



REPORT

May 2019

NETWORK COMPARE – MNO/MVNO

Rennes area
(France)

- Data & Web
- Streaming

9 May 2019

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1 Introduction : SmartViser - Test expert

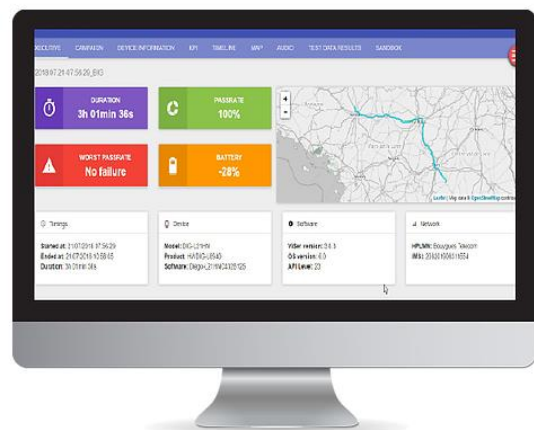
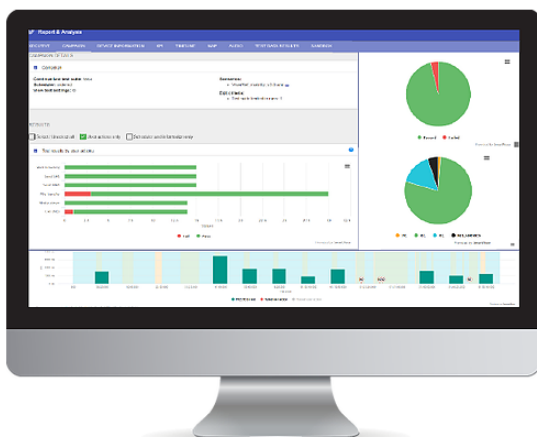
The End User is at the heart of our Innovation

Based on our Virtual User concept, our embedded powerful test engine **viSer** acts as a test bot for smartphones and networks.

It allows a quick and reliable evaluation based on a real usage automated by viSer engine and performed by a true embedded user scenario.

More than 100 KPIs reported

From battery performance to web speed and network coverage, viSer accurately records the key performance indicators in the lab or in the field.



A complementary answer to testing challenges

Our mission is to support our customers (operators, manufacturers, regulators, retailers or specialized media) in their testing activities with the objective to reach the best end user satisfaction and to empower their brand reputation.

2 Network benchmark

2.1 Objective

Report's objective is to give a comparison overview of the network performance (voice, SMS, data, streaming) in mobility condition between the Mobile Network Operator (MNO) and Mobile Virtual Network Operator (MVNO) using the same radio network coverage.

It gives reliable information to MVNO to ensure network performance meet the end users' expectations and MVNO own criteria in terms of User Experience.

2.2 Test Conditions

To give the most accurate information, we test both networks (MNO/MVNO) with the same smartphone model. The test protocols and scenarios are designed in accordance with the way network is performing network evaluation (MVNO).

Several KPIs are measured and reported.

The testing is carried out using viSer automated solution installed on all devices, each device uses a different SIM card subscription, one MNO SIM card and one MVNO SIM card. All devices are executing the same scenario simultaneously in the same place for the whole duration of the test with exactly same parameters configuration.

With viSer™ no manual operation is required, this ensures that all tests are performed exactly on the same way on all networks under testing. All results are available in CSV files (one per mobile).

In addition, data processing is performed automatically and all results / KPI collected are immediately available under VWS Web Dashboard.

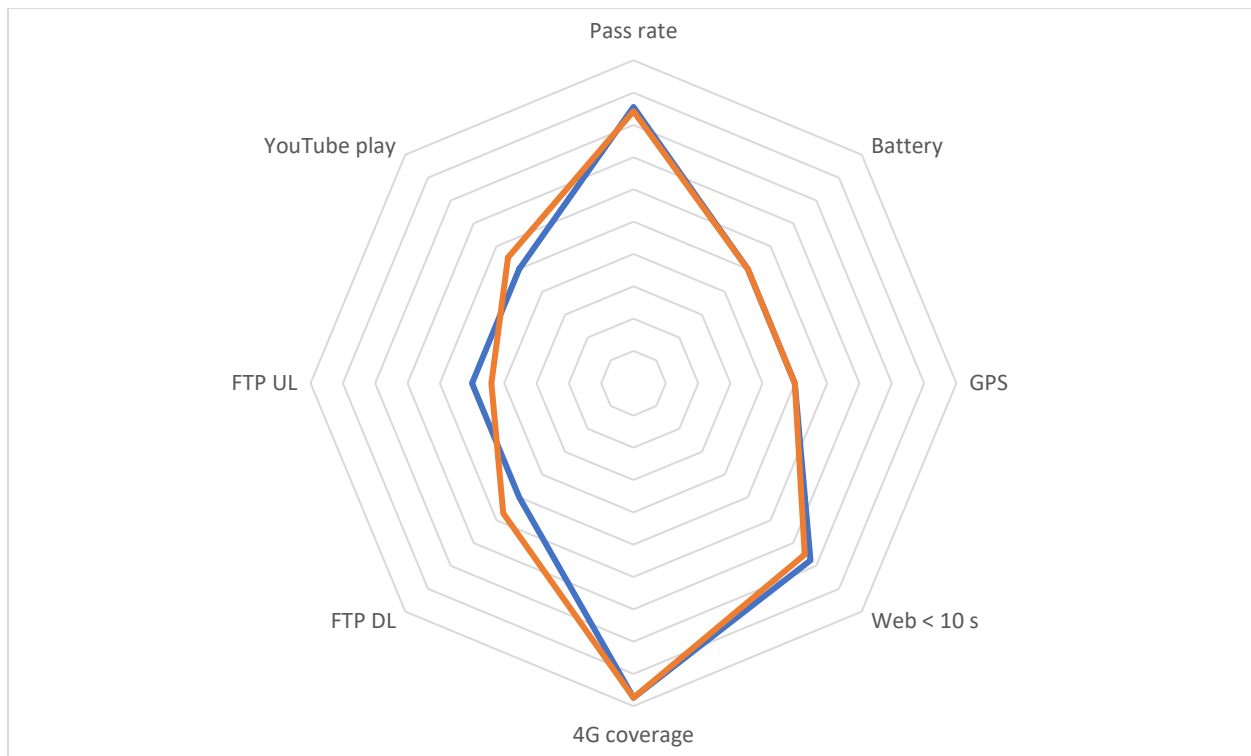
3 MNO XXX versus MVNO YYY

3.1 Test environment

DATE	AREA	NETWORKS	PACKAGE PRICE
4 th of May 2019	Rennes, France	MNO : MCC MNC: 208-10 MVNO : MCC MNC: 208-10	MNO : 15 €/month MVNO : 10 €/month

3.2 Network ranking

General overview MNO versus MVNO over the key KPIs.



In some cases, MNO reference is 50%.

KPI	MNO	MVNO
Pass rate	85.53 %	84.21 %
Battery	11 % (50%)	11 % (50%)
GPS	7.57 m (50 %)	7.56 m (50 %)
Web < 10 s	77,5 %	75 %
4G coverage	97,4 %	97,4 %
FTP DL	8.148 Mb/s (50%)	9.215 Mb/s (57 %)
FTP UL	6.801 Mb/s (50%)	5.990 Mb/s (44 %)
YouTube	2270 ms (50 %)	2003 ms (55 %)

3.3 TEST RESULTS

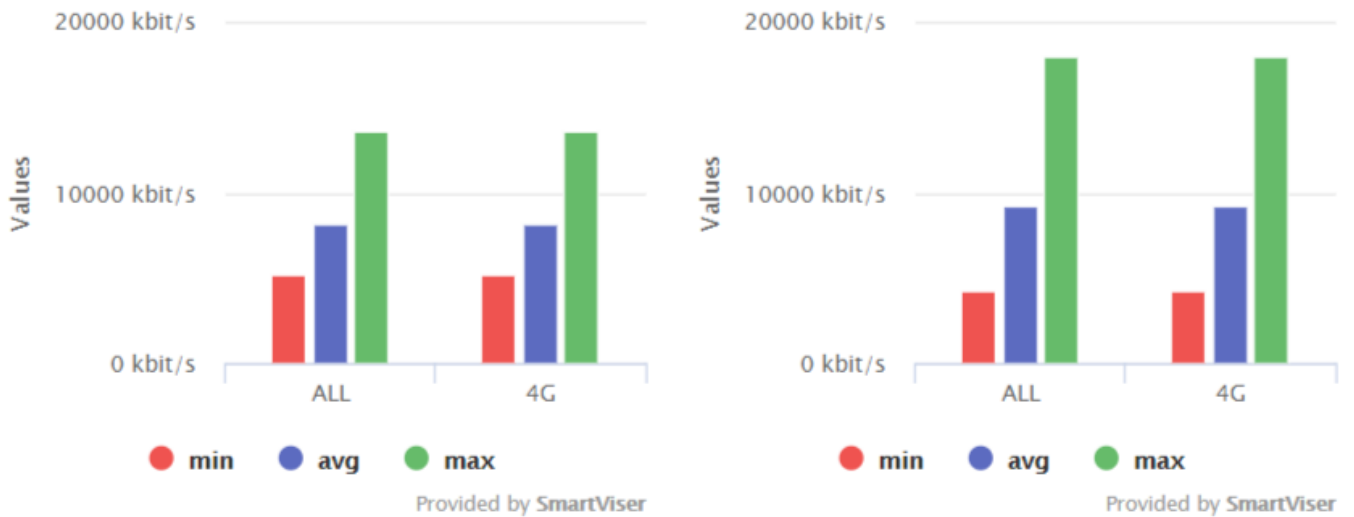
3.3.1 Web loading



KPI	MNO	MVNO	Result
Loading < 10 s	77,5 %	75 %	100 %
Loading average 4G	3 351 ms	3 368 ms	>
Loading min 4G	1 310 ms	1 238 ms	<
Loading max 4G	9 075 ms	8 907 ms	<
Loading average 3G	NA	NA	-
Loading min 3G	NA	NA	-
Loading max 3G	NA	NA	-

3.3.2 FTP File transfer

DOWNLOAD



KPI	MNO	MVNO	Result
Download < 30 s	100 %	100 %	100 %
Download average 4G	8 148 kbps	9 215 kbps	>
Download min 4G	5 166 kbps	4 274 kbps	<
Download max 4G	13 651 kbps	17 972 kbps	>
Download average 3G	NA	NA	-
Download min 3G	NA	NA	-
Download max 3G	NA	NA	-

UPLOAD



KPI	MNO	MVNO	Result
Upload < 30 s	78 %	78 %	100 %
Upload average 4G	6 801 kbps	5 990 kbps	<
Upload min 4G	1 456 kbps	1 444 kbps	<
Upload max 4G	14 244 kbps	11 233 kbps	<
Upload average 3G	NA	NA	-
Upload min 3G	NA	NA	-
Upload max 3G	NA	NA	-

3.3.3 Streaming

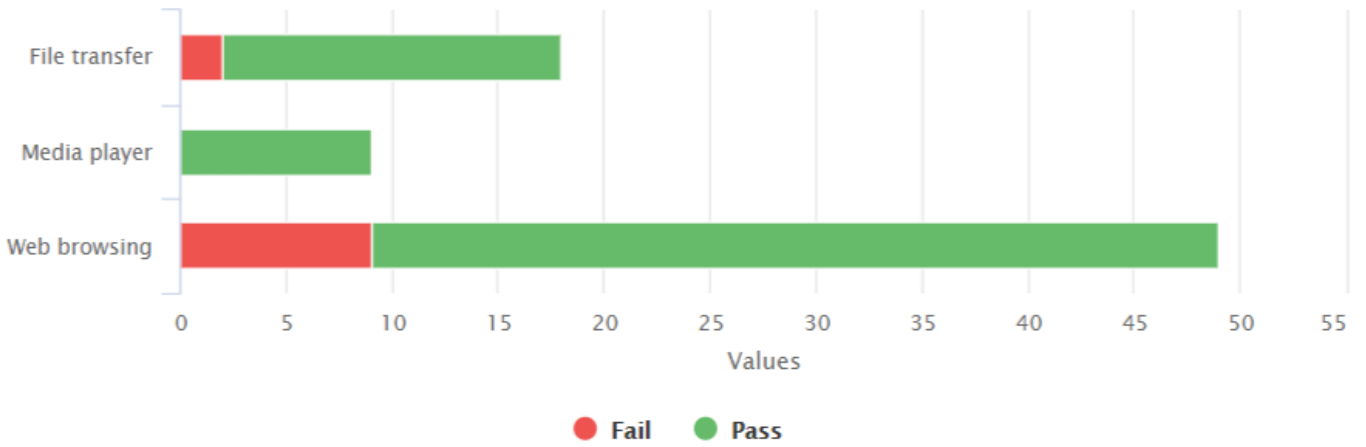
KPI	MNO	MVNO	Result
Video records	all	all	NA
Nb of buffering	0	0	=
Access time average 4G	2 270 ms	2 003 ms	W
Access time min 4G	1 781 ms	1 869 ms	<
Access time max 4G	4 961 ms	2 449 ms	>
Access time 3G	NA	NA	-
Access time min 3G	NA	NA	-
Access time max 3G	NA	NA	-

Network
Pass rate

MNO

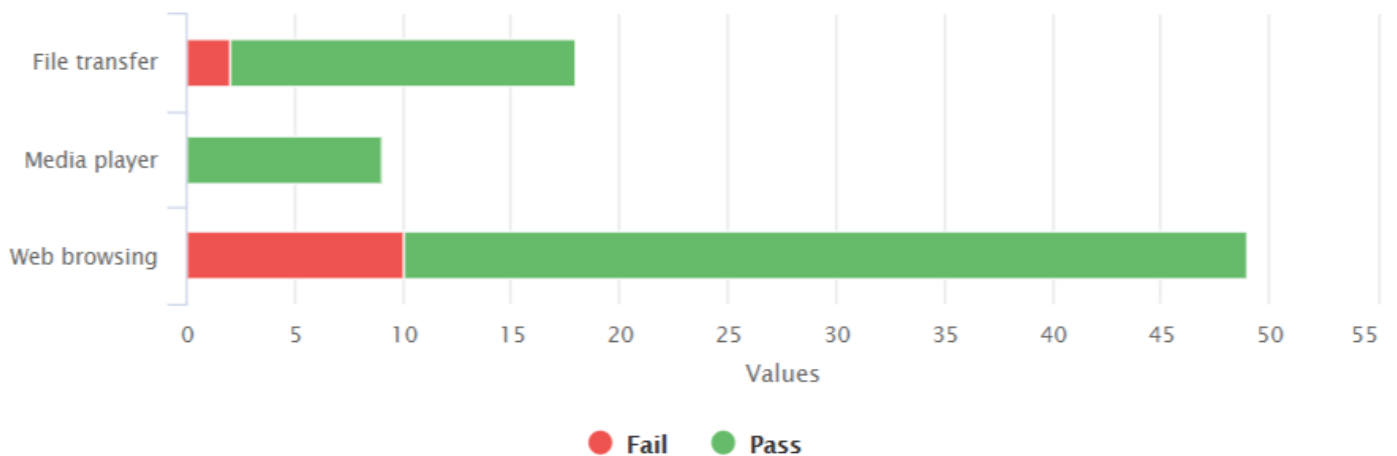


MVNO



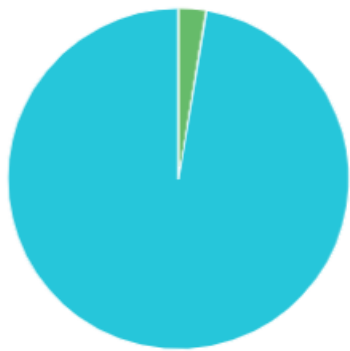
Provided by SmartViser

MVNO



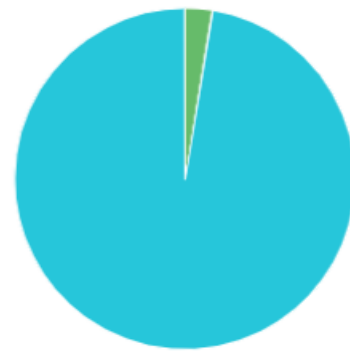
Provided by SmartViser

RAT split



● 3G ● 4G

Provided by SmartViser



● 3G ● 4G

Provided by SmartViser

KPI	MNO	MVNO	Result
4G coverage	97.4 %	97.4 %	=
Nb of network lost	0	0	0

3.3.4 Device impact

Battery

MNO



MVNO



3.3.5 GPS

KPI	MNO	MVNO	Result
GPS accuracy average	7.57 m	7.56 m	=

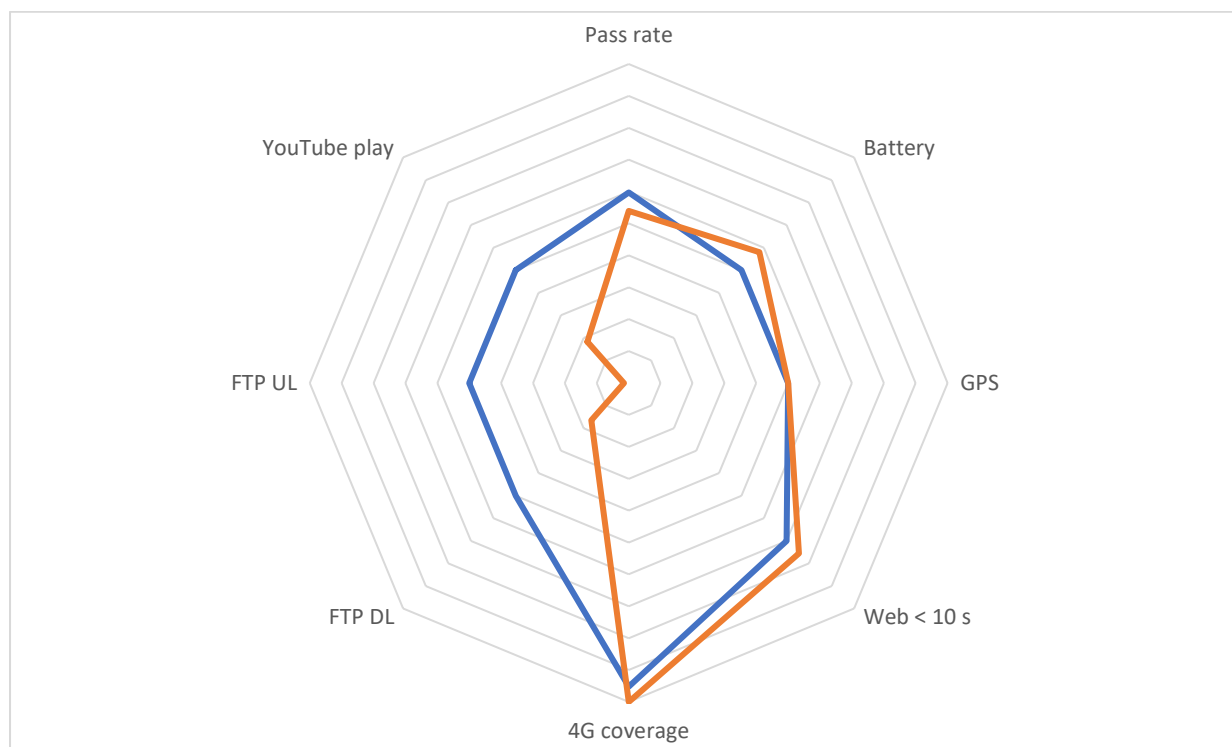
4 MNO versus MVNO

4.1 Test environment

DATE	AREA	NETWORKS	PACKAGE PRICE
4 th of May 2019	Rennes, France	MNO : MCC MNC: 208-20 MVNO : MCC MNC: 208-20	MNO : 23 €/month MVNO : 16 €/month

4.2 Network ranking

General key KPIs overview MNO versus MVNO



In some cases, MNO reference is 50%.

KPI	MNO	MVNO
Pass rate	59.74 %	53.93 %
Battery	13 % (50%)	12 % (58%)
GPS	7.6 m (50 %)	7.59 m (50 %)
Web < 10 s	70 %	75 %
4G coverage	95,2 %	100 %
FTP DL	13.451 Mb/s (50%)	4.448 Mb/s (16,5 %)
FTP UL	13.068 Mb/s (50%)	0.410 Mb/s (1,5 %)
YouTube	8398 ms (50 %)	22965 ms (18,3 %)

4.3 TEST RESULTS

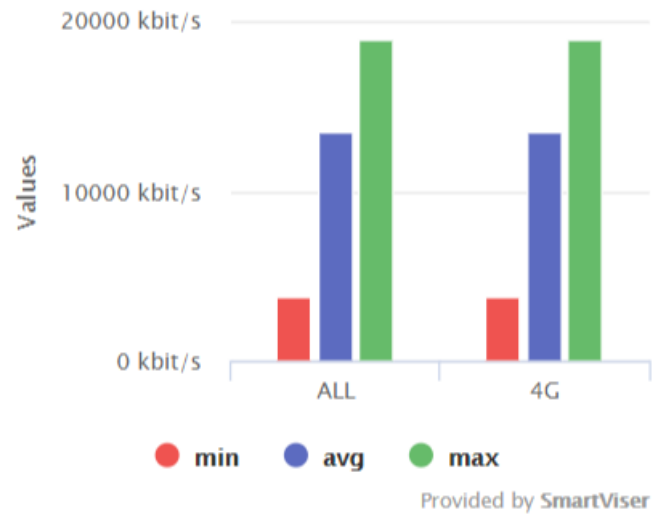
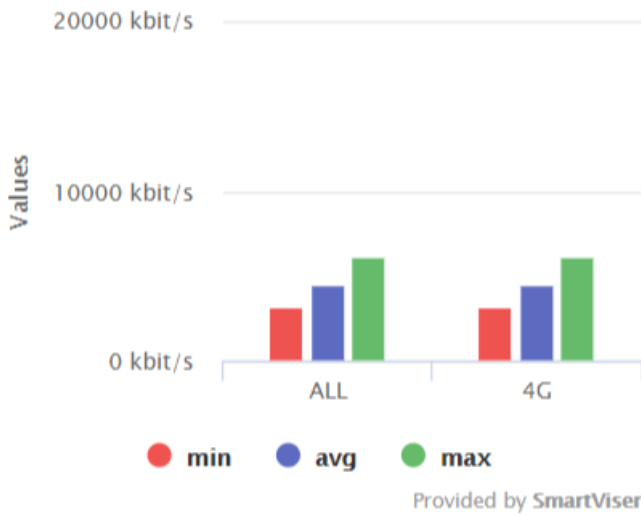
4.3.1 Web loading



KPI	MNO	MVNO	Result
Loading < 10 s	70 %	75 %	100 %
Loading average 4G	3 155 ms	3 510 ms	<
Loading min 4G	1 199 ms	1 310 ms	<
Loading max 4G	8 571 ms	9 304 ms	<
Loading average 3G	NA	NA	-
Loading min 3G	NA	NA	-
Loading max 3G	NA	NA	-

4.3.2 FTP File transfer

DOWNLOAD



KPI	MNO	MVNO	Result
Download < 30 s	44,5 %	33,33 %	100 %
Download average 4G	13 451 kbps	4 448 kbps	<
Download min 4G	3 766 kbps	3 210 kbps	<
Download max 4G	18 954 kbps	6 212 kbps	<
Download average 3G	NA	NA	-
Download min 3G	NA	NA	-
Download max 3G	NA	NA	-

UPLOAD



KPI	MNO	MVNO	Result
Upload < 30 s	33,33 %	0 %	100 %
Upload average 4G	13 068 kbps	410 kbps	<
Upload min 4G	9 570 kbps	145 kbps	<
Upload max 4G	17 537 kbps	1 578 kbps	<
Upload average 3G	NA	NA	-
Upload min 3G	NA	NA	-
Upload max 3G	NA	NA	-

Streaming

KPI	MNO	MVNO	Result
Video records	4/9	1/9	NA
Nb of buffering	0	0	=
Access time average 4G	8 398 ms	22 965 ms	<
Access time min 4G	2 958 ms	22 965 ms	<
Access time max 4G	24 070 ms	22 965 ms	>
Access time 3G	NA	NA	-
Access time min 3G	NA	NA	-
Access time max 3G	NA	NA	-

4.3.3 Network

Pass Rate

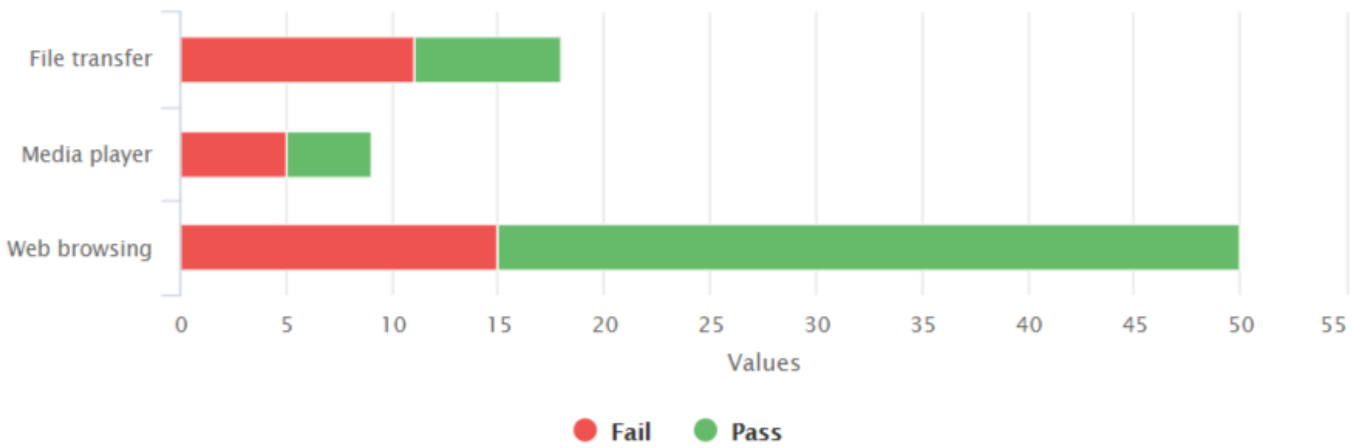
MNO



MVNO

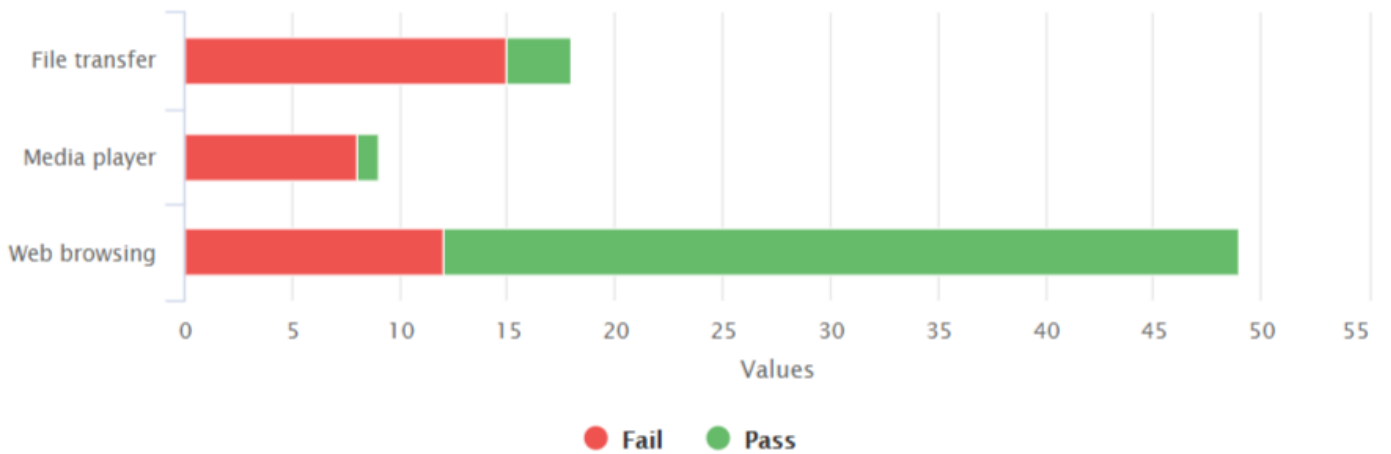


MNO



Provided by SmartViser

MVNO



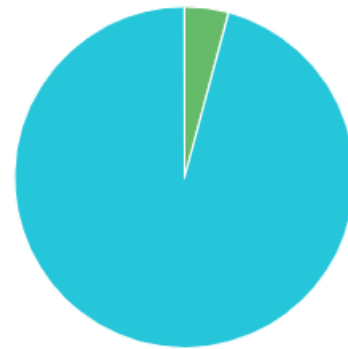
Provided by SmartViser

RAT split



● 4G

Provided by SmartViser



● 3G ● 4G

Provided by SmartViser

KPI	MNO	MVNO	Result
4G coverage	95,2 %	100 %	>
Nb of network lost	0	0	0

4.3.4 Device impact

Battery



4.3.5 GPS

KPI	MNO	MVNO	Result
GPS accuracy average	7.6 m	7.59 m	=