

best in test

For adding something on top in South Africa and reaching an overall score of 798 dots in mobile network benchmarking survey we proudly award this certificate to

Vodacom South Africa

Score 798 out of 1000 in Total
Score 220 out of 270 in Voice Services
Score 362 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 South Africa.

The audit was done as a performance benchmark performed by umlaut between 22.04.2023. and 06.06.2023 in cities and towns as well as on connection roads.

Dedicated measurements have been executed as drive tests outdoors using a Samsung Galaxy S21+ and Samsung Galaxy S22+. 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 CW51 2022 and CW22 2023.

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



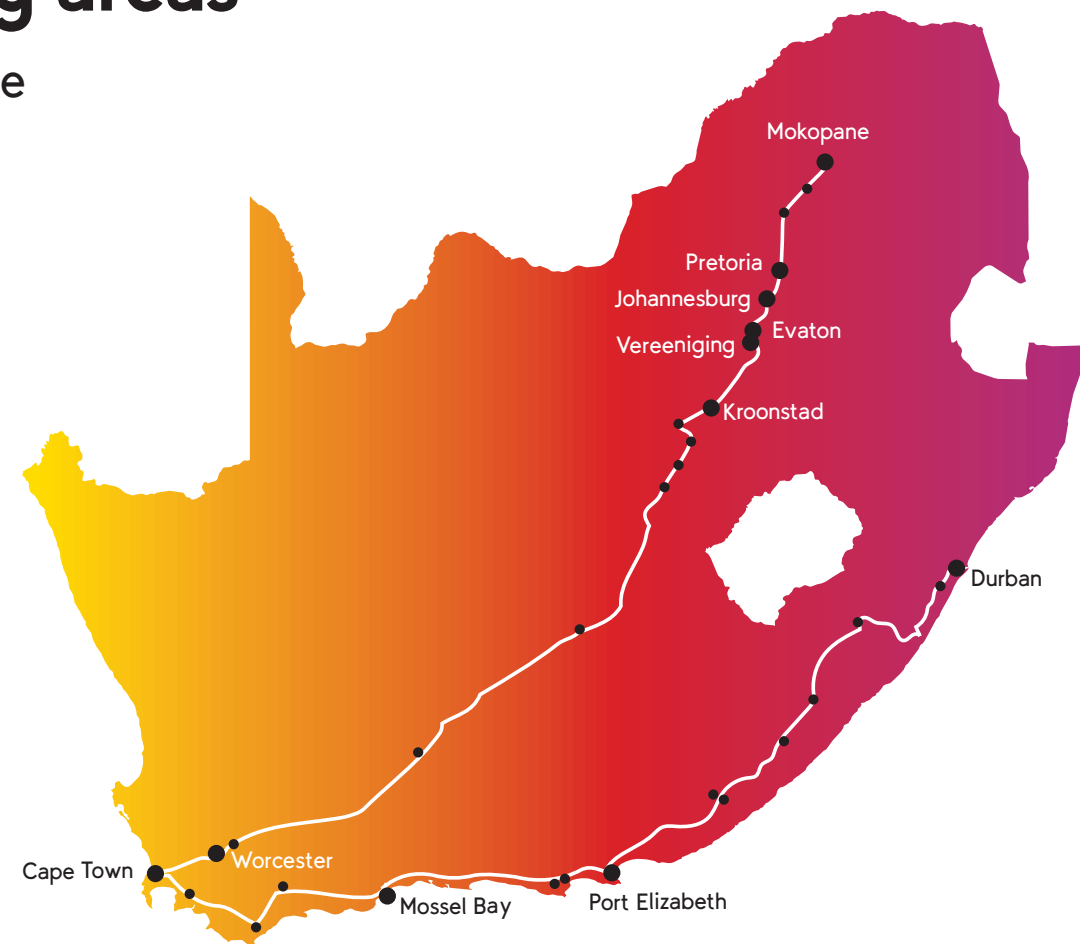
Measurement setup

Drivetest	Voice	Data
Device	Samsung Galaxy S21+	Samsung Galaxy S22+
Test Cases	Mobile-to-Mobile (M2M) Side1 (VoLTE) to Side2 (VoLTE) 105 sec call window 70 sec call duration 15 sec call setup timeout Multi-RAB traffic injection on both sides Conversational Apps	Data 4G preferred CA HTTP DL datastream 7s HTTP UL datastream 7s HTTP 10MB DL fixed file transfer HTTP 5MB UL fixed file transfer 9 Live web pages YouTube v16 Interactivity testing (eGaming)
Mobility and Route Types	Drive test: 52% in Cities, 15% in Towns and 33% on Roads Walktest: 100% in Cities	
Samples	~ 25.842	~ 174.825 in
Dates	36 measurement days 22.04.2023. - 06.06.2023	
Crowd Data Assessment	24 weeks CW51 2022 - CW22 2023	



Testing areas

Drive route

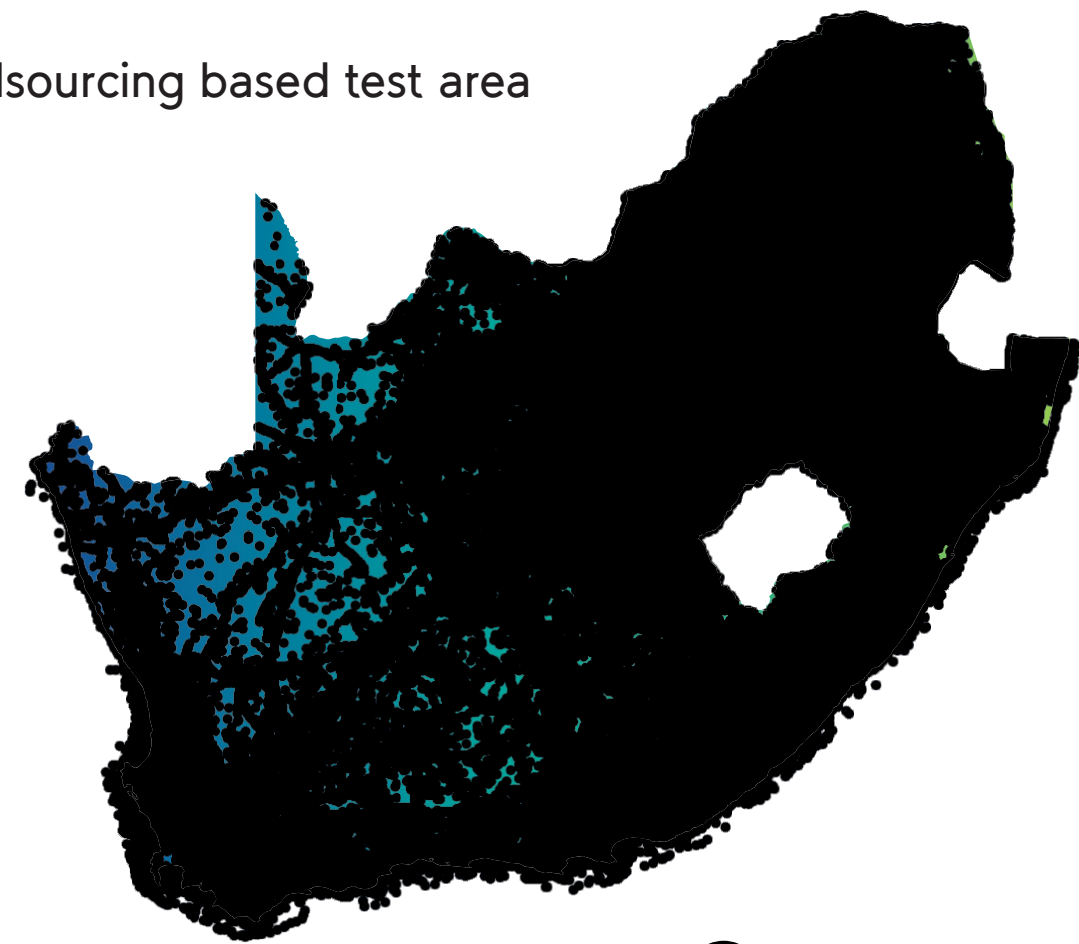


11055 km
measuring distance



~31 %
of population measured

Crowdsourcing based test area



98.1 %
of the 'build-up area' covered



683,556 km²
size of tested area




99.6 %
of the 'Population area' covered



Claims




Best in test
Vodacom South Africa



Best in data
Vodacom South Africa



Best in crowd-sourced quality
Vodacom South Africa



Best in Reliability
Vodacom South Africa



Methodology

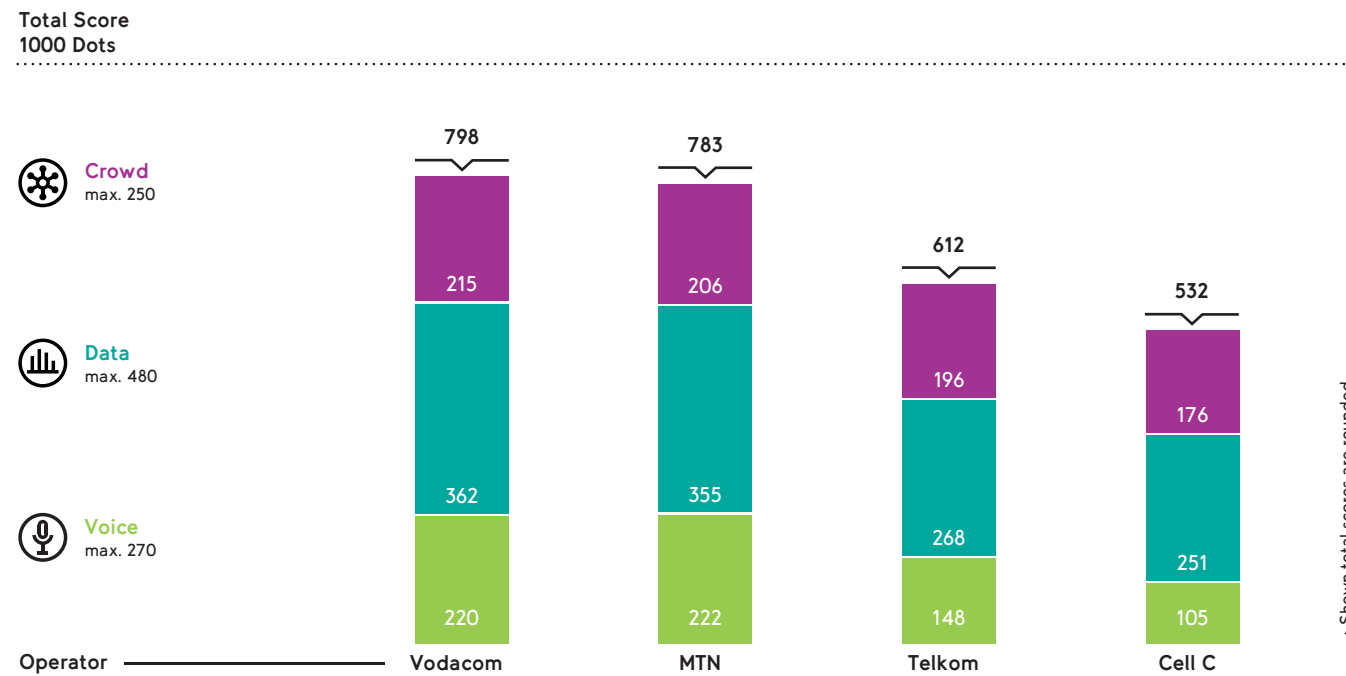
The leader in mobile benchmarking, umlaut, has analyzed the mobile networks of South Africa with regards to mobile network performance. We measure smartphone voice and data performance based on extensive drive-tests – from major metropolitan areas to smaller cities and connection roads. We objectively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

Vodacom achieved the highest overall score among competitors with 798 dots out of 1000.



→ Shown total scores are rounded.

Overall score considering Voice, Data and Crowdsourcing.

Total score

	Vodacom	MTN	Telkom	CellC
Voice (max. 270)	220	222	148	105
Cities Drivetest	122 (76%)	85%	61%	29%
Cities Walktest	41 (96%)	92%	86%	63%
Towns Drivetest	54 (87%)	88%	57%	53%
Roads Drivetest	54 (78%)	63%	16%	29%
Data (max. 480)	362	355	268	251
Cities Drivetest	216 (75%)	77%	55%	54%
Cities Walktest	72 (89%)	84%	65%	62%
Towns Drivetest	96 (77%)	70%	57%	45%
Roads Drivetest	96 (65%)	62%	49%	47%
Crowdsourced Quality (max. 250)	216	206	196	176
Broadband Coverage	100 (91%)	87%	87%	83%
Download Speed	50 (90%)	89%	88%	83%
Latency	50 (85%)	77%	72%	68%
Voice	13 (87%)	74%	80%	2%
Download Speed Active	13 (53%)	64%	26%	29%
Upload Speed Active	13 (70%)	75%	45%	48%
Stability	13 (83%)	76%	84%	67%
Total	798	783	612	532

Shown scores are rounded.



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

Data	Service Group	max	Vodacom	MTN	Telkom	CellC
Cities Drivetest	Web Browsing	48,6	81%	73%	67%	64%
	File Download	48,6	81%	88%	42%	55%
	File Upload	48,6	68%	77%	51%	44%
	YouTube	48,6	70%	73%	52%	48%
	OTT	21,6	76%	77%	76%	70%
Cities Walktest	Web Browsing	16,2	88%	84%	79%	70%
	File Download	16,2	92%	86%	58%	53%
	File Upload	16,2	86%	85%	57%	61%
	YouTube	16,2	87%	79%	59%	56%
	OTT	7,2	91%	91%	81%	81%
Towns	Web Browsing	21,6	82%	72%	67%	52%
	File Download	21,6	82%	81%	52%	40%
	File Upload	21,6	70%	60%	52%	30%
	YouTube	21,6	75%	63%	51%	47%
	OTT	9,6	72%	82%	71%	69%
Roads	Web Browsing	21,6	76%	68%	59%	58%
	File Download	21,6	78%	79%	49%	52%
	File Upload	21,6	44%	44%	33%	24%
	YouTube	21,6	59%	52%	46%	48%
	OTT	9,6	71%	71%	70%	64%

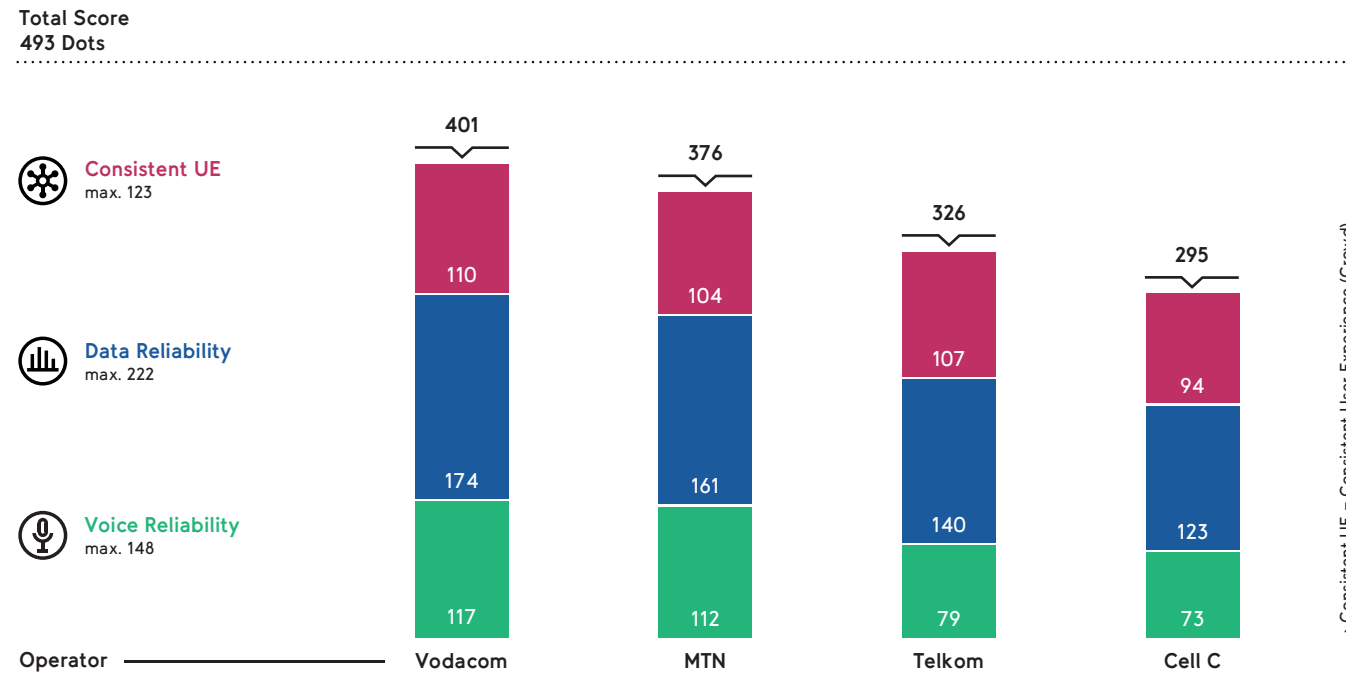


Achieved percentage of the maximum score in each of the different crowdsourcing services.

Crowd	Service Group	max	Vodacom	MTN	Telkom	CellC
Crowdsourced Quality	Broadband Coverage	100	91%	87%	87%	83%
	DL Speed	50	90%	89%	88%	83%
	Latency	50	85%	77%	72%	68%
	Voice	13	87%	74%	80%	2%
	DL Speed Active	13	53%	64%	26%	29%
	UL Speed Active	13	70%	75%	45%	48%
	Stability	13	83%	76%	84%	67%



Reliability



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

Total score

	Service Group	max	Vodacom	MTN	Telkom	CellC
Reliability	Voice Reliability	149	79%	75%	53%	49%
	Data Reliability	222	78%	73%	63%	56%
	Consistent User Experience	123	90%	85%	87%	80%

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	Vodacom	MTN	Telkom	CellC
Cities Drivetest	Qualifier	[%]	97,1	98,1	95,7	93,5
	Call Setup Time (P90)	[s]	1,6	1,4	3,5	8,3
	Speech Quality (P10)	[MOS-LQO]	3,4	3,7	3,1	2,7
	Multirab connectivity	[%]	98,4	99,0	99,1	69,3
Cities Walktest	Qualifier	[%]	99,4	98,7	99,3	98,6
	Call Setup Time (P90)	[s]	1,2	1,3	3,3	7,2
	Speech Quality (P10)	[MOS-LQO]	4,2	4,4	3,7	3,2
	Multirab connectivity	[%]	99,7	99,7	99,8	89,0
Towns	Qualifier	[%]	98,9	98,4	95,9	97,3
	Call Setup Time (P90)	[s]	1,6	1,5	4,4	7,8
	Speech Quality (P10)	[MOS-LQO]	3,8	4,0	3,2	3,0
	Multirab connectivity	[%]	96,2	98,8	97,4	68,3
Roads	Qualifier	[%]	95,2	89,7	76,4	87,4
	Call Setup Time (P90)	[s]	1,8	2,0	6,7	8,0
	Speech Quality (P10)	[MOS-LQO]	3,4	3,7	2,7	2,9
	Multirab connectivity	[%]	96,9	97,1	86,3	62,9



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 DT	KPI Name	Unit	Vodacom	MTN	Telkom	CellC
HTTP Web Page DL Smartphone	Qualifier	[%]	98,6	97,4	97,4	96,7
	Overall Session Time	[s]	2,2	2,2	2,5	2,5
HTTP 10MB DL Smartphone	Qualifier	[%]	99,3	99,4	96,0	97,7
	Overall Session Time	[s]	2,9	2,2	8,7	6,2
	90% faster than	[Mbit/s]	15,2	24,3	4,8	6,6
HTTP 5MB UL Smartphone	10% faster than	[Mbit/s]	204,1	176,2	36,8	62,5
	Qualifier	[%]	99,0	99,0	98,4	98,1
	Average Session Time	[s]	5,2	3,8	7,3	7,7
HTTP DL FDTT	90% faster than	[Mbit/s]	3,8	5,5	2,8	2,6
	10% faster than	[Mbit/s]	44,2	47,1	22,3	24,2
	Qualifier	[%]	98,7	99,3	96,8	98,7
HTTP UL FDTT	10% faster than	[Mbit/s]	414,3	315,3	60,5	66,5
	faster than 20 Mbit/s	[%]	89,3	95,0	54,0	67,2
	faster than 100 Mbit/s	[%]	50,7	63,8	1,2	2,6
YouTube	Qualifier	[%]	97,2	98,0	97,4	95,5
	10% faster than	[Mbit/s]	54,7	60,2	20,8	21,6
	faster than 2 Mbit/s	[%]	95,9	97,7	90,0	90,3
YouTube Live Smartphone	faster than 5 Mbit/s	[%]	86,3	92,5	72,4	73,2
	Qualifier	[%]	95,1	97,7	93,2	90,0
	Start Time	[s]	2,4	3,1	2,6	2,4
YouTube 4K Smartphone	Time to full resolution	[s]	7,9	8,0	8,3	8,1
	Qualifier	[%]	93,6	92,9	84,3	88,3
	Start Time	[s]	3,9	3,8	3,9	3,7
Interactivity	Time to full resolution	[s]	7,5	7,6	7,4	7,6
	Qualifier	[%]	87,0	88,4	35,0	61,5
	Start Time	[s]	2,2	3,0	2,6	2,2
Voice OTT	Time to full resolution	[s]	8,4	8,8	8,3	8,1
	Interactivity egaming	[%]	51,7	51,2	42,3	35,0
Voice OTT	Qualifier	[%]	99,7	99,1	99,6	99,6
	Speech Quality (P10)	[MOS-LQO]	2,6	2,8	3,3	3,2



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 WT	KPI Name	Unit	Vodacom	MTN	Telkom	CellC
HTTP Web Page DL Smartphone	Qualifier	[%]	99,5	98,7	98,9	97,5
	Overall Session Time	[s]	2,0	2,0	2,3	2,4
HTTP 10MB DL Smartphone	Qualifier	[%]	100,0	99,0	99,6	98,8
	Overall Session Time	[s]	1,9	2,6	7,3	7,9
	90% faster than	[Mbit/s]	25,7	20,0	5,9	5,1
	10% faster than	[Mbit/s]	225,2	219,7	38,8	49,8
HTTP 5MB UL Smartphone	Qualifier	[%]	99,6	99,8	98,5	98,5
	Average Session Time	[s]	3,3	1,9	6,2	6,0
	90% faster than	[Mbit/s]	6,3	15,3	3,5	3,5
HTTP DL FDTT	10% faster than	[Mbit/s]	58,5	60,8	23,2	32,3
	Qualifier	[%]	99,0	99,0	99,0	98,2
	10% faster than	[Mbit/s]	507,8	402,0	70,7	61,5
	faster than 20 Mbit/s	[%]	95,2	93,0	57,2	54,0
HTTP UL FDTT	faster than 100 Mbit/s	[%]	73,9	67,4	4,3	3,3
	Qualifier	[%]	99,6	97,0	98,1	97,5
	10% faster than	[Mbit/s]	73,0	77,6	25,1	29,2
	faster than 2 Mbit/s	[%]	98,3	98,8	92,0	95,4
YouTube	faster than 5 Mbit/s	[%]	93,1	98,6	78,4	78,8
	Qualifier	[%]	97,6	97,3	96,3	94,7
	Start Time	[s]	2,3	3,2	2,4	2,3
YouTube Live Smartphone	Time to full resolution	[s]	7,9	7,4	8,0	7,7
	Qualifier	[%]	97,5	96,3	86,7	90,7
	Start Time	[s]	4,0	4,2	3,5	4,0
YouTube 4K Smartphone	Time to full resolution	[s]	7,4	7,5	6,7	7,2
	Qualifier	[%]	93,2	90,0	34,7	57,3
	Start Time	[s]	2,1	2,8	2,2	2,3
Interactivity	Time to full resolution	[s]	8,5	7,8	7,5	7,3
	Interactivity egaming	[%]	63,2	70,2	50,8	45,4
Voice OTT	Qualifier	[%]	100,0	99,9	99,9	99,5
	Speech Quality (P10)	[MOS-LQO]	3,4	3,2	3,2	4,1



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	Vodacom	MTN	Telkom	CellC
HTTP Web Page DL Smartphone	Qualifier	[%]	99,1	97,6	97,8	95,2
	Overall Session Time	[s]	2,2	2,3	2,7	2,7
HTTP 10MB DL Smartphone	Qualifier	[%]	99,3	98,3	97,1	95,6
	Overall Session Time	[s]	2,3	2,9	7,5	8,2
	90% faster than	[Mbit/s]	21,2	19,6	6,5	4,5
	10% faster than	[Mbit/s]	140,6	163,2	34,4	55,4
HTTP 5MB UL Smartphone	Qualifier	[%]	99,6	98,5	98,5	97,2
	Average Session Time	[s]	6,1	5,1	7,6	10,7
	90% faster than	[Mbit/s]	3,2	4,0	2,7	1,8
HTTP DL FDTT	10% faster than	[Mbit/s]	29,3	39,3	22,7	16,8
	Qualifier	[%]	98,9	98,9	98,4	96,4
	10% faster than	[Mbit/s]	326,4	281,5	66,5	64,7
	faster than 20 Mbit/s	[%]	91,0	92,1	67,3	58,4
HTTP UL FDTT	faster than 100 Mbit/s	[%]	41,7	58,2	1,3	822,4
	Qualifier	[%]	99,1	95,5	97,1	92,3
	10% faster than	[Mbit/s]	34,4	52,7	24,5	17,1
	faster than 2 Mbit/s	[%]	95,7	94,9	91,7	86,9
YouTube	faster than 5 Mbit/s	[%]	85,2	88,4	75,0	63,3
	Qualifier	[%]	96,0	93,2	92,4	84,8
	Start Time	[s]	2,3	3,1	2,5	2,7
YouTube Live Smartphone	Time to full resolution	[s]	8,0	7,8	7,8	8,3
	Qualifier	[%]	93,8	94,7	90,4	82,2
	Start Time	[s]	3,9	3,8	3,9	3,7
YouTube 4K Smartphone	Time to full resolution	[s]	6,9	7,2	7,0	7,3
	Qualifier	[%]	90,6	81,9	40,8	48,1
	Start Time	[s]	2,4	3,1	2,4	2,3
Interactivity	Time to full resolution	[s]	8,7	8,5	7,9	8,2
	Interactivity egaming	[%]	52,2	50,0	35,0	33,9
Voice OTT	Qualifier	[%]	99,8	99,1	99,8	99,6
	Speech Quality (P10)	[MOS-LQO]	2,2	3,4	3,4	3,2



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".

Roads	KPI Name	Unit	Vodacom	MTN	Telkom	CellC
HTTP Web Page DL Smartphone	Qualifier	[%]	95,8	92,3	91,1	89,9
	Overall Session Time	[s]	2,4	2,5	2,9	2,8
HTTP 10MB DL Smartphone	Qualifier	[%]	97,5	95,3	91,4	92,2
	Overall Session Time	[s]	4,5	4,1	10,3	9,2
	90% faster than	[Mbit/s]	8,9	9,8	4,2	3,7
	10% faster than	[Mbit/s]	105,1	121,5	30,8	48,0
HTTP 5MB UL Smartphone	Qualifier	[%]	95,5	93,3	91,1	90,7
	Average Session Time	[s]	10,2	8,7	11,1	12,7
	90% faster than	[Mbit/s]	1,6	1,8	1,5	1,3
HTTP DL FDTT	10% faster than	[Mbit/s]	21,5	32,7	15,8	16,3
	Qualifier	[%]	96,3	94,5	92,1	91,8
	10% faster than	[Mbit/s]	138,5	180,1	47,9	60,0
	faster than 20 Mbit/s	[%]	80,8	85,0	32,2	53,4
HTTP UL FDTT	faster than 100 Mbit/s	[%]	22,2	39,0	1,7	0,5
	Qualifier	[%]	89,1	88,0	88,9	84,7
	10% faster than	[Mbit/s]	24,4	41,8	15,9	16,6
	faster than 2 Mbit/s	[%]	87,4	88,5	84,6	80,0
YouTube	faster than 5 Mbit/s	[%]	67,9	75,4	62,3	56,4
	Qualifier	[%]	89,5	83,9	78,3	72,0
	Start Time	[s]	2,5	3,2	2,8	2,6
YouTube Live Smartphone	Time to full resolution	[s]	7,5	8,2	7,7	8,0
	Qualifier	[%]	78,5	80,4	60,0	69,5
	Start Time	[s]	4,1	3,9	3,9	3,8
YouTube 4K Smartphone	Time to full resolution	[s]	7,1	7,1	7,3	7,2
	Qualifier	[%]	70,5	73,3	16,2	45,1
	Start Time	[s]	2,2	3,4	3,0	2,3
Interactivity	Time to full resolution	[s]	8,1	8,3	8,6	7,8
	Interactivity egaming	[%]	50,0	37,1	33,5	29,3
Voice OTT	Qualifier	[%]	99,2	98,8	98,1	99,2
	Speech Quality (P10)	[MOS-LQO]	2,3	3,3	3,5	3,0

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	Vodacom	MTN	Telkom	CellC
Broadband Coverage	Coverage Quality	[%]	92.7	89.0	88.5	86.6
	Coverage Reach	[%]	92.8	90.6	80.8	84.5
	Time on broadband	[%]	96.2	94.1	96.0	91.6
Download Speed	Basic internet class	[%]	94.8	94.0	94.3	91.5
	HD video class	[%]	76.7	77.1	73.4	69.0
	UHD video class	[%]	22.6	23.3	14.5	17.9
Latency	Gaming class	[%]	80.8	76.5	69.3	66.5
	OTT voice class	[%]	94.1	91.1	90.7	89.1
Voice	HD voice	[%]	93.5	87.2	89.8	10.3
Download Speed Active	10% faster than	[Mbit/s]	2.7	3.4	1.8	2.2
	90% faster than	[Mbit/s]	63.9	85.3	26.2	25.9
	AVG data rate	[Mbit/s]	28.3	36.2	13.1	11.6
Upload Speed Active	10% faster than	[Mbit/s]	1.7	1.6	1.3	1.2
	90% faster than	[Mbit/s]	24.2	37.6	16.1	18.0
	AVG data rate	[Mbit/s]	11.8	15.6	7.3	8.1
Stability	Transaction success	[%]	83.2	75.5	84.2	67.4



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