

Benchmarking mobile network operators

Who wins?

MAJA MITIĆ



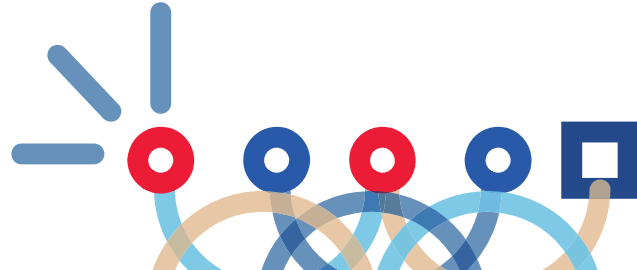
REPUBLIC OF SERBIA
RATEL
REGULATORY AGENCY FOR
ELECTRONIC COMMUNICATIONS
AND POSTAL SERVICES



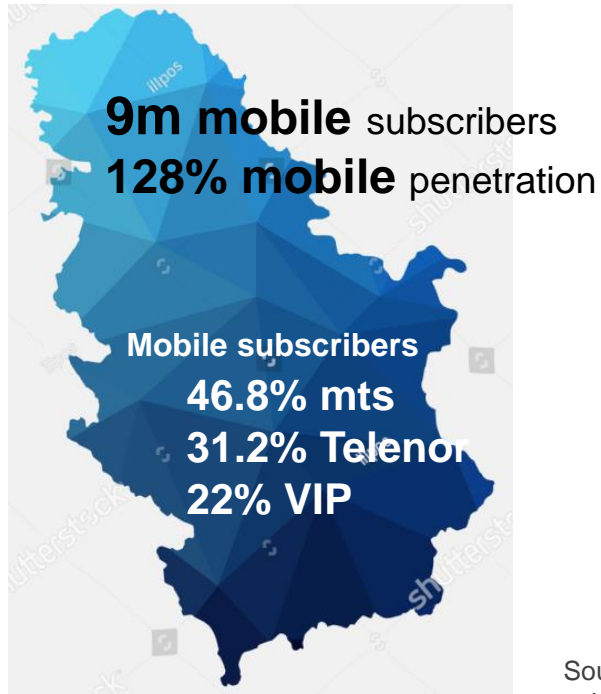
Background

Subscribers need objectively measured quality, not marketing

- Strong marketing campaigns by mobile network operators (MNO), every network is the best one
 - The lack of trust among subscribers
 - No objective and overall measurements of mobile network performance done so far in Serbia
-



Snapshot Serbia



3 MNOs with own network infrastructure

mts (Telekom Srbija)

Telenor

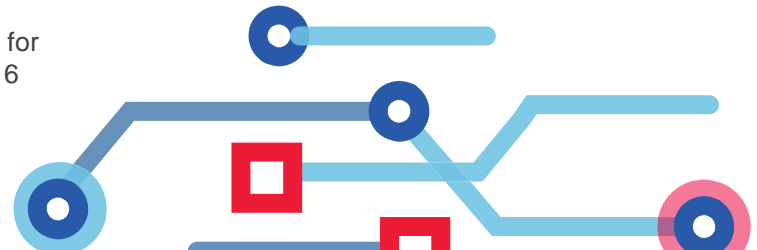
VIP mobile

Available technologies

VOICE services: 2G/3G (no VoLTE)

DATA services: 2G/3G/4G

Source: RATEL Overview for
the Telecom market 2016



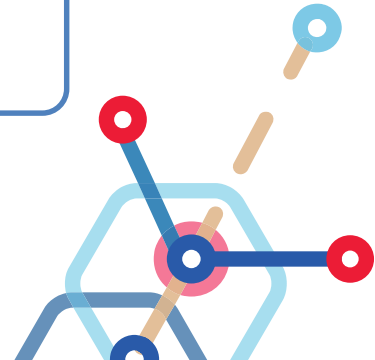
Our strategy



Promoting market competition
Encouraging further investments and
development

Objective information for subscribers,
empowering them to make an informed choice

Insight in network quality and capabilities,
current MNO's position in the market



Benchmark scope

More than 250 measurement hours

50% of the population in Serbia

35 cities

All national roads of category one (IA and IB)

More than 8000 km of drivetest route

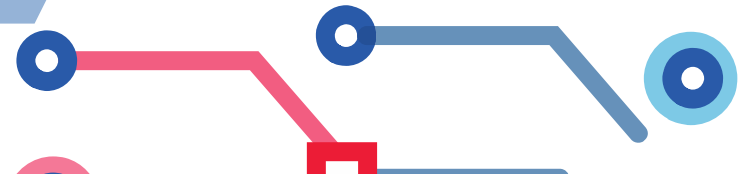
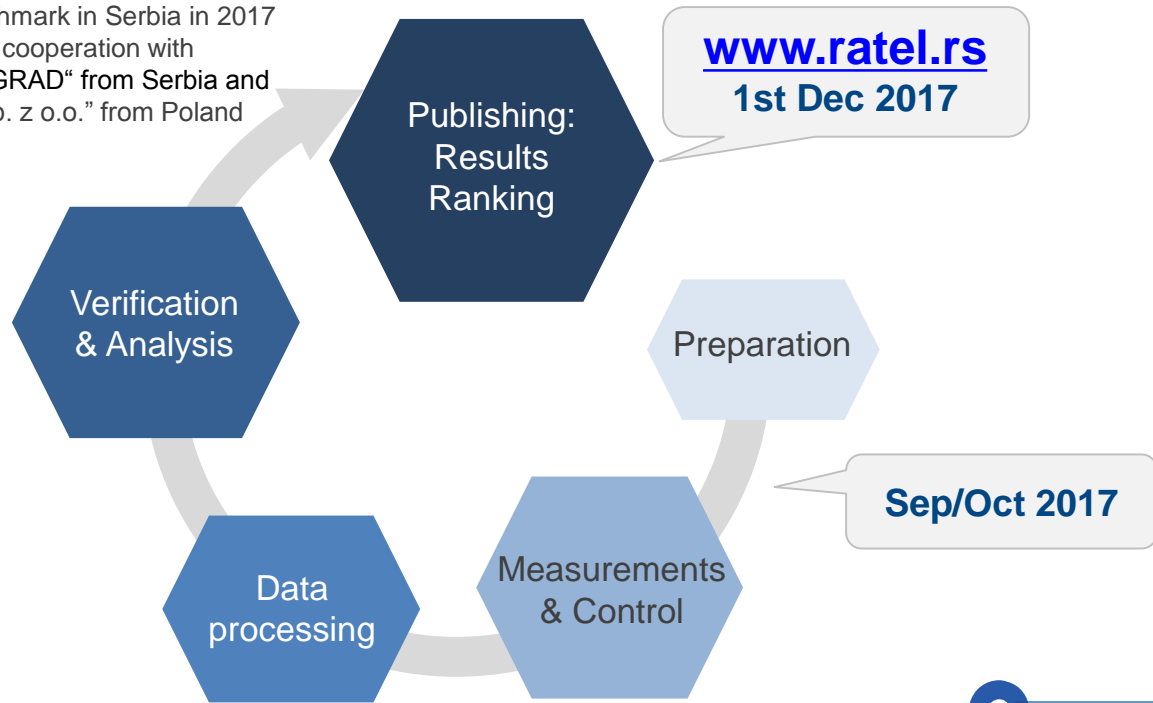
Population and roads data based on:

- ✓ The 2011 census of the Republic Institute of Statistics
- ✓ Regulation on categorization of national roads in the Republic of Serbia



Mobile drivetest benchmark

Mobile drivetest benchmark in Serbia in 2017
will be done in cooperation with
„CRONY DOO BEOGRAD“ from Serbia and
“Systemics-PAB sp. z o.o.” from Poland



Measurement equipment

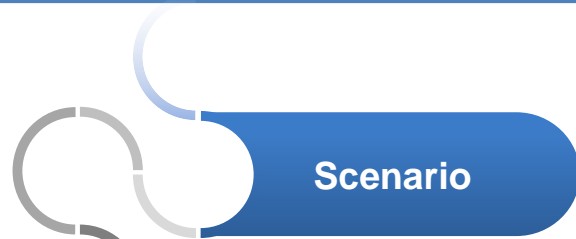
Rohde & Schwarz Diversity Benchmarker II
NQview
PCTEL SeeGull scanner
External antennas

Measurement phones:

- ✓ Samsung Galaxy S4 (LTE cat4)
- ✓ Samsung Galaxy Note4 (LTE cat6)



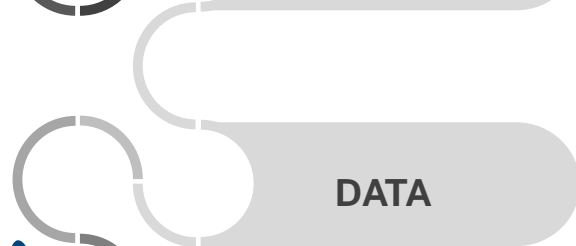
Measurement scenario



Scenario



VOICE



DATA



Measurement of:

- radio parameters for 2G/3G/4G technologies
- KPIs for voice and data services (inc. LTE/CSFB and LTE CA measurements)

Measurement server located in Serbia with 1 Gbps connectivity to the internet

Mobile-to-mobile, auto mode (4G/3/2G)

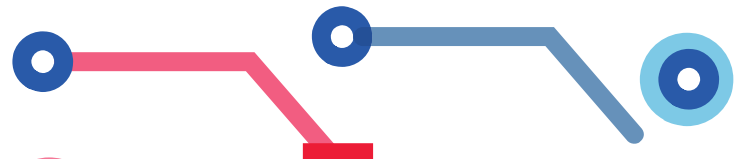
MOC: MTC = 1:1

multiRAB

Auto mode (4G/3G/2G)

File DL, File UL, Capacity tests (DL/UL)

Web Browsing, YouTube, Ping



Measurement setup

Voice

Call window duration = 115s
Call duration = 85s
Max Call Setup Time = 15s
Speech sample = Eng WB
Number of samples in the call = 6
MultiRAB size = 100KB

Data

HTTP Download = 3MB
HTTP Upload = 1MB
Capacity Download = 3 streams, 10s
Capacity Upload = 3 streams, 10s
HTTP Browsing = Kepler + 4 Live pages
YouTube = Livestream HD, 1080p, 31s
Ping = 40B and 800B



Data processing

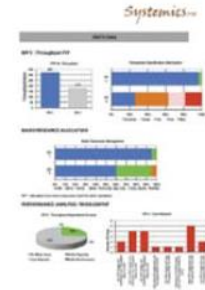
Verification and Analysis



Measurement data upload
on daily basis



Automatic data verification
Manual validation
Final cross-check



Weekly reporting
Data analysis



KPIs

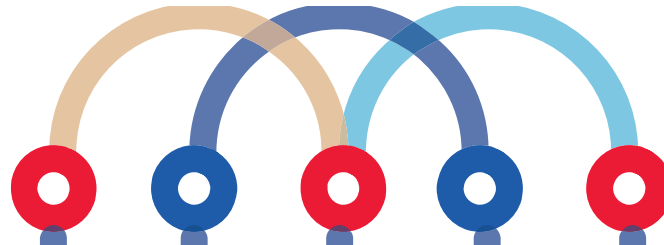
According to ETSI TS 102-250-2 standard

VOICE

- Call Success Ratio
- Call Setup Time
- CSFB Duration
- Handover Statistics
- Speech Quality
- Codec Usage
- Technology Usage

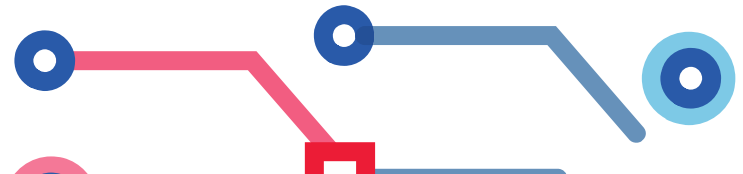
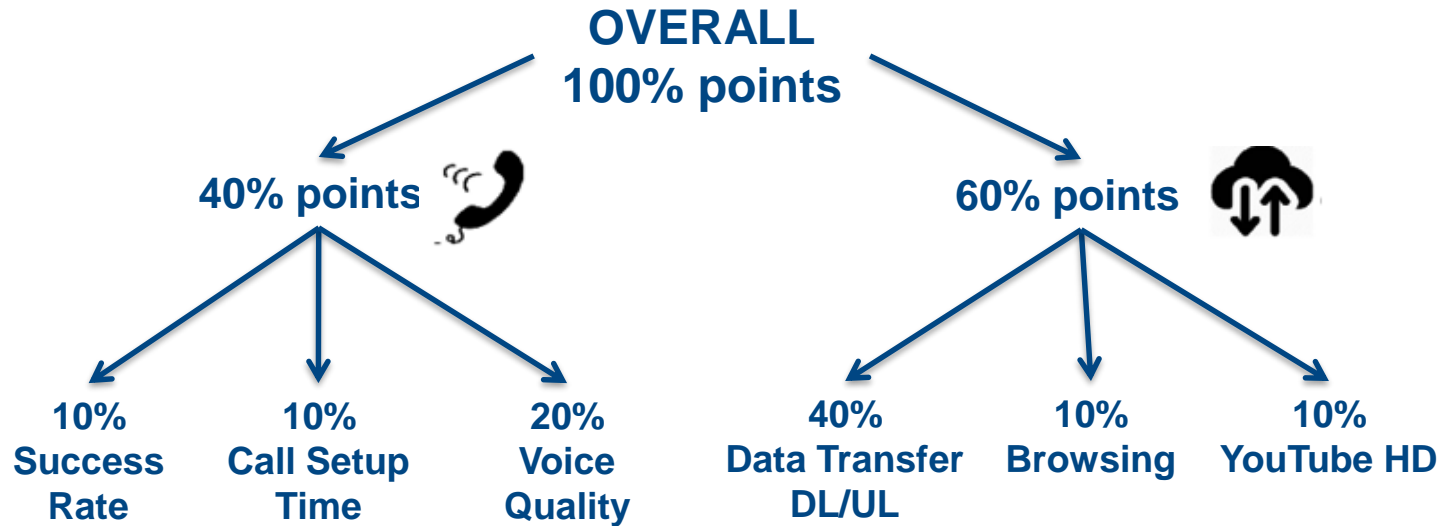
DATA

- IP Service Access Success Ratio
- IP Service Access Time
- Session Failure Ratio
- Transfer Time
- Mean User Data Rate
- Browsing Session Time
- YouTube VMOS (J.343.1)
- Technology Usage



Scoring: Best network, best service, best value

“Systemics-PAB sp. z o.o.” from Poland is the owner of the scoring methodology



Publishing results

Check www.ratel.rs on
1st December 2017

PROJECT DESCRIPTION RESULTS OVERVIEW SCORING RADIO REFERENCES

RATEL BENCHMARKING 2017 MOBILE NETWORK DRIVE TEST

SEPTEMBER – OCTOBER 2017

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SCORING RESULTS

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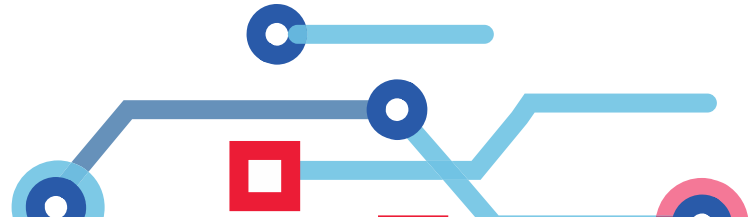
[read more](#)



VIP MOBILE

MTS SRBIA

TELENOR



Thank you

Maja Mitić

maja.mitic@ratel.rs

+381-69-8776317



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