
nethermind Documentation

Release 0.9.9

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1.1 Download

You can download the latest packages for all supported platforms from [here](#).

1.1.1 Windows

- download Windows package
- unzip
- open the folder
- run Nethermind.Launcher.exe

1.1.2 Linux (Ubuntu 16.04 or above)

You have to replace [LINUX_PACKAGE_URL] and [LINUX_PACKAGE_FILENAME] with the actual values.

Ubuntu 19.04 has an unresolved compatibility issue!

Install dependencies

```
sudo apt update && sudo apt install libsnappy-dev libc6-dev libc6 unzip
```

Create a new user

```
sudo useradd -m -s /bin/bash nethermind
```

increase the maximum number of open files

```
sudo bash -c 'echo "nethermind soft nofile 1000000" > /etc/security/limits.d/  
↳nethermind.conf'  
sudo bash -c 'echo "nethermind hard nofile 1000000" >> /etc/security/limits.d/  
↳nethermind.conf'
```

switch to the new user

```
sudo su - nethermind
```

Get Nethermind

download the package

```
wget [LINUX_PACKAGE_URL]
```

For version 0.9.9

```
wget https://nethdev.blob.core.windows.net/builds/nethermind-linux-amd64-0.9.9-  
↳47c4e5e.zip
```

extract the files

```
unzip [LINUX_PACKAGE_FILENAME] -d nethermind
```

remove the no more need package (optional)

```
rm [LINUX_PACKAGE_FILENAME]
```

switch directory

```
cd nethermind
```

start the Nethermind launcher

```
./Nethermind.Launcher
```

to exit Nethermind press `ctrl + c`

Manage Nethermind with systemd (optional)

exit the session as user `nethermind` if still active

```
exit
```

download the `nethermind.service` config

```
wget https://raw.githubusercontent.com/NethermindEth/nethermind/master/scripts/  
↳nethermind.service
```

move the config into the systemd folder

```
sudo mv nethermind.service /etc/systemd/system/
```

reload the systemd configs

```
sudo systemctl daemon-reload
```

you can now start, stop, restart Nethermind with systemd

```
sudo service nethermind start
```

display the current Nethermind output (**optional**)

```
journalctl -u nethermind -f
```

enable autorun (**optional**)

```
sudo systemctl enable nethermind
```

1.1.3 MacOS (10.12+)

- brew install gmp && brew install snappy && brew install lz4
- download MacOS package
- unzip
- cd into the folder
- ./Nethermind.Launcher

1.2 Releases

You can find the latest Nethermind releases [here](#).

1.3 Build

1.3.1 IDE (optional)

- JetBrains Rider <https://www.jetbrains.com/rider/>
- VS Code <https://code.visualstudio.com/docs/other/dotnet>

1.3.2 SDKs

You will need .NET SDK 2.2

- Windows <https://www.microsoft.com/net/download?initial-os=windows>
- Linux <https://www.microsoft.com/net/download?initial-os=linux> (make sure to select the right distribution)
- Mac <https://www.microsoft.com/net/download?initial-os=macos>

1.3.3 Linux

```
sudo apt-get update && sudo apt-get install libsnappy-dev libc6-dev libc6
```

1.3.4 MacOS

```
brew install gmp && brew install snappy && brew install lz4
```

1.3.5 Windows

you may need to install <https://support.microsoft.com/en-us/help/2977003/the-latest-supported-visual-c-downloads>

1.3.6 All Platforms

```
git clone https://github.com/tkstanczak/nethermind --recursive
cd nethermind/src/Nethermind
dotnet build Nethermind.sln -c Release
```

launch goerli testnet for quick sync and testing

```
cd Nethermind.Runner
dotnet run --no-build -c Release -- --config goerli
```

You can confirm the latest block of the Goerli testnet here: <https://blockscout.com/eth/goerli/>

or (mainnet)

```
cd Nethermind.Runner
dotnet run --no-build -c Release -- --config mainnet
```

1.3.7 Potential Issues

If you have some previous pre-release versions of .NET Core installed they may cause conflicts. Your case might be quite unique so best to search for help online.

If application crashes saying that rocksdb-sharp / rocksdb is failing then most likely your processor is not supporting AVX instructions. This would require you to build RocksDb on your machine. We will add a tutorial for this later - for now reach out to us on [gitter](#) if you need to run it on a non-AVX CPU.

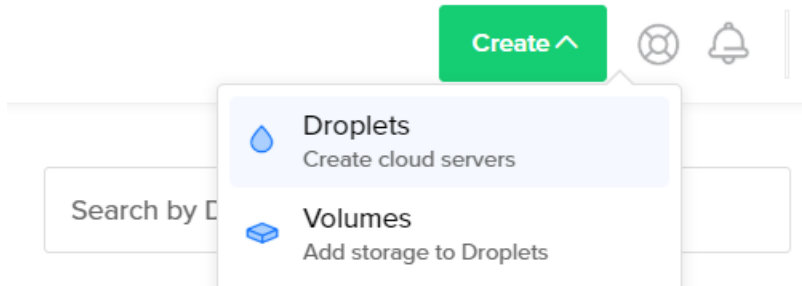
1.4 Source Code

Source code is on [GitHub](#)

1.5 Cloud

1.5.1 Digital Ocean

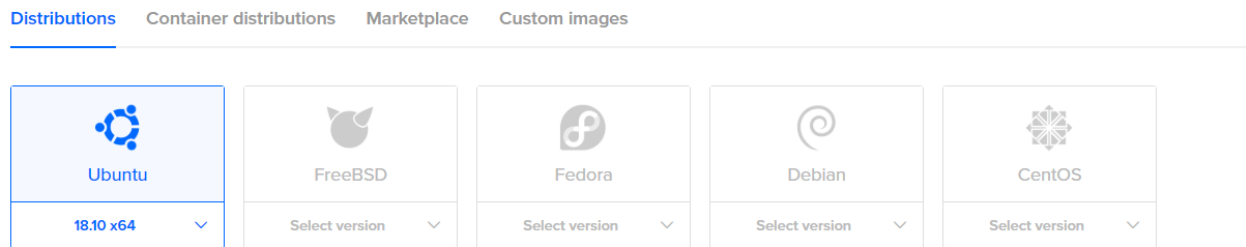
Create a new droplet



Select Ubuntu version (18.10)

Create Droplets

Choose an image ?



Choose the minimal option

Choose a plan

STARTER









Standard

Standard virtual machines with a mix of memory and com and dev/test environments.

<p>\$40/mo \$0.060/hour</p> <p>8 GB / 4 CPUs 160 GB SSD disk 5 TB transfer</p>	<p>\$80/mo \$0.119/hour</p> <p>16 GB / 6 CPUs 320 GB SSD disk 6 TB transfer</p>
---	--

Select preferred region (some will sync faster)

Choose a datacenter region

 New York 1 2 3	 San Francisco 1 2	 Amsterdam 2 3	 Singapore 1	 London 1	 Frankfurt 1
 Toronto 1	 Bangalore 1				

Choose a hostname

Finalize and create

How many Droplets?

Deploy multiple Droplets with the same [configuration](#).

— 1 Droplet +


Choose a hostname

Give your Droplets an identifying name you will remember them by. Your Droplet name can only contain alphanumeric characters, dashes, and periods.

Add Tags

Select project

Select an existing project for this Droplet/s.

 nethermind ▼

Create

Wait for the droplet to be created



nethermind DEFAULT
Service or API

→ Move Resources

Resources Activity Settings

DROPLETS (3)

 ubuntu-s-4vcpu-8gb-lon1-01

Install packages:

```
sudo apt-get update && sudo apt-get install libsnappy-dev libc6-dev libc6 unzip
```

```
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
```

```
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
```

```
root@ubuntu-s-4vcpu-8gb-lon1-01:~# sudo apt-get update && sudo apt-get install libsnappy-dev libc6-dev libc6 unzip
```

Wait for the packages (input 'Y' when prompted)

```
Suggested packages:
  glibc-doc zip
The following NEW packages will be installed:
  libc-dev-bin libc6-dev libsnappy-dev libsnappyv5 linux-libc-dev manpages-dev unzip
0 upgraded, 7 newly installed, 0 to remove and 151 not upgraded.
Need to get 6156 kB of archives.
After this operation, 30.4 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://mirrors.digitalocean.com/ubuntu cosmic/main amd64 libc-dev-bin amd64 2.28-0ubuntu1 [71.3 kB]
Get:2 http://mirrors.digitalocean.com/ubuntu cosmic-updates/main amd64 linux-libc-dev amd64 4.18.0-18.19 [1066 kB]
Get:3 http://mirrors.digitalocean.com/ubuntu cosmic/main amd64 libc6-dev amd64 2.28-0ubuntu1 [2587 kB]
Get:4 http://mirrors.digitalocean.com/ubuntu cosmic/main amd64 manpages-dev all 4.16-1 [2222 kB]
Get:5 http://mirrors.digitalocean.com/ubuntu cosmic/main amd64 unzip amd64 6.0-21ubuntu1 [167 kB]
Get:6 http://mirrors.digitalocean.com/ubuntu cosmic/main amd64 libsnappyv5 amd64 1.1.7-1 [16.0 kB]
Get:7 http://mirrors.digitalocean.com/ubuntu cosmic/main amd64 libsnappy-dev amd64 1.1.7-1 [27.2 kB]
Fetched 6156 kB in 0s (24.7 MB/s)
Selecting previously unselected package libc-dev-bin.
(Reading database ... 58781 files and directories currently installed.)
Preparing to unpack .../0-libc-dev-bin_2.28-0ubuntu1_amd64.deb ...
Unpacking libc-dev-bin (2.28-0ubuntu1) ...
Selecting previously unselected package linux-libc-dev:amd64.
Preparing to unpack .../1-linux-libc-dev_4.18.0-18.19_amd64.deb ...
Unpacking linux-libc-dev:amd64 (4.18.0-18.19) ...
Selecting previously unselected package libc6-dev:amd64.
Preparing to unpack .../2-libc6-dev_2.28-0ubuntu1_amd64.deb ...
Unpacking libc6-dev:amd64 (2.28-0ubuntu1) ...
Selecting previously unselected package manpages-dev.
Preparing to unpack .../3-manpages-dev_4.16-1_all.deb ...
Unpacking manpages-dev (4.16-1) ...
Selecting previously unselected package unzip.
Preparing to unpack .../4-unzip_6.0-21ubuntu1_amd64.deb ...
Unpacking unzip (6.0-21ubuntu1) ...
Selecting previously unselected package libsnappyv5:amd64.
Preparing to unpack .../5-libsnappyv5_1.1.7-1_amd64.deb ...
Unpacking libsnappyv5:amd64 (1.1.7-1) ...
Selecting previously unselected package libsnappy-dev:amd64.
Preparing to unpack .../6-libsnappy-dev_1.1.7-1_amd64.deb ...
Unpacking libsnappy-dev:amd64 (1.1.7-1) ...
Processing triggers for mime-support (3.60ubuntu1) ...
Setting up unzip (6.0-21ubuntu1) ...
Setting up linux-libc-dev:amd64 (4.18.0-18.19) ...
Processing triggers for libc-bin (2.28-0ubuntu1) ...
Setting up libsnappyv5:amd64 (1.1.7-1) ...
Processing triggers for man-db (2.8.4-2) ...
Setting up libc-dev-bin (2.28-0ubuntu1) ...
Setting up manpages-dev (4.16-1) ...
Setting up libc6-dev:amd64 (2.28-0ubuntu1) ...
Setting up libsnappy-dev:amd64 (1.1.7-1) ...
Processing triggers for libc-bin (2.28-0ubuntu1) ...
root@ubuntu-s-4vcpu-8gb-lon1-01:~#
```

Download Nethermind Launcher:

```
wget https://github.com/NethermindEth/nethermind/releases/download/0.9.9/nethermind-
↳ lin-x64.zip
```

```
root@ubuntu-s-4vcpu-8gb-lon1-01:~# wget https://github.com/NethermindEth/nethermind/releases/download/0.9.9/nethermind-lin-x64.zip
--2019-05-09 13:38:15-- https://github.com/NethermindEth/nethermind/releases/download/0.9.9/nethermind-lin-x64.zip
Resolving github.com (github.com) ... 140.82.118.3
Connecting to github.com (github.com)[140.82.118.3]:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://github-production-release-asset-2e65be.s3.amazonaws.com/101194285/a4350980-7073-11e9-8691-6e51f6bfff7f17X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAIWNJYAX4CSVEH5
3A82F2019050942Pus-east-1&2Fs32Faws4_request&X-Amz-Date=20190509T133815Z&X-Amz-Expires=300&X-Amz-Signature=ad921dd8f2cc3f8b4b2e6732f2dcfdbca3a1ea31925b6363c1783454d7a8fea&X-Amz-SignedHead
ers=host&response-content-disposition=attachment%3Bfilename%3Dnethermind-lin-x64.zip&response-content-type=application%2Foctet-stream [following]
--2019-05-09 13:38:15-- https://github-production-release-asset-2e65be.s3.amazonaws.com/101194285/a4350980-7073-11e9-8691-6e51f6bfff7f17X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKI
AIWNJYAX4CSVEH53A82F2019050942Pus-east-1&2Fs32Faws4_request&X-Amz-Date=20190509T133815Z&X-Amz-Expires=300&X-Amz-Signature=ad921dd8f2cc3f8b4b2e6732f2dcfdbca3a1ea31925b6363c1783454d7a8fea&
-Amz-SignedHeaders=host&response-content-disposition=attachment%3Bfilename%3Dnethermind-lin-x64.zip&response-content-type=application%2Foctet-stream
Resolving github-production-release-asset-2e65be.s3.amazonaws.com (github-production-release-asset-2e65be.s3.amazonaws.com) ... 52.216.2.16
Connecting to github-production-release-asset-2e65be.s3.amazonaws.com (github-production-release-asset-2e65be.s3.amazonaws.com)[52.216.2.16]:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 66414932 (63M) [application/octet-stream]
Saving to: 'nethermind-lin-x64.zip'

nethermind-lin-x64.zip          100%[=====>] 63.34M  23.0MB/s  in 2.8s
2019-05-09 13:38:18 (23.0 MB/s) - 'nethermind-lin-x64.zip' saved [66414932/66414932]
root@ubuntu-s-4vcpu-8gb-lon1-01:~#
```

Unzip the package:

```
unzip nethermind-lin-x64.zip -d nethermind && cd nethermind
```

```
2019-05-09 13:38:18 (23.0 MB/s) - 'nethermind-lin-x64.zip' saved [66414932/66414932]
root@ubuntu-s-4vcpu-8gb-lon1-01:~# unzip nethermind-lin-x64.zip -d nethermind
```

```
2019-05-09 13:38:18 (23.0 MB/s) - 'nethermind-lin-x64.zip' saved [66414932/66414932]
root@ubuntu-s-4vcpu-8gb-lon1-01:~# unzip nethermind-lin-x64.zip -d nethermind && cd nethermind
Archive:  nethermind-lin-x64.zip
  creating:  nethermind/configs/
  inflating:  nethermind/configs/ropsten.cfg
  inflating:  nethermind/configs/rinkeby_archive.cfg
  inflating:  nethermind/configs/hive.cfg
  inflating:  nethermind/configs/ropsten_archive.cfg
  inflating:  nethermind/configs/mainnet.cfg
  inflating:  nethermind/configs/goerli.cfg
  inflating:  nethermind/configs/mainnet_archive.cfg
  inflating:  nethermind/configs/rinkeby.cfg
  inflating:  nethermind/configs/spaceneth.cfg
  inflating:  nethermind/configs/goerli_archive.cfg
  inflating:  nethermind/Nethermind.Runner
  inflating:  nethermind/Nethermind.Launcher
root@ubuntu-s-4vcpu-8gb-lon1-01:~/nethermind#
```

Launch screen (and press ENTER):

```
screen
```

```
Archive:  nethermind-lin-x64.zip
  creating:  nethermind/configs/
  inflating:  nethermind/configs/ropsten.cfg
  inflating:  nethermind/configs/rinkeby_archive.cfg
  inflating:  nethermind/configs/hive.cfg
  inflating:  nethermind/configs/ropsten_archive.cfg
  inflating:  nethermind/configs/mainnet.cfg
  inflating:  nethermind/configs/goerli.cfg
  inflating:  nethermind/configs/mainnet_archive.cfg
  inflating:  nethermind/configs/rinkeby.cfg
  inflating:  nethermind/configs/spaceneth.cfg
  inflating:  nethermind/configs/goerli_archive.cfg
  inflating:  nethermind/Nethermind.Runner
  inflating:  nethermind/Nethermind.Launcher
root@ubuntu-s-4vcpu-8gb-lon1-01:~/nethermind# screen
```

```
GNU Screen version 4.06.02 (GNU) 23-Oct-17
Copyright (c) 2015-2017 Juergen Weigert, Alexander Naumov, Amadeusz Slawinski
Copyright (c) 2010-2014 Juergen Weigert, Sadrul Habib Chowdhury
Copyright (c) 2008-2009 Juergen Weigert, Michael Schroeder, Micah Cowan, Sadrul Habib Chowdhury
Copyright (c) 1993-2007 Juergen Weigert, Michael Schroeder
Copyright (c) 1987 Oliver Laumann

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or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program (see the file COPYING); if not, see http://www.gnu.org/licenses/, or contact Free Software
Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02111-1301 USA.

Send bugreports, fixes, enhancements, t-shirts, money, beer & pizza to screen-devel@gnu.org

Capabilities:
+copy +remote-detach +power-detach +multi-attach +multi-user +font +color-256 +utf8 +rxvt +builtin-telnet
```

Launch Nethermind:

```
./Nethermind.Launcher
```

```
root@ubuntu-s-4vcpu-8gb-lon1-01:~/nethermind# ./Nethermind.Launcher
```

Select the network

```
root@ubuntu-s-4vcpu-8gb-lon1-01:~/nethermind# ./Nethermind.Launcher
? Select network
  Goerli
 Mainnet
  Rinkeby
  Ropsten
```

Select the sync mode (fast sync or full archive)

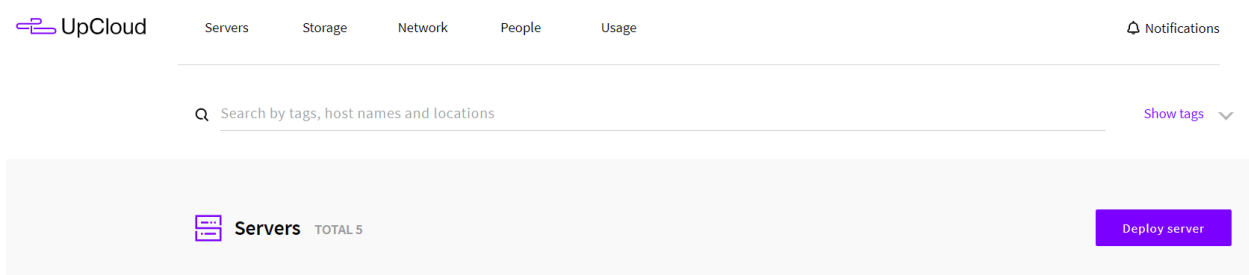
```
root@ubuntu-s-4vcpu-8gb-lon1-01:~/nethermind# ./Nethermind.Launcher
? Select network Mainnet
? Select sync
 Fast sync
  Full archive
```

It can take some time (up to a few minutes before it finds the first nodes to sync with):

```
2019-05-09 14:17:08.9247|Discovery      : udp://134.209.23.112:30303|
2019-05-09 14:17:08.9273|Ethereum      : tcp://134.209.23.112:30303|
2019-05-09 14:17:08.9413|Version      : Nethermind/v0.9.9-/X64-Linux 4.18.0-10-generic/Core4.6.27207.03|
2019-05-09 14:17:08.9413|This node     : enode://66a96c99ce72eab6c904b75023beddefb437d4900752894a3af2cc6e548034dd7f925fe46515724ee580c793a145e91304002c302be180d2dec2f1d0d0372878134.209.23.12:30303|
2019-05-09 14:17:08.9438|Node address : 0x068d12d9275f2de8a80cfdacc1928d4fafe876b (do not use as an account)|
2019-05-09 14:17:08.9589|Json RPC is disabled|
2019-05-09 14:17:09.9202|Sync peers - Initialized: 0 | All: 0 | Max: 50|
2019-05-09 14:17:09.9874|Connected to 3 bootnodes, 5 trusted/persisted nodes|
2019-05-09 14:17:10.9237|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:11.9230|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:12.9250|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:13.9248|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:14.9219|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:15.9246|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:16.9215|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:17.9261|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:18.9240|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:19.3556|Staying on sync mode Headers |best header:0|best full block:0|best peer block:7280022|
2019-05-09 14:17:19.9227|Sync peers 2(2)/50|
2019-05-09 14:17:19.9227| * [Peer|202.181.170.73:42236|7280022|Geth/v1.8.12-unstable-4e5df1c/linux-amd64/gol.10.3|2471|
2019-05-09 14:17:27.1734|Sync peer substitution
Geth: [Peer|202.181.170.73:42236|7280022|Geth/v1.8.12-unstable-4e5df1c/linux-amd64/gol.10.3|922|
  IN : [Peer|35.176.94.110:25513|7280022|Geth/v1.8.6-stable-12683fec/linux-amd64/gol.10|111|
2019-05-09 14:17:30.6352|Sync peers 3(3)/50|
2019-05-09 14:17:30.6355| * [Peer|35.176.94.110:25513|7280022|Geth/v1.8.6-stable-12683fec/linux-amd64/gol.10|111|
2019-05-09 14:17:30.7068|Staying on sync mode Headers |best header:0|best full block:0|best state:0|best peer block:7280022|
2019-05-09 14:17:30.9234|Blocks download      191/7280022|
```

1.5.2 UpCloud

Deploy a new server



Select preferred region (some will sync faster)

Location

DE-FRA1
Germany

FI-HEL1
Finland

FI-HEL2
Finland

NL-AMS1
Netherlands

SG-SIN1
Singapore

UK-LON1
UK

US-CHI1
USA

US-SJO1
USA

Summary

LOCATION	CPU
UK-LON1	-
MEMORY	STORAGE
-	10 GB
TEMPLATE	
-	
TOTAL	
- monthly	
- hourly	

Choose the server size (\$5 is enough for Goerli, \$40 is enough for the mainnet fast sync)

Simple plans

Flexible plan

\$5
month

1 cores
1 GB memory
25 GB storage

\$10
month

1 cores
2 GB memory
50 GB storage

\$20
month

2 cores
4 GB memory
80 GB storage

\$40
month

4 cores
8 GB memory
160 GB storage

\$80
month

6 cores
16 GB memory
320 GB storage

\$160
month

8 cores
32 GB memory
640 GB storage

Summary

LOCATION	CPU
UK-LON1	4 cores
MEMORY	STORAGE
8 GB	160 GB
TEMPLATE	
-	
TOTAL	
\$40 monthly	
\$0.06 hourly	

The screenshot displays a pricing interface with two main columns: 'Simple plans' and 'Flexible plan'. The 'Simple plans' column contains three options: a selected \$5/month plan (1 cores, 1 GB memory, 25 GB storage), a \$10/month plan (1 cores, 2 GB memory, 50 GB storage), and a \$40/month plan (4 cores, 8 GB memory, 160 GB storage). The 'Flexible plan' column contains three options: a \$20/month plan (2 cores, 4 GB memory, 80 GB storage), a \$80/month plan (6 cores, 16 GB memory, 320 GB storage), and a \$160/month plan (8 cores, 32 GB memory, 640 GB storage). A 'Summary' sidebar on the right shows: LOCATION UK-LON1, CPU 1 core, MEMORY 1 GB, STORAGE 25 GB, and TOTAL \$5 monthly / \$0.01 hourly.

Leave the storage size unchanged

The screenshot shows a 'Storage' configuration panel for a device named '1cpu-1gb-uk-lon1Device - 1'. It features a slider set to 25 GB, with dropdown menus for 'VirtIO (default)' and 'MaxIOPS', and an edit icon. A '+ Add a new device' button is located at the bottom.

Choose the operating system (Ubuntu 18.04)

os

Operating system

Operating systems	Custom images	CDROM
<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> <input type="radio"/> Windows Server 2019 Standard <small>Requires 25 GB disk \$0.01 / CPU core / hour</small> </div> <div style="border: 1px solid #ccc; padding: 5px;"> <input type="checkbox"/> CoreOS Stable 1068.8.0 </div>	<div style="border: 2px solid purple; padding: 5px; margin-bottom: 5px;"> <input checked="" type="radio"/> Ubuntu Server 18.04 LTS (Bionic Beaver) </div> <div style="border: 1px solid #ccc; padding: 5px;"> <input type="radio"/> CentOS 7.5 </div>	<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> <input type="radio"/> Debian GNU/Linux 9.5 (Stretch) </div>
<div style="border: 1px solid #ccc; padding: 2px; margin-bottom: 2px;">Change version ▼</div>	<div style="border: 2px solid purple; padding: 2px; margin-bottom: 2px;">Change version ▼</div> <div style="border: 1px solid #ccc; padding: 2px;">Change version ▼</div>	<div style="border: 1px solid #ccc; padding: 2px; margin-bottom: 2px;">Change version ▼</div>

Choose a hostname

Hostname
ubuntu-1cpu-1gb-uk-lon1

Description
ubuntu-1cpu-1gb-uk-lon1

Deploy

Install packages:

```
sudo apt-get update && sudo apt-get install libsnappy-dev libc6-dev libc6 unzip
```

```
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

root@ubuntu-s-4vcpu-8gb-lon1-01:~# sudo apt-get update && sudo apt-get install libsnappy-dev libc6-dev libc6 unzip
```

Wait for the packages (input 'Y' when prompted)

```
Suggested packages:
  glibc-doc zip
The following NEW packages will be installed:
  libc-dev-bin libc6-dev libsnappy-dev libsnappyv5 linux-libc-dev manpages-dev unzip
0 upgraded, 7 newly installed, 0 to remove and 151 not upgraded.
Need to get 6156 kB of archives.
After this operation, 30.4 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://mirrors.digitalocean.com/ubuntu cosmic/main amd64 libc-dev-bin amd64 2.28-0ubuntu1 [71.3 kB]
Get:2 http://mirrors.digitalocean.com/ubuntu cosmic-updates/main amd64 linux-libc-dev amd64 4.18.0-18.19 [1066 kB]
Get:3 http://mirrors.digitalocean.com/ubuntu cosmic/main amd64 libc6-dev amd64 2.28-0ubuntu1 [2587 kB]
Get:4 http://mirrors.digitalocean.com/ubuntu cosmic/main amd64 manpages-dev all 4.16-1 [2222 kB]
Get:5 http://mirrors.digitalocean.com/ubuntu cosmic/main amd64 unzip amd64 6.0-21ubuntu1 [167 kB]
Get:6 http://mirrors.digitalocean.com/ubuntu cosmic/main amd64 libsnappyv5 amd64 1.1.7-1 [16.0 kB]
Get:7 http://mirrors.digitalocean.com/ubuntu cosmic/main amd64 libsnappy-dev amd64 1.1.7-1 [27.2 kB]
Fetched 6156 kB in 0s (24.7 MB/s)
Selecting previously unselected package libc-dev-bin.
(Reading database ... 58781 files and directories currently installed.)
Preparing to unpack .../0-libc-dev-bin_2.28-0ubuntu1_amd64.deb ...
Unpacking libc-dev-bin (2.28-0ubuntu1) ...
Selecting previously unselected package linux-libc-dev:amd64.
Preparing to unpack .../1-linux-libc-dev_4.18.0-18.19_amd64.deb ...
Unpacking linux-libc-dev:amd64 (4.18.0-18.19) ...
Selecting previously unselected package libc6-dev:amd64.
Preparing to unpack .../2-libc6-dev_2.28-0ubuntu1_amd64.deb ...
Unpacking libc6-dev:amd64 (2.28-0ubuntu1) ...
Selecting previously unselected package manpages-dev.
Preparing to unpack .../3-manpages-dev_4.16-1_all.deb ...
Unpacking manpages-dev (4.16-1) ...
Selecting previously unselected package unzip.
Preparing to unpack .../4-unzip_6.0-21ubuntu1_amd64.deb ...
Unpacking unzip (6.0-21ubuntu1) ...
Selecting previously unselected package libsnappyv5:amd64.
Preparing to unpack .../5-libsnappyv5_1.1.7-1_amd64.deb ...
Unpacking libsnappyv5:amd64 (1.1.7-1) ...
Selecting previously unselected package libsnappy-dev:amd64.
Preparing to unpack .../6-libsnappy-dev_1.1.7-1_amd64.deb ...
Unpacking libsnappy-dev:amd64 (1.1.7-1) ...
Processing triggers for mime-support (3.60ubuntu1) ...
Setting up unzip (6.0-21ubuntu1) ...
Setting up linux-libc-dev:amd64 (4.18.0-18.19) ...
Processing triggers for libc-bin (2.28-0ubuntu1) ...
Setting up libsnappyv5:amd64 (1.1.7-1) ...
Processing triggers for man-db (2.8.4-2) ...
Setting up libc-dev-bin (2.28-0ubuntu1) ...
Setting up manpages-dev (4.16-1) ...
Setting up libc6-dev:amd64 (2.28-0ubuntu1) ...
Setting up libsnappy-dev:amd64 (1.1.7-1) ...
Processing triggers for libc-bin (2.28-0ubuntu1) ...
root@ubuntu-s-4vcpu-8gb-lon1-01:~#
```

Download Nethermind Launcher:

```
wget https://github.com/NethermindEth/nethermind/releases/download/0.9.9/nethermind-
↳ lin-x64.zip
```

```
root@ubuntu-s-4vcpu-8gb-lon1-01:~# wget https://github.com/NethermindEth/nethermind/releases/download/0.9.9/nethermind-lin-x64.zip
--2019-05-09 13:38:15-- https://github.com/NethermindEth/nethermind/releases/download/0.9.9/nethermind-lin-x64.zip
Resolving github.com (github.com) ... 140.82.118.9
Connecting to github.com (github.com)|140.82.118.9|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://github-production-release-asset-2e65be.s3.amazonaws.com/101194285/a4350980-7073-11e9-8691-6e51f6bfff7f17X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAIWNJYAX4CSVEH5
3A82F2019050942Pus-east-1&2Fs32Faws4_request&X-Amz-Date=20190509T133815Z&X-Amz-Expires=300&X-Amz-Signature=ad921dd8f2cc3f8b4b2e6732f2dcfdbca3a1ea31925b6363c1783454d7a8fea&X-Amz-SignedHead
ers=host&response-content-disposition=attachment%3Bfilename%3Dnethermind-lin-x64.zip&response-content-type=application%2Foctet-stream [following]
--2019-05-09 13:38:15-- https://github-production-release-asset-2e65be.s3.amazonaws.com/101194285/a4350980-7073-11e9-8691-6e51f6bfff7f17X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKI
AIWNJYAX4CSVEH53A82F2019050942Pus-east-1&2Fs32Faws4_request&X-Amz-Date=20190509T133815Z&X-Amz-Expires=300&X-Amz-Signature=ad921dd8f2cc3f8b4b2e6732f2dcfdbca3a1ea31925b6363c1783454d7a8fea&
X-Amz-SignedHeaders=host&response-content-disposition=attachment%3Bfilename%3Dnethermind-lin-x64.zip&response-content-type=application%2Foctet-stream
Connecting to github-production-release-asset-2e65be.s3.amazonaws.com (github-production-release-asset-2e65be.s3.amazonaws.com) ... 52.216.2.16
HTTP request sent, awaiting response... 200 OK
Length: 66414932 (63M) [application/octet-stream]
Saving to: 'nethermind-lin-x64.zip'

nethermind-lin-x64.zip          100%[=====>] 63.34M  23.0MB/s  in 2.8s

2019-05-09 13:38:18 (23.0 MB/s) - 'nethermind-lin-x64.zip' saved [66414932/66414932]
root@ubuntu-s-4vcpu-8gb-lon1-01:~#
```

Unzip the package:

```
unzip nethermind-lin-x64.zip -d nethermind && cd nethermind
```

```
2019-05-09 13:38:18 (23.0 MB/s) - 'nethermind-lin-x64.zip' saved [66414932/66414932]
root@ubuntu-s-4vcpu-8gb-lon1-01:~# unzip nethermind-lin-x64.zip -d nethermind
```

```
2019-05-09 13:38:18 (23.0 MB/s) - 'nethermind-lin-x64.zip' saved [66414932/66414932]
root@ubuntu-s-4vcpu-8gb-lon1-01:~# unzip nethermind-lin-x64.zip -d nethermind && cd nethermind
Archive:  nethermind-lin-x64.zip
  creating:  nethermind/configs/
  inflating:  nethermind/configs/ropsten.cfg
  inflating:  nethermind/configs/rinkeby_archive.cfg
  inflating:  nethermind/configs/hive.cfg
  inflating:  nethermind/configs/ropsten_archive.cfg
  inflating:  nethermind/configs/mainnet.cfg
  inflating:  nethermind/configs/goerli.cfg
  inflating:  nethermind/configs/mainnet_archive.cfg
  inflating:  nethermind/configs/rinkeby.cfg
  inflating:  nethermind/configs/spaceneth.cfg
  inflating:  nethermind/configs/goerli_archive.cfg
  inflating:  nethermind/Nethermind.Runner
  inflating:  nethermind/Nethermind.Launcher
root@ubuntu-s-4vcpu-8gb-lon1-01:~/nethermind#
```

Launch screen (and press ENTER):

```
screen
```

```
Archive:  nethermind-lin-x64.zip
  creating:  nethermind/configs/
  inflating:  nethermind/configs/ropsten.cfg
  inflating:  nethermind/configs/rinkeby_archive.cfg
  inflating:  nethermind/configs/hive.cfg
  inflating:  nethermind/configs/ropsten_archive.cfg
  inflating:  nethermind/configs/mainnet.cfg
  inflating:  nethermind/configs/goerli.cfg
  inflating:  nethermind/configs/mainnet_archive.cfg
  inflating:  nethermind/configs/rinkeby.cfg
  inflating:  nethermind/configs/spaceneth.cfg
  inflating:  nethermind/configs/goerli_archive.cfg
  inflating:  nethermind/Nethermind.Runner
  inflating:  nethermind/Nethermind.Launcher
root@ubuntu-s-4vcpu-8gb-lon1-01:~/nethermind# screen
```

```
GNU Screen version 4.06.02 (GNU) 23-Oct-17
Copyright (c) 2015-2017 Juergen Weigert, Alexander Naumov, Amadeusz Slawinski
Copyright (c) 2010-2014 Juergen Weigert, Sadrul Habib Chowdhury
Copyright (c) 2008-2009 Juergen Weigert, Michael Schroeder, Micah Cowan, Sadrul Habib Chowdhury
Copyright (c) 1993-2007 Juergen Weigert, Michael Schroeder
Copyright (c) 1987 Oliver Laumann

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or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program (see the file COPYING); if not, see http://www.gnu.org/licenses/, or contact Free Software
Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02111-1301 USA.

Send bugreports, fixes, enhancements, t-shirts, money, beer & pizza to screen-devel@gnu.org

Capabilities:
+copy +remote-detach +power-detach +multi-attach +multi-user +font +color-256 +utf8 +rxvt +builtin-telnet
```

Launch Nethermind:

```
./Nethermind.Launcher
```

```
root@ubuntu-s-4vcpu-8gb-lon1-01:~/nethermind# ./Nethermind.Launcher
```

Select the network

```
root@ubuntu-s-4vcpu-8gb-lon1-01:~/nethermind# ./Nethermind.Launcher
? Select network
  Goerli
 Mainnet
  Rinkeby
  Ropsten
```

Select the sync mode (fast sync or full archive)

```
root@ubuntu-s-4vcpu-8gb-lon1-01:~/nethermind# ./Nethermind.Launcher
? Select network Mainnet
? Select sync
 Fast sync
  Full archive
```

It can take some time (up to a few minutes before it finds the first nodes to sync with):

```
2019-05-09 14:17:08.9247|Discovery      : udp://134.209.23.112:30303|
2019-05-09 14:17:08.9273|Ethereum      : tcp://134.209.23.112:30303|
2019-05-09 14:17:08.9413|Version       : Nethermind/v0.9.9-/X64-Linux 4.18.0-10-generic/Core4.6.27207.03|
2019-05-09 14:17:08.9413|This node      : enode://66a96c99ce72eab6c904b75023beddefb437d4900752894a3af2cc6e548034dd7f925fe46515724ee580c793a145e91304002c302be180d2dec2f01dd0372878134.209.23.112:30303|
2019-05-09 14:17:08.9438|Node address  : 0x068d12d9275f2de8a80cfbdacc1928d4f4fe976b (do not use as an account)|
2019-05-09 14:17:08.9589|Added persisted discovery nodes: 0|
2019-05-09 14:17:08.9589|Json RPC is disabled|
2019-05-09 14:17:09.9202|Sync peers - Initialized: 0 | All: 0 | Max: 50|
2019-05-09 14:17:09.9874|Connected to 3 bootnodes, 5 trusted/persisted nodes|
2019-05-09 14:17:10.9237|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:11.9230|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:12.9250|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:13.9248|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:14.9219|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:15.9246|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:16.9215|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:17.9261|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:18.9240|Sync peers 0(0)/50, searching for peers to sync with...|
2019-05-09 14:17:19.3556|Staying on sync mode Headers |best header:0|best full block:0|best peer block:7280022|
2019-05-09 14:17:19.9227|Sync peers 2(2)/50|
2019-05-09 14:17:19.9227| * [Peer|202.181.170.73:42236|7280022|Geth/v1.8.12-unstable-4e5df1c/linux-amd64/gol.10.3|2471|
2019-05-09 14:17:27.1734|Sync peer substitution
Geth: [Peer|202.181.170.73:42236|7280022|Geth/v1.8.12-unstable-4e5df1c/linux-amd64/gol.10.3|922|
  IN : [Peer|35.176.94.110:25513|7280022|Geth/v1.8.6-stable-12683fec/linux-amd64/gol.10|111|
2019-05-09 14:17:30.6352|Sync peers 3(3)/50|
2019-05-09 14:17:30.6355| * [Peer|35.176.94.110:25513|7280022|Geth/v1.8.6-stable-12683fec/linux-amd64/gol.10|111|
2019-05-09 14:17:30.7068|Staying on sync mode Headers |best header:0|best full block:0|best state:0|best peer block:7280022|
2019-05-09 14:17:30.9234|Blocks download      191/7280022|
```

1.5.3 Google Cloud

Based on our tests it is probably the third best option from the providers listed here (after UpCloud and Digital Ocean). Should be fine (although more expensive) for fast syncing nodes. Full archive is not reasonable with the price / IOPS ratio.

1.5.4 AWS

Based on our tests it is probably the fourth best option from the providers listed here (after UpCloud, Digital Ocean, and AWS). Should be fine (although more expensive) for fast syncing nodes. Full archive is not reasonable with the price / IOPS ratio.

1.5.5 Azure

Based on our tests it is probably the worst choice from the providers listed here. Should be fine (although more expensive) for fast syncing nodes. Full archive is not reasonable with the price / IOPS ratio.

1.6 Known Issues

There are several known issues with the current version of Nethermind.

Doesn't Support Ubuntu 19.04 Because of an OpenSSL version conflict Ubuntu 19.04 will only be supported after the .NET Core 3 release in July.

Leaking Socket Descriptors On Linux our networking library is not closing socket descriptors properly. This results in the number of open files for the process growing indefinitely. Limits for the number of open files per process are different for root and other users. For root the limits are usually very high and the socket descriptors would probably not cause much trouble. Many of the cloud operators are launching VMs with root user access by default. If Nethermind process is frequently killed by OS then you may need to change the configuration for the maximum number of open files.

RocksDB on macOS RocksDB library does not always load properly on macOS. One (hacky) workaround is to install the latest version of RocksDB by running `brew install rocksdb`. For the time being it should not cause much trouble but the future RocksDB versions may be incompatible.

Does not work with Metamask Version 0.9.9 does not work with Metamask. Metamask support will be added in version 1.0.

1.7 Runtime

1.7.1 Directories

If you built the application locally then the entry point will be located in:

```
src/Nethermind/Nethermind.Runner/bin/Release/netcoreapp2.2/
```

Log files by default are located in:

```
src/Nethermind/Nethermind.Runner/bin/Release/netcoreapp2.2/logs
```

Database by default is located in:

```
src/Nethermind/Nethermind.Runner/bin/Release/netcoreapp2.2/nethermind_db
```

1.7.2 Logs

Logging level can be controlled in NLog.config file located in:

```
src/Nethermind/Nethermind.Runner/bin/Debug/netcoreapp2.2/
```

You can change the level of logging in file and in the console by choosing one of the levels (Error, Warn, Info, Debug, Trace):

```
<logger name="*" minlevel="Info" writeTo="file-async"/>
<logger name="*" minlevel="Info" writeTo="auto-colored-console-async"/>
```

1.8 Networks

By default Nethermind launches with mainnet network configuration but you can sync any of the below networks by adding a command line switch:

```
--config name_of_the_network
```

Network name can be any of the following

- [mainnet](#)
- [rinkeby](#)
- [goerli](#)
- [ropsten](#)

1.8.1 Mainnet

This is the main public Ethereum network secured by the ethash PoW algorithm.

```
Nethermind.Runner --config mainnet
```

- [MainNet Stats](#)

1.8.2 Görli (goerli)

This is a Clique-PoA based testnet supported by all major clients. It has a 15 seconds delay between blocks that are sealed by Goerli validators.

```
Nethermind.Runner --config goerli
```

- [Görli Stats](#)
- [Görli BlockScout](#)
- [Görli Gitter](#)

1.8.3 Ropsten

This is a test network secured by ethash PoW algorithm which resembles mainnet most closely but is prone to hashrate-based attacks.

```
Nethermind.Runner --config ropsten
```

1.8.4 Rinkeby

This is a Clique-PoA based testnet supported by Geth and Nethermind. It has a 15 seconds delay between blocks.

```
Nethermind.Runner --config rinkeby
```

- [Rinkeby Page](#)

1.9 Private Networks

It is possible to configure a private network (private blockchain) using Nethermind nodes. Before you setup a private network you will need to make a few decisions. One of them is choosing a consensus protocol that will be used for securing the network.

1.9.1 Consensus Algorithms

Nethermind supports the following consensus algorithms:

- PoW (ethash)
- PoA (Clique)
- None (NethDev)

PoW

In the proof of work consensus algorithm some of the nodes participate in a race to mine a new block by solving a mathematical puzzle. The difficulty of the puzzle (the amount of computation needed to find a solution) is adjusted so as to make blocks appear with some average frequency (every 15 seconds on the Ethereum mainnet). PoW is currently used to secure the public Ethereum mainnet and the Ropsten testnet. The only mining algorithm used for PoW in Ethereum is called ethash and is designed to be strict memory hard (see [Strict Memory Hard Hashing Functions](#)).

Clique

Clique is an implementation of the Proof of Authority (PoA) consensus algorithm. The idea behind PoA is to choose a group of nodes within the network with authority to create (seal) new blocks. In Clique such nodes are called signers and after the initial setup signers can vote to add new signers to the group or to remove any of the existing signers. Clique is currently supported by Geth, Parity, Nethermind and Pantheon and is used to secure the Goerli and Rinkeby testnets.

Aura

Aura is another implementation of the Proof of Authority consensus algorithm. It is currently only supported by the Parity Ethereum client. Aura is used to secure the Kovan testnet and the POA network.

NethDev

NethDev is a very simple consensus algorithm (or to better describe it - lack of consensus algorithm). NethDev can be used for setting up nodes for development and testing purposes. On the NethDev network any node can create a block with transactions and as long as it is a valid Ethereum block all other nodes will accept it.

1.9.2 Configuration

Nethermind uses the same format chainspec files that can be used for setting up private networks in Parity. Only some of the elements of the chainspec files are supported by Nethermind:

- engine (to choose between Ethash, Clique or NethDev)
- genesis block spec
- initial account allocations
- bootnodes

The following elements are NOT supported at the moment:

- hardcoded sync block hashes
- precompile definitions and precompile activation blocks

You can find below links to some of the chainspec files used to define various Ethereum networks:

- [foundation](#) - the public Ethereum mainnet
- [rinkeby](#) - the original Clique based testnet
- [goerli](#) - the new Clique based testnet
- [spaceneth](#) - a private network example with NethDev

1.10 Configuration

Use `/` as the path separator so the configs can be shared between all platforms supported (Linux, Windows, MacOS). `-config`, `-baseDbPath`, and `-log` options are available from the command line to select config file, base DB directory prefix and log level respectively.

1.10.1 DbConfig

BlockCacheSize
BlockInfosDbBlockCacheSize
BlockInfosDbCacheIndexAndFilterBlocks
BlockInfosDbWriteBufferNumber
BlockInfosDbWriteBufferSize
BlocksDbBlockCacheSize
BlocksDbCacheIndexAndFilterBlocks
BlocksDbWriteBufferNumber
BlocksDbWriteBufferSize
CacheIndexAndFilterBlocks
CodeDbBlockCacheSize
CodeDbCacheIndexAndFilterBlocks
CodeDbWriteBufferNumber
CodeDbWriteBufferSize
ConfigsDbBlockCacheSize
ConfigsDbCacheIndexAndFilterBlocks
ConfigsDbWriteBufferNumber
ConfigsDbWriteBufferSize
ConsumerDepositApprovalsDbBlockCacheSize
ConsumerDepositApprovalsDbCacheIndexAndFilterBlocks
ConsumerDepositApprovalsDbWriteBufferNumber
ConsumerDepositApprovalsDbWriteBufferSize
ConsumerReceiptsDbBlockCacheSize
ConsumerReceiptsDbCacheIndexAndFilterBlocks

ConsumerReceiptsDbWriteBufferNumber
ConsumerReceiptsDbWriteBufferSize
ConsumerSessionsDbBlockCacheSize
ConsumerSessionsDbCacheIndexAndFilterBlocks
ConsumerSessionsDbWriteBufferNumber
ConsumerSessionsDbWriteBufferSize
DepositsDbBlockCacheSize
DepositsDbCacheIndexAndFilterBlocks
DepositsDbWriteBufferNumber
DepositsDbWriteBufferSize
EthRequestsDbBlockCacheSize
EthRequestsDbCacheIndexAndFilterBlocks
EthRequestsDbWriteBufferNumber
EthRequestsDbWriteBufferSize
HeadersDbBlockCacheSize
HeadersDbCacheIndexAndFilterBlocks
HeadersDbWriteBufferNumber
HeadersDbWriteBufferSize
PendingTxDbBlockCacheSize
PendingTxDbCacheIndexAndFilterBlocks
PendingTxDbWriteBufferNumber
PendingTxDbWriteBufferSize
ReceiptsDbBlockCacheSize
ReceiptsDbCacheIndexAndFilterBlocks
ReceiptsDbWriteBufferNumber
ReceiptsDbWriteBufferSize
TraceDbBlockCacheSize
TraceDbCacheIndexAndFilterBlocks
TraceDbWriteBufferNumber
TraceDbWriteBufferSize
WriteBufferNumber
WriteBufferSize

1.10.2 DiscoveryConfig

BitsPerHop
BootnodePongTimeout
Bootnodes
BucketsCount
BucketSize
Concurrency
DiscoveryInterval
DiscoveryNewCycleWaitTime
DiscoveryPersistenceInterval
EvictionCheckInterval
IsDiscoveryNodesPersistenceOn
MasterExternalIp
MasterHost
MasterPort
MaxDiscoveryRounds
MaxNodeLifecycleManagersCount
NodeLifecycleManagersCleanupCount
PingMessageVersion
PingRetryCount
PongTimeout
SendNodeTimeout
UdpChannelCloseTimeout

1.10.3 EthStatsConfig

Contact Node owner contact details displayed on the ethstats page. default value: null

Enabled If 'true' then EthStats publishing gets enabled. default value: false

Name Node name displayed on the given ethstats server. default value: null

Secret Password for publishing to a given ethstats server. default value: null

Server EthStats server wss://hostname:port/api/ default value: null

1.10.4 HiveConfig

These items need only be set when testing with Hive (Ethereum Foundation tool)

BlocksDir Path to a directory with additional blocks. default value: "/blocks"

ChainFile Path to a file with a test chain definition. default value: "/chain.rlp"

KeysDir Path to a test key store directory. default value: “/keys”

1.10.5 InitConfig

BaseDbPath Base directoy path for all the nethermind databases. default value: “db”

ChainSpecFormat Format of the chain definition file - genesis (Geth style - not tested recently / may fail) or chainspec (Parity style). default value: “chainspec”

ChainSpecPath Path to the chain definition file (Parity chainspec or Geth genesis file). default value: null

DiscoveryEnabled If ‘false’ then the node does not try to find nodes beyond the bootnodes configured. default value: true

DiscoveryPort UDP port number for incoming discovery connections. default value: 30303

EnableRc7Fix

EnableUnsecuredDevWallet If ‘true’ then it enables the wallet / key store in the application. default value: false

GenesisHash Hash of the genesis block - if the default null value is left then the genesis block validity will not be checked which is useful for ad hoc test/private networks. default value: null

HttpHost Host for JSON RPC calls. Ensure the firewall is configured when enabling JSON RPC. default value: “127.0.0.1”

HttpPort Port number for JSON RPC calls. Ensure the firewall is configured when enabling JSON RPC. default value: 8545

IsMining If ‘true’ then the node will try to seal/mine new blocks default value: false

JsonRpcEnabled Defines whether the JSON RPC service is enabled on node startup at the ‘HttpPort’ default value: false

JsonRpcEnabledModules Defines which RPC modules should be enabled. default value: “Clique,Db,Debug,Eth,Net,Trace,TxPool,Web3”

KeepDevWalletInMemory If ‘true’ then any accounts created will be only valid during the session and deleted when application closes. default value: false

LogDirectory In case of null, the path is set to [applicationDirectiory]logs default value: null

LogFileName Name of the log file generated (useful when launching multiple networks with the same log folder). default value: “log.txt”

P2PPort TPC/IP port number for incoming P2P connections. default value: 30303

PeerManagerEnabled If ‘false’ then the node does not connect to newly discovered peers.. default value: true

ProcessingEnabled If ‘false’ then the node does not download/process new blocks.. default value: true

PubSubEnabled If ‘true’ then it enables the Kafka producer which can be configured to stream the transactions data. default value: false

StaticNodesPath Path to the file with a list of static nodes. default value: “Data/static-nodes.json”

StoreReceipts If set to ‘false’ then transaction receipts will not be stored in the database. default value: true

StoreTraces If set to ‘true’ then the detailed VM trace data will be stored in teh DB (huge data sets). default value: false

SynchronizationEnabled If 'false' then the node does not download/process new blocks.. default value: true

WebSocketsEnabled Defines whether the WebSockets service is enabled on node startup at the 'Http-Port' default value: false

1.10.6 JsonRpcConfig

EnabledModules To be reviewed / duplicate with InitConfig - InitConfig one is used. default value: null

1.10.7 KeyStoreConfig

Cipher

IVSize

Kdf

KdfparamsDklen

KdfparamsN

KdfparamsP

KdfparamsR

KdfparamsSaltLen

KeyStoreDirectory

KeyStoreEncoding

SymmetricEncrypterBlockSize

SymmetricEncrypterKeySize

TestNodeKey

1.10.8 MetricsConfig

Configuration of the Prometheus + Grafana metrics publication. Documentation of the required setup is not yet ready (but the metrics do work and are used by the dev team)

MetricsEnabled If 'true' then the node publishes various metrics to Prometheus at the given interval. default value: false

MetricsIntervalSeconds

default value: 5

MetricsPushGatewayUrl Prometheus URL. default value: "http://localhost:9091/metrics"

NodeName Name displayed in the Grafana dashboard default value: "Nethermind"

1.10.9 NetworkConfig

ActivePeersMaxCount Max number of connected peers. default value: 25

CandidatePeerCountCleanupThreshold

default value: 11000

IsPeersPersistenceOn If 'false' then discovered node list will be cleared on each restart. default value: true

MaxCandidatePeerCount

default value: 10000

MaxPersistedPeerCount

default value: 2000

P2PPingInterval

default value: 10000

P2PPingRetryCount

default value: 3

PeersPersistenceInterval

default value: 5000

PeersUpdateInterval

default value: 100

PersistedPeerCountCleanupThreshold

default value: 2200

StaticPeers List of nodes for which we will keep the connection on. Static nodes are not counted to the max number of nodes limit. default value: null

TrustedPeers Currently ignored. default value: null

1.10.10 SyncConfig

DownloadBodiesInFastSync If set to 'true' then the block bodies will be downloaded in the Fast Sync mode. default value: true

DownloadReceiptsInFastSync If set to 'true' then the receipts will be downloaded in the Fast Sync mode. default value: true

FastBlocks If set to 'true' then in the Fast Sync mode blocks will be first downloaded from the provided PivotNumber downwards. default value: false

FastSync If set to 'true' then the Fast Sync (eth/63) synchronization algorithm will be used. default value: false

PivotHash Hash of the pivot block for the Fast Blocks sync. default value: null

PivotNumber Number of the pivot block for the Fast Blocks sync. default value: null

PivotTotalDifficulty Total Difficulty of the pivot block for the Fast Blocks sync. default value: null

1.10.11 TxPoolConfig

ObsoletePendingTransactionInterval

default value: 15

PeerNotificationThreshold

default value: 5

RemovePendingTransactionInterval

default value: 600

1.10.12 Sample configuration (mainnet)

```
[
  {
    "ConfigModule": "DbConfig"
    "ConfigItems": {
      "BlockCacheSize" : [MISSING_DOCS],
      "BlockInfosDbBlockCacheSize" : [MISSING_DOCS],
      "BlockInfosDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
      "BlockInfosDbWriteBufferNumber" : [MISSING_DOCS],
      "BlockInfosDbWriteBufferSize" : [MISSING_DOCS],
      "BlocksDbBlockCacheSize" : [MISSING_DOCS],
      "BlocksDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
      "BlocksDbWriteBufferNumber" : [MISSING_DOCS],
      "BlocksDbWriteBufferSize" : [MISSING_DOCS],
      "CacheIndexAndFilterBlocks" : [MISSING_DOCS],
      "CodeDbBlockCacheSize" : [MISSING_DOCS],
      "CodeDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
      "CodeDbWriteBufferNumber" : [MISSING_DOCS],
      "CodeDbWriteBufferSize" : [MISSING_DOCS],
      "ConfigsDbBlockCacheSize" : [MISSING_DOCS],
      "ConfigsDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
      "ConfigsDbWriteBufferNumber" : [MISSING_DOCS],
      "ConfigsDbWriteBufferSize" : [MISSING_DOCS],
      "ConsumerDepositApprovalsDbBlockCacheSize" : [MISSING_DOCS],
      "ConsumerDepositApprovalsDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
      "ConsumerDepositApprovalsDbWriteBufferNumber" : [MISSING_DOCS],
      "ConsumerDepositApprovalsDbWriteBufferSize" : [MISSING_DOCS],
      "ConsumerReceiptsDbBlockCacheSize" : [MISSING_DOCS],
      "ConsumerReceiptsDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
      "ConsumerReceiptsDbWriteBufferNumber" : [MISSING_DOCS],
      "ConsumerReceiptsDbWriteBufferSize" : [MISSING_DOCS],
      "ConsumerSessionsDbBlockCacheSize" : [MISSING_DOCS],
      "ConsumerSessionsDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
      "ConsumerSessionsDbWriteBufferNumber" : [MISSING_DOCS],
      "ConsumerSessionsDbWriteBufferSize" : [MISSING_DOCS],
      "DepositsDbBlockCacheSize" : [MISSING_DOCS],
      "DepositsDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
      "DepositsDbWriteBufferNumber" : [MISSING_DOCS],
      "DepositsDbWriteBufferSize" : [MISSING_DOCS],
      "EthRequestsDbBlockCacheSize" : [MISSING_DOCS],
      "EthRequestsDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
      "EthRequestsDbWriteBufferNumber" : [MISSING_DOCS],
      "EthRequestsDbWriteBufferSize" : [MISSING_DOCS],
      "HeadersDbBlockCacheSize" : [MISSING_DOCS],
      "HeadersDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
      "HeadersDbWriteBufferNumber" : [MISSING_DOCS],
      "HeadersDbWriteBufferSize" : [MISSING_DOCS],
      "PendingTxDbBlockCacheSize" : [MISSING_DOCS],
      "PendingTxDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
      "PendingTxDbWriteBufferNumber" : [MISSING_DOCS],
```

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```

    "PendingTxsDbWriteBufferSize" : [MISSING_DOCS],
    "ReceiptsDbBlockCacheSize" : [MISSING_DOCS],
    "ReceiptsDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
    "ReceiptsDbWriteBufferNumber" : [MISSING_DOCS],
    "ReceiptsDbWriteBufferSize" : [MISSING_DOCS],
    "TraceDbBlockCacheSize" : [MISSING_DOCS],
    "TraceDbCacheIndexAndFilterBlocks" : [MISSING_DOCS],
    "TraceDbWriteBufferNumber" : [MISSING_DOCS],
    "TraceDbWriteBufferSize" : [MISSING_DOCS],
    "WriteBufferNumber" : [MISSING_DOCS],
    "WriteBufferSize" : [MISSING_DOCS],
  }
},
{
  "ConfigModule": "DiscoveryConfig"
  "ConfigItems": {
    "BitsPerHop" : [MISSING_DOCS],
    "BootnodePongTimeout" : [MISSING_DOCS],
    "Bootnodes" : [MISSING_DOCS],
    "BucketsCount" : [MISSING_DOCS],
    "BucketSize" : [MISSING_DOCS],
    "Concurrency" : [MISSING_DOCS],
    "DiscoveryInterval" : [MISSING_DOCS],
    "DiscoveryNewCycleWaitTime" : [MISSING_DOCS],
    "DiscoveryPersistenceInterval" : [MISSING_DOCS],
    "EvictionCheckInterval" : [MISSING_DOCS],
    "IsDiscoveryNodesPersistenceOn" : [MISSING_DOCS],
    "MasterExternalIp" : [MISSING_DOCS],
    "MasterHost" : [MISSING_DOCS],
    "MasterPort" : [MISSING_DOCS],
    "MaxDiscoveryRounds" : [MISSING_DOCS],
    "MaxNodeLifecycleManagersCount" : [MISSING_DOCS],
    "NodeLifecycleManagersCleanupCount" : [MISSING_DOCS],
    "PingMessageVersion" : [MISSING_DOCS],
    "PingRetryCount" : [MISSING_DOCS],
    "PongTimeout" : [MISSING_DOCS],
    "SendNodeTimeout" : [MISSING_DOCS],
    "UdpChannelCloseTimeout" : [MISSING_DOCS],
  }
},
{
  "ConfigModule": "EthStatsConfig"
  "ConfigItems": {
    "Contact" : null,
    "Enabled" : false,
    "Name" : null,
    "Secret" : null,
    "Server" : null,
  }
},
{
  "ConfigModule": "HiveConfig"
  "ConfigItems": {
    "BlocksDir" : "/blocks",
    "ChainFile" : "/chain.rlp",
    "KeysDir" : "/keys",
  }
}

```

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```

},
{
  "ConfigModule": "InitConfig"
  "ConfigItems": {
    "BaseDbPath" : "db",
    "ChainSpecFormat" : "chainspec",
    "ChainSpecPath" : null,
    "DiscoveryEnabled" : true,
    "DiscoveryPort" : 30303,
    "EnableRc7Fix" : [MISSING_DOCS],
    "EnableUnsecuredDevWallet" : false,
    "GenesisHash" : null,
    "HttpHost" : "127.0.0.1",
    "HttpPort" : 8545,
    "IsMining" : false,
    "JsonRpcEnabled" : false,
    "JsonRpcEnabledModules" : "Clique, Db, Debug, Eth, Net, Trace, TxPool, Web3",
    "KeepDevWalletInMemory" : false,
    "LogDirectory" : null,
    "LogFileName" : "log.txt",
    "P2PPort" : 30303,
    "PeerManagerEnabled" : true,
    "ProcessingEnabled" : true,
    "PubSubEnabled" : false,
    "StaticNodesPath" : "Data/static-nodes.json",
    "StoreReceipts" : true,
    "StoreTraces" : false,
    "SynchronizationEnabled" : true,
    "WebSocketsEnabled" : false,
  }
},
{
  "ConfigModule": "JsonRpcConfig"
  "ConfigItems": {
    "EnabledModules" : null,
  }
},
{
  "ConfigModule": "KeyStoreConfig"
  "ConfigItems": {
    "Cipher" : [MISSING_DOCS],
    "IVSize" : [MISSING_DOCS],
    "Kdf" : [MISSING_DOCS],
    "KdfparamsDklen" : [MISSING_DOCS],
    "KdfparamsN" : [MISSING_DOCS],
    "KdfparamsP" : [MISSING_DOCS],
    "KdfparamsR" : [MISSING_DOCS],
    "KdfparamsSaltLen" : [MISSING_DOCS],
    "KeyStoreDirectory" : [MISSING_DOCS],
    "KeyStoreEncoding" : [MISSING_DOCS],
    "SymmetricEncrypterBlockSize" : [MISSING_DOCS],
    "SymmetricEncrypterKeySize" : [MISSING_DOCS],
    "TestNodeKey" : [MISSING_DOCS],
  }
},
{
  "ConfigModule": "MetricsConfig"

```

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```

"ConfigItems": {
  "MetricsEnabled" : false,
  "MetricsIntervalSeconds" : 5,
  "MetricsPushGatewayUrl" : "http://localhost:9091/metrics",
  "NodeName" : "Nethermind",
}
},
{
"ConfigModule": "NetworkConfig"
"ConfigItems": {
  "ActivePeersMaxCount" : 25,
  "CandidatePeerCountCleanupThreshold" : 11000,
  "IsPeersPersistenceOn" : true,
  "MaxCandidatePeerCount" : 10000,
  "MaxPersistedPeerCount" : 2000,
  "P2PPingInterval" : 10000,
  "P2PPingRetryCount" : 3,
  "PeersPersistenceInterval" : 5000,
  "PeersUpdateInterval" : 100,
  "PersistedPeerCountCleanupThreshold" : 2200,
  "StaticPeers" : null,
  "TrustedPeers" : null,
}
},
{
"ConfigModule": "SyncConfig"
"ConfigItems": {
  "DownloadBodiesInFastSync" : true,
  "DownloadReceiptsInFastSync" : true,
  "FastBlocks" : false,
  "FastSync" : false,
  "PivotHash" : null,
  "PivotNumber" : null,
  "PivotTotalDifficulty" : null,
}
},
{
"ConfigModule": "TxPoolConfig"
"ConfigItems": {
  "ObsoletePendingTransactionInterval" : 15,
  "PeerNotificationThreshold" : 5,
  "RemovePendingTransactionInterval" : 600,
}
},
]

```

1.11 CLI

CLI access is not currently included in the Nethermind launcher but will be added very soon.

1.11.1 clique

- clique.discard(address) -

- `clique.getSigners()` -
- `clique.getSignersAnnotated()` -
- `clique.getSignersAtHash(hash)` -
- `clique.getSignersAtHashAnnotated(hash)` -
- `clique.getSignersAtNumber(number)` -
- `clique.getSnapshot()` -
- `clique.getSnapshotAtHash(hash)` -
- `clique.propose(address, vote)` -

1.11.2 debug

- `debug.getBlockRlp(number)` -
- `debug.getBlockRlpByHash(hash)` -
- `debug.config(category, name)` -
- `debug.traceBlock(hash, options)` -
- `debug.traceBlockByHash(hash, options)` -
- `debug.traceBlockByNumber(number, options)` -
- `debug.traceTransaction(hash, options)` -
- `debug.traceTransactionByBlockAndIndex(hash, options)` -
- `debug.traceTransactionByBlockhashAndIndex(hash, options)` -

1.11.3 diag

- `diag.cliVersion` -

1.11.4 eth

- `eth.blockNumber` -
- `eth.getBalance(address, blockParameter)` -
- `eth.getBlockByHash(hash, returnFullTransactionObjects)` -
- `eth.getBlockByNumber(blockParameter, returnFullTransactionObjects)` -
- `eth.getBlockTransactionCountByHash(hash)` -
- `eth.getBlockTransactionCountByNumber(blockParameter)` -
- `eth.getCode(address, blockParameter)` -
- `eth.getStorageAt(address, positionIndex, blockParameter)` -
- `eth.getTransactionByBlockNumberAndIndex(blockParameter, index)` -
- `eth.getTransactionReceipt(txHash)` -
- `eth.getUncleCountByBlockNumber(blockParameter)` -

- eth.protocolVersion -
- eth.sendEth(from, to, amountInEth) -
- eth.sendWei(from, to, amountInWei) -

1.11.5 net

- net.localEnode -
- net.peerCount -
- net.version -

1.11.6 node

- node.address -
- node.enode -
- node.setNodeKey(key) -
- node.switch(uri) -
- node.switchLocal(uri) -
- node.uri -

1.11.7 parity

- parity.pendingTransactions() - Returns the pending transactions using Parity format

1.11.8 personal

- personal.listAccounts -
- personal.lockAccount(addressHex) -
- personal.newAccount(password) -
- personal.unlockAccount(addressHex, password) -

1.11.9 system

- system.getVariable(name, defaultValue) -
- system.memory -

1.11.10 trace

- trace.replayBlockTransactions(blockNumber, traceTypes) - Replays all transactions in a block returning the requested traces for each transaction.
- trace.replayTransaction(txHash, traceTypes) - Replays a transaction, returning the traces.
- trace.block(blockNumber) - Returns traces created at given block.

- `trace.transaction(txHash)` - Returns all traces of given transaction

1.11.11 web3

- `web3.clientVersion` -
- `web3.sha3(data)` -
- `web3.toDecimal(hex)` -

1.12 JSON RPC

JSON RPC is available via HTTP and WS (needs to be explicitly switched on in the `InitConfig`). Some of the methods listed below are not implemented by Nethermind (they are marked).

1.12.1 admin

- `admin_addPeer(enode)`
- [NOT IMPLEMENTED] `admin_dataDir()`
- [NOT IMPLEMENTED] `admin_nodeInfo()`
- `admin_peers()`
- `admin_removePeer(enode)`
- [NOT IMPLEMENTED] `admin_setSolc()`

1.12.2 clique

- `clique_discard(signer)`
- `clique_getSigners()`
- `clique_getSignersAnnotated()`
- `clique_getSignersAtHash(hash)`
- `clique_getSignersAtHashAnnotated(hash)`
- `clique_getSignersAtNumber(number)`
- `clique_getSnapshot()`
- `clique_getSnapshotAtHash(hash)`
- `clique_propose(signer, vote)`

1.12.3 data

- `data_streamBlocks(startBlockNumber, endBlockNumber)`

1.12.4 debug

- [NOT IMPLEMENTED]debug_dumpBlock(blockParameter)
- [NOT IMPLEMENTED]debug_gcStats()
- debug_getBlockRlp(number)
- debug_getBlockRlpByHash(hash)
- debug_getConfigValue(category, name)
- [NOT IMPLEMENTED]debug_getFromDb(dbName, key)
- [NOT IMPLEMENTED]debug_memStats(blockParameter)
- [NOT IMPLEMENTED]debug_seedHash(blockParameter)
- [NOT IMPLEMENTED]debug_setHead(blockParameter)
- debug_traceBlock(blockRlp, options)
- debug_traceBlockByHash(blockHash, options)
- debug_traceBlockByNumber(number, options)
- [NOT IMPLEMENTED]debug_traceBlockFromFile(fileName, options)
- debug_traceTransaction(transactionHash, options)
- debug_traceTransactionByBlockAndIndex(blockParameter, txIndex, options)
- debug_traceTransactionByBlockhashAndIndex(blockHash, txIndex, options)

1.12.5 eth

- eth_accounts()
- eth_blockNumber()
- eth_call(transactionCall, blockParameter)
- eth_coinbase()
- eth_estimateGas(transactionCall)
- eth_gasPrice()
- eth_getBalance(address, blockParameter)
- eth_getBlockByHash(blockHash, returnFullTransactionObjects)
- eth_getBlockByNumber(blockParameter, returnFullTransactionObjects)
- eth_getBlockTransactionCountByHash(blockHash)
- eth_getBlockTransactionCountByNumber(blockParameter)
- eth_getCode(address, blockParameter)
- eth_getFilterChanges(filterId)
- eth_getFilterLogs(filterId)
- eth_getLogs(filter)
- eth_getStorageAt(address, positionIndex, blockParameter)

- `eth_getTransactionByBlockHashAndIndex(blockHash, positionIndex)`
- `eth_getTransactionByBlockNumberAndIndex(blockParameter, positionIndex)`
- `eth_getTransactionByHash(transactionHash)`
- `eth_getTransactionCount(address, blockParameter)`
- `eth_getTransactionReceipt(txHashData)`
- `eth_getUncleByBlockHashAndIndex(blockHashData, positionIndex)`
- `eth_getUncleByBlockNumberAndIndex(blockParameter, positionIndex)`
- `eth_getUncleCountByBlockHash(blockHash)`
- `eth_getUncleCountByBlockNumber(blockParameter)`
- `[NOT IMPLEMENTED]eth_getWork()`
- `eth_hashrate()`
- `eth_mining()`
- `eth_newBlockFilter()`
- `eth_newFilter(filter)`
- `eth_newPendingTransactionFilter()`
- `eth_protocolVersion()`
- `eth_sendRawTransaction(transaction)`
- `eth_sendTransaction(transactionForRpc)`
- `eth_sign(addressData, message)`
- `eth_snapshot()`
- `[NOT IMPLEMENTED]eth_submitHashrate(hashRate, id)`
- `[NOT IMPLEMENTED]eth_submitWork(nonce, headerPowHash, mixDigest)`
- `eth_syncing()`
- `eth_uninstallFilter(filterId)`

1.12.6 net

- `net_dumpPeerConnectionDetails()`
- `net_listening()`
- `net_localEnode()`
- `net_peerCount()`
- `net_version()`

1.12.7 parity

- `parity_pendingTransactions()`

1.12.8 personal

- [NOT IMPLEMENTED]personal_ecRecover(message, signature)
- [NOT IMPLEMENTED]personal_importRawKey(keyData, passphrase)
- personal_listAccounts()
- personal_lockAccount(address)
- personal_newAccount(passphrase)
- [NOT IMPLEMENTED]personal_sendTransaction(transaction, passphrase)
- [NOT IMPLEMENTED]personal_sign(message, address, passphrase)
- personal_unlockAccount(address, passphrase)

1.12.9 trace

- trace_block(numberOrTag)
- [NOT IMPLEMENTED]trace_call(message, traceTypes, numberOrTag)
- [NOT IMPLEMENTED]trace_callMany(calls)
- [NOT IMPLEMENTED]trace_filter(fromBlock, toBlock, toAddress, after, count)
- [NOT IMPLEMENTED]trace_get(txHash, positions)
- [NOT IMPLEMENTED]trace_rawTransaction(data, traceTypes)
- trace_replayBlockTransactions(numberOrTag, traceTypes)
- trace_replayTransaction(txHash, traceTypes)
- trace_transaction(txHash)

1.12.10 txpool

- txpool_content()
- txpool_inspect()
- txpool_status()

1.12.11 web3

- web3_clientVersion()
- web3_sha3(data)

1.13 Supported Platforms

- Windows 10
- other Windows (submit a PR whenever you test on a specific Windows version)
- macOS (submit a PR whenever you test on a specific macOS release)

- Ubuntu 16.04
- Ubuntu 18.04
- Ubuntu 18.10
- Ubuntu 19.04 (may fail due to openssl incompatibility)
- other Linux (submit a PR whenever you test on a specific Linux distribution)
- Raspberry PI (currently only 0.9.6 build available)

1.14 Firewall Configuration

Keep 8545 (or 8000-9000) closed except for the trusted machines - this is the JSON RPC port which gives admin access to the node.

Keep TCP 30303 (or 30300-30400) open for the outside world so other nodes can connect to your node.

1.15 Hardware Requirements

Generally the faster IO operations the better. For this reason Digital Ocean and UpCloud are so far the best cloud providers we have tested when running Nethermind nodes.

Goerli Fast Sync 1GB disk space | 1GB RAM | 1 Core CPU

Mainnet Fast Sync 60GB disk space | 8GB RAM | 2 Cores CPU

Rinkeby Fast Sync 20GB | 4GB RAM | 2 Cores CPU

Mainnet Full Archive 3TB disk space | 20GB RAM | 4 Cores CPU

1.16 Security

DO NOT treat Nethermind 0.9.9 as a secure way of handling your mainnet ETH funds!

JSON RPC endpoint (port 8545) should not be exposed publicly (should be behind the firewall).

Nethermind is thoroughly tested but the more popular it will get the more likely it will be the target of client-specific attacks. Generally you should always consider running backup client nodes implemented by a different team for any critical operations.

For non-mainnet signing you can use dev wallet configurations.

The private key from which the node ID is derived is stored on disk (not protected by password).

1.17 Docker

1.17.1 Using an existing image

<https://hub.docker.com/r/nethermind/nethermind/>

Docker pull command:


```
docker pull nethermind/nethermind
```

In order to start Nethermind.Runner, simply run:

```
docker run -it nethermind/nethermind
```

To enable JSON RPC, publish port 8345 and set `NETHERMIND_INITCONFIG_JSONRPCENABLED=true`:

```
docker run -it -p 8345:8345 -p 30312:30312 -e NETHERMIND_INITCONFIG_
↪JSONRPCENABLED=true nethermind/nethermind
```

To switch the network, set `NETHERMIND_CONFIG` variable (default value is mainnet).

Available configurations

- mainnet
- goerli
- rinkeby
- ropsten

For example:

```
docker run -it -e NETHERMIND_CONFIG=goerli nethermind/nethermind
```

It's possible to modify each configuration property via environment variable, using a simple convention:

```
NETHERMIND_{MODULE}_{PROPERTY}
```

For example:

```
NETHERMIND_INITCONFIG_NETWORKENABLED=true
```

You can find all of the possible settings [here](#).

To fully override a configuration file, you need to use a volume:

```
-v $/home/mainnet.cfg:/nethermind/configs/mainnet.cfg
```

In order to map an internal database to a local volume, you need to map `/nethermind/nethermind_db/`:

```
-v /tmp/nethermind_db:/nethermind/nethermind_db
```

1.17.2 Building an image

Dockerfile can be found in the repository [root](#) and it comes with 2 flavors:

- `Dockerfile` - requires to have a cloned repository in order to build an image.
- `Dockerfile_full` - doesn't require to have a cloned repository, as it will download it during the first step.

In order to build the images, run either:

```
docker build -t nethermind .
```

or:

```
docker build -f Dockerfile_full -t nethermind .
```

Depending on the chosen version.

Example usage of the locally created docker-image:

```
docker run -it -e NETHERMIND_CONFIG=goerli nethermind .
```

1.18 Contact

Reach out to Nethermind team on [Gitter](#)

Send us mail at [hello \[at\] nethermind \[dot\] io](mailto:hello@nethermind.io)