N-DASH USER MANUAL

N-DASH Version 1.1

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This is a modified version of the G-DASH manual for Gulden by Bastijn Koopmans.

Adapted for Novo by Frans van Aernsbergen.

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Introduction

Summary

N-DASH is a lightweight, responsive, web-based user interface for Novo users who run a wallet, node, witnessing or mining account, or all of the above on a Linux server (i.e. an Ubuntu VPS or a Raspberry Pi). With this dashboard, users can keep an eye on their Novo server and control their node and witnessing account without the need of a terminal. It also includes the option to control a Novo wallet, a holder account and a mining account.

N-DASH is derived from G-DASH.

About G-DASH (Bastijn)

When the PoW^2 whitepaper was released and the witness functionality was described, I started thinking about a way to have a wallet running 24 hours a day, 7 days a week and combining it with the option of running a full node to strengthen the network. Leaving a computer running with the wallet software day and night is a waste of energy (and cost), and renting a server for this purpose would be a bit overkill as well. Hence I started experimenting on a headless Raspberry Pi (a mini-computer without a screen/mouse/keyboard). The board itself costs about 30 Euro, and with a case, SD card, etc it is still a cheap computer fully capable of running a Gulden node.

So, I got everything working on the Pi. My Gulden node had incoming connections. Cool! But every time I wanted to check the node, I had to log in to my Pi and type a few commands to eventually see a load of text and numbers on my screen. “I should make a web interface for this, so I don’t have to log in every time” was my thought. That said, I started a small project that gave me some simple output. However, this was still the same load of text and numbers.

I like dashboards and use it every day (like Google Analytics, the status of my servers at work, etc), so I started with a simple dashboard for Gulden on Linux. While creating the dashboard, I found more people from the Gulden community were interested in this project and could benefit from this. The small project became a real project. I spoke with a few people who had a Pi collecting dust or some space left on their VPS/server and were happy to help testing the software and give their opinion to improve the software. So this project moved from a “5-minute quick and dirty” project, to an “actual project” to a “wow, 10 people are testing the software” project.

In the first year, many beta versions were pushed and everyone could download the software and test it out before a full release (version 1) was ready.

Installation

System requirements

A Linux server running the following packages:

- curl
- apache2
- php (>5.3)
- libapache2-mod-php
- php-curl
- php-json
- php-cli

Step-by-step installation instructions (Linux Debian)

Introduction

These instructions are broken down in different parts and are based on an installation on Linux Debian. If you have never done anything with Linux, start at the beginning. If you are a more experienced user, check each step carefully and skip the steps you don't need (or already have done). Note that all the directories mentioned below can be changed to other directories. For the guide below I used the following folders:

- Novo base folder: /opt/novo/
- Novo binaries: /opt/novo/novo/
- Novo data directory: /opt/novo/datadir/
- N-DASH directory: /var/www/n-dash/

The versions used for this guide are currently:

N-DASH: 1.1

Novo: 1.0.10

Configure Apache

- Install Curl, Apache and PHP:

  ```
  > sudo apt-get -y install curl apache2 php libapache2-mod-php php-curl php-json php-cli
  ```

- After installing these programs, you might see this message: "Warning: Unit file of apache2.service changed on disk, 'systemctl daemon-reload' recommended." If so, run the following command:

  ```
  > sudo systemctl daemon-reload
  ```

- Edit the settings of the apache installation (i.e. the root folder of the webserver)

  The root folder of your webserver can be edited by "root" (sudo) in /etc/apache2/sites-enabled/000default.conf

- Replace the root folder (default is /var/www/html) by the folder where you want to install N-DASH (in this example /var/www/n-dash).

Install Novo

- Download the latest Novo release from https://github.com/novocurrency/novocurrency-core/releases
- Untar the archive:

  ```
  > tar xfv Novo-1.0.10-arm64-linux.tar.gz -C /opt/novo/novo
  ```

- Make the Novo files executable:

  ```
  > sudo chmod -R a+rwx /opt/novo/novo
  ```

- Make your Linux user the owner of the novo folder:

  ```
  > sudo chown -R youruser:youruser /opt/novo/
  ```

- Create a novo.conf file in the datadir using the text editor of your choice (i.e ‘vim’)

  ```
  > vim /opt/novo/datadir/novo.conf
  ```

- Add the required configuration commands:

  ```
  maxconnections=nn

  rpcuser=xxx

  rpcpassword=yyy

  minimallogging=1

  txindex=1
  ```

  if you omit txindex ‘Total value out’ will show N/A on the dashboard!

  (xxx and yyy are securely generated settings of your own that you have chosen).

  nn = 20 is the recommended setting for low end machines, for higher system specifications set this to a higher number. The Raspberry Pi can handle at least 60 without problems. Save the file (with vim press ‘ZZ’)

Sample Novo start script /opt/novo/novostart:

```
#!/bin/bash
if [ "$1" = "nopeers" -o "$2" = "nopeers" ];
then
    echo "Removing peers.dat"
    rm /opt/novo/datadir/peers.dat
    sleep 3
fi
if [ "$1" = "nolog" -o "$2" = "nolog" ];
then
    echo "Removing debug.log"
    rm /opt/novo/datadir/debug.log
    sleep 3
fi
echo "Starting Novo-daemon"
/opt/novo/novo/Novo-daemon -datadir=/opt/novo/datadir -daemon
```

Sample Novo stop script /opt/novo/novostop:

```
#!/bin/bash
echo "Stopping Novo-daemon"
/opt/novo/novo/Novo-cli -datadir=/opt/novo/datadir stop
```

Install N-DASH

- Go to your /home/youruser folder:

  ```
  > cd /home/youruser
  ```

- Download the latest release of N-DASH from GitHub:

  ```
  > wget https://github.com/juggernt/N-DASH/archive/v1.1.tar.gz
  ```

- If not done already. Create the folder where you want to install N-DASH:

  ```
  > sudo mkdir /var/www/n-dash
  ```

- Extract the file and copy to the web folder of your Linux (note: typically /var/www/ but you can change this to whichever directory inside the "www" folder):

  ```
  > tar -xvf v1.1.tar.gz
  ```

  ```
  > sudo cp -r N-DASH-1.1/* /var/www/n-dash
  ```

- Copy the sample config to create an actual config file:

  ```
  > cd /var/www/n-dash/config
  ```

  ```
  > cp config_sample.php config.php
  ```

- Make www-data the owner of the web folder:

  ```
  > sudo chown -R www-data:www-data /var/www/n-dash/
  ```

- Restart apache to apply any changes:

  ```
  > sudo systemctl restart apache2
  ```

- Go to the webaddress of your Linux and setup N-DASH (follow the instructions)

  Note that the website will not work fully until Novo has fully synced the first time (this can take an hour or so). You can see the progress of the sync in the dashboard main screen.

Configuration

Opening N-DASH for the first time

The first time you open N-DASH you will automatically be redirected to the settings page. Please go through these settings and read through all the options carefully. All settings are divided in tabs, and most settings are self explanatory or have an explanation below that specific setting.

N-DASH

In the N-DASH settings tab you can set up the general settings for the dashboard.

N-DASH username: The username you want to use to login to the dashboard.

N-DASH password: The password you want to use to login to the dashboard.

Dashboard web address: The address that you see in the address bar of your browser (i.e. http://192.168.1.10).

Disable login screen: If this checkbox is enabled, the login screen is disabled. Note that everyone in your network can access the dashboard without the need to login. If you forwarded your N-DASH instance in your router to make it accessible from outside your network, and you have disabled the login screen, people who know or guess your IP address can enter N-DASH. Please make sure you know what you are doing if you enable this checkbox.

Use 2-factor authentication: With this setting enabled you need to scan the QR code shown below this checkbox using a 2FA app on your phone (i.e. Authy or Google Authenticator). If this setting is enabled, you will need to enter a 6 digit code, which changes every 30 seconds, next to your username and password when you log in to N-DASH. Make sure to save this QR code in a safe place. If you lose access to your phone or somehow lose the app, you will not be able to login the usual way. If this is the case, please refer to the "Troubleshooting" section in this document on how to solve this.

Notifications

N-DASH allows you to send notifications to your phone or browser using PushBullet. A script in the background will check every 5 minutes for actions related to you wallet, witness accounts and the Novo server, and then sends a message using the PushBullet service. The last message that was sent is stored in N-DASH and is visible underneath the help text.

PushBullet access token: An Access-Token is needed for the service to know where to send the messages to. To get an Access-Token you must create an account (logon with your GMail or Facebook account) on their website and on the account settings page you can find your access token. If you want the notification to appear on your smartphone, you must install the PushBullet app.

Send a notification if the Novo server is down: Check this box if you want to receive a message when your Novo-daemon server is down. You also receive a message when the server is up again.

Send a notification if an update of N-DASH is available: Receive a push message if there is a new version available for N-DASH.

Send a notification when there is an update for Novo: Receive a push message if there is a new version available for Novo.

Warning: Following notifications not supported by N-DASH at the time!

Send a notification when Novos are received: Receive a push message when you have received Novo on your wallet.

Send a notification on holding activity: Receive a push message when a holding action occurred.

Node

Your Novo application automatically runs as a node, but it can also become a full node. The difference is that you only connect to other people to receive the blocks (outbound) when you are a normal node, opposed to also receiving connections from other nodes (inbound) that receive block information from your device. Full nodes are needed to secure the network and are also needed to supply block information to others (like your Novo desktop wallet or phone wallet, it's always searching for 8 nodes).

Warning: these options are not supported by N-DASH at the time!

Upload node statistics: If you enable this feature, the Novo instances you connect to, and the instances that connect to you, are visible on the NovoNodes map (currently non-existent). Don't worry about the safety, as it's not possible to find the exact address, but only the city where this Novo app is currently.

Allow Node Requests: This feature helps people who have trouble being found as a full node. Users can request to be added by others, and if this is enabled on your node, you will help this person by adding him to your outbound connections for a maximum of 24 hours. This gives the network enough time to pick this person up, so the device can be found by others. This in turn again strengthens the network.

Wallet

The wallet is where you can store your Novo. There is currently one option in the wallet.

Rate provider: The exchange where the current Novo rate is fetched from. This is used to calculate what the value of Novo is in Euros. The current choices are Stex and CoinGecko.

Novo

The settings in the Novo tab are used for connecting to the Novo application. This connection is needed for N-DASH to function, as it's getting the information directly from the Novo application.

Novo-daemon location: The location of the Novo binaries on the server. This can also be a remote connection, although this is not recommended.

Data location: The location of the data directory containing the blockchain, wallet.dat and the novo.conf.

RPC username: The RPC (Remote Procedure Call) username as shown in the novo.conf. This is needed to talk to Novo.

RPC Password: The RPC password as shown in the novo.conf. This is needed to talk to Novo.

Host address: The address of the Novo application where N-DASH has to connect to. Usually this is the same server, so the default is "localhost" or "127.0.0.1".

Host port: The port the RPC server is listening on. The default is 9234, and unless changed manually in the novo.conf file or if running on testnet (9236), this shouldn't be changed.

Using N-DASH

Overview (main dashboard screen)

The overview page shows the basic information about the Novo application running. Here the version of Novo and sync status can be found, as well as information on the last 10 blocks and current status of inbound/outbound connections and server load.

Novo-daemon

The information on this page shows the server health (CPU and memory usage, and current temperature of the CPU). The Novo-daemon page also shows more detailed information about the current sync status, time online and number of blocks on the network as well as the number of synced blocks.

The block# is a link to dactual.com with detailed information regarding this block.

Node

If this instance of Novo is set up to be a full node, this page shows information about the number of inbound connections to the Novo Daemon. It also gives a list of the locations and version numbers that are connected to the server.

Wallet

Accounts

The wallet works the same as the desktop wallet. It shows a list of the accounts available in the wallet and new accounts can be created using the "(Add account)" link at the bottom of the account list. The amount of Novo listed on the top of the account list is the total amount available in your wallet, including the Novo locked in a witness account. When multiple accounts are created, the details of each account are shown once they are clicked on. It's also possible to rename the account by clicking on "(Rename account)" in the header of the second overview. The lock in the top left corner shows if your wallet is locked (green) or unlocked (red). When a transaction has been made to another wallet, it's possible the lock turns red, as it needs to unlock in order to send Novo. It will automatically lock again after that and the lock should turn green.

Account details

When an account is selected, the details show up in the second overview. If no account is selected, it automatically gets the information from the first account. This overview shows the balance of the selected account, and the receiving address together with a QR code that can be scanned by a mobile wallet.

Account actions

When using the wallet page for the first time after installation, N-DASH will ask you to either encrypt your wallet or to recover a wallet using the recovery phrase.

If the wallet is completely set up and encrypted, other actions become available.

Change wallet password: Change the encryption password of your wallet. This password is needed to send funds or to lock Novos in a witness account.

Show the recovery phrase: When this option is selected, it will ask for the encryption password as mentioned above. If the correct password is supplied, N-DASH shows the 12 words with which the wallet can be recovered. It is very important you write these 12 words down if you have funds in your account!

Create a transaction: This option allows you to send Novo to another Novo address.

Transaction history

The transaction history shows the 30 most recent transactions made with this account. This number is limited (as opposed to the desktop or mobile app) as all data is fetched directly from the Novo application and is not stored anywhere on your device.

Holding

The holding screen holds all the information about the general holding network activity, as well as the holder accounts on this wallet.

The holding network overview

The overview shows several details about the holding network. The current phase (information on the different phases can be found on Gulden.com), the number of holder accounts, the number of Novo locked and the network weight.

How to create a holder account

There are 2 options to create a witness account. The first one can be done by clicking on "Create account", which will create a local account and can only be funded from within the wallet N-DASH is running on. The second option is importing a holder key from another Novo wallet. This is the most used option and allows to create a holder account on the primary Novo wallet (for example a PC) and use the holder key to be imported in N-DASH. With the latter option the holding account can be managed by the desktop application, as well as by N-DASH.

Create a local holder account

Click on the "Create account" link in the witness actions list and give the account a name. It will then appear in the list and by clicking on the cog in the top right corner of the witness account the option appears to fund the account. The pop-up screen will ask where the funds should be gathered from (from which local account) and for how long the funds should be locked. The wallet password is the same password as used for the wallet functionality in N-DASH and if this is not changed from the default the password is "changeme". After funding the account, the statistics will reload and the account is ready to witness after 100 confirmations.

Importing a holding account

To import a holding key from another app, the link "Import holding key" can be used. The pop-up will ask for an account name (this doesn't have to be the same name as where the account was created from). The holder key can then be copied from the desktop app and inserted in N-DASH. Note that the whole key should be imported starting from "novo://" and ending the a number after a "#".

Note that statistics can be different in N-DASH and on the desktop. The key imported in N-DASH is a readonly key, so if a holding action is performed on the desktop this is not visible on N-DASH and there might be a difference in the number of earnings and the total amount of Novo available compared to the statistics on the desktop app (which can read the information from both instances).

Withdraw earnings

The cog on the right side of the holder account has the option to withdraw the earnings to any Novo address.

In N-DASH an option is added to extend a holding account.

Mining

The mining screen handles mining of Novo and is an enhancement to G-DASH.
Novo allows only 1 mining user.
Mining is only feasible on a sufficiently fast system. A Pi isn’t suited to mine!

Create a mining account

Before you can start mining Novos you have to create a mining account.
After that you can rename the account or delete it.

Start and stop mining

To start mining you must choose the #threads you want to make available on your system (the maximum is 8). Likewise you must specify the amount of memory you want to make available for the mining process (in steps of 512MB with a maximum of 4GB).

After that you can activate mining by pressing the ‘Start Mining’ button. When mining is active statistics are shown about the performance of the mining process.

The mining process can be stopped by pressing ‘Stop Mining’.

Change mining reward address

You can change the address where mining rewards are send to another valid Novo address.

Advanced settings pages

Config Check

If there are problems with Novo or with N-DASH, this page can be used as a reference for where the problem may come from. It checks if you have all the required packages installed on the device, and if required files are available and accessible. At the bottom it checks if the details that were entered in the Novo settings page (RPC username and password) match with the novo.conf file. If this is not the case, N-DASH can't connect to Novo.

Prerequisites: This part shows a list of all the packages needed by N-DASH and Novo to function on the server. If one of the packages is red, it needs to be installed.

Novo: The Novo checks contain a list of files and their file permissions. If the file permissions of the files are not set correctly, and there are problems with the Novo installation, this could be the cause. The most important permissions are:

- novo.conf is readable by N-DASH.
- Novo-daemon is executable.
- Novo-cli is executable.

The "least important" one is the debug.log file. As N-DASH contains a function to read the log file from the Debug Console, it could happen an error is thrown saying the file is not readable. This is nothing to worry about, it only means the file can not be accessed from within N-DASH and should be accessed directly on the server. To change the permissions of the debug.log to being readable by N-DASH, the following command can be executed on the server (assuming a basic installation as mentioned in the installation guide; file paths may differ from this example):

```
> chmod 0644 /opt/novo/datadir/debug.log
```

Listening services: A list of services running on the server that are able to receive commands. Here it is possible to check if the RPC server (port 9234) is listening and if the full node port is listening (port 9233).

Full node port forward: *Not supported in N-DASH!*

N-DASH: This part shows if the username and password entered in the "Novo settings" tab are the same as found in the novo.conf file. If this is not the case, the RPC server will not accept requests.

Debug Console

The debug console can be used to supply commands directly to Novo or to fetch information which may be useful for debugging. When the command ‘help’ is entered, it returns a list with the current commands available.

help - Show available commands

getinfo - Get Novo-daemon info

showlog - Show the last 50 lines of the Novo debug log

addnode - Add a node by IP address (usage: addnode IP)

noderequest - Add a request to be added by other nodes

walletunlock - Temporary unlock the wallet for Novo services

rescan - Rescan the blockchain for transactions

getrescanprogress - Rescan progess in percentage

novostop - Stop Novo-daemon graciously (i.e. before a reboot)

Changelog

The changelog page shows all the changelogs of the past updates. A lot of information can be found on what is available, and what is being worked on.

Command line options

N-DASH contains a small command line interface (CLI), which can be used if access to N-DASH is lost.

CLI can be reached by calling:

> `php /var/www/n-dash/gdcli`

The CLI listens to several commands. When the command

> `php /var/www/n-dash/gdcli help`

is called, it will return the options available in the CLI.
help - Shows this list of commands
reset_2fa - Disable the Two Factor Authentication
reset_login - Disable 2FA and login screen

If the command is executed, but an error is returned, it is possible there are issues with the rights of the files it tries to call on or write to. In that case the command should be called using `sudo` , for example:

```
> sudo php /var/www/n-dash/gdcli help
```

Upgrading N-DASH

When you logon to N-DASH you get a message if there is a newer version of N-DASH available.
Download the latest release from GitHub.
Copy the new version to the directory where you installed N-DASH (see initial installation).

Upgrading Novo

When you logon to N-DASH you get a message if there is a newer version of Novo available.
Download it from GitHub and install the new version.
Successively stop the Novo-daemon en start it again.

Troubleshooting

Unable to login to N-DASH

If the password is lost, this can be reset by the N-DASH Command Line Interface. For details, see the "Command line options" chapter in this manual.

Lost 2FA codes

In case you lost your 2FA codes, or access to the device containing the 2FA codes is lost, the 2FA settings can be disabled by the N-DASH Command Line Interface. For details, see the "Command line options" chapter in this manual.

FAQ

The Frequently Asked Questions (FAQ) part of this manual contains questions and answers to the (surprisingly) frequently asked questions.

I want to change my RPC password. How do I do this?

First, edit the "novo.conf" file in the datadir of your Novo installation. Here you can change the password. Then go to N-DASH and change the RPC password there as well (in the section "Novo settings"). When the passwords on both places are changed, restart Novo.

I opened TCP port 9233 as requested, but I still get the message "No inbound connections. Did you open/forwarded port 9233?".

It can take a while before the first clients connect to your node. Please check again in 30 minutes / 1 hour. If there are still no inbound connections, check if you forwarded the port correctly. If you go to the "Config check" page in the Settings menu, you can check if your port is forwarded correctly. If you don't know how to forward the port on your router, check if your router is listed on this website: https://portforward.com/

I want to submit my node statistics, but I get the message "You have no incoming connections. You have to configure your node to enable this option".

If you have opened your port on your router, please wait for about 30 minutes / 1 hour before the first connections will be made to your node. If there are still no inbound connections, check if you forwarded the port correctly. If you go to the "Config check" page in the Settings menu, you can check if your port is forwarded correctly. If you don't know how to forward the port on your router, check if your router is listed on this website: https://portforward.com/

I want to change the maximum number of connections, how can I do this?

You can change this number in the "novo.conf" file in the datadir of you Novo installation.

Why can't I change the novo.conf file from the dashboard?

For security reasons, N-DASH will only read from the novo.conf file. If your credentials would be compromised and others have access to your N-DASH, they will be able to change your novo.conf file which is a risk for yourself.

When I open my wallet in N-DASH for the first time, it is empty!

The wallet in N-DASH is a new wallet. There are no funds there yet. You can transfer some Novo to your wallet in N-DASH using the address shown or by scanning the QR code.

I want to see my Recovery Phrase, but I get the error the password is wrong, but I did not set a password.

If you used the auto installer, the default password for the wallet is "changeme" (without the quotes).

I want to get a notification when my computer or internet connection is down, but how can I do that?

If you want to be notified when your computer running Novo is offline, you can use the monitoring service from uptimerobot.com. This service checks your connection every 5 minutes. Just create an account, add a new monitor (type 'Port'), enter your IP address and port (custom port) '9233'. They also have a mobile app so you can receive push messages.

I'm 100 percent sure I set up my full node correctly, but I still don't get any incoming connections. What's wrong?

First of all. Your system is not broken or anything if you have no incoming connections. But to make you a bit more discoverable, you can now use the ‘noderequest’ function in the debug console (within N-DASH --> settings) that adds your node to a database. This database is then checked automatically by other N-DASH users and these instances (max 10) then make a connection with you for 24 hours, which makes you more discoverable to other nodes and seeds. When 10 nodes have connected to your node, you are removed from the database.

N-DASH can't connect to Novo, but the config check says username and password match.

The RPC server can't handle passwords that contain some special characters, such as "#" and "$". If you have entered a password in novo.conf and the "Novo" settings tab in N-DASH, create a new password without these symbols.

The holding statistics of my imported account are different in N-DASH and on the desktop app.

Statistics can be different in N-DASH and on the desktop. The key imported in N-DASH is a read-only key, so if a holding action is performed on the desktop this is not visible on N-DASH and there might be a difference in the number of earnings and the total amount of Novo available compared to the statistics on the desktop app. The desktop app can read the information from both instances (local and holding key).