Measuring Broadband Australia Program

ACCC
AUSTRALIAN COMPETITION & CONSUMER COMMISSION

Report 21 Appendix, June 2023

NBN fixed-line services tables

NBN video streaming tables

The following tables show information on the proportion of NBN services on the main NBN fixed-line plans which would be able to reliably stream (with a low chance of stopping and starting) a varying number of videos from Netflix simultaneously during busy hours. Data from underperforming and impaired services is included.

A High Definition stream from Netflix takes up around 2.2 Mbps data rate on average. For consumers with premium Ultra High Definition (4K) video stream, an Ultra High Definition stream from Netflix takes up 12 Mbps data rate on average. The actual data rate will vary during video streaming: for example Netflix would use a higher data rate during a fast-paced action scene. The actual data rate will also depend on how many other users are using Netflix.

The Whitebox measures the total downstream data rate available from Netflix's servers. Therefore, by using multiples of 2.2 Mbps (for High Definition) and 12 Mbps (for Ultra High Definition) it allows us to infer whether a NBN fixed-line service would be able to support different numbers of simultaneous streams. This assumes no other use of the connection at the time, i.e. that Netflix is the only application running.

By plan download speed

Download plan	1 HD (2.2 Mbps)	2 HD (4.4 Mbps)	3 HD (6.6 Mbps)	4 HD (8.8 Mbps)	5 HD (11 Mbps)	Panel size
NBN25	100%	100%	100%	99%	99%	85
NBN50	100%	100%	100%	100%	100%	539
NBN100	100%	100%	100%	100%	100%	378
Download plan	1 UHD (12 Mbps)	2 UHD (24 Mbps)	3 UHD (36 Mbps)	4 UHD (48 Mbps)	5 UHD (60 Mbps)	Panel size
NBN25	99%	87%	0%	0%	0%	85
NBN50	100%	96%	86%	68%	0%	539
NBN100	100%	99%	99%	99%	97%	378

By RSP[1]

RSP	Download plan	1 UHD	2 UHD	3 UHD	4 UHD	Panel size
Aussie Broadband	50	100%	97%	84%	60%	62
Dodo & iPrimus	50	100%	100%	80%	49%	45
Exetel	50	100%	91%	87%	74%	46
iiNet	50	100%	97%	88%	63%	60
Optus	50	100%	100%	97%	84%	62
Telstra	50	100%	99%	90%	76%	89
TPG	50	100%	100%	94%	71%	65
RSP	Download plan	1 UHD	2 UHD	3 UHD	4 UHD	Panel size
Aussie Broadband	100	100%	100%	100%	100%	67
Optus	100	100%	100%	100%	100%	47
Telstra	100	100%	100%	100%	100%	56
Superloop	100	100%	100%	100%	100%	56

[1] These tables only show data for RSPs having at least 40 units on the respective download speed tier reporting measurements.

NBN RSP tables

The following tables show statistical information on download speeds, upload speeds, and outages for each RSP across all NBN plans, and for individual NBN plans in instances where at least 40 Whiteboxes reported successfully during the test period.

- The overall speed is the average speed (download or upload) for the RSP, measured as a percentage of plan speed.

- Standard deviation is a measure of how widely or narrowly test speeds are distributed in the data set.

- The 95% confidence interval is a range in which the 'true' average value is estimated to lie and is a function of the sample size (i.e. number of Whiteboxes online) and standard deviation.

If the standard deviation is larger then the confidence interval will be wider, reflecting greater variability in the underlying data. If the sample size is larger then the confidence interval will be narrower, reflecting more certainty in the underlying data.

For example: during testing, we measured an average download performance of 96.7% of plan speed for Dodo & iPrimus across all NBN plans with a 95% confidence interval of ±3.2%. If we were to repeat our sampling 100 times, we expect that this average would fall between 93.4% and 99.9% in at least 95 cases.

Period	RSP	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Aussie Broadband	98.8%	14.5%	96.6% - 101.1%	164	59,706
All hours	Dodo & iPrimus	96.7%	15.2%	93.4% - 99.9%	84	30,684
All hours	Exetel	104.8%	8.0%	103.1% - 106.5%	85	29,106
All hours	iiNet	98.0%	13.5%	95.4% - 100.5%	108	39,481
All hours	Launtel	105.2%	7.5%	103.3% - 107.2%	59	18,041
All hours	Optus	101.4%	12.7%	99.0% - 103.7%	115	40,259
All hours	Telstra	101.6%	12.9%	99.7% - 103.6%	166	62,180
All hours	TPG	99.9%	11.5%	97.9% - 101.9%	128	44,977
All hours	Superloop	98.1%	12.7%	95.6% - 100.6%	97	35,056
All hours	Vodafone	98.8%	13.7%	95.2% - 102.4%	56	19,434

Period	RSP	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Aussie Broadband	97.5%	14.5%	95.3% - 99.8%	164	11,042
Busy hours	Dodo & iPrimus	95.4%	15.3%	92.1% - 98.7%	84	5,600
Busy hours	Exetel	103.5%	7.9%	101.8% - 105.2%	85	5,244
Busy hours	iiNet	96.8%	13.6%	94.2% - 99.3%	108	7,017
Busy hours	Launtel	103.3%	8.2%	101.2% - 105.3%	59	3,237
Busy hours	Optus	100.1%	12.6%	97.8% - 102.4%	115	6,830
Busy hours	Telstra	99.8%	13.0%	97.8% - 101.7%	166	11,364
Busy hours	TPG	98.1%	11.7%	96.0% - 100.1%	127	8,043
Busy hours	Superloop	96.9%	12.6%	94.4% - 99.5%	97	6,261
Busy hours	Vodafone	97.8%	13.6%	94.2% - 101.4%	56	3,457

Period	RSP	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Aussie Broadband	85.4%	16.9%	82.8% - 87.9%	164	48,518
All hours	Dodo & iPrimus	83.5%	21.2%	79.0% - 88.1%	84	24,921
All hours	Exetel	88.2%	13.0%	85.5% - 91.0%	85	23,727
All hours	iiNet	83.0%	20.6%	79.1% - 86.9%	108	32,177
All hours	Launtel	88.0%	8.3%	85.9% - 90.1%	59	14,713
All hours	Optus	87.5%	13.5%	85.1% - 90.0%	115	33,064
All hours	Telstra	86.1%	16.9%	83.6% - 88.7%	166	50,592
All hours	TPG	84.1%	18.8%	80.8% - 87.3%	128	36,736
All hours	Superloop	86.9%	17.9%	83.4% - 90.5%	97	28,471
All hours	Vodafone	88.8%	15.1%	84.9% - 92.8%	56	15,897

Period	RSP	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Aussie Broadband	85.0%	17.1%	82.4% - 87.6%	164	5,598
Busy hours	Dodo & iPrimus	83.3%	21.1%	78.8% - 87.8%	84	2,847
Busy hours	Exetel	87.8%	13.0%	85.0% - 90.6%	85	2,636
Busy hours	iiNet	82.9%	20.6%	79.0% - 86.7%	108	3,667
Busy hours	Launtel	87.2%	8.9%	84.9% - 89.4%	59	1,674
Busy hours	Optus	87.4%	13.4%	85.0% - 89.9%	115	3,441
Busy hours	Telstra	86.0%	16.9%	83.4% - 88.6%	166	5,776
Busy hours	TPG	83.8%	18.8%	80.5% - 87.0%	127	4,069
Busy hours	Superloop	86.5%	17.8%	83.0% - 90.1%	97	3,130
Busy hours	Vodafone	88.4%	15.0%	84.5% - 92.3%	56	1,743

Period	RSP	Download plan	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Aussie Broadband	50	96.3%	16.7%	92.2% - 100.5%	62	22,974
All hours	Aussie Broadband	100	100.8%	10.9%	98.2% - 103.4%	67	23,443
All hours	Dodo & iPrimus	50	92.1%	17.8%	86.9% - 97.3%	45	16,398
All hours	Exetel	50	103.7%	9.9%	100.9% - 106.5%	49	17,007
All hours	iiNet	50	96.1%	16.4%	92.0% - 100.3%	60	22,553
All hours	Optus	50	103.3%	10.8%	100.6% - 106.0%	62	22,361
All hours	Optus	100	98.8%	14.0%	94.8% - 102.8%	47	15,644
All hours	Telstra	50	100.5%	14.8%	97.5% - 103.6%	90	34,389
All hours	Telstra	100	102.2%	10.6%	99.5% - 105.0%	56	21,650
All hours	TPG	50	99.3%	11.9%	96.5% - 102.1%	67	23,018
All hours	Superloop	100	100.4%	8.2%	98.3% - 102.5%	57	19,712

Period	RSP	Download plan	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Aussie Broadband	50	95.0%	16.4%	90.9% - 99.1%	62	4,190
Busy hours	Aussie Broadband	100	99.5%	11.1%	96.8% - 102.1%	67	4,405
Busy hours	Dodo & iPrimus	50	90.8%	17.9%	85.5% - 96.0%	45	2,988
Busy hours	Exetel	50	102.3%	9.8%	99.5% - 105.0%	49	3,093
Busy hours	iiNet	50	95.0%	16.6%	90.8% - 99.2%	60	3,982
Busy hours	Optus	50	101.7%	10.8%	99.0% - 104.4%	62	3,838
Busy hours	Optus	100	97.8%	14.1%	93.8% - 101.8%	47	2,575
Busy hours	Telstra	50	98.7%	14.7%	95.7% - 101.7%	90	6,232
Busy hours	Telstra	100	100.7%	10.5%	97.9% - 103.4%	56	3,936
Busy hours	TPG	50	97.7%	11.8%	94.8% - 100.5%	67	3,950
Busy hours	Superloop	100	99.3%	8.2%	97.2% - 101.4%	57	3,499

Period	RSP	Upload plan	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Aussie Broadband	20	84.3%	18.7%	80.8% - 87.9%	108	31,968
All hours	Dodo & iPrimus	20	79.4%	24.4%	73.1% - 85.7%	58	16,978
All hours	Exetel	20	86.3%	15.6%	82.2% - 90.4%	55	15,258
All hours	iiNet	20	79.3%	23.0%	73.9% - 84.8%	69	21,099
All hours	Optus	20	87.2%	14.6%	84.0% - 90.4%	78	22,762
All hours	Telstra	20	85.8%	17.5%	82.9% - 88.7%	139	43,774
All hours	TPG	20	82.2%	19.7%	77.9% - 86.4%	83	22,898
All hours	Superloop	20	84.1%	22.0%	78.4% - 89.8%	57	17,975
All hours	Vodafone	20	89.7%	12.4%	86.3% - 93.2%	50	13,965

Period	RSP	Upload plan	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Aussie Broadband	20	84.0%	18.9%	80.5% - 87.6%	108	3,653
Busy hours	Dodo & iPrimus	20	79.2%	24.3%	72.9% - 85.4%	58	1,945
Busy hours	Exetel	20	85.9%	15.6%	81.8% - 90.0%	55	1,687
Busy hours	iiNet	20	79.2%	23.0%	73.8% - 84.7%	69	2,386
Busy hours	Optus	20	87.1%	14.5%	83.9% - 90.3%	78	2,370
Busy hours	Telstra	20	85.6%	17.5%	82.7% - 88.5%	139	4,971
Busy hours	TPG	20	81.9%	19.6%	77.7% - 86.1%	83	2,458
Busy hours	Superloop	20	83.9%	21.9%	78.3% - 89.6%	57	1,999
Busy hours	Vodafone	20	89.4%	12.3%	86.0% - 92.8%	50	1,502

RSP	Average daily outages lasting longer than 30 seconds	Standard deviation	95% confidence interval of the mean	Panel size
Aussie Broadband	0.35	1.30	0.15 - 0.55	161
Dodo & iPrimus	0.31	0.53	0.19 - 0.42	84
Exetel	0.27	1.11	0.04 - 0.51	85
iiNet	0.11	0.28	0.06 - 0.17	108
Launtel	0.55	1.14	0.26 - 0.85	59
Optus	0.15	0.52	0.06 - 0.25	115
Telstra	0.23	0.52	0.15 - 0.31	166
TPG	0.33	1.20	0.12 - 0.54	127
Superloop	0.24	0.72	0.10 - 0.38	97
Vodafone	0.20	0.31	0.12 - 0.29	56

RSP	Percentage of outages lasting 30-60 sec	Percentage of outages lasting 1-3 min	Percentage of outages lasting 3-10 min	Percentage of outages lasting 10 min or more
Aussie Broadband	23.7%	17.6%	46.2%	12.5%
Dodo & iPrimus	16.4%	28.5%	32.1%	23.0%
Exetel	14.2%	28.8%	30.0%	27.0%
Launtel	44.9%	18.9%	29.1%	7.0%
Optus	12.7%	23.7%	49.5%	14.1%
Superloop	15.0%	31.3%	34.9%	18.9%
TPG	27.9%	35.8%	25.3%	11.0%
Telstra	21.2%	28.2%	21.2%	29.5%
Vodafone	27.0%	42.1%	18.9%	11.9%
iiNet	18.6%	25.2%	40.5%	15.7%

NBN plan tables

The following tables show statistical information on download and upload speeds for each NBN plan, including all tested RSPs.

Period	Download plan	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	25	104.1%	7.5%	102.5% - 105.7%	88	32,929
All hours	50	98.7%	14.6%	97.4% - 99.9%	547	197,786
All hours	100	99.8%	11.4%	98.6% - 100.9%	382	133,705
All hours	250	98.6%	16.8%	94.8% - 102.5%	74	23,680

Period	Download plan	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	25	102.9%	8.1%	101.2% - 104.6%	87	6,127
Busy hours	50	97.0%	14.7%	95.8% - 98.3%	546	35,308
Busy hours	100	98.4%	11.6%	97.3% - 99.6%	382	23,883
Busy hours	250	95.7%	18.2%	91.5% - 99.8%	74	4,376

Period	Upload plan	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	5	88.2%	14.8%	84.3% - 92.1%	55	16,057
All hours	20	84.3%	18.8%	83.0% - 85.6%	779	228,832
All hours	40	89.7%	10.1%	88.1% - 91.3%	156	43,382

Period	Upload plan	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	5	88.1%	14.8%	84.2% - 92.1%	54	1,886
Busy hours	20	84.0%	18.8%	82.7% - 85.3%	779	25,473
Busy hours	40	89.3%	10.1%	87.7% - 90.9%	156	4,764

NBN technology tables

The following tables show statistical information on download speeds, upload speeds, and outages on a per-technology basis.

Period	Technology	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Fibre to the premises - FTTP	104.4%	8.4%	103.4% - 105.3%	325	112,971
All hours	Fibre to the curb - FTTC	102.9%	5.8%	101.7% - 104.2%	83	28,389
All hours	Hybrid fibre-coaxial - HFC	103.3%	8.8%	102.3% - 104.4%	263	91,807
All hours	Fibre to the node - FTTN	93.8%	16.4%	92.3% - 95.3%	462	169,441
Period	Technology	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Fibre to the premises - FTTP	102.6%	9.5%	101.6% - 103.6%	324	20,389
Busy hours	Fibre to the curb - FTTC	101.5%	5.9%	100.2% - 102.8%	82	5,016
Busy hours	Hybrid fibre-coaxial - HFC	101.6%	9.2%	100.5% - 102.7%	263	16,737
Busy hours	Fibre to the node - FTTN	92.4%	16.5%	90.9% - 93.9%	462	30,253
Period	Technology	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Fibre to the premises - FTTP	91.0%	7.9%	90.2% - 91.9%	325	92,139
All hours	Fibre to the curb - FTTC	90.9%	8.1%	89.1% - 92.6%	83	23,179
All hours	Hybrid fibre-coaxial - HFC	90.9%	9.0%	89.8% - 92.0%	263	74,841
All hours	Fibre to the node - FTTN	78.2%	22.6%	76.2% - 80.3%	462	138,058

Period	Technology	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Fibre to the premises - FTTP	90.5%	8.2%	89.7% - 91.4%	325	10,446
Busy hours	Fibre to the curb - FTTC	90.7%	8.2%	88.9% - 92.5%	82	2,505
Busy hours	Hybrid fibre-coaxial - HFC	90.5%	9.0%	89.4% - 91.6%	263	8,407
Busy hours	Fibre to the node - FTTN	78.0%	22.6%	76.0% - 80.1%	462	15,416

Technology	Average daily outages lasting longer than 30 seconds	Standard deviation	95% confidence interval of the mean	Panel size
Fibre to the premises - FTTP	0.21	0.75	0.130 - 0.29	325
Fibre to the curb - FTTC	0.50	1.94	0.079 - 0.91	83
Hybrid fibre-coaxial - HFC	0.39	0.91	0.276 - 0.50	261
Fibre to the node - FTTN	0.28	0.73	0.212 - 0.35	459

Technology	Percentage of outages lasting 30-60 sec	Percentage of outages lasting 1-3 min	Percentage of outages lasting 3-10 min	Percentage of outages lasting 10 min or more
Fibre to the curb - FTTC	43.2%	30.5%	19.2%	7.1%
Fibre to the node - FTTN	26.4%	23.3%	35.1%	15.2%
Fibre to the premises - FTTP	20.6%	30.5%	32.9%	16.0%
Hybrid fibre-coaxial - HFC	20.3%	31.9%	29.1%	18.7%

NBN state tables

This table shows statistical information on download speeds on a per-state basis. In this report, we have been able to draw upon all of the test results from a range of locations.

Period	State or Territory	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	NSW	100.0%	12.6%	98.7% - 101.3%	362	130,401
All hours	ACT	92.3%	19.1%	87.1% - 97.4%	53	18,047
All hours	VIC	101.0%	12.4%	99.7% - 102.4%	310	109,090
All hours	QLD	99.2%	13.1%	97.4% - 101.1%	192	65,249
All hours	WA	97.5%	15.4%	94.5% - 100.6%	100	36,956
All hours	TAS	101.0%	11.9%	97.7% - 104.3%	50	17,999
All hours	NT + SA	101.4%	9.8%	99.1% - 103.8%	66	24,866

NBN50 and NBN100 advertised speed tables

The figures in the following table are based on the typical evening hour speeds that were the predominant speed advertised by RSPs during the measurement period. The single weighted average speed claim is calculated based on the number of Whiteboxes online for each RSP for each plan (excluding underperforming and impaired services).

RSP	NBN50 advertised % of plan speed	NBN100 advertised % of plan speed	Number of NBN50 Whiteboxes (excluding underperforming and impaired services)	Number of NBN100 Whiteboxes (excluding underperforming and impaired services)	Weighted advertised % of plan speed
Aussie Broadband	98.0%	98.0%	49	61	98.0%
Dodo & iPrimus	100.0%	100.0%	33	20	100.0%
Exetel	100.0%	100.0%	45	23	100.0%
Optus	100.0%	100.0%	55	41	100.0%
Superloop	96.0%	95.0%	26	54	95.3%
TPG	100.0%	90.0%	54	20	97.3%
Telstra	100.0%	100.0%	76	51	100.0%
Vodafone	100.0%	90.0%	27	20	95.7%
iiNet	100.0%	90.0%	46	25	96.5%

There were 124 busy hours (Monday–Sunday) across the 31 day period from 1st March 2023 to 31st March 2023. The following table shows the proportion of busy hours in which each RSP's average speed for each plan met the advertised claims above.

RSP	% of busy hours in which advertised download speed met or exceeded	% of busy hours in which advertised download speed met or exceeded (excluding underperforming and impaired services)
Aussie Broadband	41%	98%
Dodo & iPrimus	27%	77%
Exetel	95%	98%
Optus	50%	94%
Superloop	61%	100%
TPG	52%	97%
Telstra	66%	97%
Vodafone	82%	96%
iiNet	50%	96%

NBN Whiteboxes connected to underperforming services

The following table shows the number of Whiteboxes on NBN services for each RSP, alongside the number of Whiteboxes connected to underperforming services.

RSP	NBN Whiteboxes	NBN Whiteboxes on underperforming services	% NBN Whiteboxes on underperforming services
Aussie Broadband	164	10	6%
Dodo & iPrimus	84	9	11%
Exetel	85	1	1%
Launtel	59	1	2%
Optus	115	5	4%
Other RSPs	71	6	8%
Superloop	97	5	5%
TPG	128	7	5%
Telstra	166	10	6%
Vodafone	56	3	5%
iiNet	108	7	6%
Total	1,133	64	6%

As highlighted earlier in the report, the majority of underperforming services are connected to fibre to the node infrastructure. The following table shows the number of Whiteboxes on fibre to the node services for each plan, alongside the number of underperforming services.

Technology	Plan	NBN Whiteboxes	NBN Whiteboxes on underperforming services	% NBN Whiteboxes on underperforming services
Fibre to the node - FTTN	12	7	0	0%
Fibre to the node - FTTN	25	58	2	3%
Fibre to the node - FTTN	50	292	41	14%
Fibre to the node - FTTN	100	100	16	16%
Fibre to the node - FTTN	Other NBN plans	5	0	0%
Fibre to the node - FTTN	All NBN Plans	462	59	13%

NBN very high speed services tables

The figures in the following table are based on very high speed services, where the underlying wholesale product sold by NBN Co has a download/upload speed range of 500-990/50 Mbps.

Period	Plan	Download average Mbps (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Very High Speed	788.6 Mbps	209.8 Mbps	753.7 Mbps - 823.5 Mbps	139	44,491

Period	Plan	Download average Mbps (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Very High Speed	724.8 Mbps	194.7 Mbps	692.3 Mbps - 757.3 Mbps	138	8,034

Period	Plan	Upload average Mbps (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Very High Speed	46 Mbps	1.8 Mbps	45.7 Mbps - 46.3 Mbps	139	36,344

Period	Plan	Upload average Mbps (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Very High Speed	45.8 Mbps	1.7 Mbps	45.5 Mbps - 46 Mbps	138	4,109

Plan	Average daily outages lasting longer than 30 seconds	Standard deviation	95% confidence interval of the mean	Panel size
Very High Speed	0.36	1.5	0.11 - 0.61	139

Plan	Percentage of outages lasting 30-60 sec	Percentage of outages lasting 1-3 min	Percentage of outages lasting 3-10 min	Percentage of outages lasting 10 min or more
Very High Speed	27.4%	32.2%	17.5%	22.9%

NBN fixed wireless services tables

The figures in the following table are based on both the 25/5Mbps fixed wireless plan and the Fixed Wireless Plus plan.

Period	Technology	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Fixed Wireless	109.9%	27.4%	104.0% - 115.7%	84	30,857

Period	Technology	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Fixed Wireless	86.2%	30.2%	79.8% - 92.7%	84	5,592

Period	Technology	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	Fixed Wireless	75.5%	34.0%	68.2% - 82.8%	84	25,140

Period	Technology	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	Fixed Wireless	60.5%	32.8%	53.5% - 67.6%	83	2,795

Technology	Average daily outages lasting longer than 30 seconds	Standard deviation	95% confidence interval of the mean	Panel size
Fixed Wireless	0.33	0.63	0.2 - 0.47	84

Technology	Percentage of outages lasting 30-60 sec	Percentage of outages lasting 1-3 min	Percentage of outages lasting 3-10 min	Percentage of outages lasting 10 min or more
Fixed Wireless	24.9%	24.1%	27.3%	23.6%

Other superfast access networks

The figures in the following table show results for services on other superfast access networks (all plans).

Period	Download average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	104%	15%	100% - 108%	51	18,109

Period	Download average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	102%	17%	97% - 107%	51	3,337

Period	Upload average % of plan speed (all hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
All hours	89%	5%	88% - 90%	51	14,642

Period	Upload average % of plan speed (busy hours)	Standard deviation	95% confidence interval of the mean	Panel size	Number of tests
Busy hours	89%	4%	88% - 90%	51	1,673

Technology	Average daily outages lasting longer than 30 seconds	Standard deviation	95% confidence interval of the mean	Panel size
Other superfast access networks	0.22	0.77	0.01 - 0.43	51

Technology	Percentage of outages lasting 30-60 sec	Percentage of outages lasting 1-3 min	Percentage of outages lasting 3-10 min	Percentage of outages lasting 10 min or more
Other superfast access networks	34.8%	34.8%	19.0%	11.3%

Test Definitions & Glossary

Test definitions

	Test	Definition
	Download	The speed at which data can be transferred from the SamKnows test server to your computer, measured in megabits per second (Mbps).
	Upload	The speed at which information is transferred from your computer to the SamKnows test server, measured in megabits per second (Mbps).
	Latency	How long it takes a data packet to go from your device to our test server and back to your device, measured in milliseconds (ms). The shorter the latency, the better.
	Jitter	The variation in the delay of received packets, measured in milliseconds (ms). Essentially it is a measure of the stability of latency.
	Packet loss	Packet loss counts packets that are sent over a network and don't make it to their destination, measured as a percentage of packets lost out of all packets sent.
	Webpage loading time	The time it takes for a specific webpage to fully load. This is a combination test that includes download, latency and DNS in one test that accurately mimics real-world usage.
	Outages	The outages metric tracks how many times per day your broadband connection goes offline for at least 30 seconds. Outages between 12am and 5am are excluded from this metric as this is when network maintenance typically occurs.
	Video streaming	Measures the highest bitrate (in Mbps), and therefore quality level, you can reliably stream from real content servers.

Glossary

Term	Definition
Advertised speed	The speed claim made by an RSP for a given plan during a Measuring Broadband Australia reporting period. May be the same as or lower than plan speed.
All hours	Refers to tests conducted at any time of the day.
Busiest hour	Fifth lowest hourly average speed out of all busy hours in the month (including weekends cf. 'busy hours').
Busy hours	Refers to tests conducted between 19:00:00 and 22:59:59, Monday to Friday. For calculating the busiest hour and for determining the % of busy hours where the speed claim was attained, "busy hours" include 19:00:00 and 22:59:59, Monday to Sunday
Customer-premises equipment (CPE)	Network equipment provided by an RSP (generally including a home router/gateway).
Download performance	Measured download speed expressed as a percentage of plan speed. e.g. for an NBN50 service, 100% download performance would be 50 Mbps. Prior to overprovisioning this was capped at 100%. Since NBN has begun overprovisioning services, results above 100% are common.
FTTN / Fibre to the node	Measuring Broadband Australia treats the FTTN / Fibre to the Node and FTTB / Fibre to the Building access technologies as identical for reporting.
Fixed-Line	For reporting, fixed-line encompasses the FTTP (Fibre to the Premises), FTTB (Fibre to the Building), HFC (Hybrid Fibre-Coaxial), FTTC (Fibre to the Curb), and FTTN (Fibre to the Node) access technologies.
Impaired service	FTTN / Fibre to the Node services where the maximum attainable line speed measured by NBN Co is below plan speed.
NBN service	A proxy for a single household which accesses the internet through the NBN.
Plan and plan speed	Plan refers to the retail broadband product. Each plan has an associated download and upload speed. For example, a 100/20 Mbps plan includes a 100 Mbps download plan speed and a 20 Mbps upload plan speed. The term "NBN100" refers to a download plan speed of 100 Mbps, but the upload plan speed may vary.
SamKnows	The independent testing provider appointed to conduct testing for Measuring Broadband Australia. https://samknows.com/
Testing infrastructure	SamKnows-maintained test servers hosted within Australia.
Underperforming service	Services which reach above 75% of plan speed in no more than 5% of download tests. These are services which rarely or never attain plan speed.
Very high speed service	Services where the underlying wholesale product sold by NBN Co has a download/upload speed range of 500-990/50 Mbps (referred to by NBN Co as 'Home Ultrafast').
Whitebox	A purpose-built hardware measurement agent manufactured by SamKnows, installed in volunteers' homes.