateway
```

Install trinity node requirement package

```
pip install -r requirements
```

### 1.2.3 Install Trinity Routing Node Gateway

Open gateway configuration file

```
vi gateway/config.py
```

Find 'cg\_public\_ip\_port = "localhost:8089"' and Put user's public ip address at the localhost

egcg\_public\_ip\_port = "8.8.8.8:8089"

Create a new session window

```
screen -S TrinityGateway #TrinityGateway:
```

Enter virtual environment

```
source venv/bin/activate
```

Run the Gateway service

```
python start.py
```

The code below indicates the Gateway successfully started

```
##### Trinity Gateway Start Successfully! #####
```

Use ctrl+a+d to close current TrinityGateway session window

Note: call the function below to re-open the existing TrinityGateway session window

```
screen -r TrinityGateway
```

### 1.2.4 Install Trinity Routing Node Wallet

Revise configuration file

```
vi wallet/configure.py
```

The default configure file applies to the testnet, for which configure\_testnet.py and configure\_mainnet.py co-exist in the wallet catalog. For the mainnet, simply copy configure\_mainnet.py and paste it to configure.py.

Please refer to notes for configuration details.

Create a new session window

```
screen -S TrinityWallet
```

Activate python3.6 virtualenv

```
source venv/bin/activate
```

Run the Gateway serviceEnter trinity/ wallet source code catelog)

- Mainnet Wallet

```
python3.6 prompt.py -m
```

- Testnet Wallet

```
python3.6 prompt.py
```

close or reopen the gateway session please refer to the details of ‘run the gateway service’

## 1.2.5 Channel Nodes Interworking

After trinity CLI wallet running, the subsequent channel and wallet operations can be performed on the wallet console.

Input help to the wallet console to view all trinity CLI wallet commands.

Here are a few channel-related commands:

1. Use create wallet command to create an address before using state channels.

```
trinity> create wallet /root/test/test.json # /root/test/test.json is the path of ↵
↵wallet
```

2. Use open wallet command to open existing wallet. Note: open a wallet with channel function, or the function will be restricted.

```
trinity> open wallet /root/test/test.json
```

Note: After creating or re-opening a wallet, the wallet will automatically connect to the gateway and enable channel function. If channel function was not enabled within 30s, please call channel function to open it manually

3. Use channel enable command to activate channel function before operating on state channels.

```
trinity> channel enable
```

4. channel show uri

```
trinity> channel show uri
```

5. Use channel create

```
trinity> channel create xxxxxxxxxxxx@xx.xx.xx.xx:xxxx TNC 80000
```

Note: TNC deposit is calculated on \$800 USD, which means 800 TNC is required if TNC current price is \$1 USD. The command below will tell how much TNC is needed currently for deposit. This is only valid for TNC channel.

6. Call channel depoist\_limit to check the minimum TNC deposit

```
trinity> channel depoist_limit
```

7.Call channel tx to execute off-chain transactions. tx parameters supports pymentlink code, or use uri + asset + value

```
trinity> channel tx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx # payment link code
```

or

```
trinity> channel tx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx@xx.xx.xx.xx:xxxx TNC 10
```

8.Call channel payment to generate payment code

```
trinity> channel payment TNC 10 "mytest" # asset typevalue comments
```

9.Call channel close to complete settlement and close the channel

```
trinity> channel close xxxxxxxxxxxxxxxx # channel name
```

10.channel peer is for peer node review

```
trinity> channel peer
```

## 2.1 Trinity Network

[TOC]

*Trinity python3.6pythonpython3.6 TrinityTrinityUbuntu16.04*

### 2.1.1 Trinity

```
sudo apt-get install screen git libleveldb-dev libssl-dev g++
```

mongodb

```
sudo apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv_
↪2930ADAE8CAF5059EE73BB4B58712A2291FA4AD5

echo "deb [ arch=amd64,arm64 ] http://repo.mongodb.org/apt/ubuntu xenial/mongodb-org/
↪3.6 multiverse" | sudo tee /etc/apt/sources.list.d/mongodb-org-3.6.list

sudo apt-get update

sudo apt-get install mongodb-org

sudo service mongod start
```

*mongodb <https://docs.mongodb.com/manual/tutorial/install-mongodb-on-ubuntu/>*

python3.6

```
sudo apt-get install software-properties-common

sudo add-apt-repository ppa:jonathonf/python-3.6
```

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```
sudo apt-get update

sudo apt-get install python3.6 python3.6-dev
```

pip3.6

```
sudo wget https://bootstrap.pypa.io/get-pip.py

sudo python3.6 get-pip.py
```

virtualenv

```
sudo pip3.6 install virtualenv
```

## 2.1.2 Trinity

```
git clone https://github.com/trinity-project/trinity.git /home
```

trinity

```
cd /home/trinity
```

```
virtualenv -p /usr/bin/python3.6 venv

source venv/bin/activate
```

trinity

```
pip install -r requirements
```

## 2.1.3 Trinity

gateway

```
vi gateway/config.py
```

```
cg_public_ip_port = "localhost:8089"localhostip
cg_public_ip_port = "8.8.8.8:8089"
```

```
screen -S TrinityGateway #TrinityGateway:
```

```
source venv/bin/activate
```

```
python start.py
```

```
##### Trinity Gateway Start Successfully! #####
```

ctrl+a+dTrinityGateway

TrinityGateway

```
screen -r TrinityGateway
```

## 2.1.4 Trinity

```
vi wallet/configure.py
```

```
configurewalletconfigure_testnet.pyconfigure_mainnet.pyconfigure_mainnet.pyconfigure.py
```

```
screen -S TrinityWallet #TrinityWallet:
```

```
python3.6 virtualenv(venv)
```

```
source venv/bin/activate
```

trinity/wallet

- 

```
python3.6 prompt.py -m #
```

- 

```
python3.6 prompt.py #
```

## 2.1.5 Channel

trinity CLI

helptrinity CLI

1.create wallet

```
trinity> create wallet /root/test/test.json # /root/test/test.json
```

2.open wallet

```
trinity> open wallet /root/test/test.json
```

walletgatewaychannel30schannelchannel.

3.channel enablechannelchannel

```
trinity> channel enable
```

4.channel show uri uri

```
trinity> channel show uri
```

5.channel create

```
trinity> channel create xxxxxxxxxxxx@xx.xx.xx.xx:xxxx TNC 80000
# create peeruri(PublicKey@ip_address:port, asser_type, depoist
```

*TNC800TNC1800TNC*

6.channel depoist\_limitTNC

```
trinity> channel depoist_limit
```

7.channel txtpaymentlinkuri + asset + value

```
trinity> channel tx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx # payment link
```

```
trinity> channel tx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx@xx.xx.xx.xx:xxxx TNC 10
```

8.channel payment

```
trinity> channel payment TNC 10 "mytest" # payment asset type valuecomments comments
```

9.channel close

```
trinity> channel close xxxxxxxxxxxxxxxx #close channel name
```

10.channel peerchannelpeer

```
trinity> channel peer
```

## 2.2 Trinity-Eth Network

*Trinity python3.6pythonpython3.6 TrinityTrinityUbuntu16.04*

### 2.2.1 Trinity

```
sudo apt-get install screen git libleveldb-dev libssl-dev g++
```

mongodb

```
sudo apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv-  
↳2930ADAE8CAF5059EE73BB4B58712A2291FA4AD5  
  
echo "deb [ arch=amd64,arm64 ] http://repo.mongodb.org/apt/ubuntu xenial/mongodb-org/  
↳3.6 multiverse" | sudo tee /etc/apt/sources.list.d/mongodb-org-3.6.list  
  
sudo apt-get update  
  
sudo apt-get install mongodb-org  
  
sudo service mongod start
```

*mongodb <https://docs.mongodb.com/manual/tutorial/install-mongodb-on-ubuntu/>*

python3.6

```
sudo apt-get install software-properties-common  
  
sudo add-apt-repository ppa:jonathonf/python-3.6  
  
sudo apt-get update  
  
sudo apt-get install python3.6 python3.6-dev
```



pip3.6

```
sudo wget https://bootstrap.pypa.io/get-pip.py
sudo python3.6 get-pip.py
```

virtualenv

```
sudo pip3.6 install virtualenv
```

## 2.2.2 Trinity

```
git clone https://github.com/trinity-project/trinity-eth.git /home ##wallet
git clone https://github.com/trinity-project/trinity-gateway.git /home ##gateway
```

trinity-eth

```
cd /home/trinity-eth
```

```
virtualenv -p /usr/bin/python3.6 venv
source venv/bin/activate
```

trinity

```
pip install -r requirements
```

wallet

```
cd /home/wallet
```

wallet

```
pip install -r requirements
```

## 2.2.3 Trinity

gateway

```
vi gateway/config.py
```

```
cg_public_ip_port = "localhost:8089"localhostip
cg_public_ip_port = "8.8.8.8:8089"
```

```
screen -S TrinityGateway #TrinityGateway:
```

```
source venv/bin/activate
```

```
python start.py
```

```
##### Trinity Gateway Start Successfully! #####
```

```
ctrl+a+dTrinityGateway
```

TrinityGateway

```
screen -r TrinityGateway
```

## 2.2.4 Trinity

```
vi wallet/configure.py
```

```
configurewalletconfigure_testnet.pyconfigure_mainnet.pyconfigure_mainnet.pyconfigure.py
```

```
screen -S TrinityWallet #TrinityWallet:
```

```
python3.6 virtualenv(venv)
```

```
source venv/bin/activate
```

trinity/wallet

- 

```
python3.6 prompt.py -m #
```

- 

```
python3.6 prompt.py #
```

## 2.2.5 Channel

trinity CLI

helptrinity CLI

1.create wallet

```
trinity> create wallet /root/test/test.json # /root/test/test.json
```

2.open wallet

```
trinity> open wallet /root/test/test.json
```

walletgatewaychannel30schannelchannel.

3.channel enablechannelchannel

```
trinity> channel enable
```

4.channel show uri uri

```
trinity> channel show uri
```

5.channel create

```
trinity> channel create xxxxxxxxxxxx@xx.xx.xx.xx:xxxx TNC 80000  
# create peeruri(PublicKey@ip_address:port, asset_type, depoist
```

*TNC800TNC1800TNCTNCTNC*

#### 6.channel depoist\_limitTNC

```
trinity> channel depoist_limit
```

#### 7.channel txtxpaymentlinkuri + asset + value

```
trinity> channel tx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx # payment link
```

```
trinity> channel tx xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx@xx.xx.xx:xxxx TNC 10
```

#### 8.channel payment

```
trinity> channel payment TNC 10 "mytest" # payment asset type valuecomments comments
```

#### 9.channel close

```
trinity> channel close xxxxxxxxxxxxxxxx #close channel name
```

#### 10.channel peerchannelpeer

```
trinity> channel peer
```