

best in test

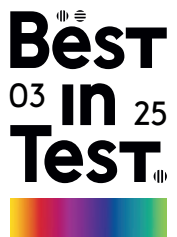
For adding something on top in Romania and reaching an overall score of 921 dots in mobile network benchmarking survey we proudly award this certificate to

Vodafone Romania

Score 921 out of 1000 in Total
Score 260 out of 270 in Voice Services
Score 445 out of 480 in Data Services
Score 216 out of 250 in Crowdsourced Quality



Hakan Ekmen
Global Networks Lead, Comms Industry





Measurement Overview

umlaut tested and measured the performance of its voice and data services on smartphones in comparison to other 5G/LTE mobile radio networks in metropolitan and rural areas of Romania.

The audit was done as a performance benchmark performed by umlaut between 18.02.2025. and 17.03.2025 in cities and towns as well as on connection roads.

Dedicated measurements have been executed as drive tests outdoors using a Samsung Galaxy S23+.

All data measurements have been performed in 5G preferred mode. Voice measurements have been done in 5G/5G preferred mode on both sides, while call origin has been alternated.

In addition crowdsourced performance data has been collected and evaluated between CW40 2024 and CW11 2025.

The following pages provide a comparative overview about the performance results observed for the different tested service types.



Measurement setup

Drivetest	Voice	Data
Device	Samsung Galaxy S23+	Samsung Galaxy S23+
Test Cases	Mobile-to-Mobile Side1 (VoLTE, 5G pref.) to Side2 (VoLTE, 5G pref.) 105 sec call window 70 sec call duration 15 sec call setup timeout Multi-RAB traffic injection on both sides	Data 5G preferred HTTP DL datastream 7s HTTP UL datastream 7s HTTP 10MB DL fixed file transfer HTTP 5MB UL fixed file transfer Web Browsing – Kepler ETSI Ref. Page 8 Live web pages 2 YouTube videos ~45s (Full HD and Live Full HD) Interactivity eGaming Conversational App
Mobility and Route Types	Drivetest and Walktest Drivetest: 57% in Cities, 14% in Towns and 29 % on Roads Walktest: 100% Cities	
Samples	19760	175418
Dates	24 measurement days 18.02.2025. – 17.03.2025	
Crowd Data Assessment	24 weeks CW40 2024 – CW11 2025	



Testing areas

Drive route

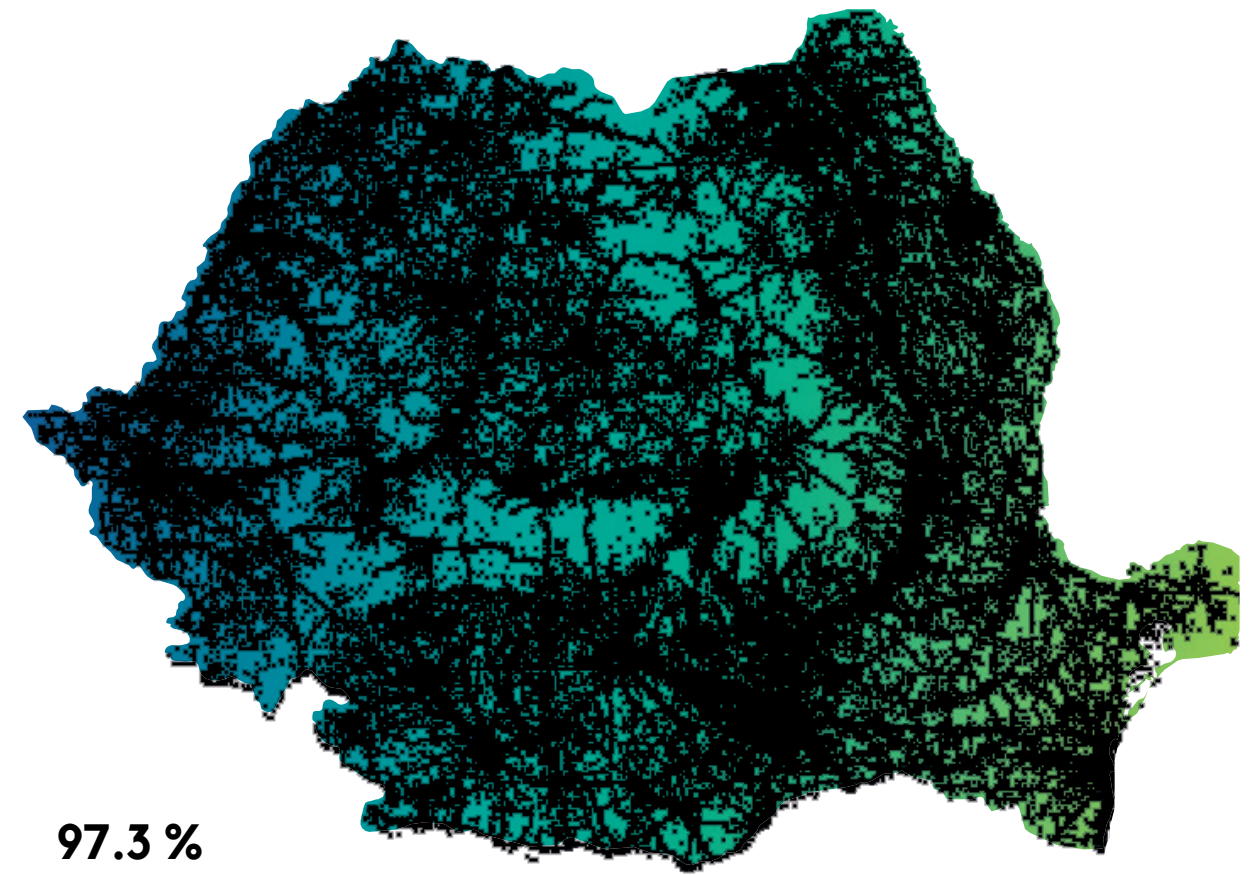


8600 km
measuring distance



24 %
of population measured

Crowdsourcing based test area



97.3 %
of the 'built-up area' covered




98.0 %
of the 'Population area' covered




145,005 km²
size of tested area



Claims

Best in test
Vodafone Romania



Best in data
Vodafone Romania



Best in voice
Vodafone Romania



Best in Reliability
Vodafone Romania



Methodology

The leader in mobile benchmarking, umlaut, has analyzed the mobile networks of Romania with regards to mobile network performance. We measure smartphone voice and data performance based on extensive drivetests – from major metropolitan areas to smaller cities and connection roads.

We objectively define the routes and test methodology and publish the results through certificates or public benchmark reports. In addition crowdsourced performance data has been collected and evaluated.

As the de-facto industry standard, our benchmarking methodology focuses on customer-experienced network quality and covers a wide range of mobile services.

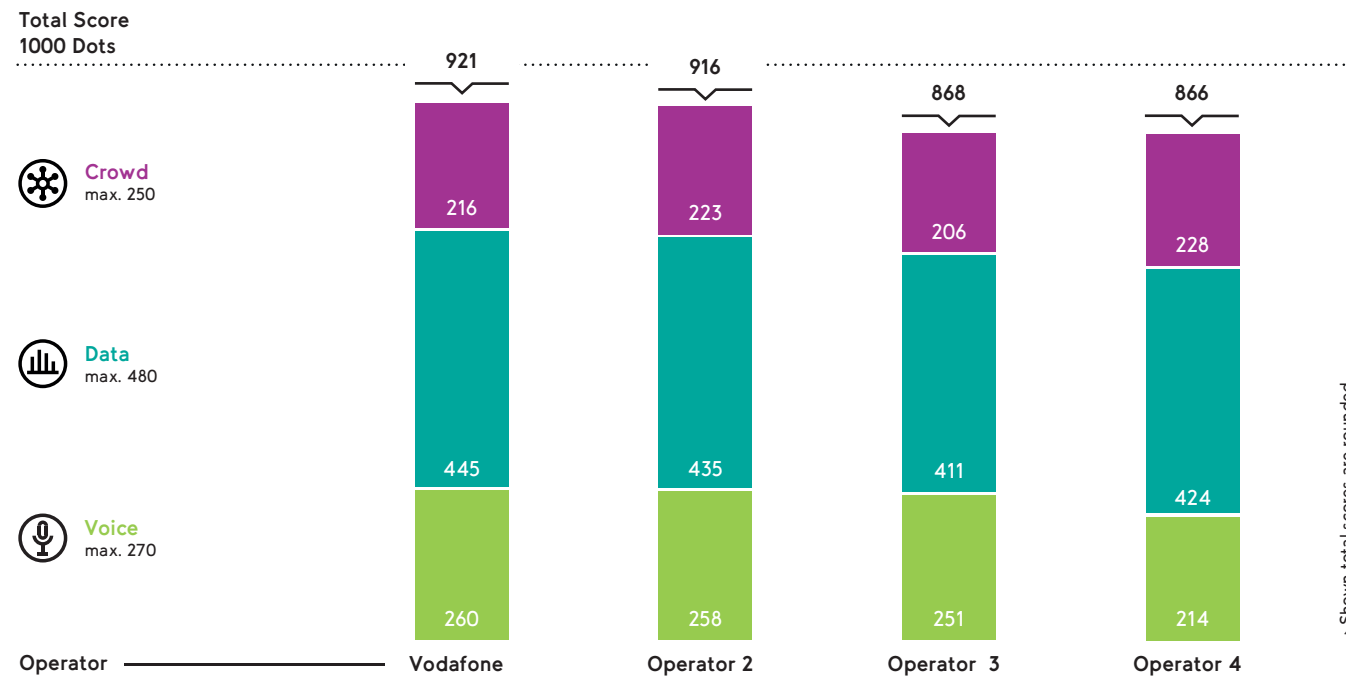
Today, more than 200 mobile networks in more than 120 countries are being evaluated by our unique scoring methodology.

It allows a technical analysis that is unprecedented in its level of detail and enables comparisons between the network performance and capability of each mobile network. Our public benchmarks as well as the certificate benchmarks help network operators to demonstrate how well they are delivering wireless connections to consumers, business users and enterprises and reveals the areas of improvement.



Score and breakdown

Vodafone Romania achieved the highest overall score among competitors with 921 dots out of 1000.



Overall score considering Voice, Data and Crowdsourcing.

Total score

		Vodafone	Operator 2	Operator 3	Operator 4
Voice	max. 270	260	258	251	214
Cities Drivetest	122	97%	97%	96%	79%
Cities Walktest	41	99%	98%	91%	90%
Towns Drivetest	54	94%	96%	95%	73%
Roads Drivetest	54	95%	90%	86%	78%
Data	max. 480	445	435	411	424
Cities Drivetest	216	95%	94%	90%	91%
Cities Walktest	72	95%	94%	84%	94%
Towns Drivetest	96	91%	85%	85%	85%
Roads Drivetest	96	89%	86%	78%	81%
Crowdsourced Quality	max. 250	216	223	206	228
Broadband Coverage	100	89%	91%	85%	96%
Download Speed	55	78%	87%	73%	85%
Upload Speed	20	90%	91%	89%	88%
Latency	50	83%	88%	81%	87%
Voice	10	93%	88%	89%	96%
Stability	15	95%	94%	95%	96%
Total	1000	921	916	868	866

Shown scores are rounded.



Achieved percentage of the maximum score in each of the different data services.

Data	Service Group	max	Vodafone	Operator 2	Operator 3	Operator 4
Cities Drivetest	Web Browsing	37,8	99%	98%	96%	95%
	File Download	48,6	95%	97%	86%	90%
	File Upload	48,6	95%	96%	95%	93%
	YouTube	48,6	97%	94%	90%	91%
	OTT	32,4	86%	83%	80%	86%
Cities Walktest	Web Browsing	12,6	98%	97%	92%	95%
	File Download	16,2	96%	97%	86%	94%
	File Upload	16,2	94%	94%	88%	96%
	YouTube	16,2	98%	95%	80%	94%
	OTT	10,8	86%	83%	73%	87%
Towns	Web Browsing	16,8	98%	94%	91%	92%
	File Download	21,6	85%	82%	79%	82%
	File Upload	21,6	92%	91%	87%	86%
	YouTube	21,6	96%	82%	84%	84%
	OTT	14,4	80%	76%	83%	81%
Roads	Web Browsing	16,8	96%	95%	85%	91%
	File Download	21,6	82%	83%	74%	78%
	File Upload	21,6	88%	89%	82%	80%
	YouTube	21,6	94%	83%	73%	80%
	OTT	14,4	83%	77%	79%	81%

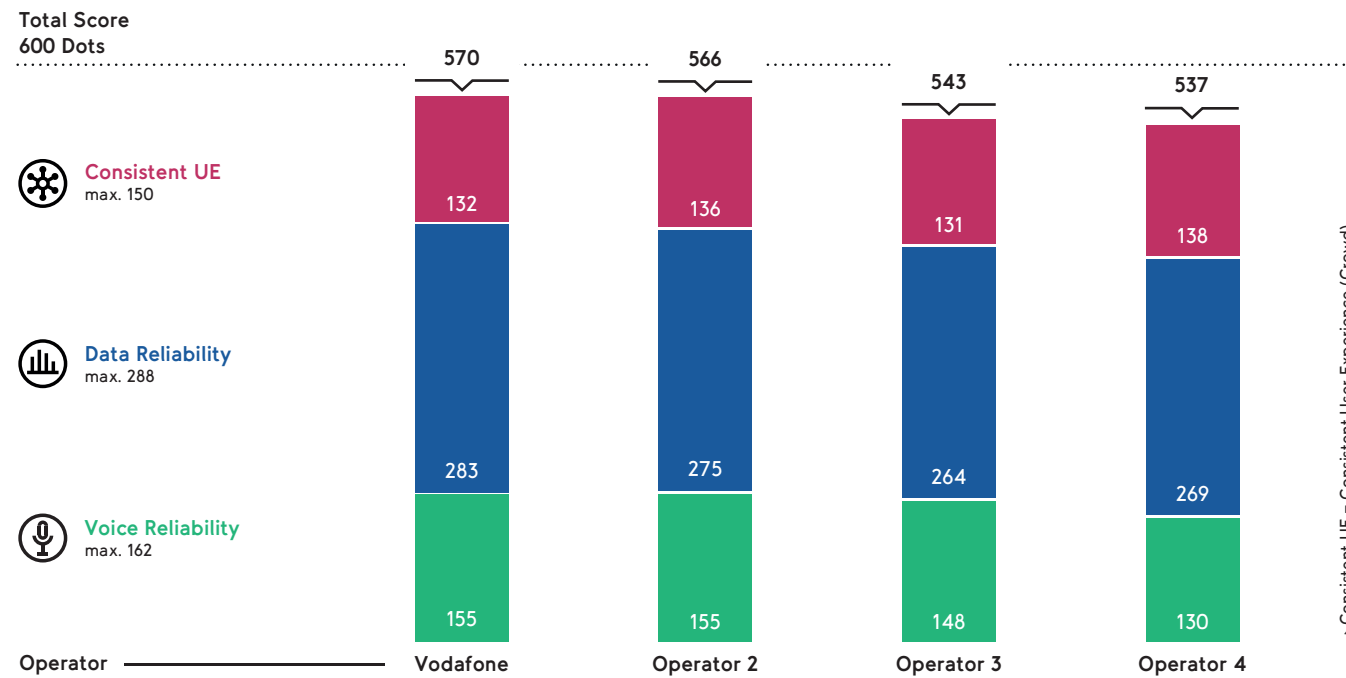


Achieved percentage of the maximum score in each of the different crowdsourcing services.

Crowd	Service Group	max	Vodafone	Operator 2	Operator 3	Operator 4
Crowdsourced Quality	Broadband Coverage	100	89%	91%	85%	96%
	DL Speed	55	78%	87%	73%	85%
	UL Speed	20	90%	91%	89%	88%
	Latency	50	83%	88%	81%	87%
	Voice	10	93%	88%	89%	96%
	Stability	15	95%	94%	95%	96%



Reliability



Reliability score considering Voice Reliability, Data Reliability and Consistent UE.

Total score

	Service Group	max	Vodafone	Operator 2	Operator 3	Operator 4
Reliability	Voice Reliability	162	96%	96%	92%	80%
	Data Reliability	288	98%	96%	92%	93%
	Consistent User Experience	150	88%	90%	87%	92%

Score achievement in school grades:
 outstanding (≥95%), very good (≥85% and <95%), good (≥75% and ≤85%), satisfactory (≤65% and <75%), sufficient (≤55% and <65%).



Voice KPI overview

Achieved values of all networks under test in each of the relevant Voice Key Performance Indicators (KPIs) for the geographical categories "Cities", "Towns" and "Roads".

Voice	Service Group	Unit	Vodafone	Operator 2	Operator 3	Operator 4
Cities Drivetest	Qualifier	[%]	99,7	99,8	99,6	98,5
	Call Setup Time (P90)	[s]	1,4	2,1	1,9	4,5
	Speech Quality (P10)	[MOS-LQO]	4,5	4,5	4,4	3,8
Cities Walktest	Qualifier	[%]	100,0	99,9	99,0	99,2
	Call Setup Time (P90)	[s]	1,3	2,1	1,9	2,3
	Speech Quality (P10)	[MOS-LQO]	4,6	4,6	4,5	3,9
Towns	Qualifier	[%]	99,4	99,6	99,5	97,0
	Call Setup Time (P90)	[s]	1,3	2,0	1,9	2,9
	Speech Quality (P10)	[MOS-LQO]	4,4	4,5	4,4	3,8
Roads	Qualifier	[%]	99,1	98,4	97,3	97,0
	Call Setup Time (P90)	[s]	1,4	2,2	2,1	4,2
	Speech Quality (P10)	[MOS-LQO]	4,4	4,2	4,2	3,7



Data Services KPI overview

Achieved values of all networks under test in each of the relevant Data Key Performance Indicators (KPIs) for the geographical category "Cities Drivetest".

Data Cities Drivetest	KPI Name	Unit	Vodafone	Operator 2	Operator 3	Operator 4
HTTP Web Page DL Smartphone	Qualifier	[%]	100,0	99,9	99,7	99,7
	Overall Session Time	[s]	1,2	1,2	1,5	1,6
HTTP 10MB DL Smartphone	Qualifier	[%]	100,0	100,0	99,9	100,0
	Overall Session Time	[s]	1,4	1,4	2,2	2,0
	90% faster than	[Mbit/s]	36722,5	33826,6	22678,4	24443,2
	10% faster than	[Mbit/s]	200250,6	250000,0	122324,2	168421,1
HTTP 5MB UL Smartphone	Qualifier	[%]	99,9	99,9	99,9	99,9
	Average Session Time	[s]	2,0	1,9	2,0	2,1
	90% faster than	[Mbit/s]	13027,7	12348,4	13541,4	12989,6
	10% faster than	[Mbit/s]	48543,7	64829,8	65093,6	66711,2
HTTP DL FDTT	Qualifier	[%]	100,0	100,0	99,7	99,7
	10% faster than	[Mbit/s]	328837,2	555567,9	177116,3	234615,7
	faster than 20 Mbit/s	[%]	97,9	98,0	94,2	95,2
	faster than 100 Mbit/s	[%]	65,3	74,7	38,2	57,5
HTTP UL FDTT	Qualifier	[%]	100,0	100,0	99,7	99,5
	10% faster than	[Mbit/s]	61230,9	102771,4	96601,2	93534,6
	faster than 2 Mbit/s	[%]	100,0	99,7	99,7	99,4
	faster than 5 Mbit/s	[%]	99,0	98,8	98,3	98,3
YouTube	Qualifier	[%]	99,9	99,7	99,0	99,4
	Start Time	[s]	1,6	1,9	2,1	2,1
	AVG Resolution	[p]	1079,5	1079,4	1079,0	1078,2
YouTube Live Smartphone	Qualifier	[%]	99,9	99,7	99,2	99,2
	Start Time	[s]	2,4	2,7	2,8	2,8
	AVG Resolution	[p]	1080,0	1078,9	1078,2	1078,3
Interactivity	Qualifier	[%]	99,1	96,8	93,5	98,4
	Interactivity egaming	[%]	47,2	42,4	32,6	49,9
Interactivity Videochat	Qualifier	[%]	96,1	96,0	96,6	95,4
	Interactivity egaming	[%]	85,9	86,1	83,0	87,2
Conversational App	Qualifier	[%]	99,8	100,0	99,9	99,8
	Speech Quality (P10)	[MOS-LQO]	4,2	3,9	4,0	4,0



Data Services KPI overview

Achieved values of all networks under test in each of the relevant Data Key Performance Indicators (KPIs) for the geographical category "Cities Walktest".

Data Cities Walktest	KPI Name	Unit	Vodafone	Operator 2	Operator 3	Operator 4
HTTP Web Page DL Smartphone	Qualifier	[%]	99,9	99,8	99,3	99,6
	Overall Session Time	[s]	1,2	1,3	1,7	1,5
HTTP 10MB DL Smartphone	Qualifier	[%]	100,0	100,0	99,7	100,0
	Overall Session Time	[s]	1,2	1,2	3,0	1,6
	90% faster than	[Mbit/s]	40895,9	40342,9	19233,5	38082,4
	10% faster than	[Mbit/s]	189395,5	259740,3	112678,1	174677,5
HTTP 5MB UL Smartphone	Qualifier	[%]	100,0	100,0	99,1	99,7
	Average Session Time	[s]	2,1	2,2	2,6	2,0
	90% faster than	[Mbit/s]	13231,1	10183,3	12897,3	16328,5
HTTP DL FDTT	10% faster than	[Mbit/s]	45527,0	64123,3	59101,8	65573,8
	Qualifier	[%]	100,0	100,0	100,0	100,0
	10% faster than	[Mbit/s]	318311,1	586743,8	173854,3	261880,7
HTTP UL FDTT	faster than 20 Mbit/s	[%]	98,0	97,6	93,1	97,7
	faster than 100 Mbit/s	[%]	75,6	81,5	43,0	58,4
	Qualifier	[%]	99,7	100,0	99,7	100,0
YouTube	10% faster than	[Mbit/s]	56106,6	102579,4	90715,2	93310,6
	faster than 2 Mbit/s	[%]	100,0	99,1	97,6	99,7
	faster than 5 Mbit/s	[%]	99,4	98,8	97,0	98,5
	Qualifier	[%]	100,0	100,0	97,3	99,7
YouTube Live Smartphone	Start Time	[s]	1,6	1,9	2,2	2,1
	AVG Resolution	[p]	1079,7	1079,7	1077,6	1079,0
	Qualifier	[%]	100,0	99,7	98,2	99,7
Interactivity	Start Time	[s]	2,3	2,8	3,0	2,7
	AVG Resolution	[p]	1080,0	1078,3	1078,3	1078,3
	Qualifier	[%]	98,9	94,7	81,8	98,8
Interactivity egaming	Interactivity egaming	[%]	46,5	45,0	33,0	51,6
	Qualifier	[%]	95,9	96,7	96,9	96,5
Interactivity Videochat	Interactivity egaming	[%]	87,3	87,1	80,8	89,9
	Qualifier	[%]	100,0	99,7	100,0	100,0
Conversational App	Speech Quality (P10)	[MOS-LQO]	4,3	4,2	4,0	4,2



Achieved values of all networks under test in each of the relevant Data Key Performance Indicators (KPIs) for the geographical category "Towns".

Data Towns	KPI Name	Unit	Vodafone	Operator 2	Operator 3	Operator 4
HTTP Web Page DL Smartphone	Qualifier	[%]	99,9	99,6	99,1	99,3
	Overall Session Time	[s]	1,3	1,6	1,6	1,7
HTTP 10MB DL Smartphone	Qualifier	[%]	100,0	100,0	99,8	100,0
	Overall Session Time	[s]	2,4	3,1	3,7	2,8
	90% faster than	[Mbit/s]	16210,8	15505,8	15026,4	18714,4
	10% faster than	[Mbit/s]	123763,5	115592,0	91586,3	146388,7
HTTP 5MB UL Smartphone	Qualifier	[%]	100,0	100,0	99,8	99,6
	Average Session Time	[s]	2,6	3,1	3,4	3,4
	90% faster than	[Mbit/s]	8949,6	7857,2	7622,2	6343,4
HTTP DL FDTT	10% faster than	[Mbit/s]	46349,9	40924,9	47789,7	64547,4
	Qualifier	[%]	100,0	99,8	99,6	98,7
	10% faster than	[Mbit/s]	161336,3	190906,4	106651,0	213045,6
HTTP UL FDTT	faster than 20 Mbit/s	[%]	93,0	86,6	88,1	90,9
	faster than 100 Mbit/s	[%]	32,4	32,1	12,6	49,5
	Qualifier	[%]	99,8	100,0	99,8	99,6
YouTube	10% faster than	[Mbit/s]	62384,7	67107,9	63998,6	95430,6
	faster than 2 Mbit/s	[%]	99,5	99,6	97,5	97,3
	faster than 5 Mbit/s	[%]	96,4	95,8	94,0	93,4
	Qualifier	[%]	100,0	98,9	98,4	98,9
YouTube Live Smartphone	Start Time	[s]	1,8	2,2	2,1	2,1
	AVG Resolution	[p]	1079,7	1077,8	1078,0	1079,2
	Qualifier	[%]	99,8	97,5	98,4	97,9
Interactivity	Start Time	[s]	2,6	3,1	2,9	2,9
	AVG Resolution	[p]	1079,1	1071,3	1075,8	1075,8
	Qualifier	[%]	98,0	92,9	97,8	95,7
Interactivity egaming	Interactivity egaming	[%]	43,0	32,3	33,6	44,3
	Qualifier	[%]	88,9	88,8	96,9	94,8
Interactivity Videochat	Interactivity egaming	[%]	85,3	83,3	85,7	87,2
	Qualifier	[%]	99,6	99,9	99,9	99,4
Conversational App	Speech Quality (P10)	[MOS-LQO]	4,0	4,0	3,9	4,0



Data Services KPI overview

Achieved values of all networks under test in each of the relevant Data Key Performance Indicators (KPIs) for the geographical category "Roads".

Data Roads	KPI Name	Unit	Vodafone	Operator 2	Operator 3	Operator 4
HTTP Web Page DL Smartphone	Qualifier	[%]	99,7	99,5	97,8	98,7
	Overall Session Time	[s]	1,4	1,6	1,8	1,7
HTTP 10MB DL Smartphone	Qualifier	[%]	99,8	100,0	99,8	99,8
	Overall Session Time	[s]	3,9	4,1	5,6	4,8
	90% faster than	[Mbit/s]	10419,4	10521,1	6208,0	7918,4
	10% faster than	[Mbit/s]	98888,4	76725,7	76060,1	80645,2
HTTP 5MB UL Smartphone	Qualifier	[%]	99,7	99,4	98,9	98,4
	Average Session Time	[s]	4,4	3,9	5,7	4,9
	90% faster than	[Mbit/s]	5263,9	6007,8	3854,6	4658,1
	10% faster than	[Mbit/s]	39308,2	39596,2	40298,2	33444,8
HTTP DL FDDT	Qualifier	[%]	99,8	99,5	98,7	98,9
	10% faster than	[Mbit/s]	127989,8	127508,3	92493,5	96809,3
	faster than 20 Mbit/s	[%]	69,6	77,3	66,0	73,9
	faster than 100 Mbit/s	[%]	15,4	18,5	7,4	9,3
HTTP UL FDDT	Qualifier	[%]	99,7	99,4	99,2	98,4
	10% faster than	[Mbit/s]	48281,8	60371,2	52913,2	36686,2
	faster than 2 Mbit/s	[%]	97,8	98,7	95,7	95,8
	faster than 5 Mbit/s	[%]	90,2	92,9	86,0	89,3
YouTube	Qualifier	[%]	99,4	98,3	95,4	96,8
	Start Time	[s]	1,9	2,2	2,4	2,2
	AVG Resolution	[p]	1078,7	1076,1	1074,3	1077,6
YouTube Live Smartphone	Qualifier	[%]	99,4	96,4	95,3	96,1
	Start Time	[s]	2,8	3,1	3,4	3,0
	AVG Resolution	[p]	1076,6	1072,3	1063,8	1071,9
Interactivity	Qualifier	[%]	95,2	93,2	91,8	90,7
	Interactivity egaming	[%]	45,0	33,3	32,5	42,6
Interactivity Videochat	Qualifier	[%]	88,6	84,8	90,1	90,4
	Interactivity egaming	[%]	87,1	81,7	86,0	86,9
Conversational App	Qualifier	[%]	99,6	99,7	99,6	99,7
	Speech Quality (P10)	[MOS-LQO]	4,0	3,7	3,8	3,8



Crowd KPI overview

Achieved values of all networks under test in each of the relevant Crowd Key Performance Indicators (KPIs) for the categories "Broadband Coverage", "Download Speed", "Latency", "Voice Crowd" and "Stability".

Category	KPI name	Unit	Vodafone	Operator 2	Operator 3	Operator 4
Broadband Coverage	Coverage Quality	[%]	97.7	97.3	98.4	99.5
	Coverage Reach	[%]	82.2	85.2	70.1	88.6
	Time on broadband	[%]	96.7	97.1	96.5	99.6
Download Speed	Basic internet class	[%]	95.1	95.2	93.3	94.8
	HD video class	[%]	86.1	87.6	69.5	86.2
	UHD video class	[%]	20.7	23.3	16.0	24.2
Latency	OTT voice class	[%]	96.6	97.1	96.3	97.3
	Gaming class	[%]	82.0	86.8	82.3	88.4
	Egoshooter class	[%]	5.9	12.9	3.8	6.1
Voice	HD voice	[%]	95.2	92.1	92.3	97.5
Download Speed Active	90% faster than	[Mbit/s]	4.2	6.1	4.8	5.9
	10% faster than	[Mbit/s]	86.3	110.1	80.1	105.8
	AVG data rate	[Mbit/s]	36.7	51.3	35.1	48.3
Upload Speed Active	90% faster than	[Mbit/s]	2.8	2.7	2.6	2.3
	10% faster than	[Mbit/s]	38.7	41.8	37.8	40.2
	AVG data rate	[Mbit/s]	17.6	19.2	17.0	19.1
Stability	Transaction success	[%]	94.7	94.3	94.7	96.3



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