

The 2022 Mobile Network Test in Luxembourg



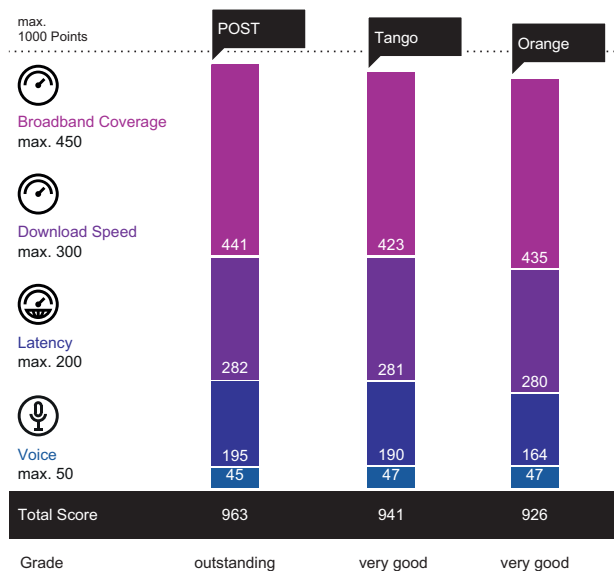
For the first time, umlaut and connect take a closer look at the performance of the mobile networks in Luxembourg. It reveals one outstanding and two very good operators, by umlaut's assessment.

For the first time in Luxembourg, umlaut and connect have used umlaut's sophisticated crowdsourcing approach to offer a comprehensive look at the user experience of mobile customers in this country. The results reflect a high level of performance – with one operator even achieving the grade “outstanding” and the two others receiving the grade “very good”.

Scope

For its assessment of the Luxembourg mobile operators, umlaut has conducted crowd-sourced analyses based on data gathered between calendar weeks 19 (early May) and 42 (mid-October), 2022. A total of 8.851.885 samples has been considered in the analyses. This represents 99.7% of the built-up area of Luxembourg and 99.9% of the population. The detailed methodology of our assessment is described on page 5.

CROWDSOURCING FACTS



Shown latency, download speed, upload speed and total scores are rounded.

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The Luxembourg Mobile Operators



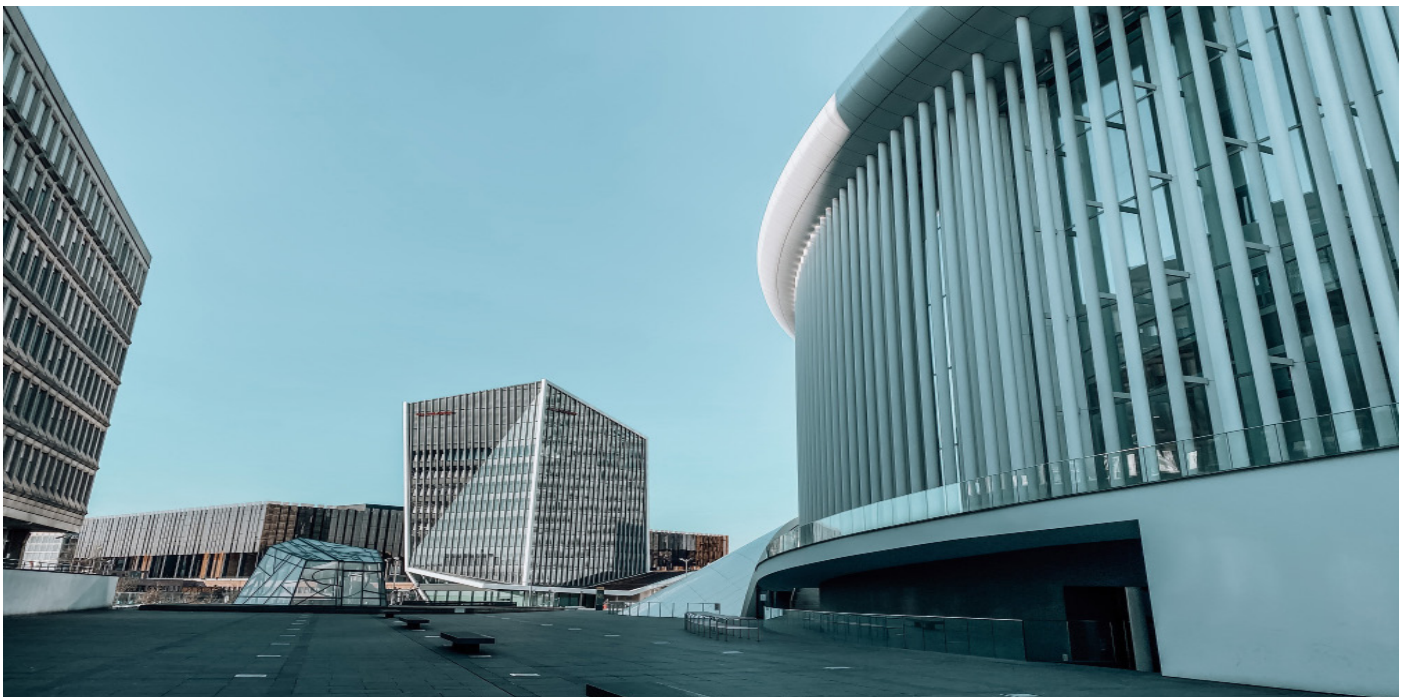
Post Luxembourg: In addition to conventional mail and finance services, Post Luxembourg also offers fixed-line and mobile communications to its customers. For its mobile services, the former incumbent took over the mobile network LuxGSM in 2013. With approx. 450.000 mobile customers (estimation by connect), this operator is the mobile market leader in Luxembourg. The company operates GSM 900/1800, 3G, 4G/4G+ and 5G mobile networks. It claims to reach 98.8% of the population with 4G and 97% with 4G+. About 10% of the Luxembourg population can already use the 5G service of Post.



Tango: Tango is a subsidiary of Proximus, formerly Belgacom, which offers fixed-line and mobile communications in Luxembourg. On an international scale, the company cooperates with Vodafone. Tango states to have 276.000 mobile subscribers, which makes it the number two on this marketplace in terms of subscriber numbers. Tango offers GSM 900/1800, 3G and 4G/4G+ to its customers and has also started deploying 5G in the country. The company claims to cover 97% of the population with 4G/4G+.



Orange: Orange Luxembourg is a subsidiary of Orange Belgium offers fixed-line and mobile communications to its customers. The company only publishes customer numbers for the combined markets of Belgium and Luxembourg (where its total customer base recently surpassed 5 million) but estimates to have a 15 percent market share in mobile communications within Luxembourg. This would roughly correspond to a customer count of 134.000 mobile subscribers. Orange Luxembourg operates GSM 900/1800, 3G, 4G/4G+ and has also started to deploy 5G. Orange claims to reach 97% of the population with 4G.



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Results at a Glance



Post Luxembourg is the winner of our comparison, achieving the grade “outstanding”. The biggest operator in Luxembourg wins due to leading in the categories of Broadband Coverage and Latency. In terms of Download Speeds, the winner is also ahead, but only at a slight gap of one point ahead of Tango and two points ahead of Orange. In the Voice assessment, Tango and Orange are ahead of Post at a gap of two points.



Tango ranks second with the overall grade “very good”. The second-largest operator in the country achieves this result with strong results in the Download Speed and Voice categories. In terms of Broadband coverage, this operator scores somewhat behind the other two contenders. In the Latency category, it is five points behind Post, but 26 points ahead of Orange.



Orange takes third place, also with the overall grade “very good”. Luxembourg’s smallest mobile operator is the second strongest contender in the Broadband Coverage category, scoring 6 points behind Post in this section. In terms of Download Speed, Orange scores two points behind the overall winner Post, in the Voice category it scores on a par with Tango. umlaut’s assessment reveals particularly some room for improvement in the Latency category.

Results

Overall Results	max.	POST	Tango	Orange
Broadband Coverage	450P.	441	423	435
Coverage Quality	67,5	63,4	53,0	63,6
Coverage Reach	135,0	133,5	131,7	128,8
Time on Broadband	247,5	243,8	238,3	242,5
Download Speed	300P.	282	281	280
Basic Internet Class	165,0	153,1	153,3	152,1
HD Video Class	101,3	97,6	97,0	96,7
UHD Video Class	33,8	31,2	31,0	30,7
Latency	200P.	195	190	164
Gaming Class	90,0	88,6	85,9	72,2
OTT Voice Class	110,0	106,7	104,2	91,3
Voice	50P.	45	47	47
HD Voice	50,0	45,1	47,0	47,5
Total	1000P.	963	941	926



“Post Luxembourg is showing an outstanding customer experience with strong performances in the categories of Broadband Coverage and Latency.

Tango and Orange are also convincing with a very good overall performance.”

Hakan Ekmen, CEO Telecommunication at umlaut, part of Accenture



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Detailed Results

Broadband Coverage

In the Broadband Coverage category, Post takes the overall lead. In terms of Coverage quality, the proportion of 4G/5G samples in relation to the average of all valid Evaluation Areas, POST and Orange are on a par. In the assessment of Coverage Reach, the size of the 4G/5G footprint, POST is clearly ahead, followed by Tango and then Orange, each at distinct gaps. Regarding the Time on Broadband, the count how often each individual user had 4G/5G reception, Post again takes the lead. Here, Orange takes second place, scoring ahead of Tango.

COVERAGE

POST

KPI Values	POST	Tango	Orange
Broadband Coverage			
Coverage Quality [%]	98.5	94.6	98.5
Coverage Reach [%]	97.8	95.1	91.0
Time on Broadband [%]	99.0	97.5	98.6

Download Speeds

In the assessment category of Download Speeds, all three Luxembourg operators ranks closely together. However, at a margin of one point, Tango takes the lead over the other two contenders. In the Basic Internet Class with its minimum threshold of 2 Mbps, Orange is slightly ahead of Tango, with Post following at some distance. In the HD Video Class, where the samples have to reach at least 5 Mbps, Tango manifests is lead, slightly ahead of Post, with Orange following. The decision is ultimately made in the UHD video class: Post achieves the highest count of samples with at least 20 Mbps, with Tango following. Here, Orange falls clearly behind, which costs valuable points.

DOWNLOAD SPEEDS

POST

KPI Values	POST	Tango	Orange
Download Speed			
Basic Internet Class [%]	96.4	96.4	96.1
HD Video Class [%]	90.7	89.1	88.4
UHD Video Class [%]	36.1	32.1	24.9

Latency

In the Latency category, Post takes the lead, ahead of Tango and, at a more distinct distance, Orange. This ranking is shown both in the OTT Voice Class (which counts samples with round trip times up to 100 ms) as well as in the more demanding Gaming Class, which demands roundtrip times of 50 ms and below. In the latter category, the ranking becomes quite clear: Post leads the field, Tango achieves a solid second rank, while Orange shows some distinct room for improvement.

LATENCY

POST

KPI Values	POST	Tango	Orange
Latency			
Gaming Class [%]	97.4	92.3	76.2
OTT Voice Class [%]	98.9	98.1	94.1

Voice

The HD Voice parameter indicates what proportion of the voice calls made by the user were transported via VoLTE (Voice over LTE), VoNR (Voice over 5G New Radio) or VoWiFi (Voice over WiFi). Here, in terms of the achieved score, Orange and Tango rank on a par – in the KPI value, Tango is slightly ahead. In this category, the former incumbent and today's market leader Post, falls a little behind.

VOICE

ORANGE & TANGO

KPI Values	POST	Tango	Orange
Voice			
HD Voice [%]	95.1	97.0	97.5

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Methodology

Our benchmarks are the result of a sophisticated crowdsourcing analysis, based on data gathered over a period of 24 weeks and representing the real-life user experience of mobile customers.

umlaut, Part of Accenture and headquartered in Aachen, Germany, is a world leader in mobile network testing. umlaut is partnering with the international telecommunications magazine connect, which has 30 years of editorial expertise and is one of the leading test authorities in Europe for telecommunication products and services. Together, we – umlaut and connect – have been conducting the most important network benchmark test in Germany for almost 20 years, extending it to other European countries since 2009. As the de-facto industry standard, our benchmarking methodology focuses on customer-perceived network quality.

Comprehensive crowdsourcing

The results of this benchmark are based on a comprehensive analysis of crowd-sourced data which is performed by umlaut, Part of Accenture. The data for their sophisticated analysis was gathered over a period of 24 weeks. To obtain this data, thousands of popular apps collect parameters in the background during smartphone use, such as the mobile technology of the connection, the data rates of downloads and the technology used for voice connections – provided the user has previously consented to this absolutely anonymous data collection. Measured values such as data throughputs are aggregated in a 15-minute interval and regularly transmitted to the umlaut servers.

The reports are only a few bytes in size, so that they have virtually no impact on the users' data volume. Samples that were captured via Wi-Fi or when the flight mode was active, for example, are filtered out before further analysis. To determine the quality of broadband coverage, we look at several parameters: The analysis is based on Evaluation Areas (EAs) – tiles of two by two kilometers. An EA is considered valid if there are at least two sub-tiles with an edge length of 500 meters in it with at least two users, each of which has supplied at least 20 samples. This must be true for all network operators (MNOs).

In-depth look at network performance

For the Coverage quality, we determine in which EAs 4G/5G samples are available for a network operator and in which tiles all providers are represented ("common footprint"). The KPI indicates the proportion of 4G/5G samples in relation to the average of all valid EAs. The Coverage Reach analyzes the size of the

Broadband Coverage

45%

Coverage Quality

Coverage Reach

Time on Broadband

HD Voice

Download Speed

30%

Basic Internet Class

HD Video Class

UHD Video Class

Gaming Class

OTT Voice Class



Voice

5%

Latency

20%

4G/5G footprint: Here, the network used (Telekom, Vodafone, O2) receives three points for 4G/5G coverage, three points for 4G/5G coverage or one point for 3G. The sum of the points per network operator is divided by the possible number of points of all EAs in the "common footprint". The time on broadband is not determined per underlying mobile network, but separately for each MVNO. It tells how often an individual user had 4G/5G reception in the period under consideration. To determine this, umlaut puts the samples that show 4G/5G coverage in relation to the total number of all samples. Important: These percentages reflect the fulfillment ratio of our coverage KPIs – not the percentage of 4G/5G mobile coverage of area or population. In order to take into account that many mobile tariffs limit the usable speed, umlaut has defined three application-related speed classes for evaluating data rates: For basic Internet, a minimum of 2 Mbps must be achieved, for HD video 5 Mbps and for UHD video 20 Mbps. For a sample to be valid, a minimum amount of data must have flowed in a 15-minute period. Similarly, the latency of the data packets is assigned to application-specific classes: Roundtrip times up to 100 ms are sufficient for OTT Voice services, less than 50 ms qualify a sample for Gaming. The parameter HD Voice indicates what proportion of the voice calls made by the user were made in high-definition quality – or in other words: transported via VoLTE (Voice over LTE), VoNR (Voice over 5G New Radio) or VoWiFi (Voice over WiFi). An assessment is only made if the smartphone used supports the respective standard.