

CERTIFICATE

P3 communications GmbH

Am Kraftversorgungsturm 3, D-52070 Aachen, Germany

hereby certifies that



vodafone

Vodafone Fiji Limited

168 Princes Road, Tamavua, Suva , Fiji

achieved „**Best in Test**“ with a

Total Score of **489 of 1000**

in the **Mobile Benchmark Fiji 11/2017**.

(Score 211 of 400 in Voice, Score 278 of 600 in Data Services)

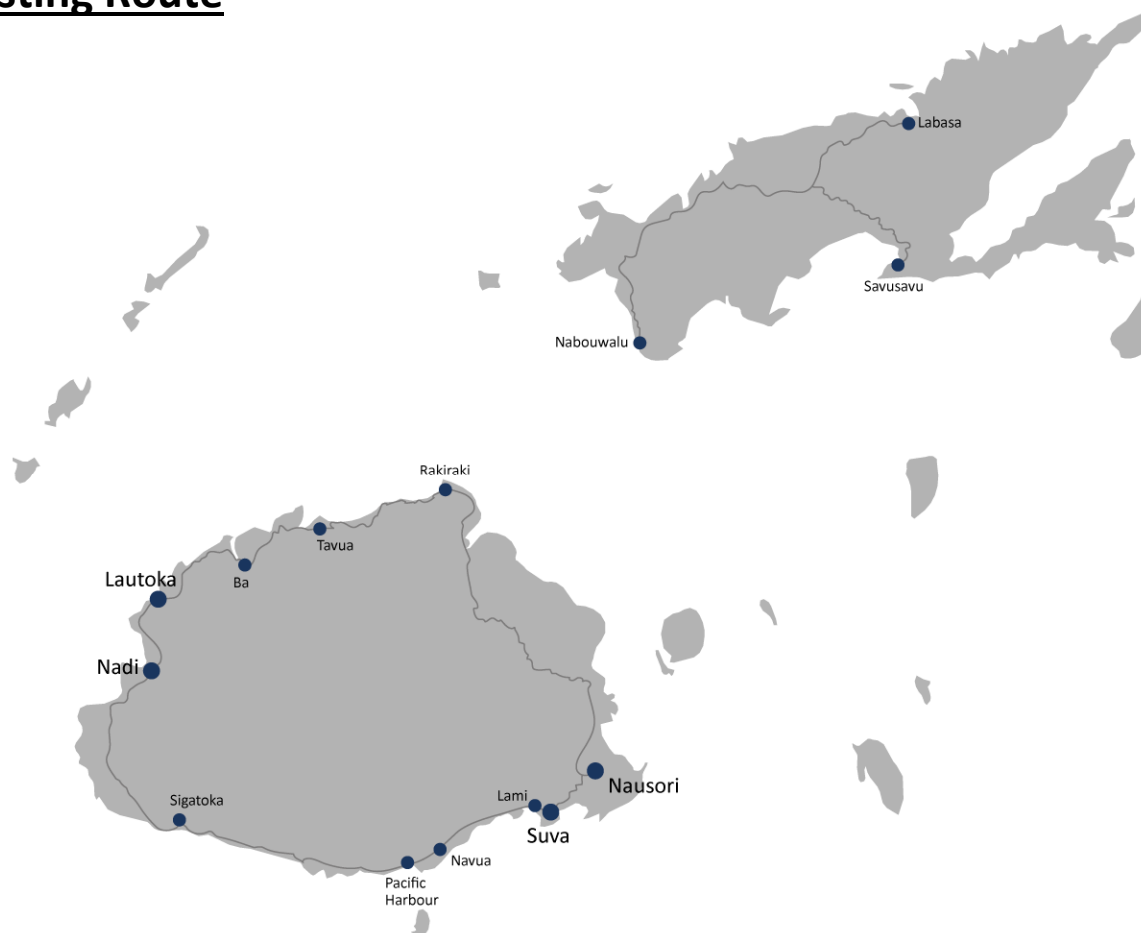


Maziar Kianzad
*Head of Measurement
and Testing Solutions*
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Measurement Setup

	Voice	Data
Device	Samsung Galaxy S7 cat9	Samsung Galaxy S7 cat9
Test Cases	<p>Mobile-to-Mobile</p> <p>Channel-01: 4G preferred to 4G preferred</p> <p>Channel-02: 4G preferred to 4G preferred</p> <p>115 sec call window</p> <p>70 sec call duration</p> <p>15 sec call setup timeout</p> <p>Multi-RAB traffic injection on both sides</p>	<p>Data 4G preferred CA</p> <p>HTTP DL datastream 7s</p> <p>HTTP UL datastream 7s</p> <p>HTTP 3MB DL fixed file transfer</p> <p>HTTP 1MB UL fixed file transfer</p> <p>Web Browsing - Kepler ETSI Ref. Page 10 Live web pages (50% http / 50% https)</p> <p>4 YouTube HD video ~ 45s</p>
Mobility and Route Types	<p>Drivetest</p> <p>59% in Cities, 22% in Towns and 18% on Roads</p> <p>Walktest</p> <p>100% in cities</p>	<p>Drivetest</p> <p>60% in Cities, 23% in Towns and 18% on Roads</p> <p>Walktest</p> <p>100% in cities</p>
Samples	<p>Drivetest: ~ 4400 per Operator</p> <p>Walktest: ~ 1100 per operator</p>	<p>Drivetest: ~ 1400 per Operator</p> <p>Walktest: ~ 400 per operator</p>
Dates	<p>18 measurement days (12 days Drivetest, 6 days Walktest)</p> <p>03.11.2017 – 15.11.2017</p>	

Testing Route



Score Points and Breakdown

The following table indicates the score points achieved by the networks under test in the modules “Voice” and “Data Services” as well as the breakdown of achieved points in the geographical categories “Cities”, “Towns” and “Roads”.

Module	Infrastructure	Max.	Vodafone	Operator 2
Voice	Total	400	211	151
	Cities (Drivetest)	180	55%	36%
	Cities (Walktest)	60	68%	55%
	Towns (Drivetest)	80	55%	51%
	Roads (Drivetest)	80	34%	16%
Data	Total	600	278	225
	Cities (Drivetest)	270	54%	47%
	Cities (Walktest)	90	62%	61%
	Towns (Drivetest)	120	37%	18%
	Roads (Walktest)	120	27%	18%
TOTAL		1.000	489	376

Shown voice, data and total scores are rounded

The following table indicates the achieved percentage of the maximum score in each of the different data services.

Data	Service Group	Max.	Vodafone	Operator 2
Cities – Drivetest	Web Browsing	81,0	25%	42%
	File Download	67,5	64%	49%
	File Upload	67,5	69%	53%
	YouTube	54,0	66%	46%
Cities – Walktest	Web Browsing	27,0	28%	54%
	File Download	22,5	64%	67%
	File Upload	22,5	81%	56%
	YouTube	18,0	87%	70%
Towns – Drivetest	Web Browsing	36,0	17%	14%
	File Download	30,0	52%	12%
	File Upload	30,0	39%	18%
	YouTube	24,0	46%	30%
Roads – Drivetest	Web Browsing	36,0	9%	13%
	File Download	30,0	43%	14%
	File Upload	30,0	26%	20%
	YouTube	24,0	34%	29%

Voice KPI Overview

The following table indicates the 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 M2M	Kpi Name	Unit	Vodafone	Operator 2
Cities – Drivetest	Qualifier	[%]	94,9	93,1
	Call Setup Time	[s]	6,9	8,8
	AVG Speech Quality	[MOS-LQO]	3,1	2,6
Cities – Walktest	Qualifier	[%]	97,2	97,3
	Call Setup Time	[s]	6,4	9,2
	AVG Speech Quality	[MOS-LQO]	3,1	2,5
Towns – Drivetest	Qualifier	[%]	94,8	94,5
	Call Setup Time	[s]	6,8	6,2
	AVG Speech Quality	[MOS-LQO]	3,1	2,7
Roads – Drivetest	Qualifier	[%]	85,8	76,5
	Call Setup Time	[s]	6,0	6,6
	AVG Speech Quality	[MOS-LQO]	3,0	2,7

Data KPI Overview

The following table indicates the achieved values of all networks under test in each of the relevant Data Key Performance Indicators (KPIs) for the geographical categories “Cities”, “Towns” and “Roads”.

Data Cities – Drivetest	KPI Name	Unit	Vodafone	Operator 2
HTTP LIVE PAGE DL	Qualifier	[%]	74,3	91,5
	Time to first Byte	[ms]	1498	922
	KBytes first second	[KB]	254	369
HTTP Static Page DL	Qualifier	[%]	93,4	93,0
	Overall Session Time	[s]	2,8	2,2
HTTP file DL 3MB	Qualifier	[%]	96,7	93,6
	AVG Session Time	[s]	3,9	3,8
	90% faster than	[kbit/s]	4227	3449
	10% faster than	[kbit/s]	45802	29703
HTTP file UL 1MB	Qualifier	[%]	95,6	94,6
	AVG Session Time	[s]	2,7	3,1
	90% faster than	[kbit/s]	2380	1265
	10% faster than	[kbit/s]	24316	16084
HTTP DL FDTT 7s	Qualifier	[%]	96,1	94,7
	AVG throughput	[kbit/s]	37403	20089
	90% faster than	[kbit/s]	5184	3525
	10% faster than	[kbit/s]	68897	45159
HTTP UL FDTT 7s	Qualifier	[%]	97,1	94,4
	AVG throughput	[kbit/s]	23888	11028
	90% faster than	[kbit/s]	4606	1353
	10% faster than	[kbit/s]	35616	25200
YouTube	Qualifier	[%]	93,3	89,2
	Start Time	[s]	3,3	3,1
	Playouts w/o interruptions	[%]	99,1	98,4
	AVG Resolution	[p]	1059,4	1050,1

Data Cities – Walktest	KPI Name	Unit	Vodafone	Operator 2
HTTP LIVE PAGE DL	Qualifier	[%]	72,7	94,1
	Time to first Byte	[ms]	1632	961
	KBytes first second	[KB]	255	373
HTTP Static Page DL	Qualifier	[%]	95,1	96,0
	Overall Session Time	[s]	2,6	2,2
HTTP file DL 3MB	Qualifier	[%]	94,0	98,4
	AVG Session Time	[s]	2,4	3,4
	90% faster than	[kbit/s]	9095	3971
	10% faster than	[kbit/s]	42942	29172
HTTP file UL 1MB	Qualifier	[%]	95,1	95,3
	AVG Session Time	[s]	1,8	2,9
	90% faster than	[kbit/s]	8175	1816
	10% faster than	[kbit/s]	25189	14970
HTTP DL FDTT 7s	Qualifier	[%]	98,1	97,1
	AVG throughput	[kbit/s]	38780	18722
	90% faster than	[kbit/s]	9291	3877
	10% faster than	[kbit/s]	65572	40822
HTTP UL FDTT 7s	Qualifier	[%]	99,7	94,4
	AVG throughput	[kbit/s]	25419	9933
	90% faster than	[kbit/s]	8684	2369
	10% faster than	[kbit/s]	36384	22433
YouTube	Qualifier	[%]	98,1	94,3
	Start Time	[s]	3,1	3,1
	Playouts w/o interruptions	[%]	99,4	99,0
	AVG Resolution	[p]	1071,3	1050,0

Data Towns – Drivetest	KPI Name	Unit	Vodafone	Operator 2
HTTP LIVE PAGE DL	Qualifier	[%]	75,7	76,3
	Time to first Byte	[ms]	1232	1042
	KBytes first second	[KB]	254	275
HTTP Static Page DL	Qualifier	[%]	87,6	69,7
	Overall Session Time	[s]	2,8	3,5
HTTP file DL 3MB	Qualifier	[%]	94,0	80,9
	AVG Session Time	[s]	5,0	13,3
	90% faster than	[kbit/s]	2582	603
	10% faster than	[kbit/s]	45403	33058
HTTP file UL 1MB	Qualifier	[%]	92,2	84,1
	AVG Session Time	[s]	3,7	6,2
	90% faster than	[kbit/s]	1064	663
	10% faster than	[kbit/s]	22896	17175
HTTP DL FDTT 7s	Qualifier	[%]	94,7	80,7
	AVG throughput	[kbit/s]	32623	20202
	90% faster than	[kbit/s]	3451	691
	10% faster than	[kbit/s]	67919	56030
HTTP UL FDTT 7s	Qualifier	[%]	89,8	84,0
	AVG throughput	[kbit/s]	14699	7094
	90% faster than	[kbit/s]	1193	643
	10% faster than	[kbit/s]	33381	24228
YouTube	Qualifier	[%]	87,8	53,9
	Start Time	[s]	3,5	3,4
	Playouts w/o interruptions	[%]	99,6	95,4
	AVG Resolution	[p]	1057,2	1002,1

Data Roads – Drivetest	KPI Name	Unit	Vodafone	Operator 2
HTTP LIVE PAGE DL	Qualifier	[%]	58,6	60,4
	Time to first Byte	[ms]	1554	1184
	KBytes first second	[KB]	194	226
HTTP Static Page DL	Qualifier	[%]	72,0	57,3
	Overall Session Time	[s]	4,0	3,9
HTTP file DL 3MB	Qualifier	[%]	88,8	66,8
	AVG Session Time	[s]	8,1	13,3
	90% faster than	[kbit/s]	1352	777
	10% faster than	[kbit/s]	41086	25144
HTTP file UL 1MB	Qualifier	[%]	68,4	72,5
	AVG Session Time	[s]	5,2	7,3
	90% faster than	[kbit/s]	915	668
	10% faster than	[kbit/s]	23810	10422
HTTP DL FDTT 7s	Qualifier	[%]	88,1	68,1
	AVG throughput	[kbit/s]	19363	10485
	90% faster than	[kbit/s]	1524	801
	10% faster than	[kbit/s]	62812	34357
HTTP UL FDTT 7s	Qualifier	[%]	72,2	79,1
	AVG throughput	[kbit/s]	11048	4723
	90% faster than	[kbit/s]	891	615
	10% faster than	[kbit/s]	31754	18671
YouTube	Qualifier	[%]	74,8	46,9
	Start Time	[s]	5,1	4,7
	Playouts w/o interruptions	[%]	94,4	92,2
	AVG Resolution	[p]	964,6	937,6