

netBravo



netBravo Summary Description

By CLEMENT Francis,
FOLLONI Gianluca,
LUMACHI Stefano,
LUZARDI Stefano

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WHAT IS IT?

netBravo is a European Commission crowd-sourcing project designed to gather and share radio spectrum data about mobile telephony coverage, WIFI channel occupancy, broadband and net neutrality connection tests. Anyone with a recent smart phone can download the netBravo app which will automatically record the characteristics of the signal they're getting on their phone – WIFI, 4G, 3G, 2G or nothing - and test the latency, upload and download performance of their Internet connection with additional net neutrality tests they can select. This data is saved locally to the phone and can be sent back to the netBravo research database. The aim is then to plot the aggregated findings on a map, in an interactive web site (<http://netbravo.jrc.ec.europa.eu/>).

Furthermore, some of the most useful network tools are also included: LAN scan, SERVICE scan and Traceroute.

The app is free to download, does not contain any advertisements and it uses very little bandwidth and battery. The data is anonymised and will not collate or store any personal data.

It could tell us, for instance, whether our mobile networks are capable of delivering broadband connectivity in parts of the country where the fixed line service is patchy, whether coverage across cities is consistently good, and whether some operators are supplying a better service than others.

It can help also enforcement agencies and EU Commission to better assess for example:

- Are really the various cellular operators giving good signal strength overall of the full territory?
- Are 2.4GHz/5GHz Wi-Fi channels fully crowded or there are still available space?
- Is the 30Mb/s by 2020 broadband speed target of the EU Commission (RSPP Article 3.c of 243/2012/EU⁶) will be reached?
- Are Internet Service Providers blocking some protocols on their network?

Of course, there is no guarantee that this crowdsourcing experiment will work.

MEASURED PARAMETERS

- Handset type, model and operating system version
- Location of measurements
- Time and date of measurements
- Cellular performance and characteristics (GSM/UMTS/4G, signal strength, etc...)
- Wi-Fi performance and characteristics (2.4/5 GHz used channel, security protocols, SID, etc...)
- Broadband speed test: Download and upload data transfer rates
- Broadband latency, ping and DNS lookup test
- Broadband network neutrality test (VOIP, NAT, P2P, etc...)
- LAN scan (to discover who is on your network)
- SERVICE scan (to check which port has a service running)
- Traceroute (to verify the route/path and measure the transit delay of your Ethernet packets)

HOW DOES IT WORK?

On Android phones, the app runs in the background collecting Cellular and Wi-Fi data and must be launched manually to start the Broadband and Net Neutrality tests. Data collected is kept on the phone until a Wi-Fi internet connection is available then all data is (if authorized) automatically moved, on an encrypted connection, to a JRC server or saved locally on the phone.

The app never starts automatically the Bluetooth or the Wi-Fi telephone services.

In the settings, it is possible to change the netBravo app consumption of battery (3 levels of contribution).

The app tries to take measurements every 1,5,15 minutes following the following table:

Battery level	Low level of contribution		Medium level of contribution		High level of contribution	
	GSM/WIFI	GPS(*)	GSM/WIFI	GPS(*)	GSM/WIFI	GPS(*)
100% - 70%	15'	Active	5'	Active	1'	Active
70% - 60%	15'	Passive	5'	Active	1'	Active
60% - 45%	15'	Passive	5'	Passive	1'	Active
45% - 0%	OFF	OFF	OFF	OFF	OFF	OFF

(*)

Active: Start GPS when measuring

Passive: Do not start GPS but use GPS data if GPS already started

If the battery level is < 60%, Wi-Fi automatic data upload is suspended (if user enabled).

On iOS phones, the app must be run manually for all operations (no background execution).

Each Broadband test consumes in average less than 10 MB under 3G and less than 20 MB under 4G/WIFI connection. Extreme mode will consume about 250MB an hour if operated.

SOCIAL

You can create an avatar and associate multiple devices to it. This allows you to sum up all the tests done on each of your devices for increasing your contribution score and improving your position in the netBravo official contributor's ladder (<http://netbravo.jrc.ec.europa.eu/Contributors>). Using the same avatar credentials, you can also login on the web site (<http://netbravo.jrc.ec.europa.eu/AvatarManagement/>) to download the data file for all your tests.

Points are awarded to each installation of the application proportionally to the number of measurements and tests uploaded to our servers.

OUTPUT

- Full raw data collected can be saved locally on the smartphone as Comma-Separated Values (CSV) files².
- Geographically aggregated data of all contributors is available anonymously via the European open data portal (<https://open-data.europa.eu/en/data/>). Weekly maximum, minimum, mean and standard deviation (on a week) of the following anonymized measures are downloadable:
 - Cellular signal strength by operator
 - Wi-Fi channel occupancy
 - Broadband ping, upload, download by operator
 - Various Net Neutrality tests by operator
- Geographical map of the aggregated data are visible at <http://netbravo.jrc.ec.europa.eu/> For privacy reason, only measurements done at the same place by at least 3 contributors are plotted.

PREREQUISITES

Smart phone operating system:

- iOS 8.1 and above
- Android 4.0.3 and above

REFERENCES

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2. Server Aggregated Data Format ([Server Aggregated Data Format.pdf](#))
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6. INSPIRE D2.8.1.2 Data Specification on Geographical Grid Systems – Technical Guidelines
http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_EF_v3.0.pdf