NENG v1.4.0 Android Mining, randomSpike Evaluation

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Major Success - v1.3.x Scrypt randomSpike Release

NENG core v1.3.x randomSpike hard fork in March 2020 was major success so far. The NENG block chain has been operational smoothly for several months since the hard fork and timestamp attack was more or less mitigated.

Overview of randomSpike

Spike difficulty (difficulty around 244,000) was introduced in v1.2.x as road blocks to block instant mining of big ASIC rigs and to enhance security against 51% attack. In typical scrypt coins with regular scrypt mining algorithm, big ASIC rigs tend to constantly manipulate mining difficulty by moving in and out frequently and apply instant mining in low difficulty reset period. Instant mining impose high risk of 51% attack for all altcoins.

The main change on v1.3.x randomSpike over the prior version is the change of spike difficulty arrangement within initial seconds of each block time. The v1.2.x spike difficulty was in effect within first 3 seconds of each block, and also apply for any block time earlier than the prior block time. However, frequent timestamp attacks ruined the economics on base difficulty reset day by over-penalizing the honest ASIC rigs. RandomSpike resolved the issue by loosening off spike difficulty by allowing any block time before the prior time. RandomSpike also introduced 50% random chance of rejection for any blocks found during 18 seconds window (+- 9 seconds around the prior block timestamp) in order to randomize the winners during base difficulty reset day and to encourage solo mining and small mining pools.

Observation of Effect on Base Diff Reset Day

The randomSpike positive effect have been obvious. We observed frequently during base difficulty reset day by observing the blocks from web page:
https://miningpoolstats.stream/newenglandcoin

It happened frequently that during base difficulty reset day, a small mining pool at 10 MH/s hashrate had higher mining rewards than a big mining pool at 500 MH/s when the base difficulty is below 1. When the base difficulty roses above 1, the rewards of high vs low hash rate across mining pool has been consistently proportional to their hash rate. In other word, 500 MH/s mining pool was observed to have 50 times more rewards than 10 MH/s when the base difficulty was above 1. Solo mining situation can not be tracked easily. But the trend was similar, in low diff on reset day, solo mining on futurebit moonlander 2 USB ASIC stick on two rotating full node can consistently mine 5 to 6 million NENG rewards in one day, better than any pools small or large shown above. GPU solo miners too has much better than 5-6 million NENG rewards during the base difficulty reset day.

Conclusion on v1.3.x randomSpike Release

v1.3.0.1 will be stable release for windows, linux, macOs computers for quite a while. Unless there is something new issues pop up that needs to be fixed, this release is expected to stay long term without need of upgrade anytime soon.

Ubuntu 20.04 LTS Support on v1.4.0

Some members reported that NENG core can not be easily compiled from source on Ubuntu 20.04 LTS desktop. Linux has many different distros with incompatible library files. It is difficult to support many different flavors of linux. Ubuntu is the most popular distro of linux by any metrics and it is our dev intention to support Ubuntu LTS versions on x86_64 hardware.

NENG core v1.4.0 release soon will support Ubuntu 20.04 desktop on x86_64 platform. The ubuntu 20.04 wallet will continue to use v1.3.x binary files with additional missing library support. In other word, v1.4.0 ubuntu 20.04 will have no new real NENG source code change from v1.3.0.1. It is merely a linux OS level support for latest ubuntu LTS version.

NENG core v1.4.0 Upgrade Proposal – Mobile Mining Start on Android Phones

A year ago we started mobile mining project by evaluating all possible development paths. The original mobile mining project was inspired by Electroneum (ETN) mobile mining project and we started to evaluate all aspect of mobile mining project including features and development time estimate.

Table 1 – Mobile Mining Comparison of Electroneum (ETN) and NewEnglandcoin (NENG)

coin	Market Cap	Decentralized	Real or Fake Mining	Android	iPhone
ETN	$58 Million USD	No	Fake	Yes	Yes
NENG	$2550 USD	Yes	Real	Yes	No

ETN mobile mining on cell phone was more or less simulation, or fake mining. It was centralized approach by Electroneum company (main dev team) reserving large portion of coins for mining. Recently Electroneum went further by shutting down the cloud based mining and offering only tasks/ads based earning. In that sense, ETN mobile mining becomes a marketing tool rather than a real mining experience. With the v1.4.0 release expected in July 2020, NENG will become the first and the only real mobile mining coin in the world.

We now propose to restart our NENG mobile mining project by incorporating the latest technology trends in embedded linux on android, cloud computing and our own CPU mining technology with Cheetah_Cpuminer software.

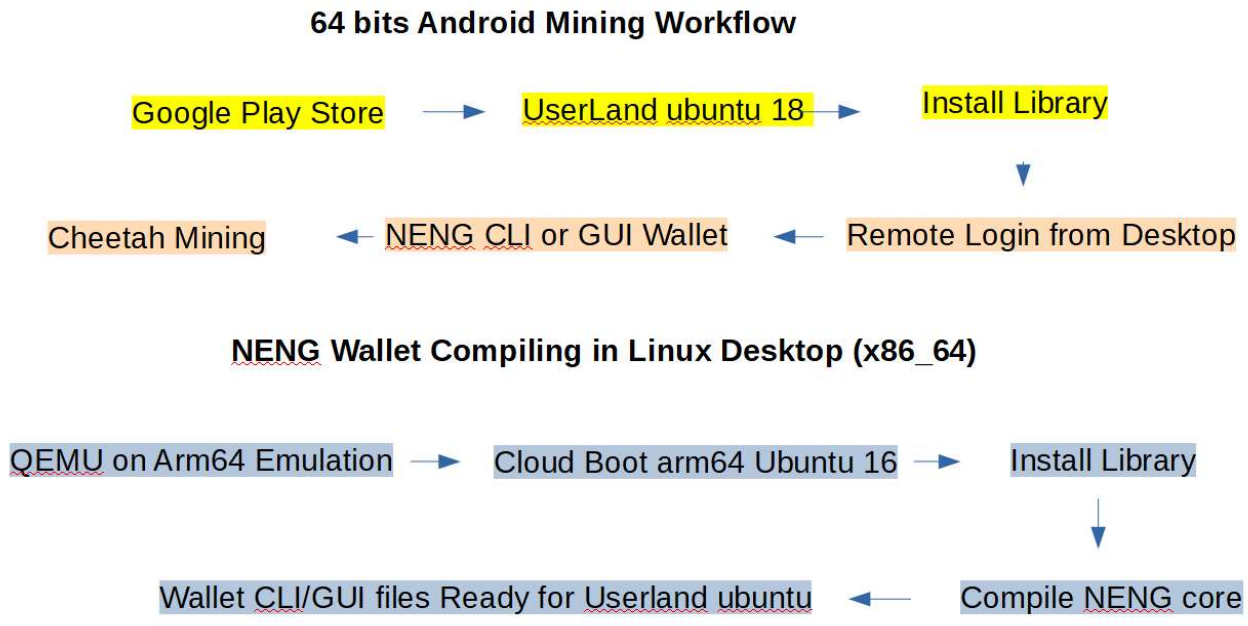
Linux, Cloud, Docker/QEMU virtualization Tech Advancement

Linux is most popular OS today. Many people are not aware of that their android phones run on top of linux kernel. Virtually majority of cloud based internet servers run on linux. Most TV setup boxes, IoT embedded devices run some version of linux OS under the hood.

Cloud computing is more or less built upon linux operating system. Docker/container is a pure linux technology in that you can run one linux kernel in host machine, with few command line, you can run another different version of linux as subsystem like a virtual machine (called container) using the same kernel. You could run multiple levels of docker/container, a debian linux 7 container inside a ubuntu 16.04 container which itself is inside a ubuntu 18.04 host with docker/container technology easily. Cloud computing and docker technology is revolutionary in that developers no longer bring software to some fixed version of hardware/OS, in stead, dev can have a set of application tools in github, and then pick and choose proper linux OS version to run, say ubuntu 16.04 OS as docker/container to run those application sharing the same linux kernel.

This is precisely the similar technology that allows UserLand/GNUroot/Termux android apps to run embedded linux inside an android phone sharing the same linux kernel that android phone uses. The speed and performance we tested on both Userland or GNUroot has been quite impressive like a native OS app. Essentially we can think of this whole set up as one linux kernel, running two OS on top of it, one is android, another is Ubuntu linux for Userland app or Debian linux for GNUroot app.

Embedded linux running in android is not truly 100% as powerful as desktop linux running in PC. In both GNUroot or Userland cases we found that we could not compile NENG wallet binary files inside phones. Qemu is another set of cloud virtualization tool that allows developer to run arm linux inside a x86_64 desktop computer by mimicking arm hardware on software level. Eventually we compiled NENG core wallet in QEMU inside a x86_64 desktop PC, which is binary compatible for android phone.



Userland for arm64 android – Easy to Setup or Use

In our own testing, a quad core 64 bits android 8.0 phone mines between 500k to 2 million NENG per day. Even for those who are new into linux, this should be easy to set up and mine NENG casually or heavily on relative newer android phones.

We have tested Termux and UserLand for 64 bits android phones and decided to recommend UserLand for our 64 bits based android phone mobile mining on NENG. For any phone with android version 5.0 or higher, Userland app can be freely downloaded from Google Play Store for installation, no android root is required. Inside Userland, we support "Ubuntu" installation. Pick username, a password, you can login into a linux terminal inside Userland running arm64 version of Ubuntu 18.04. We will provide preparation shell script to run inside UserLand ubuntu. Remote login into android UserLand is also available with windows 10 (putty) or linux/Mac (ssh) with automatic ssh server configuration from UserLand app without need of any further user work. Even remote running QT GUI wallet of NENG is easy on this phone with remote login method from windows 10. We will provide details of putty or ssh remote login and QT remote running from windows 10 PC guide in v1.4.0 release.

UserLand is also user friendly for routine regular phone usage. We have found that whenever we picked up the phone, unhooked the phone from power charger for our daily use for work, commute etc, UserLand app will stop and pause. This is precisely the phone should do as we do not want NENG mining in Userland to interfere with regular phone use. Whenever we re-charge the phone and want to restart the NENG mining, we can remote login into UserLand, then type a few commands from desktop computer easily. The commands can also be done directly from phone without using a computer for restarting mining task.

Alpha Release - GNUroot for 32 bits arm android

- Minimum Hardware requirement: 1G memory, 32 bits arm phones
- Minimum Software requirement: download GNUroot and GNUroot wheezy from Google Play Store, No android root is required.
- Linux server required: need a linux server with ip address on ssh server. Virutalbox installation of Ubuntu 18.04 with bridged networking setup at home will work. The only way to remote login into GNUroot phone is through ssh tunnel into this Linux server in a complicated setup.

This is only suitable for linux enthusiastic developer only, not suitable for average users who just want to mine NENG casually on an old cell phone. In our testing, google galaxy nexus phone on 32 bits armel platform can only mine 40,000 to 60,000 NENG per day.

For 32 bits arm android phones (armel or amhf), GNUroot is tested to be working for mining NENG. However, the procedure for installation and configuration of remote login on GNUroot is complicated and only suitable for linux expert users only. The NENG core in Google Galaxy Nexus phone is less stable due to lack of memory and needs to restart once per day. Overall we would rate GNUroot app NENG mining for 32 bits android phones as alpha software solution.

Even though this is only an alpha level solution, it could still be fun and useful for those power users and android/linux enthusiasts. Therefore we still plan to provide detailed software guides on v1.4.0 release.

Android Hardware Compatibility Issue on arm phones

64 bits arm64 based android phones are hardware compatible across different android phones. This is similar to x86_64 regular desktop computers. We expect that all 64 bits phones should just work after following our guide on installation of UserLand and NENG wallet/Cheetah Cpuminer.

32 bits arm phones (either armel or armhf linux in GNUroot) are different story. We faced a lots of crash and difficulty in compiling a proper version of NENG core wallet for Google Galaxy Nexus. The initially compiled wallet on different hardware from QEMU cloud environment would crash within 1 or 2 hours running. Eventually we find a workaround by doing the following step:

(1) Always install and compile all the required library files inside the phone GNUroot environment. This works for Google Galaxy Phone as we can install the needed library dependency and compile Berkeley DB files inside the phone.
(2) NENG wallet itself could not be compiled in Galaxy Nexus Phone. However, a workaround solution was found that using the phone compiled Berkely DB files into QEMU environment to mimick the phone hardware, then compile NENG wallet files inside QEMU on different hardware environment. This NENG wallet file can be run inside galaxy nexus phones for hours for mobile mining.

Memory Issue on Old 32 bits phone

Google Galaxy Nexus is 8 years old with only 1G memory in phone. We have uninstalled all other android app, and unchecked all the “show notification”, and disabled all the Google App, but still NENG core wallet would crash once per day.

We think this is mainly due to limitation of memory. NENG core wallet takes 500 MB memory at start and grows as time goes by. Embedded linux in GNUroot or in UserLand does not allow user to set swapfile as swap memory so that memory is the hard limit on NENG mining.

In QEMU cloud environment, even under 250 M memory we can add 2 G swap to expand memory, but unfortunately embedded linux uses the same kernel from Android and this swap feature is disabled on kernel level.

Due to limitation of memory size in old phones, we believe Google Galaxy Nexus is likely to be oldest phone that can mine NENG in android with this solution. The bigger the memory, the smoother the operation on NENG android mining for user experience.