

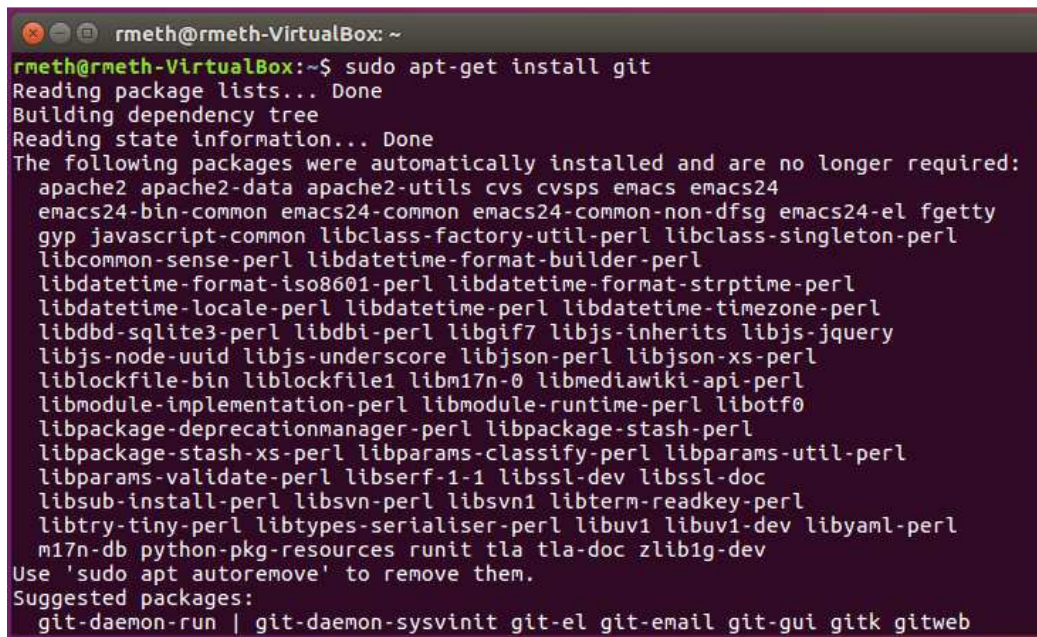
Q1: Installation of GIT Software

Before installing any command from ubuntu package manager, lets update and upgrade the package manager repository using below command.

```
$ sudo apt-get update  
$ sudo apt-get upgrade
```

Now, run below command to install git

```
$ sudo apt-get install git
```



```
rmeth@rmeth-VirtualBox: ~  
rmeth@rmeth-VirtualBox:~$ sudo apt-get install git  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following packages were automatically installed and are no longer required:  
apache2 apache2-data apache2-utils cvs cvsps emacs emacs24  
emacs24-bin-common emacs24-common emacs24-common-non-dfsg emacs24-el fgetty  
gyp javascript-common libclass-factory-util-perl libclass-singleton-perl  
libcommon-sense-perl libdatetime-format-builder-perl  
libdatetime-format-iso8601-perl libdatetime-format-strptime-perl  
libdatetime-locale-perl libdatetime-perl libdatetime-timezone-perl  
libdbd-sqlite3-perl libdbi-perl libgif7 libjs-inherits libjs-jquery  
libjs-node-uuid libjs-underscore libjson-perl libjson-xs-perl  
liblockfile-bin liblockfile1 libm17n-0 libmediawiki-api-perl  
libmodule-implementation-perl libmodule-runtime-perl libotf0  
libpackage-deprecationmanager-perl libpackage-stash-perl  
libpackage-stash-xs-perl libparams-classify-perl libparams-util-perl  
libparams-validate-perl libserf-1-1 libssl-dev libssl-doc  
libsub-install-perl libsvn-perl libsvn1 libterm-readkey-perl  
libtry-tiny-perl libtypes-serialiser-perl libuv1 libuv1-dev libyaml-perl  
m17n-db python-pkg-resources runit tla tla-doc zlib1g-dev  
Use 'sudo apt autoremove' to remove them.  
Suggested packages:  
git-daemon-run | git-daemon-sysvinit git-el git-email git-gui gitk gitweb
```

Installing latest version of curl

If you want to install curl from repositories, the curl package is in the Ubuntu repositories.

So just use the following command

```
$ sudo apt-get install curl    or    $ sudo apt install curl
```

But the repositories are not updated frequently. So, it may be possible the you end up installing older version.

Run the following set of commands to install curl 7.50.3 on Ubuntu 16.04 in Terminal.

The same procedure can be followed for Ubuntu 15.04, Ubuntu 14.04 and other Ubuntu Derivatives:

```
$ wget http://curl.haxx.se/download/curl-7.50.3.tar.gz
```

```
$ tar -xvf curl-7.50.3.tar.gz
```

```
$ cd curl-7.50.3/
```

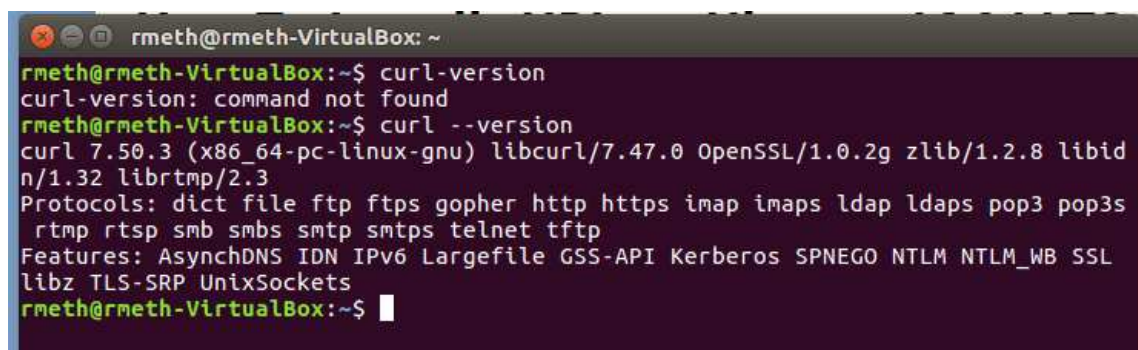
```
$ ./configure
```

```
$ make
```

```
$ sudo make install
```

Once installed, we can verify curl using the command given below:

```
$ curl -version
```

A terminal window titled 'rmeth@rmeth-VirtualBox: ~' with a dark background and light-colored text. The user enters the command 'curl-version', which returns 'curl-version: command not found'. Then, the user enters 'curl --version', which returns the following output: 'curl 7.50.3 (x86_64-pc-linux-gnu) libcurl/7.47.0 OpenSSL/1.0.2g zlib/1.2.8 libidn/1.32 librtmp/2.3'. Below this, it lists protocols: 'dict file ftp ftps gopher http https imap imaps ldap ldaps pop3 pop3s rtmp rtsp smb smbs smtp smtps telnet tftp'. Finally, it lists features: 'Features: AsynchDNS IDN IPv6 Largefile GSS-API Kerberos SPNEGO NTLM NTLM_WB SSL libz TLS-SRP UnixSockets'. The prompt returns to 'rmeth@rmeth-VirtualBox:~\$' with a cursor.

```
rmeth@rmeth-VirtualBox: ~  
rmeth@rmeth-VirtualBox:~$ curl-version  
curl-version: command not found  
rmeth@rmeth-VirtualBox:~$ curl --version  
curl 7.50.3 (x86_64-pc-linux-gnu) libcurl/7.47.0 OpenSSL/1.0.2g zlib/1.2.8 libid  
n/1.32 librtmp/2.3  
Protocols: dict file ftp ftps gopher http https imap imaps ldap ldaps pop3 pop3s  
rtmp rtsp smb smbs smtp smtps telnet tftp  
Features: AsynchDNS IDN IPv6 Largefile GSS-API Kerberos SPNEGO NTLM NTLM_WB SSL  
libz TLS-SRP UnixSockets  
rmeth@rmeth-VirtualBox:~$
```

Q2: Installation of Node Packages

Node package can be downloaded from the below URL

<https://nodejs.org/en/download/package-manager/>

Before install nodejs, get the latest nodejs setup file

```
curl -sL https://deb.nodesource.com/setup_8.x | $ sudo -E bash -
```

```
rmeth@rmeth-VirtualBox: ~
rmeth@rmeth-VirtualBox:~$ curl -sL https://deb.nodesource.com/setup_8.x | sudo -E bash -
[sudo] password for rmeth:

## Installing the NodeSource Node.js 8.x LTS Carbon repo...

## Populating apt-get cache...

+ apt-get update
Hit:1 http://us.archive.ubuntu.com/ubuntu xenial InRelease
Hit:2 http://security.ubuntu.com/ubuntu xenial-security InRelease
Hit:3 http://us.archive.ubuntu.com/ubuntu xenial-updates InRelease
Ign:4 http://dl.google.com/linux/chrome/deb stable InRelease
Hit:5 http://us.archive.ubuntu.com/ubuntu xenial-backports InRelease
Get:6 http://dl.google.com/linux/chrome/deb stable Release [1,189 B]
Hit:7 http://ppa.launchpad.net/ethereum/ethereum/ubuntu xenial InRelease
Get:8 http://dl.google.com/linux/chrome/deb stable Release.gpg [819 B]
Get:9 http://ppa.launchpad.net/git-core/ppa/ubuntu xenial InRelease [17.5 kB]
Get:10 http://dl.google.com/linux/chrome/deb stable/main amd64 Packages [1,354 B]
Get:11 http://ppa.launchpad.net/git-core/ppa/ubuntu xenial/main amd64 Packages [3,296 B]
Get:12 http://ppa.launchpad.net/git-core/ppa/ubuntu xenial/main i386 Packages [3,300 B]
Get:13 http://ppa.launchpad.net/git-core/ppa/ubuntu xenial/main Translation-en [2,604 B]
Fetched 30.1 kB in 1s (22.9 kB/s)
Reading package lists... Done
```

Now, install nodejs using command

```
$ sudo apt-get install -y nodejs
```

```
$ sudo apt-get install -y build-essential
```

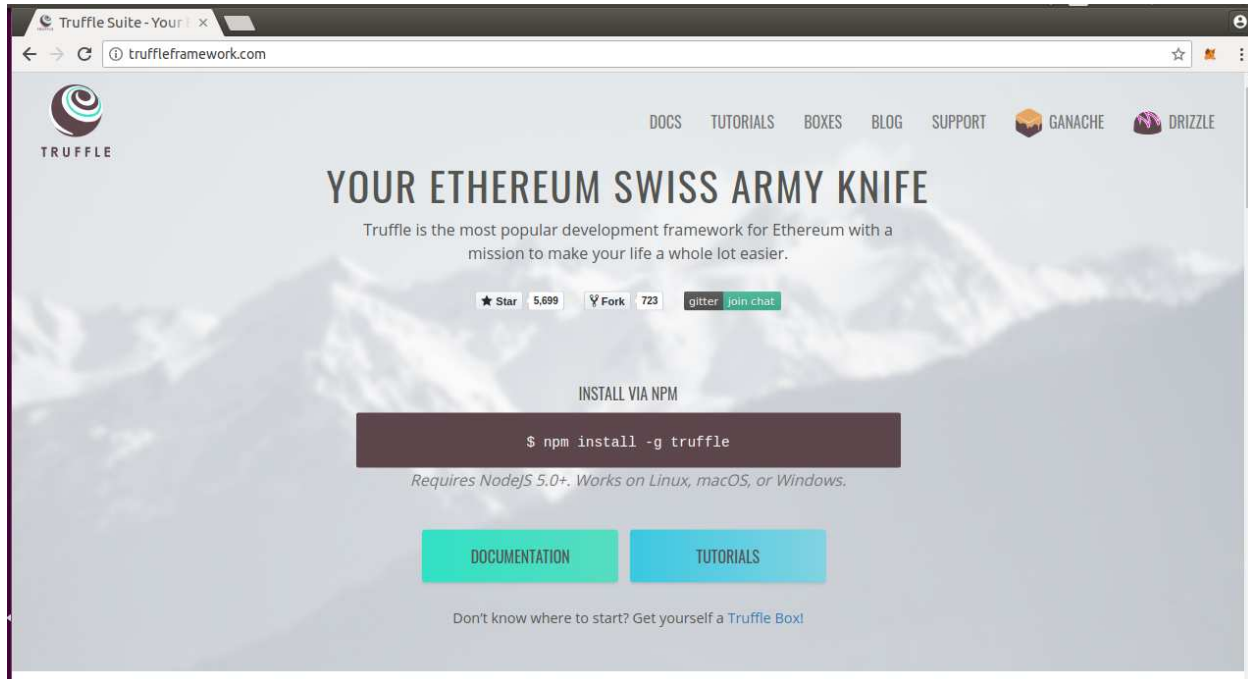
```
rmeth@rmeth-VirtualBox: ~
rmeth@rmeth-VirtualBox:~$ sudo apt-get install -y nodejs
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
 apache2 apache2-data apache2-utils cvs cvsps emacs emacs24 emacs24-bin-common emacs24-common
 emacs24-common-non-dfsg emacs24-el fgetty gyp javascript-common libclass-factory-util-perl libclass-singleton-perl
 libcommon-sense-perl libdatetime-format-builder-perl libdatetime-format-iso8601-perl
 libdatetime-format-strptime-perl libdatetime-locale-perl libdatetime-perl libdatetime-timezone-perl
 libdbd-sqlite3-perl libdbi-perl libgif7 libjs-inherits libjs-jquery libjs-node-uuid libjs-underscore libjson-perl
 libjson-xs-perl liblockfile-bin liblockfile1 libm17n-0 libmediawiki-api-perl libmodule-implementation-perl
 libmodule-runtime-perl libotf0 libpackage-deprecationmanager-perl libpackage-stash-perl libpackage-stash-xs-perl
 libparams-classify-perl libparams-util-perl libparams-validate-perl libserf-1-1 libssl-dev libssl-doc
 libsub-install-perl libsvn-perl libsvn1 libterm-readkey-perl libtry-tiny-perl libtypes-serialiser-perl libuv1
 libuv1-dev libyaml-perl m17n-db python-pkg-resources runit tla tla-doc zlib1g-dev
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
 nodejs
0 upgraded, 1 newly installed, 0 to remove and 3 not upgraded.
1 not fully installed or removed.
Need to get 12.6 MB of archives.
```

To check the version, we can run `node -v` or `nodejs -v`. The version should display 8.11.1

Q3: Installation of Truffle Framework

You can download and install truffle framework from the below link

<http://truffleframework.com/>



Run command

```
$ sudo npm install -g truffle
```

```
rmeth@rmeth-VirtualBox: ~  
nodejs: bad option: --v  
rmeth@rmeth-VirtualBox:~$ nodejs -v  
v8.11.1  
rmeth@rmeth-VirtualBox:~$ sudo npm install -g truffle  
/usr/bin/truffle -> /usr/lib/node_modules/truffle/build/cli.bundled.js  
+ truffle@4.1.7  
added 92 packages in 8.796s  
rmeth@rmeth-VirtualBox:~$
```

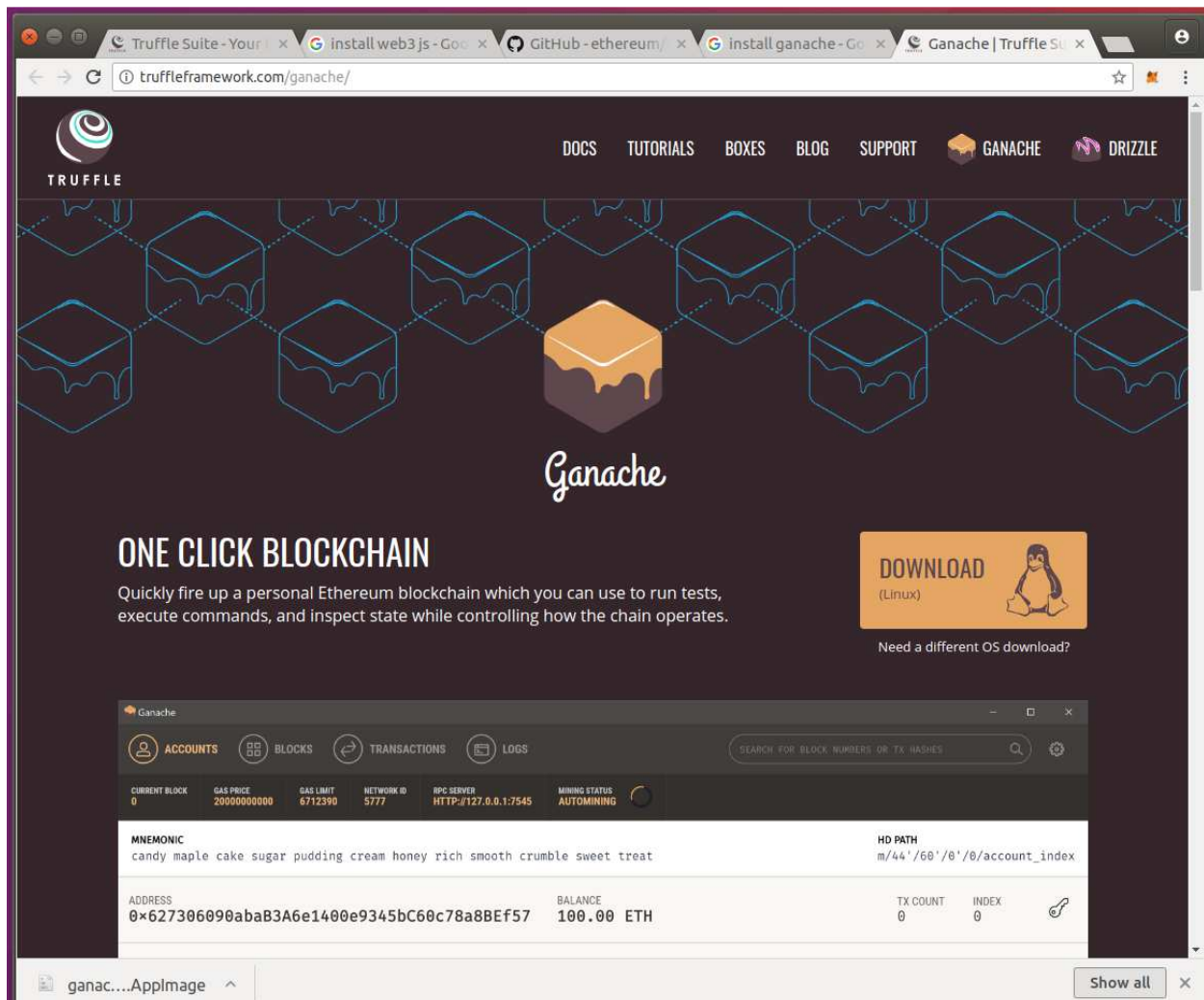
```
$ truffle version
```

 - display the version 4.1.7 and solidity 0.4.23

```
rmeth@rmeth-VirtualBox:~$ truffle version  
Truffle v4.1.7 (core: 4.1.7)  
Solidity v0.4.23 (solc-js)  
rmeth@rmeth-VirtualBox:~$
```


Installing Ganache

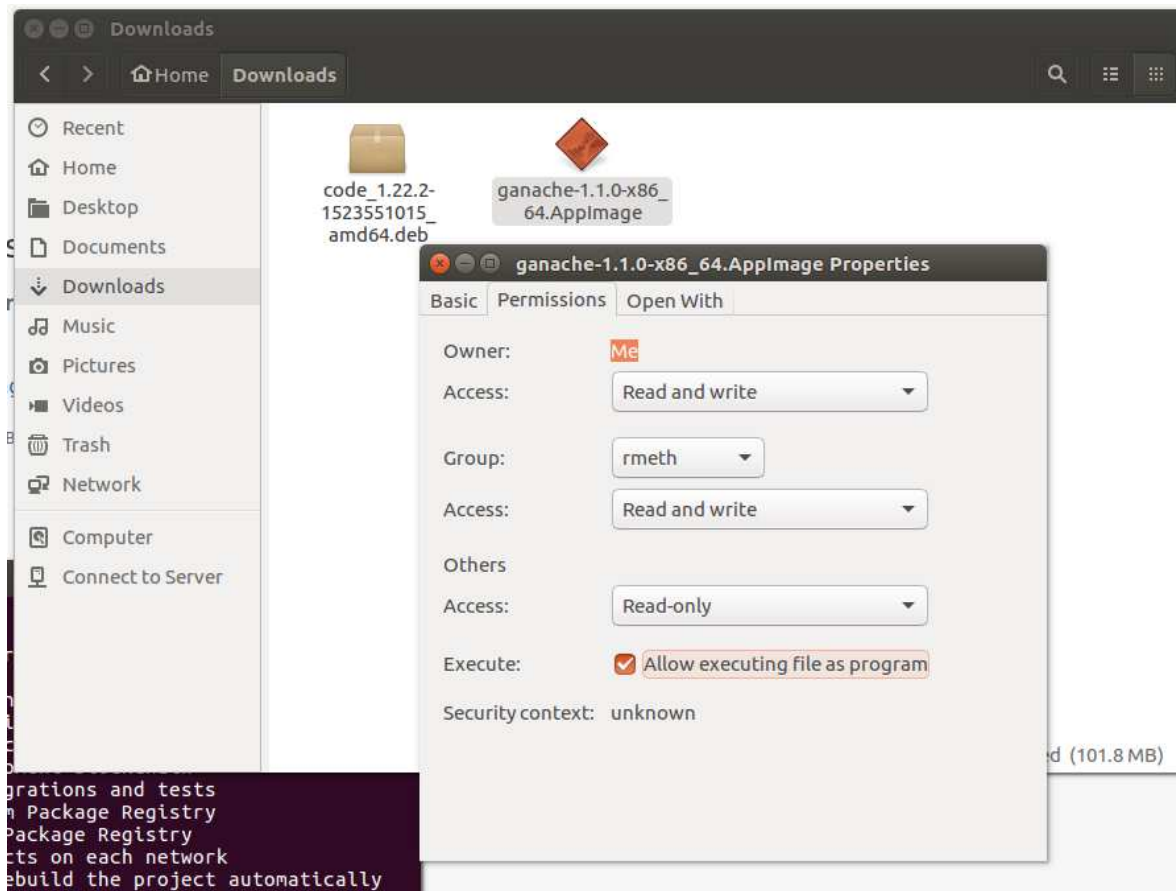
Go to truffleframework.com/ganache/ and click download (linux)



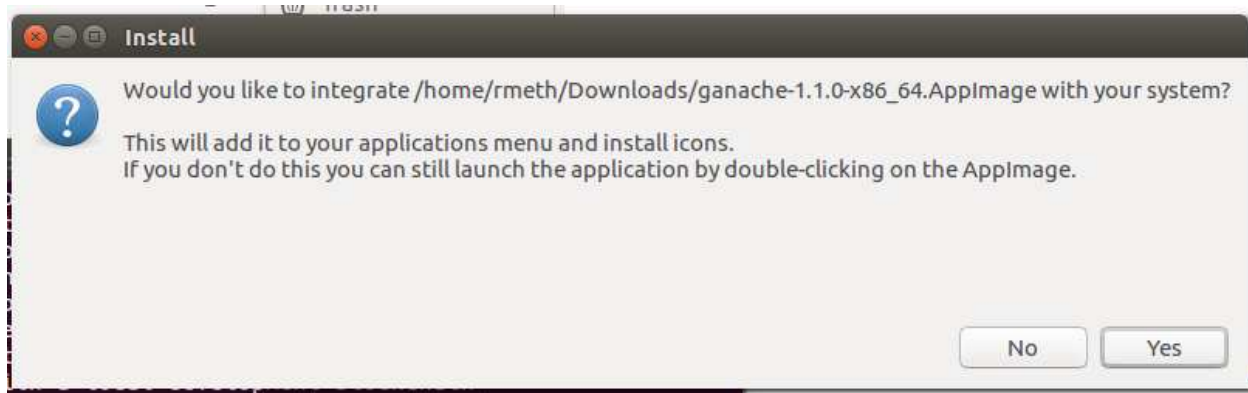
Go to download folder, you will find Ganache..*.ApplImage file. This file doesn't simply install. First we need to make this executable.

How to make executable?

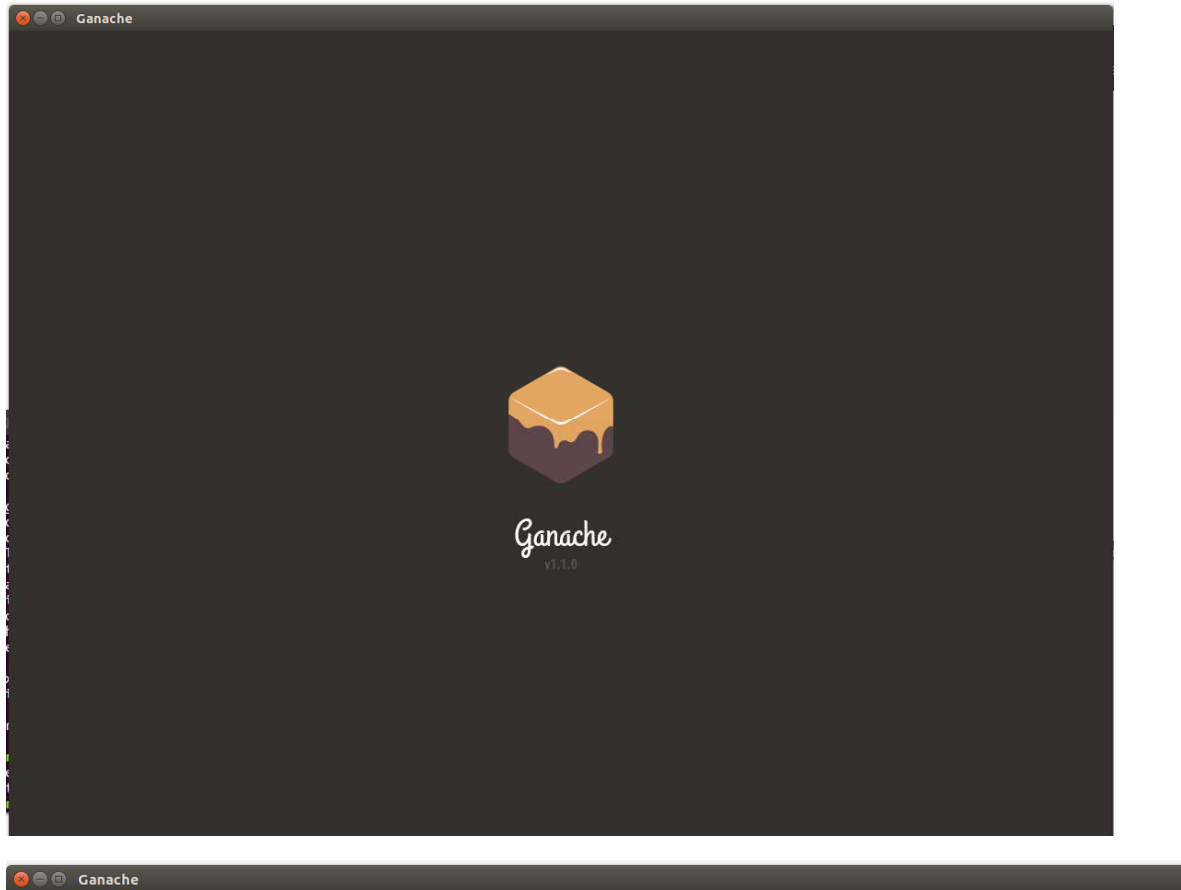
Right click on the file > Properties > Permissions > Check Allow executing file as program



Now, double click on the ganache-*.AppImage file and select Yes on Install dialog box



The installation will start now with following screen



SUPPORT GANACHE

Ganache includes Google Analytics tracking to help us better understand how you use it during your normal development practices. You can opt-out of this tracking by selecting the option below.

By enabling this feature, you provide the Truffle team with valuable metrics, allowing us to better analyze usage patterns and add new features and bug fixes faster.

Thanks for your help, and happy coding!

-- The Truffle Team

WHAT WE TRACK

- A unique UUID generated upon first use
- Window width and height
- Ganache version
- Exception messages (without paths)
- Screens viewed during use

We do not collect addresses or private keys.

☒ Analytics enabled. Thanks!

CONTINUE

The screenshot shows the Ganache application interface. At the top, there are tabs for ACCOUNTS, BLOCKS, TRANSACTIONS, and LOGS. Below these, a status bar displays various metrics: CURRENT BLOCK (0), GAS PRICE (2000000000), GAS LIMIT (6721975), NETWORK ID (5777), RPC SERVER (HTTP://127.0.0.1:7545), and MINING STATUS (AUTOMINING). The main area displays the MNEMONIC (elder unlock pioneer worth rocket rebuild easy guard inherit drink decline surge) and the HD PATH (m/44'/60'/0'/0'/account_index). Below this, a table lists 10 accounts, each with an ADDRESS, BALANCE (100.00 ETH), TX COUNT (0), and INDEX (0 to 8). Each account entry also includes a key icon for importing the account.

ADDRESS	BALANCE	TX COUNT	INDEX
0x2AC3FdDc01c7004ade82e7a9c306651dCb669fe	100.00 ETH	0	0
0xc5B1CE0eBB6867C5b45849734Efd3AF0e6c4901b	100.00 ETH	0	1
0xBf1568a7bDc02781d70D7E8bF8568c4Dc160A623	100.00 ETH	0	2
0x795Af389FA39080f5eFe2E6c5D07D930FB0177Ce	100.00 ETH	0	3
0x5f377A47E2F24b07a05814Db4bde2E09AebeF58B	100.00 ETH	0	4
0xeC2DE52e5D0cb64e2286Aab54321A3484e1572b2	100.00 ETH	0	5
0x4B9AC718dB8943834DF77303859c7826694627ff	100.00 ETH	0	6
0x2AE308F0Ba10B17418D9b2F011BA0d2629855924	100.00 ETH	0	7
0xfF70f2cD98323bEb62262188A5E60D245834d4d0	100.00 ETH	0	8

By default, Ganache give us 10 accounts from index 0 to 9 with each of having 100 ETH balances for testing purpose.

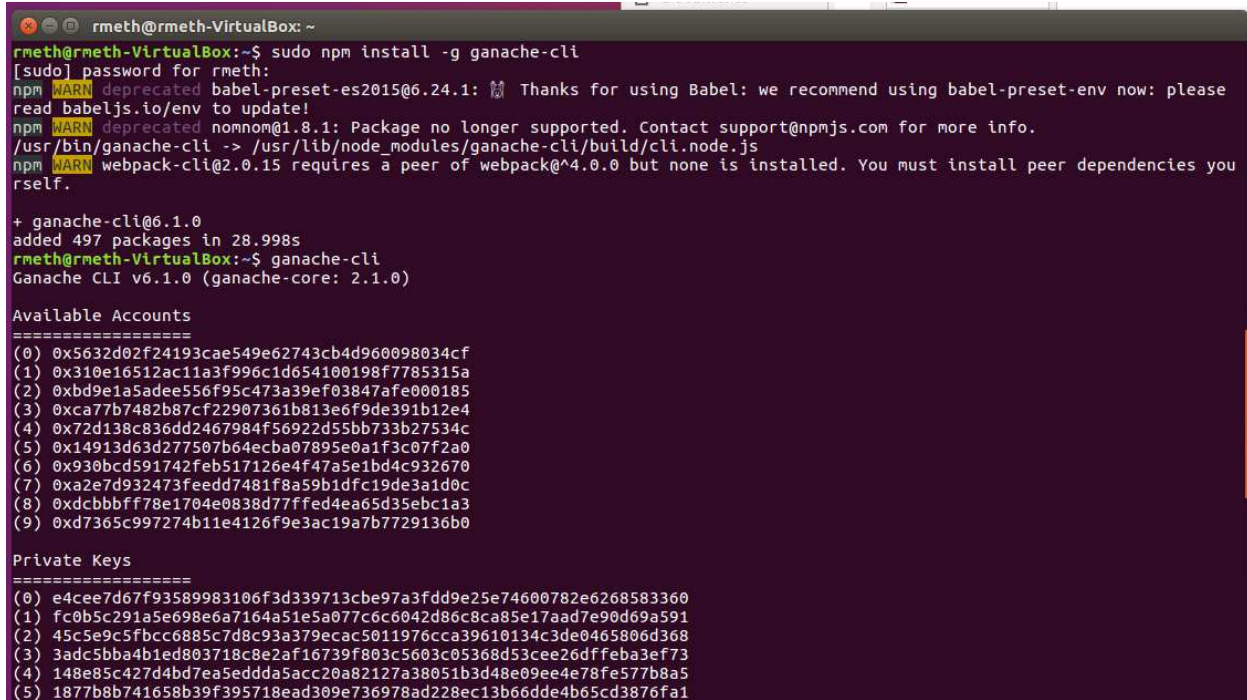
We can also install Ganache-cli instead Ganache UI

To install Ganache-cli

```
$ npm install -g ganache-cli
```

To run ganache

```
$ ganache-cli
```

A terminal window titled 'rmeth@rmeth-VirtualBox: ~' showing the installation of Ganache CLI. The user runs 'sudo npm install -g ganache-cli'. The terminal shows several npm warnings about deprecated packages and a peer dependency. It then shows the installation of 'ganache-cli@6.1.0' and the execution of 'ganache-cli'. The output shows 'Ganache CLI v6.1.0 (ganache-core: 2.1.0)' and a list of 'Available Accounts' (9 accounts) and 'Private Keys' (5 keys).

```
rmeth@rmeth-VirtualBox: ~  
rmeth@rmeth-VirtualBox:~$ sudo npm install -g ganache-cli  
[sudo] password for rmeth:  
npm WARN deprecated babel-preset-es2015@6.24.1: Thanks for using Babel: we recommend using babel-preset-env now: please read babeljs.io/env to update!  
npm WARN deprecated nomnom@1.8.1: Package no longer supported. Contact support@npmjs.com for more info.  
npm WARN deprecated ganache-cli -> /usr/lib/node_modules/ganache-cli/build/cli.node.js  
npm WARN deprecated webpack-cli@2.0.15 requires a peer of webpack@^4.0.0 but none is installed. You must install peer dependencies you  
rself.  
  
+ ganache-cli@6.1.0  
added 497 packages in 28.998s  
rmeth@rmeth-VirtualBox:~$ ganache-cli  
Ganache CLI v6.1.0 (ganache-core: 2.1.0)  
  
Available Accounts  
=====
```

Account	Address
(0)	0x5632d02f24193cae549e62743cb4d960098034cf
(1)	0x310e16512ac11a3f996c1d654100198f7785315a
(2)	0xbd9e1a5adee556f95c473a39ef03847afe000185
(3)	0xca77b7482b87cf22907361b813e6f9de391b12e4
(4)	0x72d138c836dd2467984f56922d55bb733b27534c
(5)	0x14913d63d277507b64ecba07895e0a1f3c07f2a0
(6)	0x930bcd591742feb517126e4f47a5e1bd4c932670
(7)	0xa2e7d932473feedd7481f8a59b1dfc19de3a1d0c
(8)	0xdcbbbf78e1704e0838d77ffed4ea65d35ebc1a3
(9)	0xd7365c997274b11e4126f9e3ac19a7b7729136b0

```
Private Keys  
=====
```

Account	Private Key
(0)	e4cee7d67f93589983106f3d339713cbe97a3fdd9e25e74600782e6268583360
(1)	fc0b5c291a5e698e6a7164a51e5a077c6c6042d86c8ca85e17aad7e90d69a591
(2)	45c5e9c5fbcc6885c7d8c93a379ecac5011976cca39610134c3de0465806d368
(3)	3adc5bba4b1ed803718c8e2af16739f803c5603c05368d53cee26dffeba3ef73
(4)	148e85c427d4bd7ea5eddda5acc20a82127a38051b3d48e09ee4e78fe577b8a5
(5)	1877b8b741658b39f395718ead309e736978ad228ec13b66dde4b65cd3876fa1

Q4: Installation of Web3.js libraries

Web3.js libraries are available in the below link

<https://github.com/ethereum/web3.js/>

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Sign up

Ethereum JavaScript API

ethereum javascript api swarm whisper

1,381 commits 8 branches 63 releases 89 contributors

Branch: develop New pull request Find file Clone or download

Commit	Message	Time ago
LukasDrgon and frozeman	Add CDN link (#1506)	10 days ago
dist	build files	2 months ago
example	Add html to <DOCTYPE> (#1459)	18 days ago
lib	Update web3.js (#1556)	11 days ago
test	Added optional padding parameter to utils.fromAscii and updated tests (...)	17 days ago
.bowerrc	fixed #149	3 years ago
.editorconfig	Updated bower.json & Readme	4 years ago
.gitignore	ignore packages folder for now	10 months ago

To clone web3.js

```
$ git clone https://github.com/ethereum/web3.js
```

```
rmeth@rmeth-VirtualBox: ~/web3.js
rmeth@rmeth-VirtualBox:~$ git clone https://github.com/ethereum/web3.js/
Cloning into 'web3.js'...
remote: Counting objects: 16585, done.
remote: Total 16585 (delta 0), reused 0 (delta 0), pack-reused 16585
Receiving objects: 100% (16585/16585), 30.46 MiB | 1.90 MiB/s, done.
Resolving deltas: 100% (11582/11582), done.
Checking connectivity... done.
rmeth@rmeth-VirtualBox:~$ ls
curl-7.50.3 Desktop Downloads git Pictures Templates web3.js
curl-7.50.3.tar.gz Documents examples.desktop Music Public Videos
rmeth@rmeth-VirtualBox:~$ cd web3.js
rmeth@rmeth-VirtualBox:~/web3.js$ ls
bower.json dist gulpfile.js lib package-init.js package.json styleguide.md
circle.yml example index.js LICENSE package.js README.md test
```

Web3.js is based on each project. This provider need to install on each project folder

To Install Web3.js, run

```
$ npm install web3
```

```
$ sudo npm install web3
```

```
rmeth@rmeth-VirtualBox:~$ npm install web3
npm WARN deprecated fs-promise@2.0.3: Use mz or fs-extra^3.0 with Promise Support
npm WARN deprecated tar.gz@1.0.7: ⚠ WARNING ⚠ tar.gz module has been deprecated and your application is vulnerable. Please
use tar module instead: https://npmjs.com/tar
> scrypt@6.0.3 preinstall /home/rmeth/node_modules/scrypt
> node node-scrypt-preinstall.js

> scrypt@6.0.3 install /home/rmeth/node_modules/scrypt
> node-gyp rebuild

make: Entering directory '/home/rmeth/node_modules/scrypt/build'
SOLINK_MODULE(target) Release/obj.target/copied_files.node
COPY Release/copied_files.node
CC(target) Release/obj.target/scrypt_wrapper/src/util/memlimit.o
CC(target) Release/obj.target/scrypt_wrapper/src/scryptwrapper/keyderivation.o
CC(target) Release/obj.target/scrypt_wrapper/src/scryptwrapper/pickparams.o
```