

Mapping and QoS in the Czech Republic from NRA perspective



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- **Czech Telecommunication Office**
 - experience with the infrastructure (and service) mapping
 - experience with the QoS measurement (NetMeter)

- **why the CTO?**

- legal power to demand data from operators
- experience (2013 mapping)

- **main focus – NGA infrastructure mapping**

- for the purposes of NGA roll out state aid programme
 - economical analysis source data
 - NGA coverage (to justify potential need of funding)
 - protection of private investments (existing infrastructure) and marking the state aid target areas (white, grey, black areas)

- **which data are collected?**
 - services (retail and business separately)
 - infrastructure intended for provision of IAS
 - currently used & easily-to-be-bulit
 - 3 years scope situation
 - granularity – individual address points

■ how?

- via e-forms – web format – CTO's portal for authorized users
 - modular solution, interactive
 - basic data check even before hand-out
- a form for each technology solution (FTTx, xDSL, CATV, wireless)

■ How? E-form:

- data for each ADM (address point):
 - how many services are provided?
 - retail; business
 - infrastructure for IAS provision available (i.e. achievable number of services provided)?
 - basic broadband, 30 Mbps +, 100 Mbps +
 - separately for current state and „+ 3 years“ state
 - additional checkbox for more info – DOCSIS 3.0 and Wi-Fi

■ How? E-form features:

- manual filling
- *.csv files importing
- connected to the RUIAN database
 - address point viability check
 - export the address point database for future filling
- basic data check
- „historical data“ view
- save/load feature
- interface for communicating with CTO's personel

■ Data verification:

- manual verification, form by form
- complex set of automatic control features
 - checking with the „registry of buildings“
 - in case of problem indication - checking maps and even the street-view
- communication with the operators

■ Data evaluation:

- methodic is set by the state aid program managing authority
- administrative division into the „basic habitable units“
- less than 50 % of total number of address points covered - „white areas“
- detailed analysis of „white areas“, uncovered address point clusters make possible state aid target

■ Timeplan:

- 2015 – preparation of system, consulting with relevant public and academic bodies as well as telco sector
- data collection – January – March 2016
- data verification – May, April 2016
- data evaluation – end of April 2016
- !!! public consultation !!! – summer 2016

■ Struggles:

- initial setup – consultations, consultations, consultations
 - huge help is to bring respected academic body
- time
- reliability of systems (for instance the register of address points)
- data relevance in the scope of address points – wireless networks
 - unavailability of demanded data

- **Goal? To give customers reliable and truly neutral tool to measure their IAS service**
- **NetMetr project**
 - provided by CZ.NIC and CTO
 - <https://www.netmetr.cz/>
 - measurement of quality and coverage of service
 - developed by RTR (*Rundfunk und Telekom Regulierungs-GmbH*)

■ NetMetr

- noncommercial, independent solution
- measuring server is connected directly to NIX
- OpenSource, OpenData

■ NetMetr application

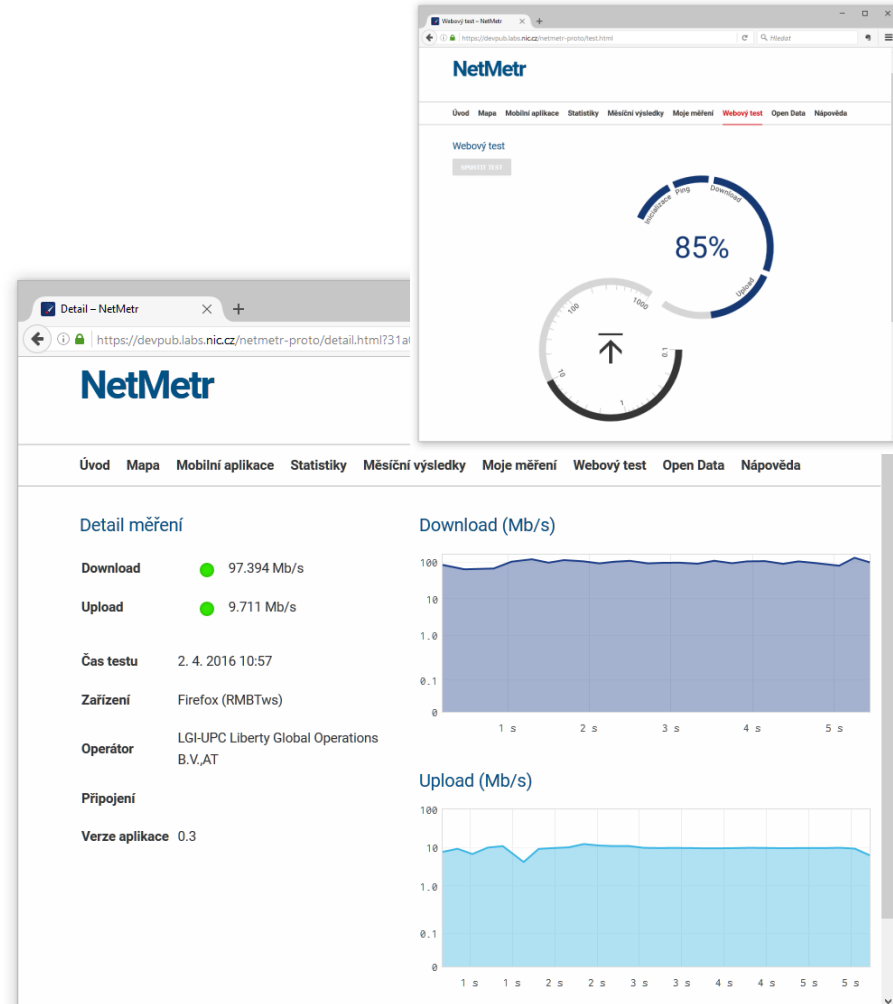
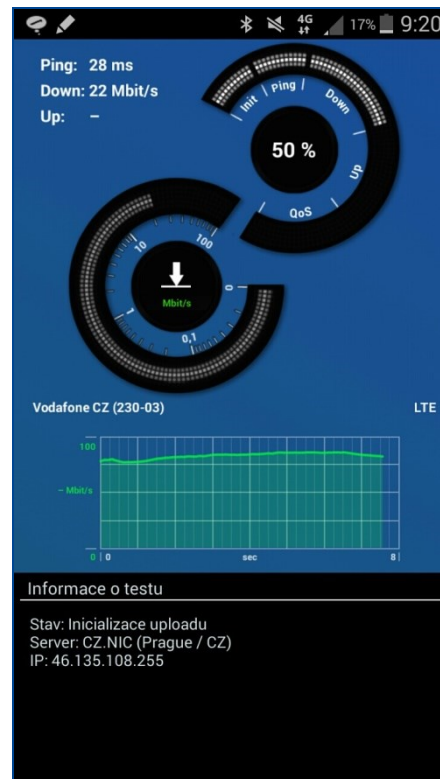
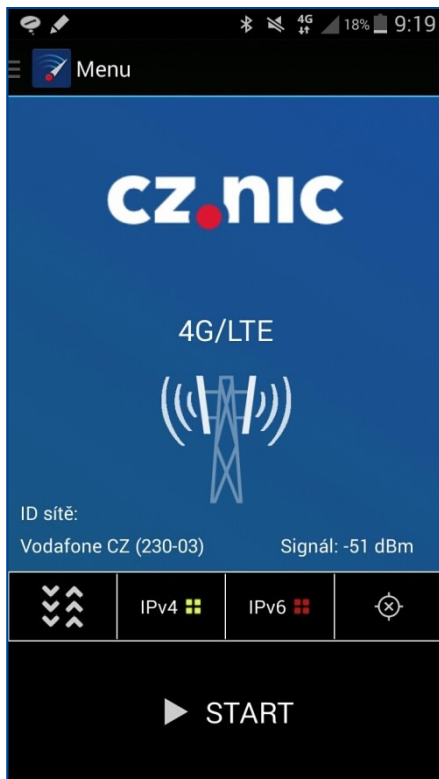
- Android, iOS app available
- mobile data, Wi-Fi data measurement
- web client for socket measuring – currently N/A (in test phase)

■ App

– Android and iOS

■ web client

– browser



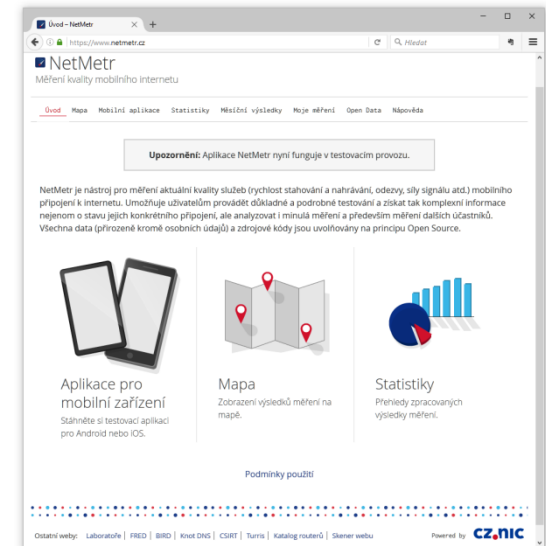
- **What does it measure?**
 - download speed
 - upload speed
 - signal latency (ping)
 - signal level (if available via terminal)

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 - NDT test available (by M-Lab) on Android systems

- **... and how?**
 - maximum data volume in 20 sec bursts
 - GPRS – 130 kB; HSDPA – 14 MB

■ results?

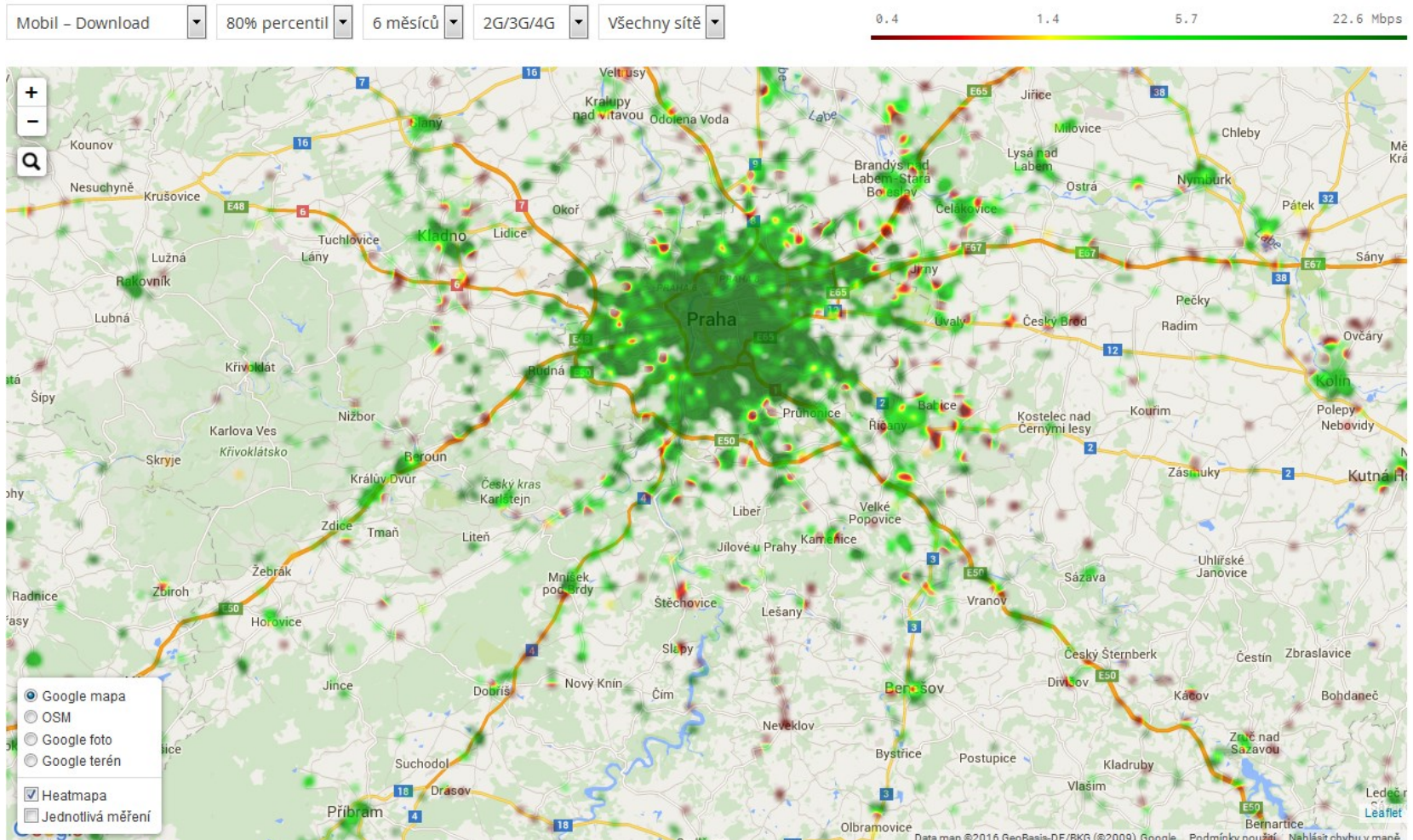
- available to all, *.csv file availability
- my measurements (even shared among multiple devices via special code)
- tabs:



Čas testu	OS	Zařízení	Signál	Stahování	Ping	Upload	Operátor
1. 4. 2016 10:41	Android 4G	Galaxy Note (2014)	N/A dBm	49,72 Mb/s	20,1 ms	31,21 Mb/s	O2 CZ
1. 4. 2016 10:30	Android WLAN	Galaxy Mega 6.3 (GT-I9205)	-46 dBm	37,32 Mb/s	16,8 ms	52,90 Mb/s	MACH3NET Mach3Net s.r.o.,CZ
1. 4. 2016 10:21	Android WLAN	SM-G925F	-60 dBm	35,39 Mb/s	15,7 ms	1,39 Mb/s	GIN Ipex Ltd.,CZ
1. 4. 2016 10:08	Android 2G	Lenovo A7000-a	-65 dBm	0,04 Mb/s	161,2 ms	0,02 Mb/s	T-Mobile CZ
1. 4. 2016 10:08	Android WLAN	Galaxy S Duos	-78 dBm	10,73 Mb/s	15,6 ms	1,96 Mb/s	ASMJANIK Mjanik.net s.r.o.,CZ
1. 4. 2016 10:04	Android 3G	HUAWEI Y550-L01	-77 dBm	9,90 Mb/s	60,7 ms	1,03 Mb/s	T-Mobile CZ
1. 4. 2016 10:02	iOS WLAN	iPad Air Cellular	N/A dBm	23,30 Mb/s	12,8 ms	11,56 Mb/s	LGI-UPC Liberty Global Operations B.V.,AT

Název	Stahování	Upload	Ping	Testy
SM-N910F	24,40 Mb/s	16,66 Mb/s	26,5 ms	744
iPhone7,2	21,96 Mb/s	12,97 Mb/s	24,7 ms	444
Sony Xperia Z3 Compact (D5803)	20,86 Mb/s	13,12 Mb/s	24,9 ms	370
iPhone8,1	19,00 Mb/s	6,94 Mb/s	27,0 ms	347
Galaxy S5 (SM-G900F)	16,43 Mb/s	12,42 Mb/s	25,1 ms	318
iPhone 5s	17,48 Mb/s	8,78 Mb/s	25,2 ms	312
SM-G920F	23,39 Mb/s	10,46 Mb/s	27,9 ms	179
Galaxy S4 Mini	15,54 Mb/s	7,62 Mb/s	30,2 ms	166
Galaxy S5 Mini (SM-G800F)	16,02 Mb/s	10,14 Mb/s	29,4 ms	139
LG-D390n	9,01 Mb/s	4,12 Mb/s	37,0 ms	125

■ results? We also have maps



■ Results? Not only speeds, but also ...

- client NAT type, IP address (IPv4 first 3 bytes)
- client location, operating system, terminal model
- mobile network type (2G/3G/4G, EDGE/HSDPA/LTE) and Cell ID
- network and operator ID



Thanks for your attention