



Brussels 5G QoE Benchmarking

MedUX Insights: Detailed report, February 2025

5G

Measurement campaign: Q42024
FINAL REPORT [CONFIDENTIAL]

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5G Benchmark in Europe

with TRUE QoE KPIs



MedUX Insights:

Brussels 5G QoE Benchmarking

At MedUX we have conducted our third **5G QoE Benchmark in Europe**. The study unveils a very good winner and co-leader in Belgium, followed closely , and a strong contender.

We have leveraged our autonomous and cost-effective 'light' drive testing solution to benchmark, monitor and improve mobile networks. It aims at improving customer satisfaction by delivering an honest, **independent review that enhances service quality** from the viewpoint of the people who matter most – the users.





5G Benchmark in Brussels

Did you know?



MOBILE PERFORMANCE
VERY GOOD

BEST EXPERIENCE
IN BRUSSELS (BE)


Q4/2024

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Best Mobile Quality of Experience
in Brussels

FASTEST 5G DL SPEED

1260 Mbps

Achieved by Orange

FASTEST 5G UL SPEED

189 Mbps

Achieved by Proximus

STREAMING

85%

4K Playback Time
Achieved by Proximus

5G COVERAGE

46%

Top 5G Availability
achieved by Proximus

RELIABILITY

99.59%

Most consistent
experience by Telenet



Key findings

MedUX 5G QoE benchmark conducted in Brussels in Q4 2024 shows two very good winners and co-leaders, and a strong contender.

Proximus shares the first overall position with Orange in the Brussels 5G QoE Benchmarking campaign, winning the Streaming Experience Award and all 5G Awards. Orange, as co-leader, obtains the best Data and OTT Experience and Value for Speed.



Proximus provides the finest experience in Brussels, leading all the categories in 5G experience

Best 5G Availability with highest 5G registration rate (46%).

Best Streaming Experience, with highest ratio in Full Resolution (4K), both in the blended and 5G.

Best 5G Gaming Experience with the lowest latency both in the blended and 5G.

QoE Score: 4.168 out of 5

5G QoE Score 4.59 out of 5



Orange co-leads with Proximus, delivering the best Value for Speed and Data and OTT experience

Best in Social Media Experience, both in the blended and 5G.

Best Web Browsing, Cloud Storage and File Transferring experience.

Highest average and median 5G download speeds: 353 and 324 Mbps respectively (Highest overall with 1260 Mbps).

QoE Score: 4.166 out of 5

Best avg. DL speed with 236 Mbps



Telenet shows the best Reliability, along with the best Accessibility

Highest reliability with 99.59% of completion rate (successful internet sessions).

Lowest jitter in Network Responsiveness (15 ms).

Best jitter consistency in Gaming with 85% of sessions below 20 ms.

94.5% of Reliability Score

94.3% of Accessibility Score



Benchmarking Methodology

With the goal of providing an independent and international benchmarking tool, MedUX developed its own QoE ScoreCard to determine and certify the best provider or operator with respect of the services accessed via mobile networks.

This goal is achieved by executing benchmarking tests that represent a major part of the services used by final customers of mobile networks. The results collected are individually and collectively weighted and aggregated into an overall score.

The service category scoring model and its drill-down capabilities makes it exploitable by different stakeholders, from executive management (CxOs) to more technical departments (engineering and optimization). Thus, providers or operators can improve their networks and services offering a better experience to their customers.

To give transparency and a clear interpretation of the benchmarking results, MedUX publishes a description of the scoring methodology, in line with the current state of the ETSI TR 103 559 V1.2.1

In this context we introduce the following terms, Quality of Service (QoS) and Quality of Experience (QoE):

- QoS: "Totality of characteristics of a telecommunications service that bear on its ability to satisfy stated and implied needs of the user of the service."
- QoE: "Degree of delight of the user of a service. In the context of communication services, it is influenced by content, network, device, application, user expectations and goals, and context of use."

MedUX propose a model where technical measurements are transformed into perceptive indicators taking into account the human response to mobile service's events, improvements and degradations.

For further details about the methodology used please visit our blog ["Assessing customer experiences with an advanced mobile broadband benchmarking methodology"](#)

Quality of Experience – Ranking approach

MedUX mobile benchmarking approach, based on our MedOS (MedUX Opinion Score) and QoE Scorecard, assesses network performance and end-user experience in the 5G Era. We revisit criteria and thresholds once a year to consider best practices but also to reflect technology and industry development.

At MedUX we use the concept of Mean opinion score (MOS) for most of the rankings, which ratings are algorithmically estimated based on test results and KPIs, in line with the current state of the ETSI TR 103 559 V1.2.1 and ITU Recommendation ITU-T P.800.1.

• Top Awards:

- **Overall QoE Score** – a combination of availability, accessibility, speed, streaming, and data and OTT experience results.
- **Reliability** – assesses network consistency across all service categories, focusing on 5G stability by considering the success rate (%) of all tests and services described above. A test is considered as not successful if it fails or if does not meet minimum service thresholds.

• Experience Awards:

- **Accessibility** (responsiveness) – how long it takes to access the network. Particularly in 5G it measures how long takes to access the 5G network across all testing categories while taking latency and network responsiveness results into account.
- **Value for Speed** (throughput) - how much data can be transferred. Particularly in 5G it measures how is the network capacity when stressing the line (multi-thread and multi-server stress test with our patented Cloud Speed Test).
 - DL Speed
 - UL Speed
- **Video Streaming experience** - it measures the average video experience for each operator while considering video resolution, video loading time, and stall ratio.
- **Data and OTT experience** - a combination of gaming, web browsing, social networks, file transfer experiences.

Quality of Experience – Ranking approach

• 5G Awards

- **5G Availability** – the percentage of 5G network registration, a proxy of 5G coverage available during the measurements.
- **5G DL Speed** (throughput) – how much data can be transferred in 5G downlink channel, how is the network capacity when stressing the line (multi-thread and multi-server stress test with our patented Cloud Speed Test),
- **5G UL Speed** (throughput) – how much data can be transferred in 5G uplink channel, how is the network capacity when stressing the line (multi-thread and multi-server stress test with our patented Cloud Speed Test),
- **5G Gaming**, it measures the average 5G gaming experience rating different key parameters

For further details about the methodology used please visit our blog [“Assessing customer experiences with an advanced mobile broadband benchmarking methodology”](#)

Mobile Experience Awards

Awards are granted to the best performing operators in each attribute or category we test. If two or more operators record statistically indistinguishable results*, each operator earns an Experience Award while sharing the highest rank in that category.

Proximus and Orange lead the Brussels 5G QoE Benchmarking campaign, winning all Mobile Experience Awards except for Reliability and Accessibility that go to Telenet.

	Top Awards	Experience Awards					5G Awards			
	Best Experience	Reliability	Data & OTT	Streaming	Value for Speed	Accessibility	5G Availability	5G DL Speed	5G UL Speed	5G Gaming
Brussels	 							 		



- Proximus and Orange lead most of the rankings across all mobile experience categories
- Proximus and Orange win the most important award for Best QoE while showing best stability across most mobile experience categories and KPIs.
- Telenet leads the second most important award, Best Reliability, as well as other specific Awards on Accessibility.

NOTE*: Co-leaders (less than 0.5% difference)



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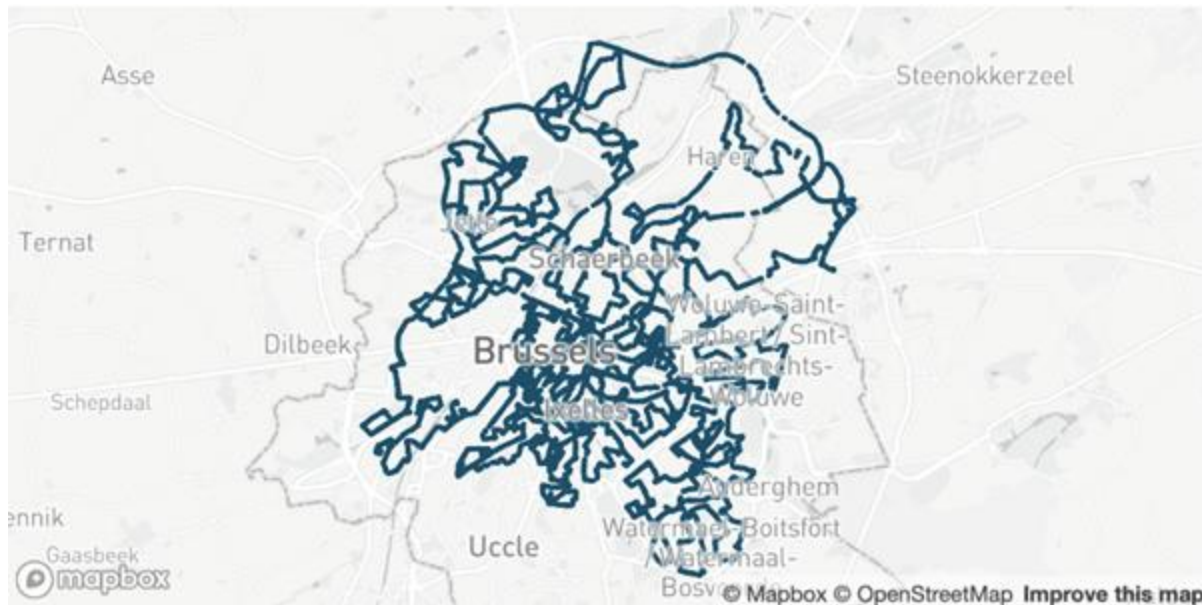
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5G Campaign Overview

The measurement campaign consisted of drive tests conducted during Q4 2024 in Brussels, one of the most important cities in Europe with more than two million inhabitants in urban areas.

One drive test car covered more than 300 kilometers and 100km² to understand how mobile operators cover the Belgian capital.



 >300 km and >100 km²

Measurement Scope



Technology: Up to 5G
• Unforced mode



Devices: 6 MedUX Mobile
• Commercial smartphone-based probes



Vehicles: 1 car
• 6 devices per vehicle



Sampling:
• Tests: approx. 10K samples
• Radio: approx. 300K samples



Complete Test protocol
• Targets, servers, OTTs, destinations,...



5G SIM cards



Planned route: 3 Days



Timing: Q4 2024



Tests suite

MedUX evaluates mobile networks experience by ranking the performance of typical consumer use cases such as web browsing popular websites, downloading/uploading content, visiting social networks, accessing gaming servers and streaming video content, among other.

	Service Availability	Connectivity based on radio technology samples.
	Cloud DL	Multi-thread download speed test based on public CDNs.
	Cloud UL	Multi-thread upload speed test based on dedicated servers.
	HTTP DL	File download test based on dedicated servers (7 seconds Burst)
	HTTP UL	File upload test based on dedicated servers (7 seconds Burst)
	Dropbox	Single-thread download from a file (10MB) hosted in Dropbox.

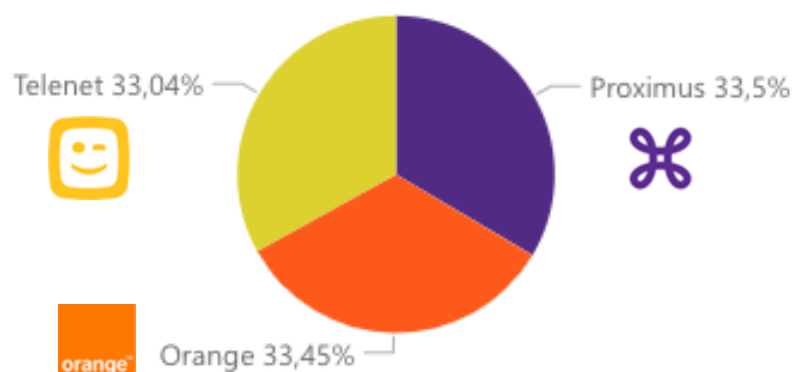
	Latency	Echo request to a specific URL based on ICMP.
	Social Media	Social media sessions based on Chrome browser
	Streaming	Youtube Video playback based on a Android multimedia player.
	Gaming	Echo request to gaming servers based on ICMP.
	Web Browsing	Navigation of any website based on Chrome browser.

5G Campaign Setup – Tests performed

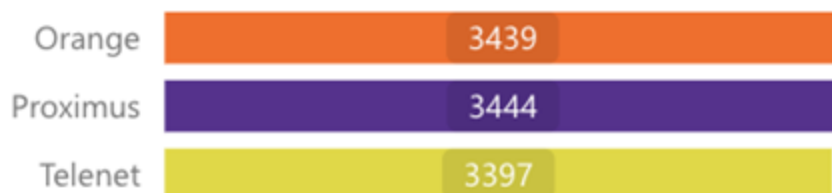
For connectivity purposes, a total of around 300k radio samples were collected. For service performance purposes, a total of around 10k data samples were collected. All in all, resulting in a total of around 100k radio samples and 3,5k tests per operator.

% of TestName by Network

Network ● Proximus ● Orange ● Telenet



Network ● Orange ● Proximus ● Telenet



10.280

#Test performed

ServiceType	Orange	Proximus	Telenet	Total
DATA & OTT	2269	2276	2238	6783
Dropbox	148	153	148	449
GamingTest	598	604	588	1790
HTTP-DL	156	156	158	470
HTTP-UL	125	133	101	359
Social Media	619	612	623	1854
Web Browsing	623	618	620	1861
Network Responsiveness	753	750	759	2262
Ping	753	750	759	2262
Streaming	153	151	152	456
YouTube	153	151	152	456
Value for Speed	264	267	248	779
Cloud-DL	156	156	161	473
Cloud-UL	108	111	87	306
Total	3439	3444	3397	10280

For further details about the test cases covered in the campaign scope please see “Tests Suite” or “Testing and KPI details” below.



Benchmarking Experience - Best QoE

Proximus and Orange achieved the best overall ranking result. Out of 5 possible points, Proximus and Orange scored with 4.168 and 4.166 respectively, closely followed by Telenet. With a difference of 0.13 (-3,1%) points, Telenet is in third place.



- Proximus provides the finest experience in Brussels, coupled with the best performance in Streaming and leading all the categories in 5G experience, including 5G Availability and Performance



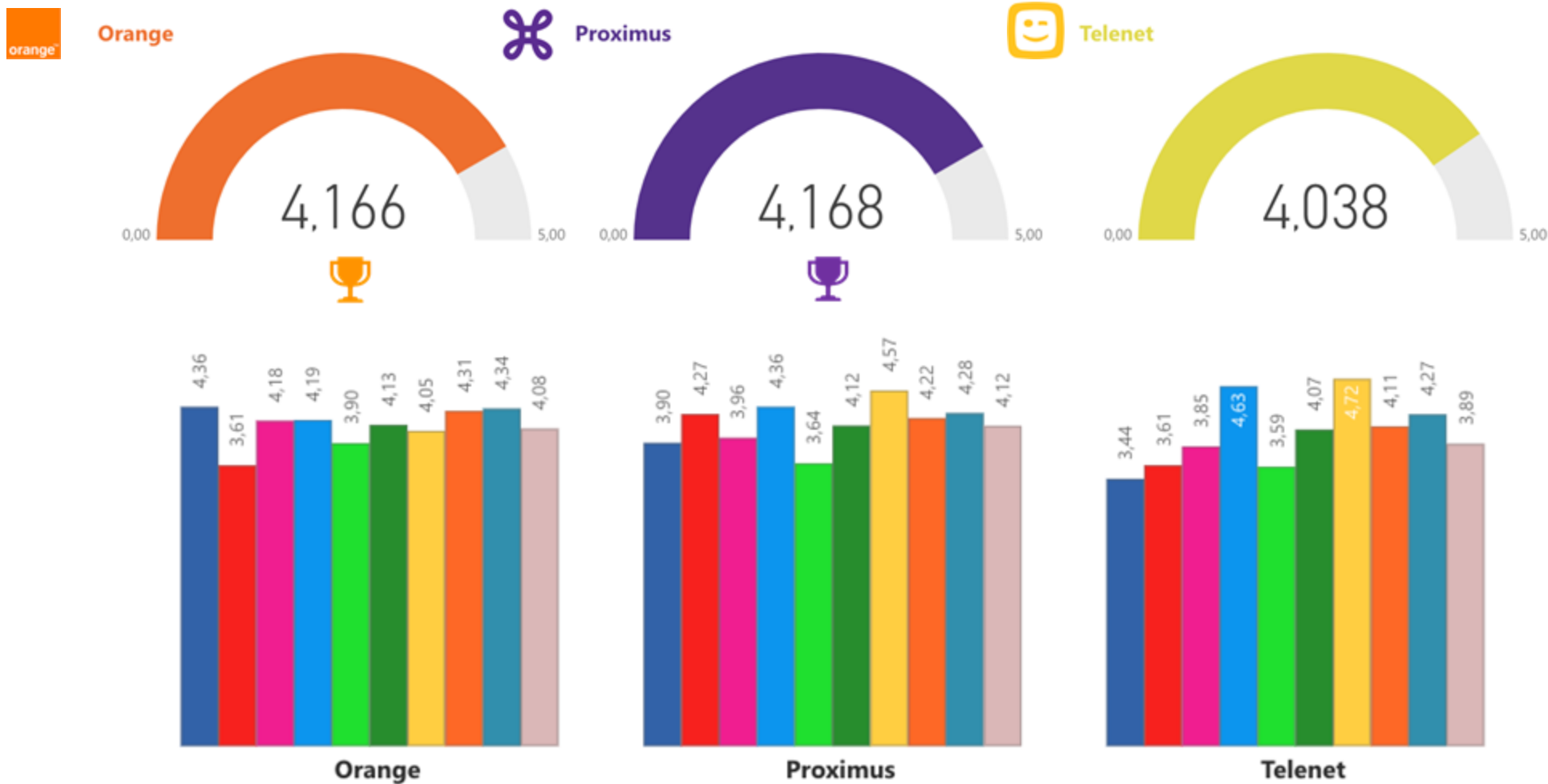
- Orange co-leads with Proximus, delivering the best Value for Speed and Data and OTT experience, including best Social Media, Web Browsing, Cloud Storage and File Transferring experience.



- Telenet provides the most reliable experience, along with the best Network Responsiveness (Accessibility) and best Gaming experience.



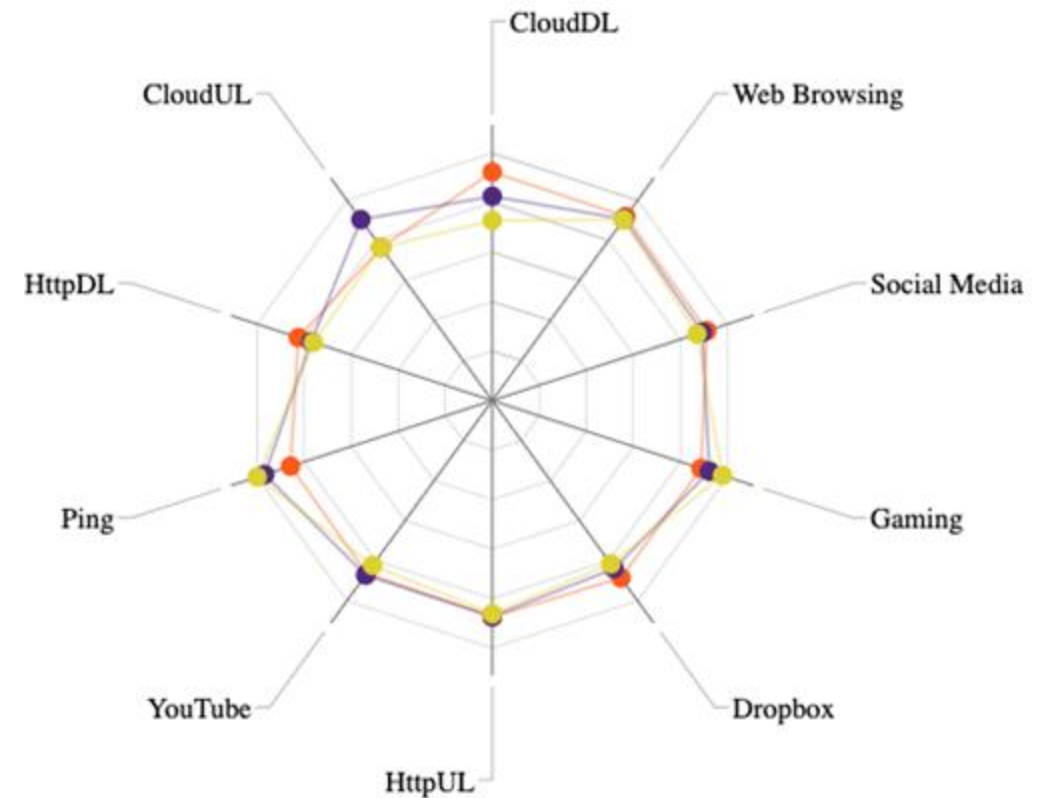
Benchmarking Experience – Results per category



Benchmarking Experience – Results per category

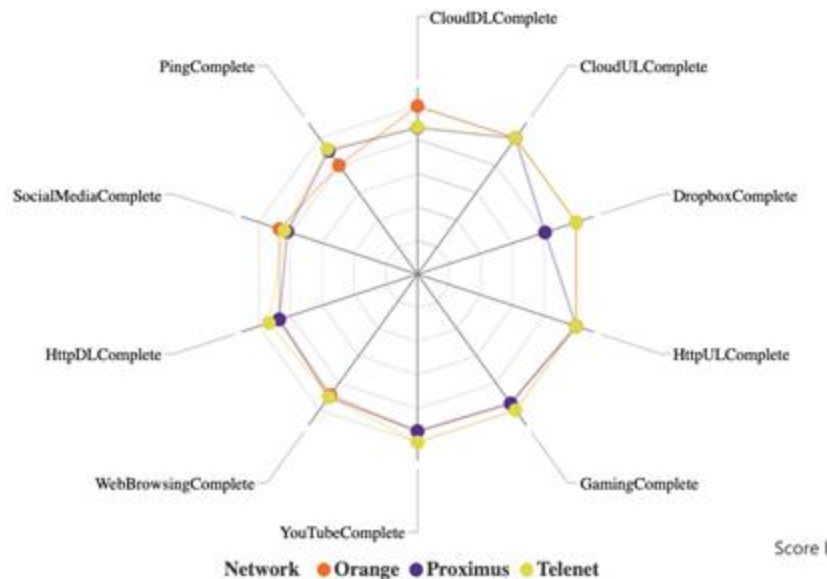


Network	Orange		Proximus		Telenet	
Services MOS (Max MOS)	Value	%	Value	%	Value	%
DATA & OTT (2.625)	2,225	84,75 %	2,192	83,50 %	2,187	83,33 %
MOS Dropbox (0.25)	0,209	83,69 %	0,198	79,28 %	0,193	77,06 %
MOS Gaming (0.375)	0,315	83,88 %	0,327	87,27 %	0,347	92,54 %
MOS HttpDL (0.25)	0,195	77,94 %	0,182	72,76 %	0,180	71,87 %
MOS HttpUL (0.25)	0,207	82,62 %	0,206	82,43 %	0,204	81,41 %
MOS SocialMedia (0.5)	0,431	86,23 %	0,422	84,37 %	0,411	82,23 %
MOS WebBrowsing (1)	0,868	86,83 %	0,857	85,66 %	0,853	85,34 %
Network Responsiveness (0.375)	0,304	81,08 %	0,343	91,48 %	0,354	94,49 %
MOS Ping (0.375)	0,304	81,08 %	0,343	91,48 %	0,354	94,49 %
Streaming (1.25)	1,021	81,67 %	1,030	82,38 %	0,972	77,76 %
MOS YouTube (1.25)	1,021	81,67 %	1,030	82,38 %	0,972	77,76 %
Value for Speed (0.75)	0,617	82,25 %	0,604	80,48 %	0,524	69,92 %
MOS CloudDL (0.5)	0,436	87,26 %	0,390	78,00 %	0,344	68,76 %
MOS CloudUL (0.25)	0,181	72,23 %	0,214	85,42 %	0,181	72,25 %
Total MOS (5)	4,166	83,33 %	4,168	83,37 %	4,038	80,76 %



Benchmarking Reliability – Consistent performance

Network	Orange		Proximus		Telenet	
Services MOS (Max MOS)	Value	%	Value	%	Value	%
Reliability (2.75)						
MOS Reliability (2.75)	2,539	92,32 %	2,492	90,63 %	2,593	94,31 %



Best Experience:

- 7.5% - Accessibility
- 15% - Value for speed
- 25% - Streaming
- 52.5% - Data & OTT

Reliability (part of QoE Scorecard):

- 0.206p - Accessibility*
- 0.412p - Value for speed*
- 0.687p - Streaming Experience*
- 1.445p - Data & OTT*

*MOS Reliability
is based on 2.75p max

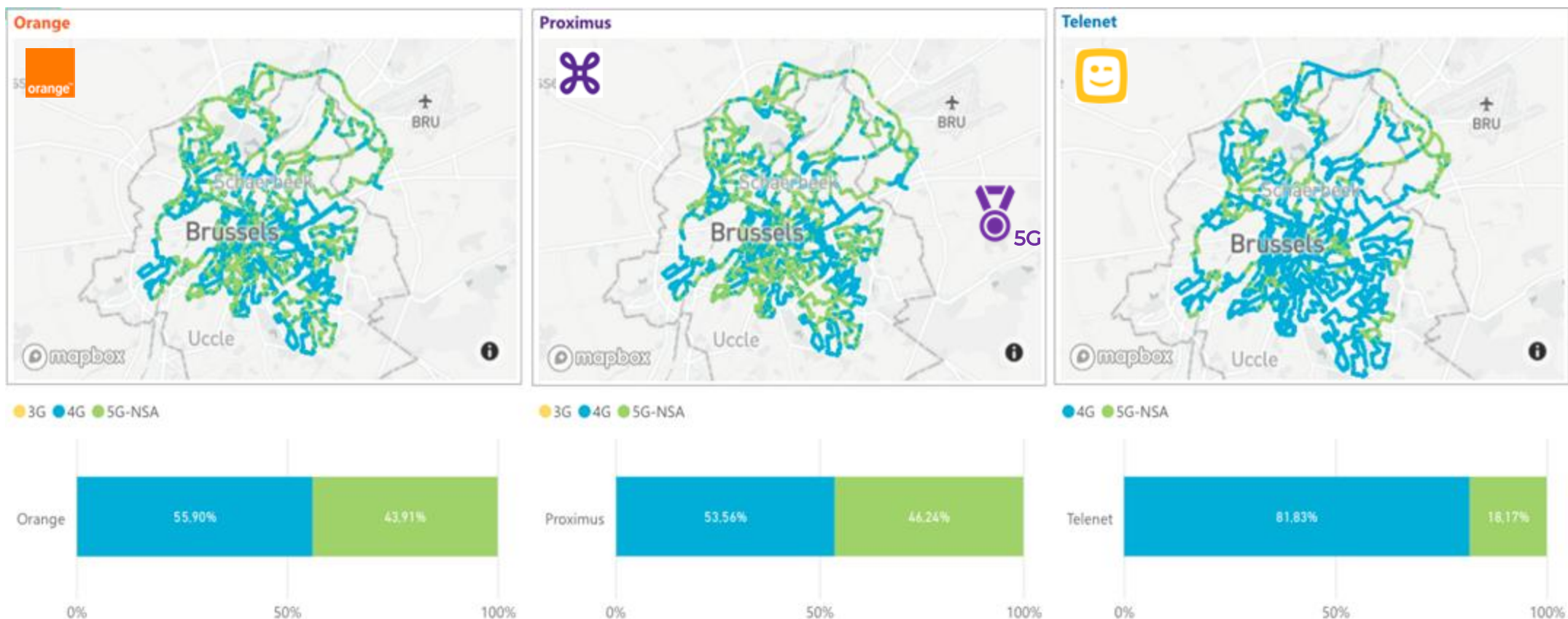
KPIs Reliability (Success Rate above qualifiers - min value)

	Orange	Proximus	Telenet
CloudDLCompleteQ (%)	100,00 %	98,72 %	98,76 %
CloudULCompleteQ (%)	100,00 %	100,00 %	100,00 %
WebBrowsingCompleteQ (%)	98,88 %	99,03 %	99,03 %
DropboxCompleteQ (%)	100,00 %	98,04 %	100,00 %
GamingCompleteQ (%)	99,50 %	99,50 %	100,00 %
HTTPDLCompleteQ (%)	98,72 %	98,72 %	99,37 %
HttpULCompleteQ (%)	100,00 %	100,00 %	100,00 %
PingCompleteQ (%)	98,01 %	99,07 %	99,21 %
SocialMediaCompleteQ (%)	98,71 %	98,20 %	98,39 %
YouTubeCompleteQ (%)	98,04 %	99,34 %	100,00 %

KPIs Reliability (Success Rate)

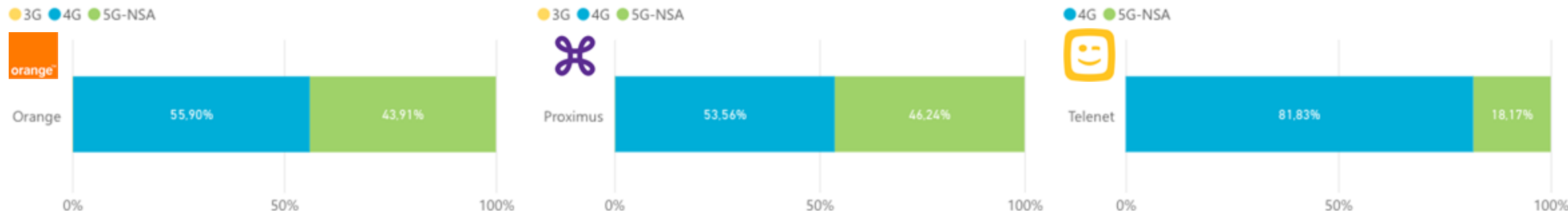
	Orange	Proximus	Telenet
CloudDLComplete (%)	100,00 %	100,00 %	100,00 %
CloudULComplete (%)	100,00 %	100,00 %	100,00 %
WebBrowsingCompleteQ (%)	98,88 %	99,03 %	99,03 %
DropboxComplete (%)	100,00 %	98,04 %	100,00 %
GamingComplete (%)	99,50 %	99,50 %	100,00 %
HttpDLComplete (%)	100,00 %	100,00 %	100,00 %
HttpULComplete (%)	100,00 %	100,00 %	100,00 %
PingComplete (%)	99,20 %	99,73 %	99,74 %
SocialMediaComplete (%)	99,03 %	98,20 %	98,88 %
YouTubeComplete (%)	99,35 %	99,34 %	100,00 %

Benchmarking Availability – Best 5G registration rate



- Proximus has the best 5G availability (coverage) with over 46.24% technology registration.

Benchmarking Availability – 5G Deployment



NR Bands Distribution [%]

NR Band	DL BW	DL Freq	ARFCN	%Total
78	100MHz	3649.44MHz	643296	78,16%
1	15MHz	2161.45MHz	432290	11,54%
28	10MHz	772.85MHz	154570	10,30%

NR Bands Distribution [%]

NR Band	DL BW	DL Freq	ARFCN	%Total
78	100MHz	3750.24MHz	650016	63,22%
1	25MHz	2130.15MHz	426030	32,40%
28	10MHz	782.55MHz	156510	4,39%

NR Bands Distribution [%]

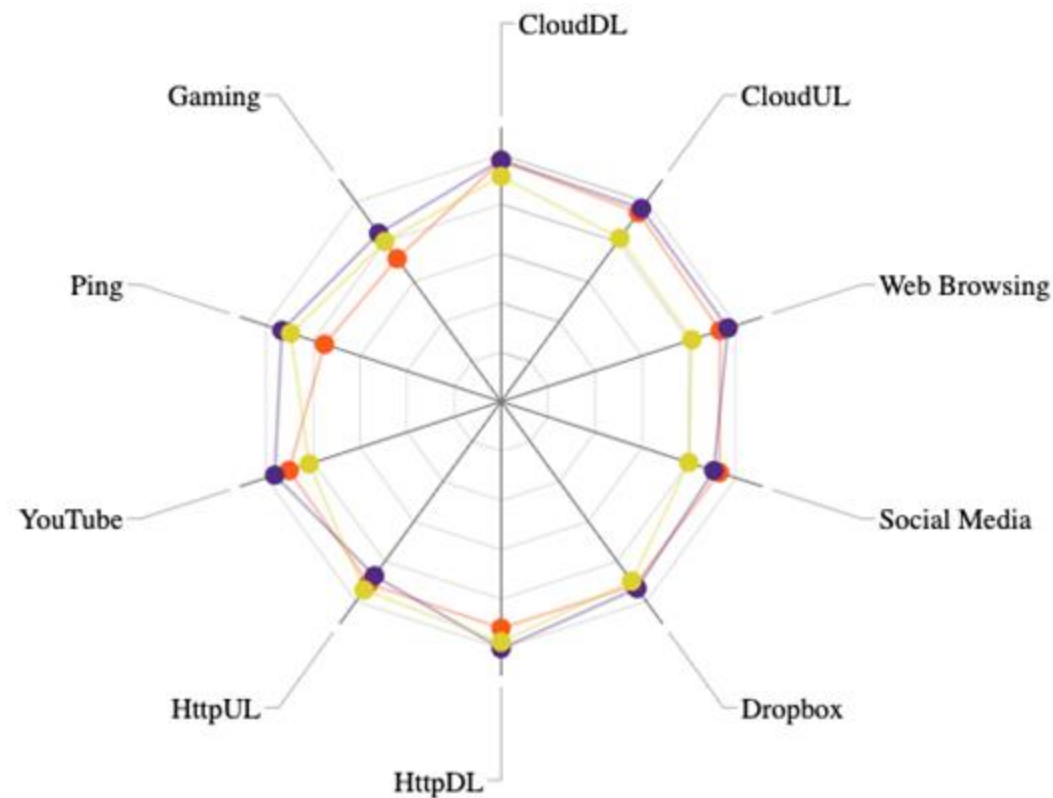
NR Band	DL BW	DL Freq	ARFCN	%Total
78	100MHz	3489.6MHz	632640	71,58%
1	15MHz	2139.65MHz	427930	20,00%
28	5MHz	765.65MHz	153130	8,42%

- However, Orange has the largest 5G mid-band deployment with 34% of overall technology registration in band n78.

Benchmarking 5G Experience – Results per category

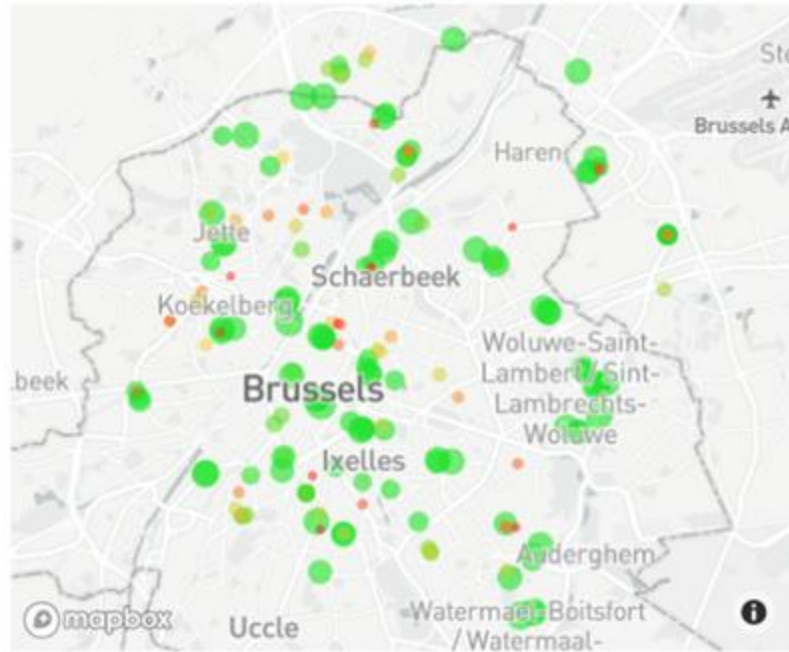


Network	Orange		Proximus		Telenet	
Services MOS (Max MOS)	Value	%	Value	%	Value	%
DATA & OTT (2.625)	2,289	87,22 %	2,371	90,32 %	2,156	82,15 %
MOS Dropbox (0.25)	0,224	89,55 %	0,228	91,03 %	0,219	87,44 %
MOS Gaming (0.375)	0,261	69,70 %	0,308	82,03 %	0,292	77,98 %
MOS HttpDL (0.25)	0,223	89,31 %	0,243	97,33 %	0,237	94,76 %
MOS HttpUL (0.25)	0,222	88,74 %	0,212	84,90 %	0,230	91,84 %
MOS SocialMedia (0.5)	0,452	90,45 %	0,441	88,10 %	0,389	77,72 %
MOS WebBrowsing (1)	0,907	90,69 %	0,940	93,97 %	0,790	79,03 %
Network Responsiveness (0.375)	0,274	73,18 %	0,340	90,79 %	0,327	87,20 %
MOS Ping (0.375)	0,274	73,18 %	0,340	90,79 %	0,327	87,20 %
Streaming (1.25)	1,098	87,85 %	1,172	93,77 %	0,994	79,52 %
MOS YouTube (1.25)	1,098	87,85 %	1,172	93,77 %	0,994	79,52 %
Value for Speed (0.75)	0,705	94,03 %	0,711	94,83 %	0,643	85,73 %
MOS CloudDL (0.5)	0,475	95,01 %	0,476	95,20 %	0,444	88,79 %
MOS CloudUL (0.25)	0,230	92,08 %	0,235	94,09 %	0,199	79,61 %
Total MOS (5)	4,367	87,35 %	4,595	91,89 %	4,120	82,41 %



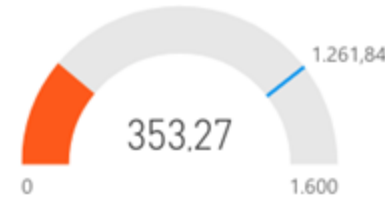
Benchmarking 5G DL Speed - Cloud Speed Test (multi-thread)

Cloud DL (Mbps) by Color Network & Speed (Size)



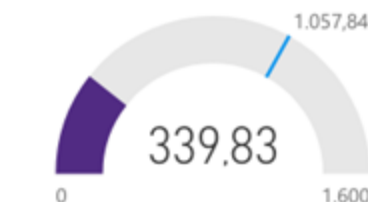
Orange

CloudDLAvg & CloudDLMax (Mbps)



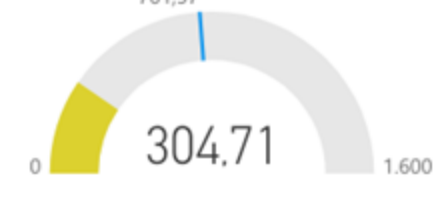
Proximus

CloudDLAvg & CloudDLMax (Mbps)

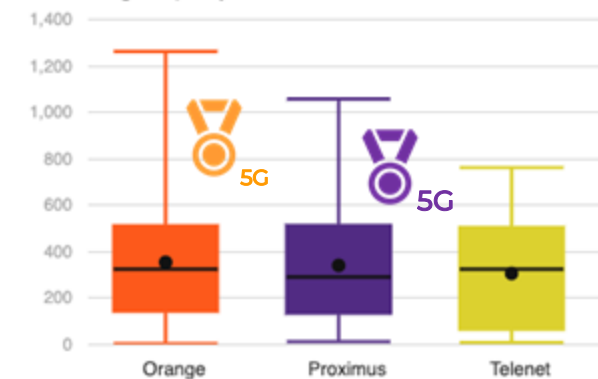


Telenet

CloudDLAvg & CloudDLMax (Mbps)

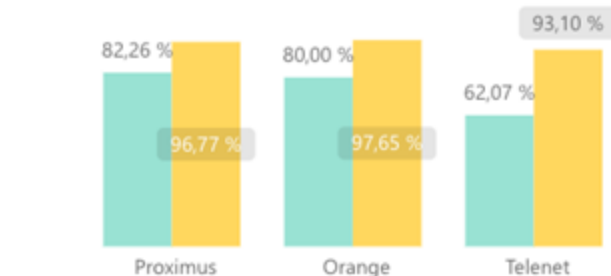


CloudDLAvg (Mbps) by Network Box



CloudDL > 100Mbps (%) y CloudDL > 20Mbps (%) por Network

CloudDL > 100Mbps (%) CloudDL > 20Mbps (%)

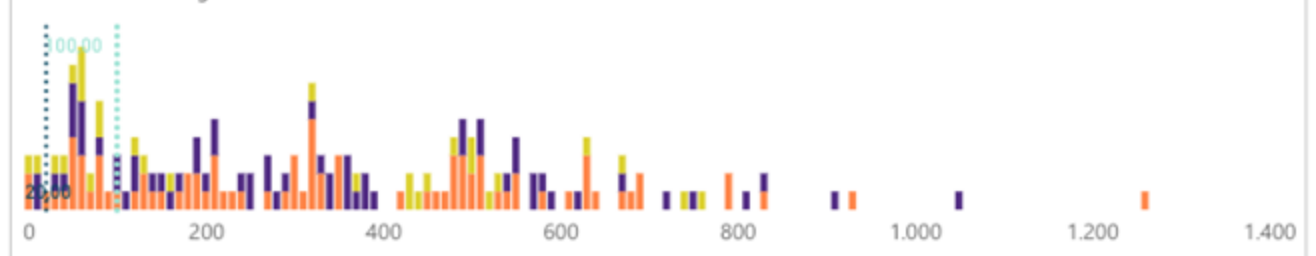


	Orange	Proximus	Telenet
CloudDLComplete (%)	100,00 %	100,00 %	100,00 %
CloudDLCompleteQ (%)	100,00 %	100,00 %	100,00 %
CloudDLAvg (Mbps)	353,27	339,83	304,71
CloudDLp10	59,35	59,29	44,62
CloudDLp90	662,28	672,21	645,76
Máx. de CloudDLAvg (Mbps)	1.261,84	1.057,84	761,57
CloudDL > 100Mbps (%)	80,00 %	82,26 %	62,07 %
CloudDL > 20Mbps (%)	97,65 %	96,77 %	93,10 %



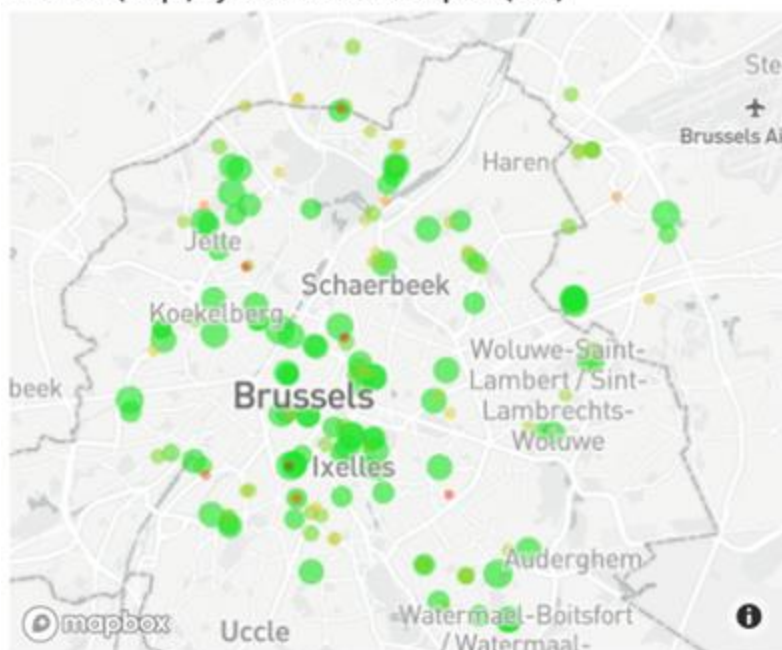
Recuento de CloudDLAvg (10Mbps) por CloudDLAvg (10Mbps) y Network

Network Orange Proximus Telenet



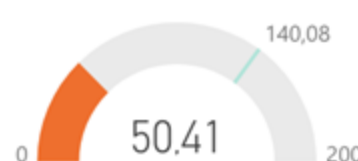
Benchmarking 5G UL Speed - Cloud Speed Test (multi-thread)

Cloud UL (Mbps) by Color Network & Speed (Size)



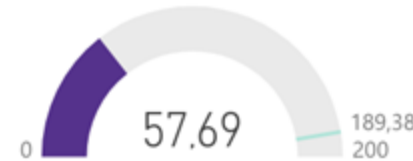
Orange

CloudDLAvg & CloudDLMax (Mbps)



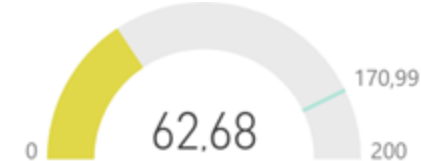
Proximus

CloudDLAvg & CloudDLMax (Mbps)

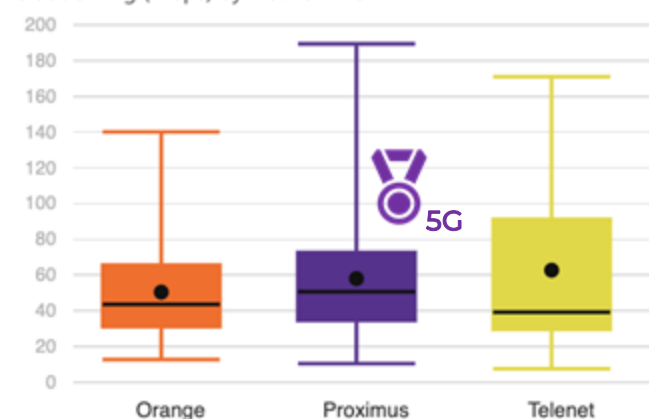


Telenet

CloudDLAvg & CloudDLMax (Mbps)

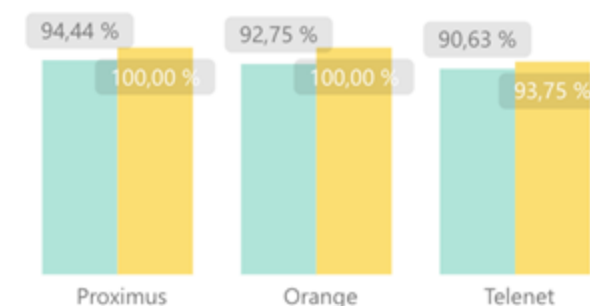


CloudULAvg (Mbps) by Network Box



CloudULFasterDiffA (%) and CloudULFasterDiffB (%) by Network

CloudUL>20Mbps (%) CloudUL>10Mbps (%)

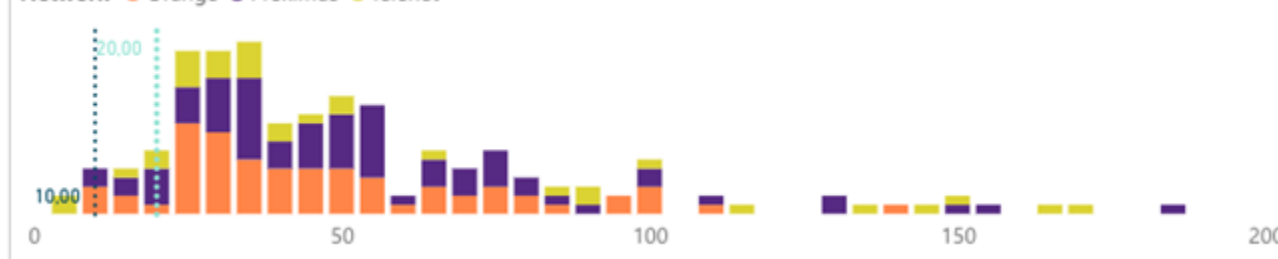


	Orange	Proximus	Telenet
CloudULComplete (%)	100,00 %	100,00 %	100,00 %
CloudULCompleteQ (%)	100,00 %	100,00 %	100,00 %
CloudULAvg (Mbps)	50,41	57,69	62,68
CloudULp10	26,69	24,62	23,00
CloudULp90	89,65	101,99	146,28
Máx. de CloudULAvg (Mbps)	140,08	189,38	170,99
CloudUL>20Mbps (%)	92,75 %	94,44 %	90,63 %
CloudUL>10Mbps (%)	100,00 %	100,00 %	93,75 %



Recuento de CloudULAvg (5Mbps) por CloudULAvg (5Mbps) y Network

Network Orange Proximus Telenet



Detailed Benchmarking Results



Registered Technology

Network	3G	4G	5G-NSA
Orange	0,18%	55,90%	43,91%
Proximus	0,19%	53,56%	46,24%
Telenet		81,83%	18,17%



KPIs Value for Speed

	Orange	Proximus	Telenet
CloudDLComplete (%)	100,00 %	100,00 %	100,00 %
CloudDLCompleteQ (%)	100,00 %	98,72 %	98,76 %
CloudDL>100Mbps (%)	60,26 %	55,84 %	32,70 %
CloudDL>20Mbps (%)	92,31 %	89,61 %	87,42 %
CloudDLP90	555,40	555,53	285,40
CloudDLAvg (Mbps)	235,61	200,85	115,54
CloudDLP10	25,58	17,84	15,46
CloudULComplete (%)	100,00 %	100,00 %	100,00 %
CloudULCompleteQ (%)	100,00 %	100,00 %	100,00 %
CloudUL>20Mbps (%)	77,78 %	83,78 %	82,76 %
CloudUL>10Mbps (%)	95,37 %	100,00 %	94,25 %
CloudULP90	79,44	82,00	87,61
CloudULAvg (Mbps)	39,90	45,98	38,97
CloudULP10	13,47	17,69	16,02



KPIs DL & UL File Transferring

	Orange	Proximus	Telenet
HttpDLComplete (%)	100,00 %	100,00 %	100,00 %
HTTPDLCompleteQ (%)	98,72 %	98,72 %	99,37 %
HttpDLSpeedAvg (Mbps)	192,74	183,57	127,04
HttpDLP10	23,77	15,74	17,63
HttpDLP90	476,89	438,89	373,75
HttpULComplete (%)	100,00 %	100,00 %	100,00 %
HttpULCompleteQ (%)	100,00 %	100,00 %	100,00 %
HttpULSpeedAvg (Mbps)	36,04	32,29	32,36
HttpULP10	7,78	9,96	7,29
HttpULP90	78,48	70,85	82,81



KPIs Network Responsiveness

	Orange	Proximus	Telenet
PingComplete (%)	99,20 %	99,73 %	99,74 %
PingCompleteQ (%)	98,01 %	99,07 %	99,21 %
PingJitter<50ms (%)	78,90 %	84,83 %	97,88 %
PingLatencyAvg (ms)	45,19	38,18	42,33
PingJitterAvg (ms)	31,49	27,69	14,95



Detailed Benchmarking Results



KPIs Gaming

	Orange	Proximus	Telenet
GamingComplete (%)	99,50 %	99,50 %	100,00 %
GamingCompleteQ (%)	99,50 %	99,50 %	100,00 %
GamingJitter<20ms (%)	65,38 %	62,73 %	84,69 %
GamingLatencyAvg (ms)	51,96	46,42	49,95
GamingJitterAvg (ms)	27,88	26,93	14,34



KPIs Web Browsing

	Orange	Proximus	Telenet
WebBrowsingComplete (%)	99,04 %	99,35 %	99,19 %
WebBrowsingCompleteQ (%)	98,88 %	99,03 %	99,03 %
WebBrowsingDnsLess50ms (%)	88,12 %	88,96 %	85,14 %
WebBrowsingTTFB<200ms (%)	96,93 %	94,80 %	95,95 %
WebBrowsingDnsDelayAvg (ms)	35,50	42,58	37,98
WebBrowsingWBTAvg (ms)	1058,22	1220,19	1199,91



KPIs Social Media

	Orange	Proximus	Telenet
SocialMediaComplete (%)	99,03 %	98,20 %	98,88 %
SocialMediaCompleteQ (%)	98,71 %	98,20 %	98,39 %
SocialMediaSession<6s (%)	98,70 %	99,51 %	98,55 %
SocialMediaSDAvg (ms)	2565,11	2431,83	2792,37
SocialMediaTTFBAvg (ms)	155,55	145,09	181,31



KPIs Streaming

	Orange	Proximus	Telenet
SocialMediaComplete (%)	99,03 %	98,20 %	98,88 %
SocialMediaCompleteQ (%)	98,71 %	98,20 %	98,39 %
SocialMediaSession<6s (%)	98,70 %	99,51 %	98,55 %
SocialMediaSDAvg (ms)	2565,11	2431,83	2792,37
SocialMediaTTFBAvg (ms)	155,55	145,09	181,31



KPIs Cloud Storage

	Orange	Proximus	Telenet
DropboxComplete (%)	100,00 %	98,04 %	100,00 %
DropboxCompleteQ (%)	100,00 %	98,04 %	100,00 %
DropboxTimeDL (ms)	2297	1602	3087
DropboxP10	15,84	27,64	13,92
DropboxP90	193,22	202,85	108,14

Detailed Benchmarking Results (5G)



KPIs Value for Speed

	Orange	Proximus	Telenet
CloudDLComplete (%)	100,00 %	100,00 %	100,00 %
CloudDLCompleteQ (%)	100,00 %	100,00 %	100,00 %
CloudDL>100Mbps (%)	80,00 %	82,26 %	62,07 %
CloudDL>20Mbps (%)	97,65 %	96,77 %	93,10 %
CloudDLp90	662,28	672,21	645,76
CloudDLAvg (Mbps)	353,27	339,83	304,71
CloudDLp10	59,35	59,29	44,62
CloudULComplete (%)	100,00 %	100,00 %	100,00 %
CloudULCompleteQ (%)	100,00 %	100,00 %	100,00 %
CloudUL>20Mbps (%)	92,75 %	94,44 %	90,63 %
CloudUL>10Mbps (%)	100,00 %	100,00 %	93,75 %
CloudULp90	89,65	101,99	146,28
CloudULAvg (Mbps)	50,41	57,69	62,68
CloudULp10	26,69	24,62	23,00



KPIs DL & UL File Transferring

	Orange	Proximus	Telenet
HttpDLComplete (%)	100,00 %	100,00 %	100,00 %
HTTPDLCompleteQ (%)	98,77 %	100,00 %	100,00 %
HttpDLSpeedAvg (Mbps)	280,10	305,43	362,40
HttpDLP10	46,19	71,49	29,83
HttpDLP90	577,26	622,13	712,96
HttpULComplete (%)	100,00 %	100,00 %	100,00 %
HttpULCompleteQ (%)	100,00 %	100,00 %	100,00 %
HttpULSpeedAvg (Mbps)	46,61	40,25	56,86
HttpULP10	10,27	7,92	9,31
HttpULP90	84,69	85,86	124,52



KPIs Network Responsiveness

	Orange	Proximus	Telenet
PingComplete (%)	99,49 %	99,47 %	99,22 %
PingCompleteQ (%)	97,96 %	99,47 %	99,22 %
PingJitter<50ms (%)	65,89 %	76,05 %	96,88 %
PingLatencyAvg (ms)	51,84	36,73	57,01
PingJitterAvg (ms)	40,88	27,63	19,09



Detailed Benchmarking Results (5G)



KPIs Gaming

	Orange	Proximus	Telenet
GamingComplete (%)	98,98 %	100,00 %	100,00 %
GamingCompleteQ (%)	98,98 %	100,00 %	100,00 %
GamingJitter<20ms (%)	49,31 %	48,25 %	58,47 %
GamingLatencyAvg (ms)	60,62	51,26	60,74
GamingJitterAvg (ms)	41,10	30,86	16,91



KPIs Web Browsing

	Orange	Proximus	Telenet
WebBrowsingComplete (%)	99,68 %	100,00 %	97,66 %
WebBrowsingCompleteQ (%)	99,68 %	100,00 %	97,66 %
WebBrowsingDnsLess50ms (%)	85,90 %	89,63 %	86,72 %
WebBrowsingTTFB<200ms (%)	97,11 %	97,41 %	96,88 %
WebBrowsingDnsDelayAvg (ms)	38,57	34,29	43,72
WebBrowsingWBTAvg (ms)	1044,44	1037,71	1192,32



KPIs Social Media

	Orange	Proximus	Telenet
SocialMediaComplete (%)	99,05 %	98,44 %	97,32 %
SocialMediaCompleteQ (%)	99,05 %	98,44 %	97,32 %
SocialMediaSession<6s (%)	98,41 %	100,00 %	98,66 %
SocialMediaSDAvg (ms)	2495,95	2323,24	2777,24
SocialMediaTTFBAvg (ms)	128,91	117,77	165,14



KPIs Streaming

	Orange	Proximus	Telenet
YouTubeComplete (%)	100,00 %	100,00 %	100,00 %
YouTubeCompleteQ (%)	100,00 %	100,00 %	100,00 %
YouTubePlayStartTimeAvg (ms)	1.881,14	1.731,80	2.384,82
YouTubeStalls<1 (%)	100,00 %	100,00 %	100,00 %
YouTubeFullResTime (%)	84,36 %	89,81 %	78,88 %



KPIs Cloud Storage

	Orange	Proximus	Telenet
DropboxComplete (%)	100,00 %	98,68 %	100,00 %
DropboxCompleteQ (%)	100,00 %	98,68 %	100,00 %
DropboxTimeDL (ms)	1517	1196	1523
DropboxP10	25,75	49,91	23,36
DropboxP90	197,85	248,56	158,97

Testing and KPI details (1/2)

	Test Name	KPI Name	KPI Details
	• Network Availability	• % Registered network time	• % of time that the MedUX device has an active connection
	• Latency-Ping	• Average Latency (ms) • Completed Tests (%) • Jitter (ms) • Packet Loss (%)	• Average latency obtained during the test execution • % of total tests performed that have successfully completed • Variance in time delay between data packets over the network • % of packet loss during test execution
	• HTTP Down (Burst)	• Average DL Speed (Mbps) • Completed Tests (%) • P10 DL Speed (Mbps) • P90 DL Speed (Mbps)	• Download Speed (Mbps) • % of total tests performed that have successfully completed • P10 of the values obtained in the test • P90 of the partial values obtained in the test
	• HTTP Up (Burst)	• Average UL Speed (Mbps) • Completed Tests (%) • P10 UL Speed (Mbps) • P90 UL Speed (Mbps)	• Upload Speed (Mbps) • % of total tests performed that have successfully completed • P10 of the values obtained in the test • P90 of the values obtained in the test
	• Cloud Speed test DL	• Average DL Speed (Mbps) • Completed Tests (%) • P10 DL Speed (Mbps) • P90 DL Speed (Mbps)	• Download Speed (Mbps) • % of total tests performed that have successfully completed • P10 of the values obtained in the test • P90 of the partial values obtained in test
	• Cloud Speed test UL	• Average UL Speed (Mbps) • Completed Tests (%) • P10 UL Speed (Mbps) • P90 UL Speed (Mbps)	• Upload Speed (Mbps) • % of total tests performed that have successfully completed • P10 of the values obtained in test • P90 of the values obtained in test

Testing and KPI details (2/2)

	Test Name	KPI Name	KPI Details
	• Web Browsing	• Average DNS Lookup Time (ms) • Completed tests (%) • Loading time (ms)	• Average DNS lookup by resource • % of total tests performed that have completely loaded requested URL • Time to completely browse the website
	• Streaming (YouTube)	• Average Full resolution time (%) • Startup Time (ms) • Completed Tests (%)	• Percentage of time that the video was played in full resolution • Time to begin playing the video (Player Loading Time + Time to Play) • % of total tests performed that have successfully played requested video
	• Gaming	• Average Latency (ms) • Completed Tests (%) • Jitter (ms)	• Average latency obtained during the test execution • % of total tests performed that have successfully completed • Variance in time delay between data packets over the network
	• Social Media	• Average Session duration (ms) • Completed Tests (%) • Average Time to first byte (ms)	• Time to complete a navigation session through the platform • % of total tests performed that have successfully completed • Time to receive the first byte from the social media server
	• Dropbox	• Average DL Time (ms) • Completed Tests (%) • P10 DL Speed (Mbps) • P90 DL Speed (Mbps)	• Time to download the file • % of total tests performed that have successfully completed • P10 of the partial values obtained in the test • P90 of the partial values obtained in the test
	• All tests	• CompleteQ (%) • KPI < X (%) • KPI > X (%)	• % of total tests successfully completed that fulfils the qualifier thresholds. • % of total tests which value is below the threshold. • % of total tests which value is above the threshold.

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