

SMART RADIO MONITOR (SRM)

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Joint Research Center

www.jrc.ec.europa.eu



*Serving society
Stimulating innovation
Supporting legislation*



Digital Single Market – Radio Spectrum Policy – Broadband Access

- **Signal strength** of various Telecom Operators across the EU
- **Occupancy** of 2.4GHz/5GHz Wi-Fi channels over Europe - crowded or sparse use?
- Progress towards the **2020 broadband speed target** 30MB/s (RSPP Article 3.c of 243/2012/EU)
- Blocking of services or protocols by Internet Service Providers (**Net Neutrality**)



JRC Mobile App for Radio Spectrum using Crowd sourcing approach

Policy support on **efficient use** of the
radio spectrum

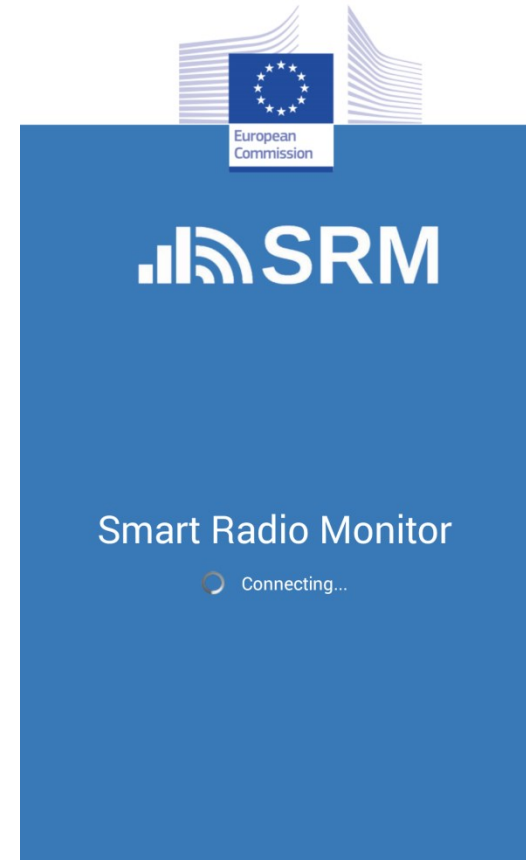
Exploit pervasive **smart consumer
devices** (smart phones, tablets, ...)

Easy to deploy, easy to use, gives
added value

Low life-cycle cost

Long-term maintainability

Respect of privacy and security policies





SRM Features

Version 1:

- Background collection of mobile network signal strength.
- Background collection of WiFi network signal strength.
- Send measurements to centralized server for further analysis.

Enhancements in Version 2:

- Broadband speed test: latency, download speed and upload speed.
- Network service neutrality (test over voip, nat).
- Nearest wifi (gives nearest used or open wifi networks)
- Contributor chart (optional and pseudonymous)
- Improved GUI

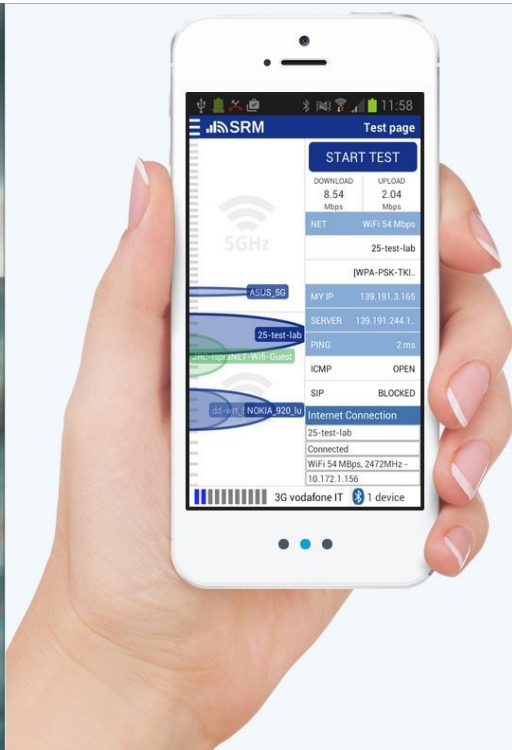
Server:

- Visualization of data over maps with grid maps.
- Filters (technology, operators, frequencies).
- Openlayer map implementation (Google, BING, Openstreetmap, ...)



Smart phones / Tablets with most popular operating systems:

- iOS 7.0 and above
- Android 4.0.3 and above
- Access to WiFi
- Access to a mobile network



Test your network

SRM is a JRC project that try to map mobile coverage, WIFI channel occupancy and broadband connection speeds. Every one with a recent smart phone (Android or iPhone) can record the characteristic of the signal and broadband they're getting on their phone. If they want the app feeds the data back to JRC research project where he aggregated findings on a map is plotted.

Install from google play

requires Android version 4.0.3 and above

1.

Free and optimized

The app is free to download, It uses very little bandwidth and battery. The data is anonymised and JRC will not collate or store any personal data. Daily update of aggregated measurements will be available via EU Open Data portal.

2.

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...)

3.

Why is useful

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.



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Gratis

Categoria: Utility
 Pubblicato: 18/03/2015
 Versione: 2.0
 Dimensioni: 0.9 MB
 Lingua: Inglese
 Sviluppatore: European Union - Publications Office
 © 2015, European Union
 Valutazione: 4+

Compatibilità: Richiede iOS 7.0 o versioni successive.
 Compatibile con iPhone, iPad e iPod touch. Questa app è ottimizzata per iPhone 5.

Valutazione dei clienti

Versione attuale:
 ★★★★★ 5 valutazioni

Altre app per iPhone di European Union Apps



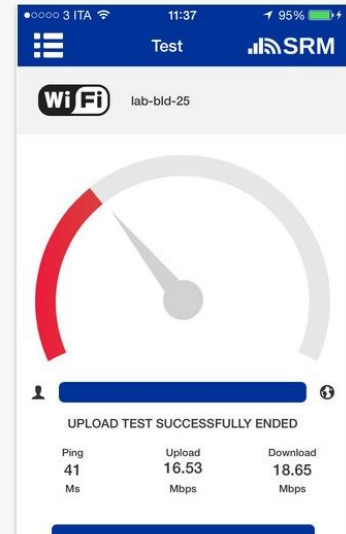
Descrizione

The European Commission crowd-sourcing project designed to gather and share data about mobile telephony coverage, WIFI channel occupancy, broadband and net neutrality connection tests. Anyone with a recent iPhone can download an app that will automatically record the characteristics of the signals they are getting on their phone -

[Sito web di European Union Apps](#)
[Supporto per Smart Radio Monitor](#)

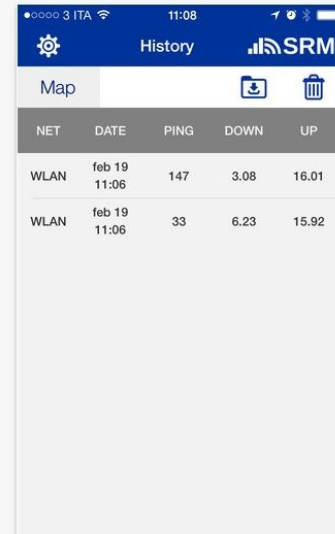
[...Altro](#)

Istantanea iPhone



UPLOAD TEST SUCCESSFULLY ENDED

Ping	Upload	Download
41 Ms	16.53 Mbps	18.65 Mbps



NET	DATE	PING	DOWN	UP
WLAN	feb 19 11:06	147	3.08	16.01
WLAN	feb 19 11:06	33	6.23	15.92



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...)



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:

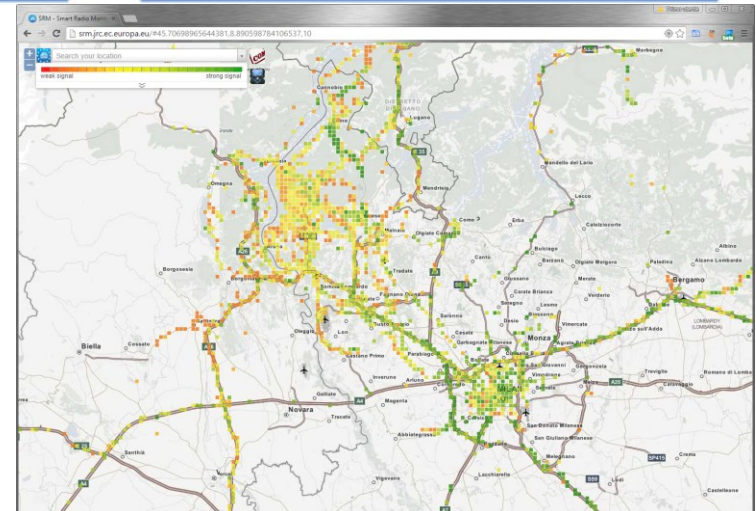
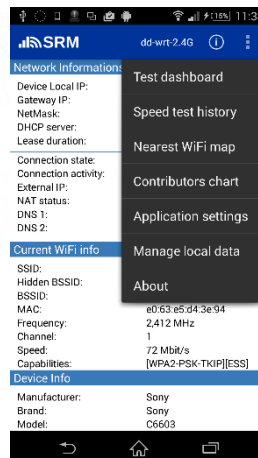
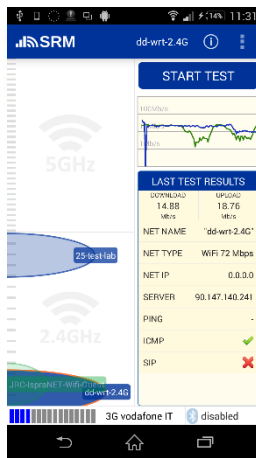
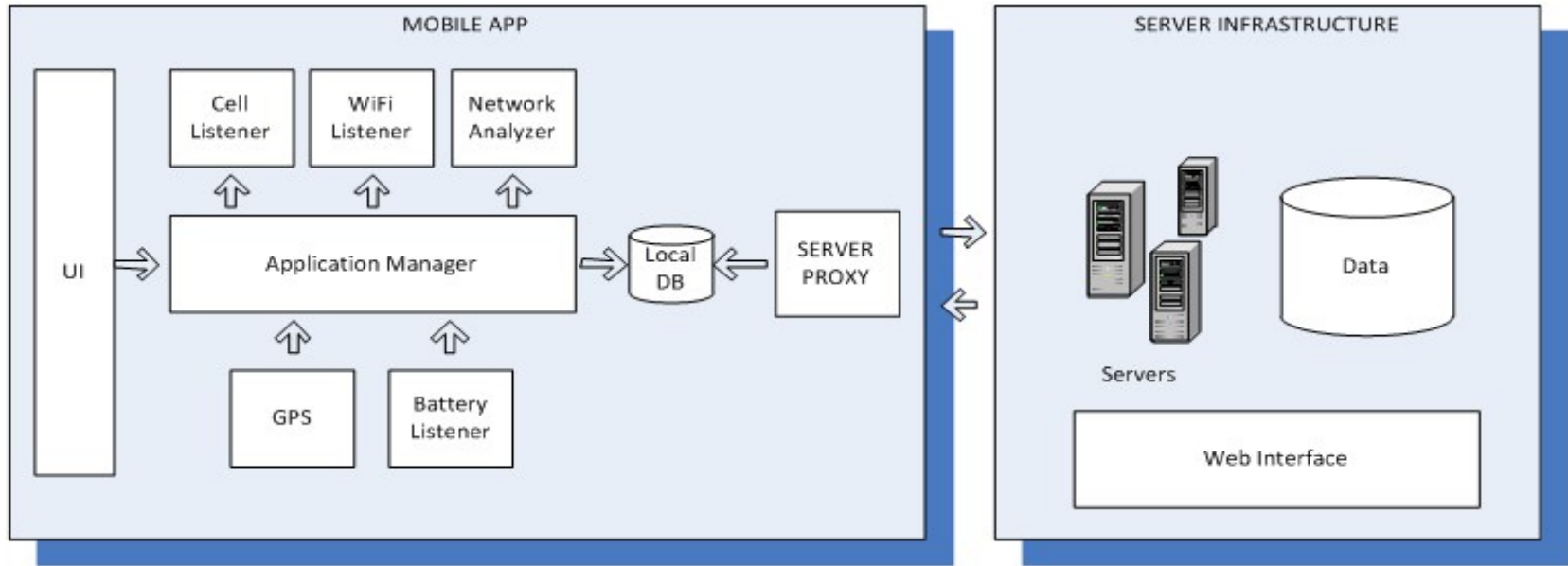
- Cellular signal strength by operator
- Wi-Fi channel occupancy
- Broadband ping, upload, download by operator
- Various Net Neutrality tests by operator

Geographical map of the aggregated data are visible at <http://srm.jrc.ec.europa.eu/> .

For privacy reason, only measurements done at the same place by at least 3 contributors are plotted.

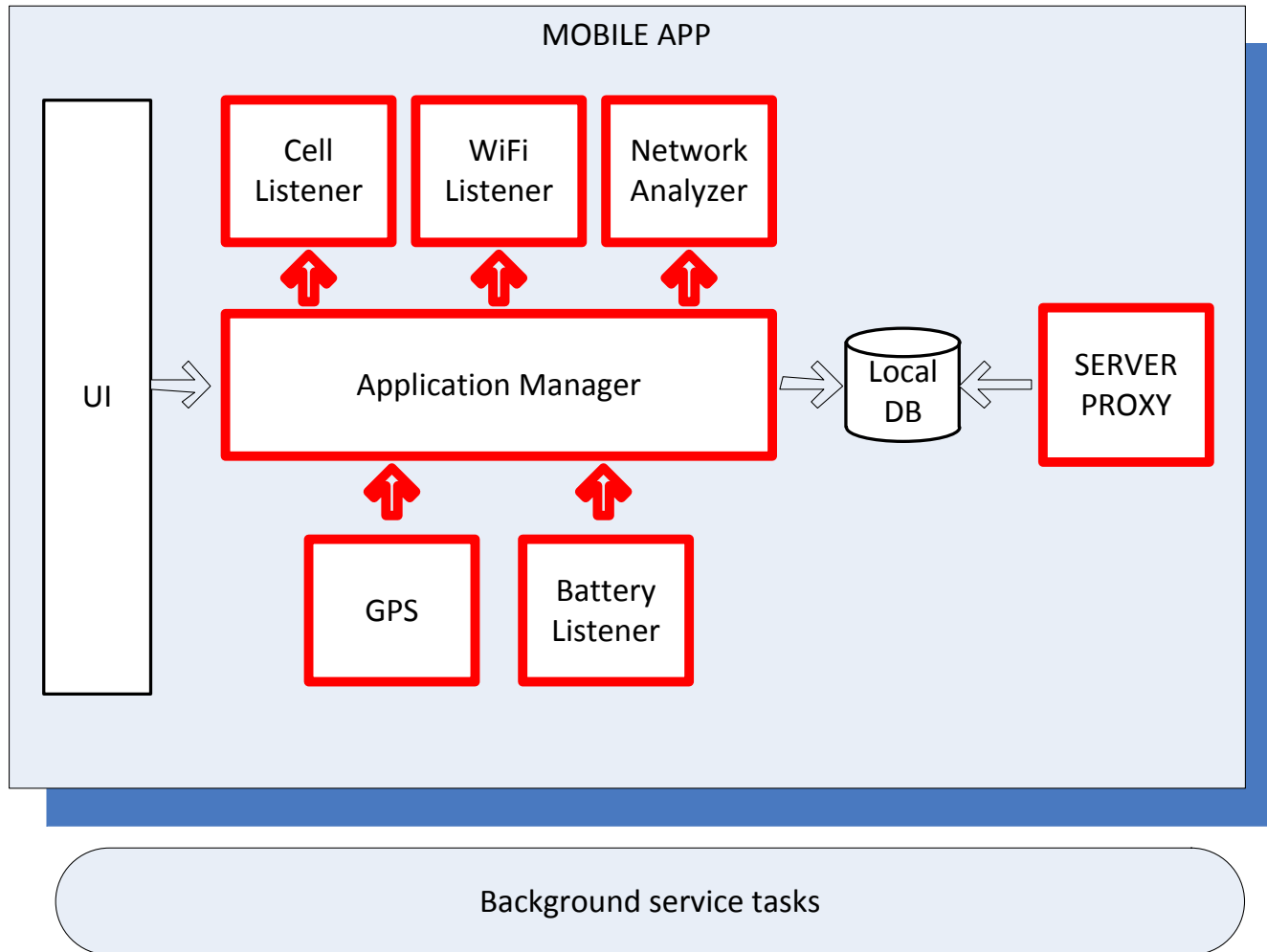


Application architecture



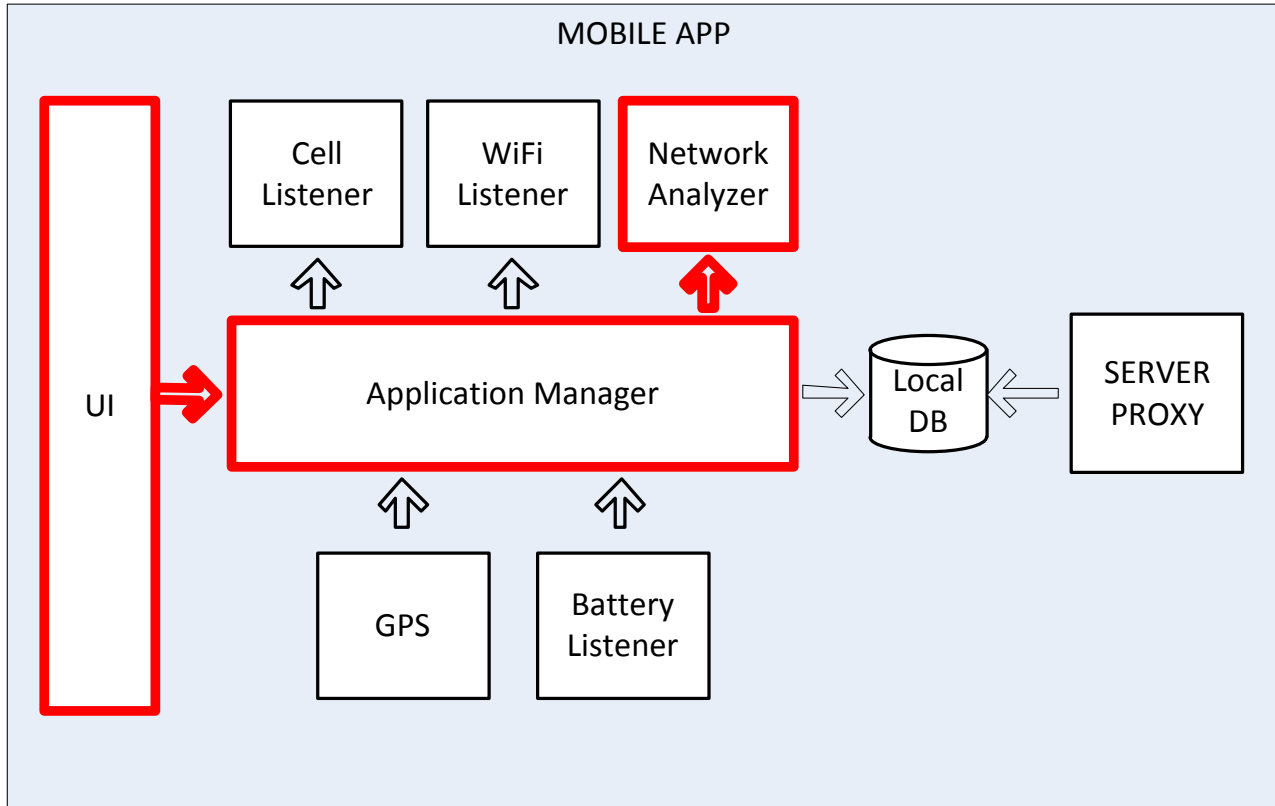
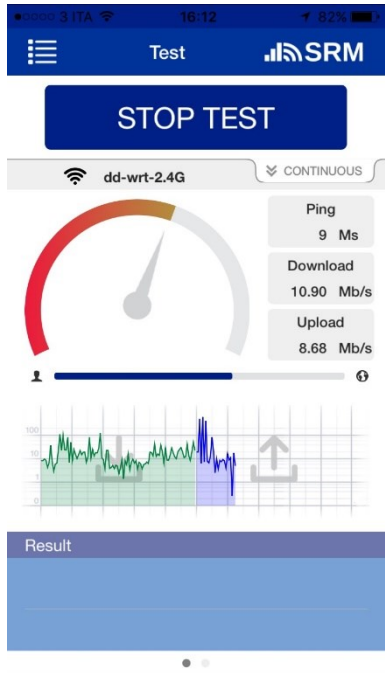


Mobile application back-end





Mobile Application Front-end



Foreground service tasks



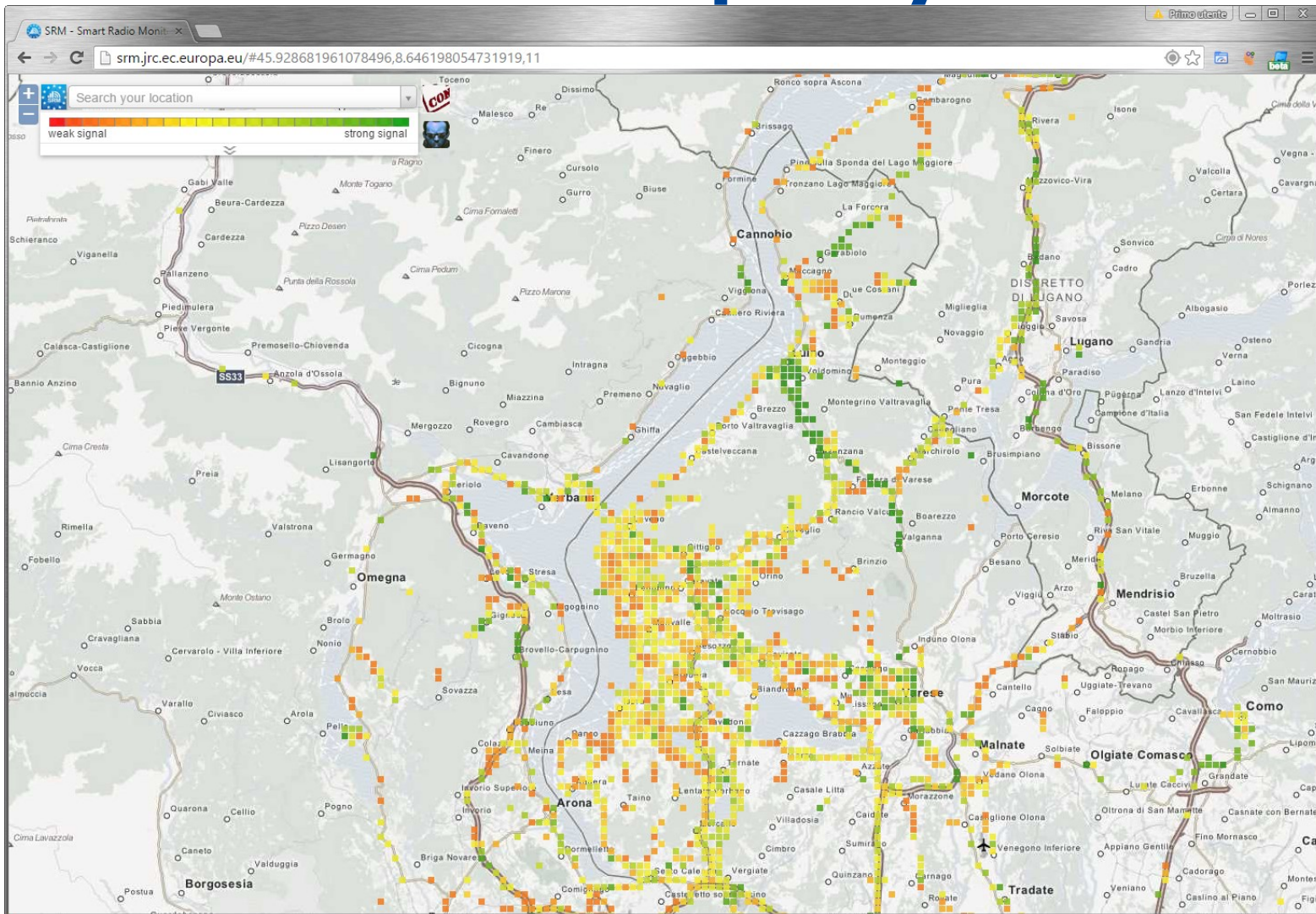
Application optimizations

The application is:

- Optimized for battery usage
- Optimized for Bandwidth consumption
- Takes measurements only when location is available
- Measurements are made based on battery state and location availability
- Uploads measurements to the server when the preferred connection is available
- Application user data is fully anonymised.

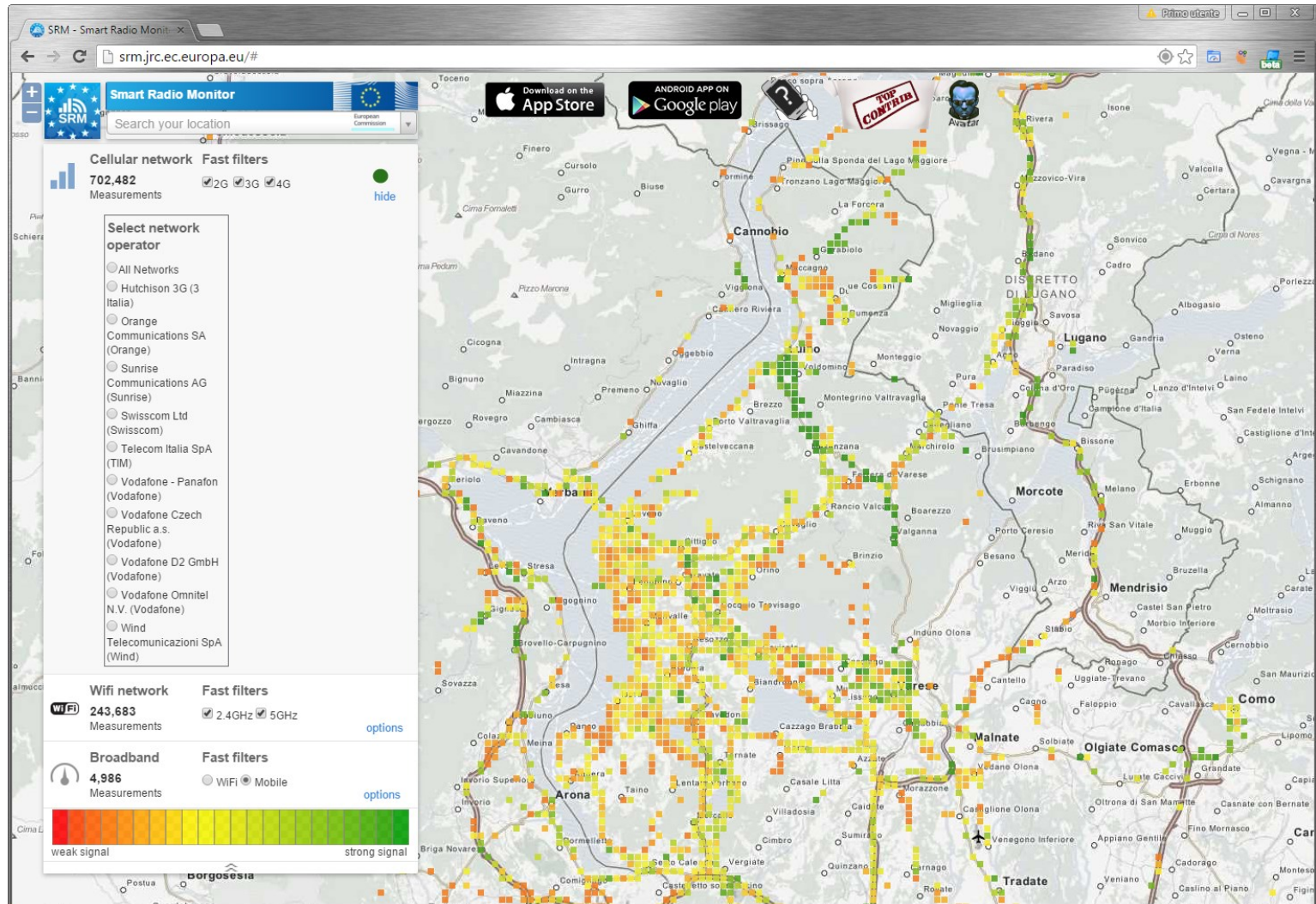


Service channel occupancy



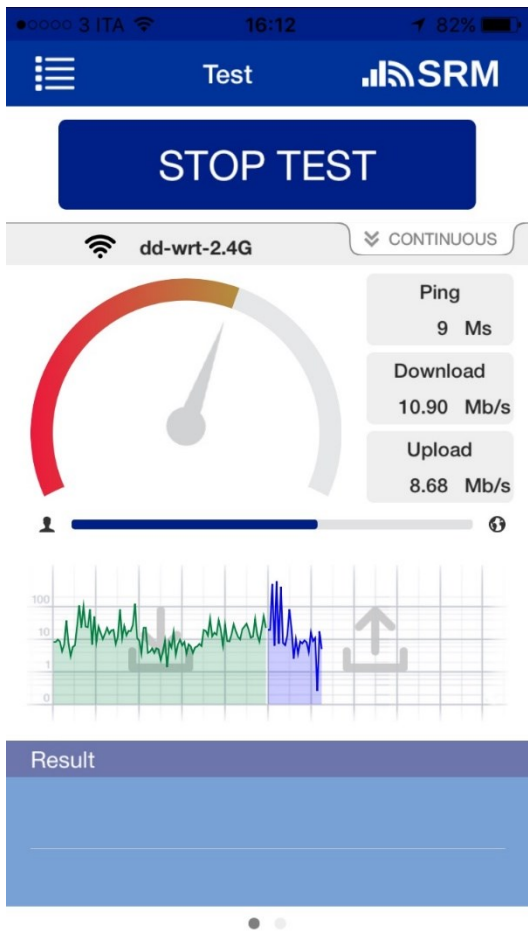


Service channel occupancy

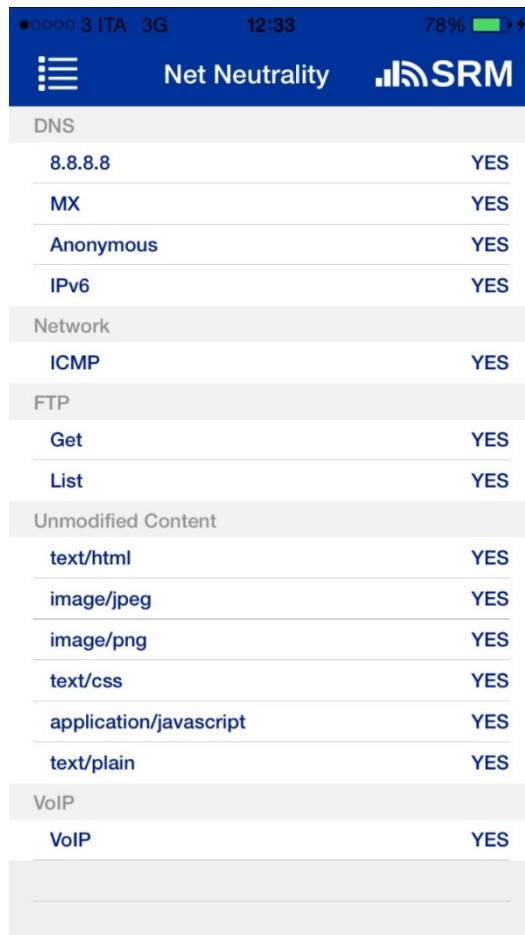




iOS Application screen-shots



SRM Test screen showing a 'STOP TEST' button, network status (dd-wrt-2.4G), and performance metrics: Ping 9 Ms, Download 10.90 Mb/s, Upload 8.68 Mb/s. A speedometer and a line graph are also visible.



SRM Net Neutrality screen displaying a list of network-related tests and their results.

Category	Test	Result
DNS	8.8.8.8	YES
	MX	YES
	Anonymous	YES
	IPv6	YES
Network	ICMP	YES
FTP	Get	YES
	List	YES
Unmodified Content	text/html	YES
	image/jpeg	YES
	image/png	YES
	text/css	YES
	application/javascript	YES
	text/plain	YES
VoIP	VoIP	YES

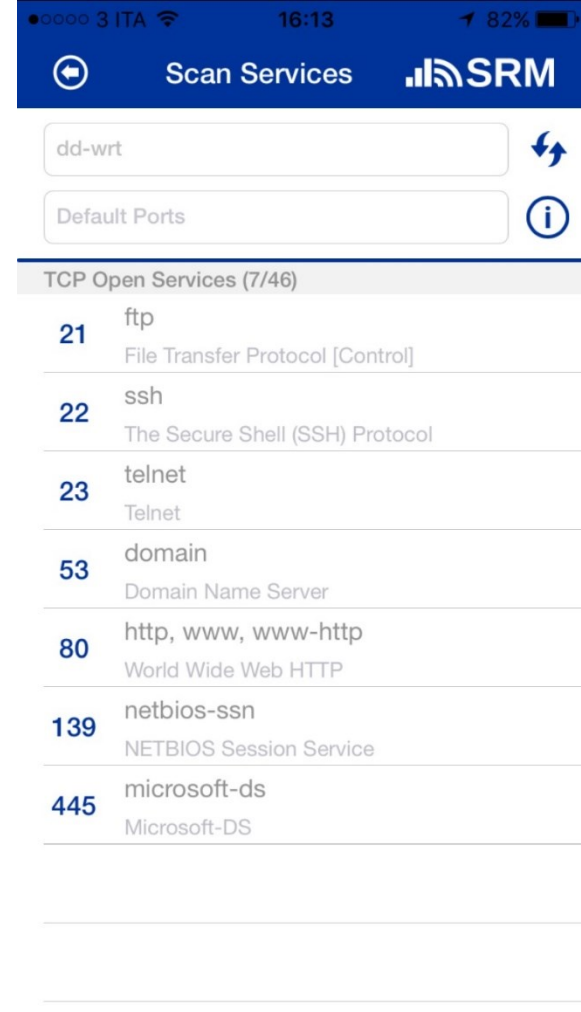
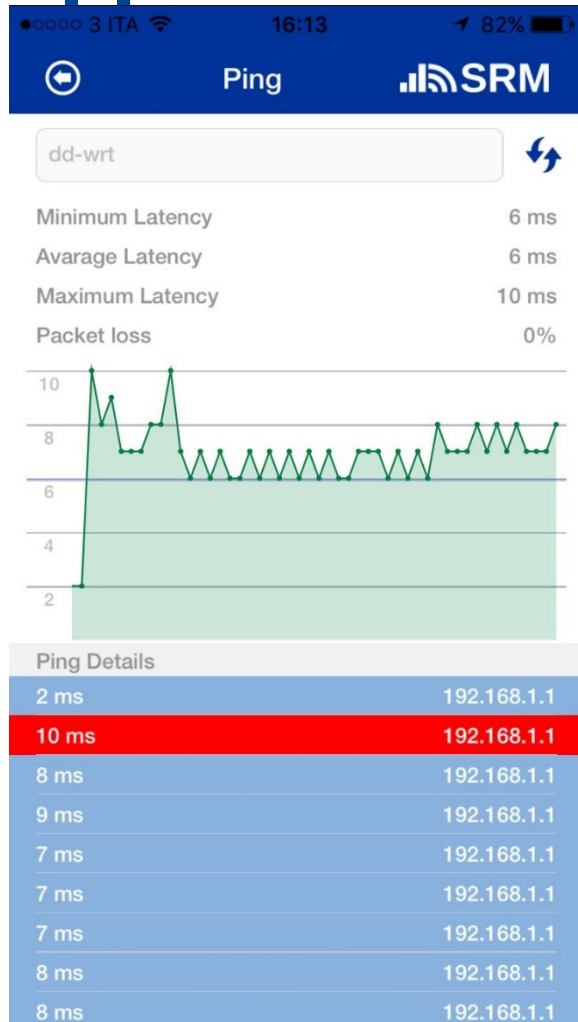


SRM Lan Scan screen showing a list of discovered devices on the network.

IP Address	MAC Address	Manufacturer
192.168.1.1	C8:D7:19:AA:4C:4D	Cisco Consumer Products, LLC
192.168.1.11	6C:40:08:E8:51:7F	Apple
192.168.1.12	BC:C6:DB:6D:6D:8E	Nokia Corporation
192.168.1.14	CC:78:5F:B8:10:03	Apple
192.168.1.126	EC:35:86:3E:F7:00	Apple
192.168.1.136	E8:80:2E:EB:13:F2	Apple
192.168.1.136		Not Available



iOS Application screen-shots





Android Application screen-shots

SRM dd-wrt-2.4G

START TEST

100Mb/s
1Mb/s

5GHz

25-test-lab

2.4GHz

JRC-IspraNET-Wifi-Guest
dd-wrt-2.4G

3G vodafone IT disabled

LAST TEST RESULTS	
DOWNLOAD	UPLOAD
14.88 Mb/s	18.76 Mb/s
NET NAME	"dd-wrt-2.4G"
NET TYPE	WiFi 72 Mbps
NET IP	0.0.0.0
SERVER	90.147.140.241
PING	-
ICMP	✓
SIP	✗

SRM dd-wrt-2.4G

25-test-lab

2.4GHz

JRC-IspraNET-Wifi-Guest

dd-wrt-2.4G

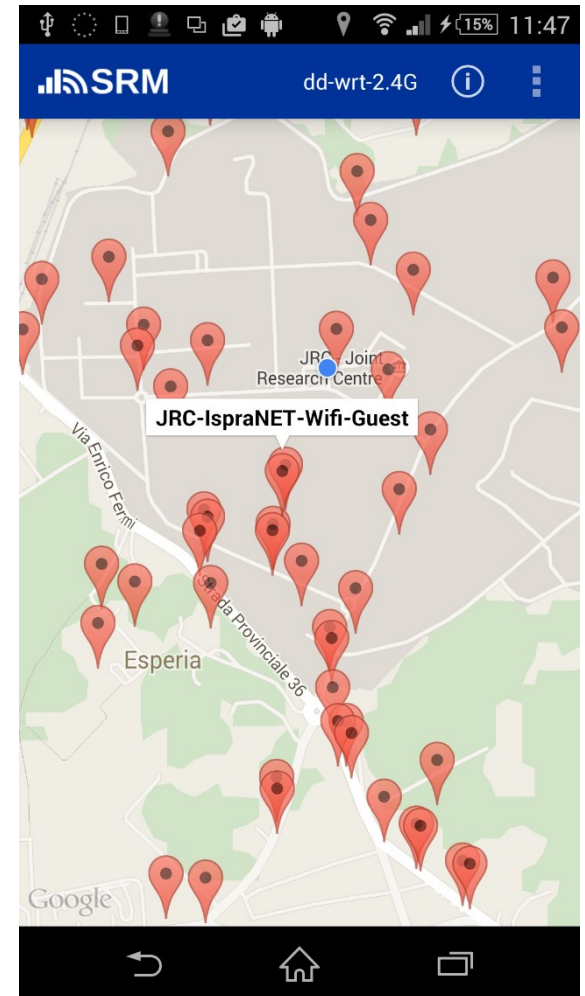
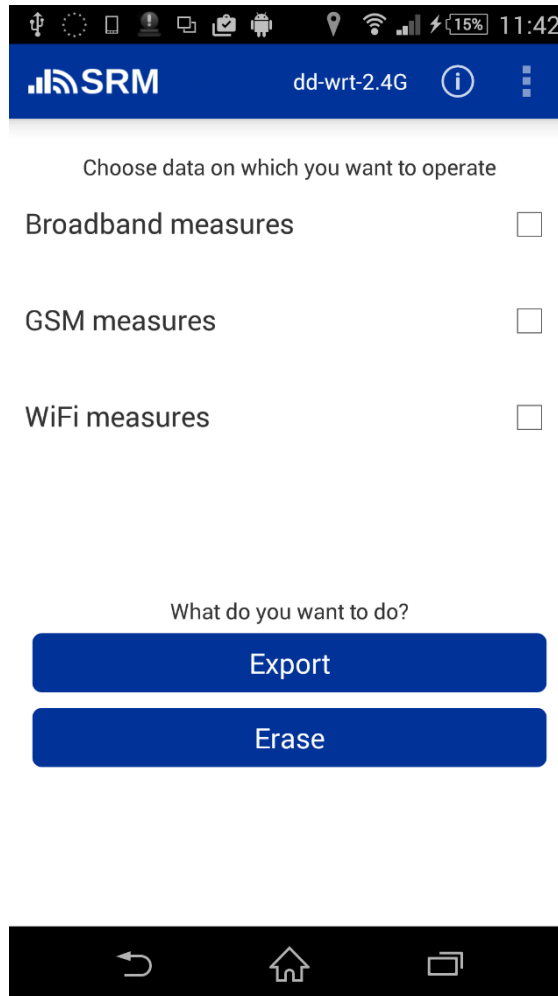
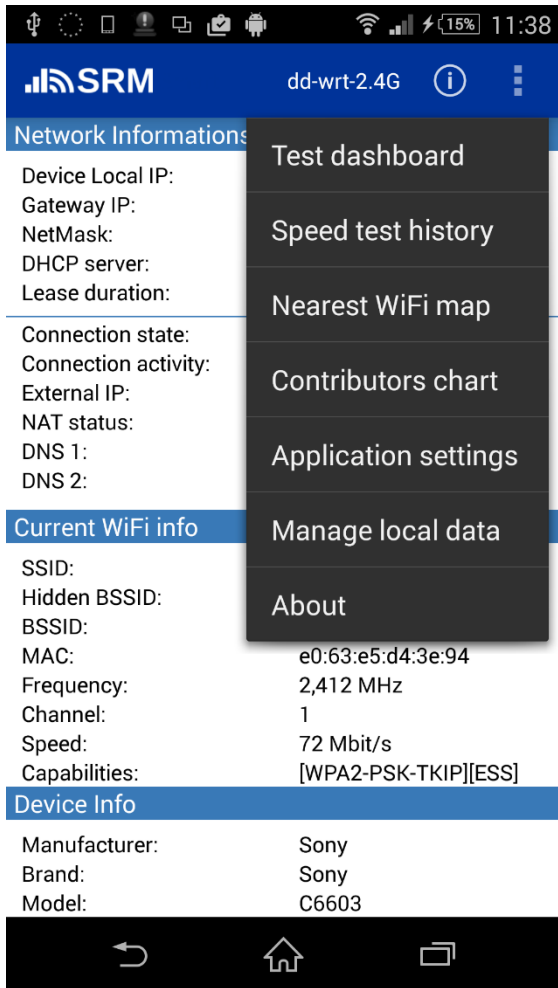
SRM dd-wrt-2.4G

100Mb/s
10Mb/s
1Mb/s

DOWNLOAD	22.9 Mb/s	UPLOAD	10.62 Mb/s
NET NAME	"dd-wrt-2.4G"		
NET TYPE	WiFi 72 Mbps		
NET IP	139.191.141.118		
SERVER	90.147.140.241		
PING	-		
ICMP	✓		



Android Application screen-shots





Some Other Tools for QoE Monitoring

Start

Latest measurement

25 Nov 2015 21:10:56

Download	36119 kbit/s
Upload	2694 kbit/s
Latency	61 ms
Network	WLAN

Network Signal Info

MOBILE WLAN CELL LOCATION SYSTEM

Percent: 50%
Percent 0: 50%
dBm: -85
dBm 0: -85

Net. operator:
Sim operator: USIM
Net. type: Unknown
Net. strength: -85 dBm * 14 ASU
Data state: Disconnected
Data activity: -
Cell: 38841 (Cell ID, short)
93689785 (Cell ID, long)
61429 (LAC - Local Area Code)
MNC: 01 (MNC - Mobile Network Code)
MCC: 001 (MCC - Mobile Country Code)
Country code:
IP: (WiFi IP) 10.44.87.217
External IP: (WiFi IP) 185.82.168.30
Roaming: Roaming is OFF

SPEED TEST

NETWORK PERFORMANCE TEST FOR

DOWNLOAD PING UPLOAD

Mbps ms Mbps

15 30 100

NULL, ITALY
2015-11-25 21:11 ON JYT JY-S3

EXTENDED TEST
REGULAR TEST

START TEST

SPEEDTEST

PING 4 ms
DOWNLOAD 15.01 Mbps
UPLOAD 20.36 Mbps

Test Again Remove Ads

Prima di mettere il fotovoltaico a casa, leggi queste 3 novità che stanno cambiando il mercato (DA FOTOFOLTOAIQUE PER TE)

SPEEDTEST RESULTS SETTINGS

Menu

RTR-NETZTEST

Austrian Regulatory Authority for Broadcasting and Telecommunications

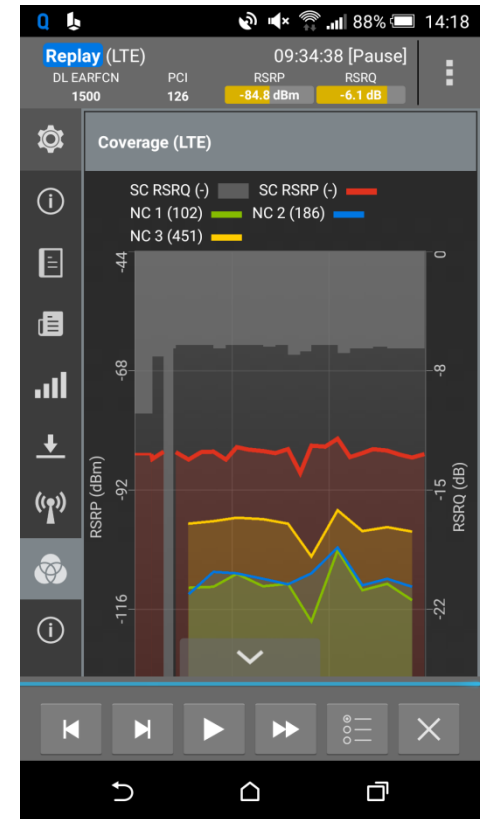
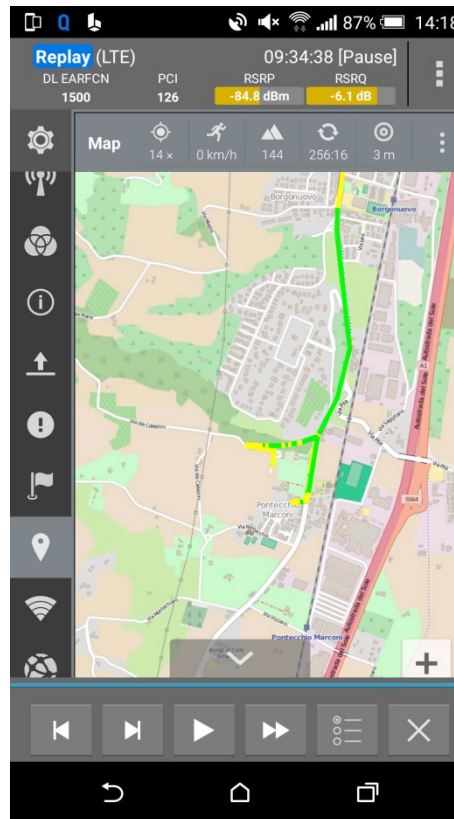
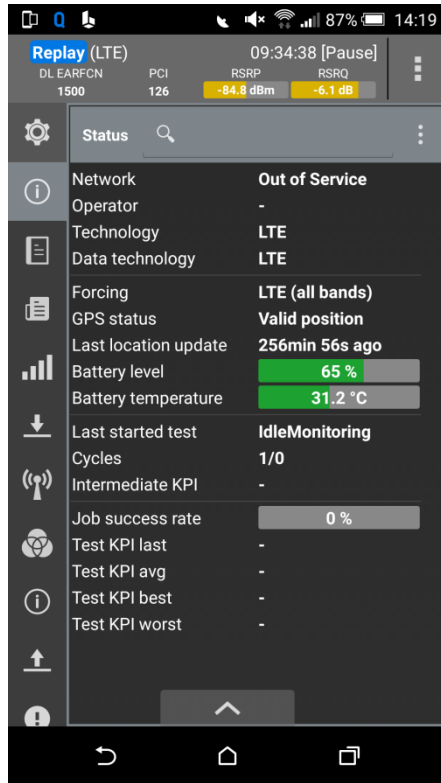
Network ID:
FreeLepida FGM Signal: -61 dBm

IPV4 IPV6

START



Professional Tools for QoS





Thank you

Further information:

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