

Broadband QoSE: Measurability, Comparability & Practicality

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Hardware offers accuracy, but may be expensive



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Select language

Measure your broadband accurately

Together, the European Commission and SamKnows aim to provide Europe with reliable and accurate statistics of broadband performance across Europe.

Volunteers will receive a purpose-built broadband measurement unit which can be plugged into the existing modem/router. This is called the SamKnows Whitebox.

If you are interested in helping us by hosting a SamKnows Whitebox, and playing a part in changing the face of the European broadband industry, then please sign up below!

It's worth taking the time to read through the requirements before proceeding.

Please note that not everyone who registers here will necessarily receive a SamKnows Whitebox - we do however thank all of you for helping to make European broadband better.



- Equipment directly connects to the line between the router and the PC → Accurate
- Expensive
- SamKnows is being used by the FCC (US), Ofcom (UK), IDA (Singapore), European Commission etc.

Software may be more cost effective

The image shows a web-based speed test interface. At the top, there's a navigation bar with 'Test', 'Results', 'Configuration', 'Schedule', 'FAQ', and 'About'. Below this, there are several configuration sections:

- Select Service Provider:** Includes a dropdown for 'Service Provider', a 'Request for your service provider to be added to the list' button, and a 'Select Your Package' dropdown.
- DOMAINS:** Includes checkboxes for 'ISP', 'National', and 'International'. A note states: 'To get the most accurate results, please close all other browsers and stop other processes that may slow down your connection'.
- METRICS:** A section with a note '* At least one metric must be selected' and checkboxes for 'Download', 'Latency', 'Packet Loss', 'Upload', 'Jitter', and 'Network Availability'.
- PROGRESS OF THE TEST:** Includes input fields for 'Sub Process' and 'Main Process'.

On the right side, there's a header for the 'Telecommunications Regulatory Commission of Sri Lanka' (TRCSL) with a navigation menu: 'HOME', 'ABOUT US', 'SERVICES', 'PRESS ROOM', 'INFORMATION', 'BROADBAND', 'CONTACT US'. Below the header is a world map with markers for 'USA' and 'GERMANY'. A 'BROADBAND DOWNLOAD SPEED TEST' overlay is visible, featuring a file size selection dropdown (1 MB, 10 MB, 35 MB, 100 MB), a 'Please wait.....' message, a progress bar, and a 'TEST SPEED' button.

- Levels of accuracy can vary
- Cost effective
- E.g: TRCSL (Sri Lanka | Implemented), ICTA (Mauritius), BICMA (Bhutan | Ongoing), CAM (Maldives | Ongoing), PIRRC (Fiji | Ongoing), LIRNEasia - since 2008

Parameters affect the user experience in different ways

Service	Download (kbps)	Upload (kbps)	Latency (Round Trip Time, RTT) (ms)	Jitter (ms)	Packet Loss (%)
Browsing (Text)	++	-	++	-	-
Browsing (Media)	+++	-	++	+	+
Downloading	+++	-	-	-	-
Transactions	-	-	++	+	-
Streaming media	+++	-	++	++	++
VOIP	+	+	+++	+++	+++
Games	+	+	+++	++	++

+++ Highly relevant; ++ Very relevant; + Relevant; - Irrelevant

- **RTT** has implications on client-server interactive systems
- **Jitter** adds to the 'noise' of the transmission
- **Packet Loss** affects streaming media

NRAs are best positioned to conduct diagnostics

Diagnostics conducted by	Pros	Cons
Service Providers	<ul style="list-style-type: none"> • Easy to implement 	<ul style="list-style-type: none"> • Results based on equipment placed in the most optimised points of the network • Not representative of the 'actual' speeds
Users	<ul style="list-style-type: none"> • Represents actual user experiences 	<ul style="list-style-type: none"> • Assumes user's PC is virus-free, with no parallel process running etc. • Dependant on user's willingness to participate • Large files impact user's data limits
National Regulatory Authorities (NRAs)	<ul style="list-style-type: none"> • In a position to request operator involvement when necessary 	<ul style="list-style-type: none"> • Known test locations will prompt operators to optimise networks in selected areas

Various attributes impact measurement; Trade-offs involved in any practical solution

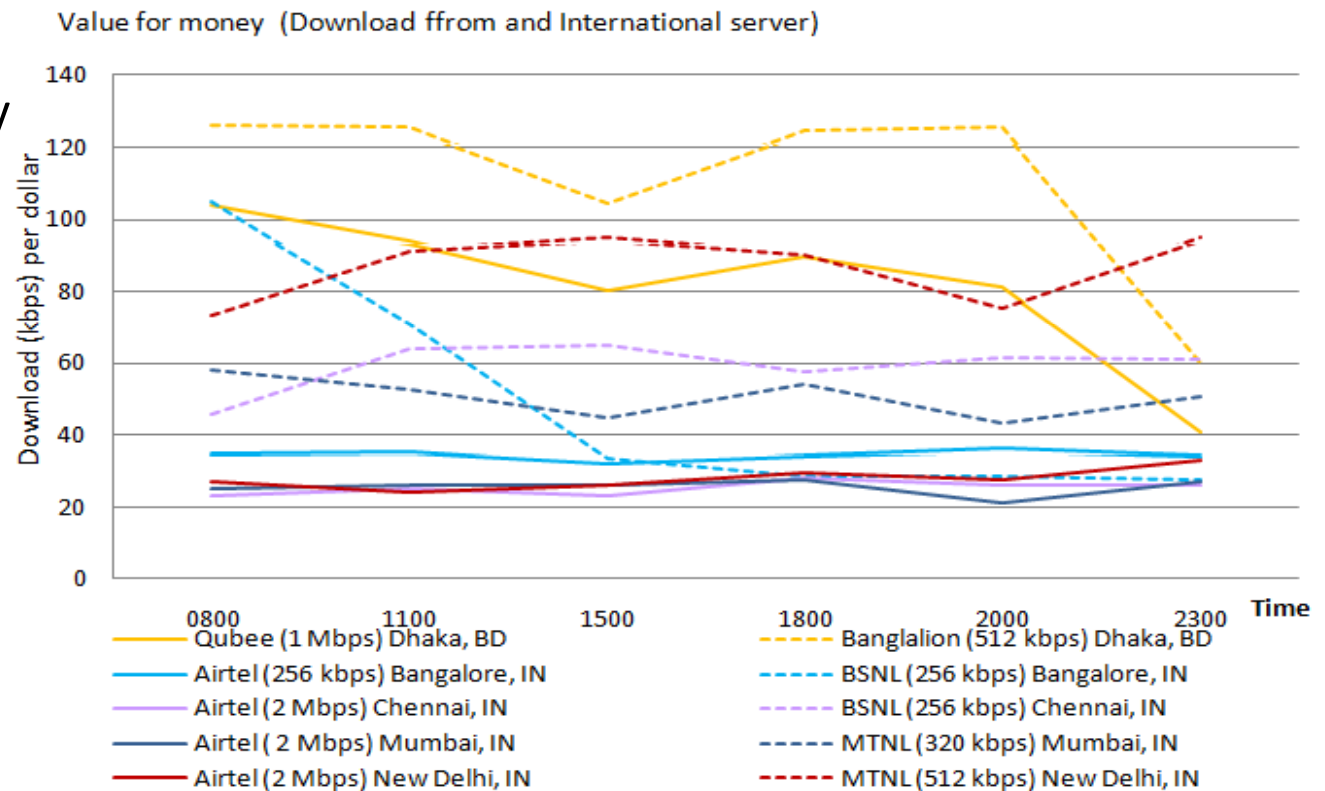
Attributes	Ideal case	Minimum requirement
Location	Statistically representative	Random locations
Service provider	All	Largest service provider
Broadband Plan	All	Select plans based on advertised speeds. For example: <ul style="list-style-type: none"> • Up to 1 Mbps • 2 Mbps – 4 Mbps • 5 Mbps – 10 Mbps • Above 10 Mbps
File size	<p>Accurate results are obtained by using a large file that <u>maximises use of the channel capacity</u>.</p> <p><u>Example</u> of file sizes:</p> <ul style="list-style-type: none"> • 10 MB for connections up to 10 Mbps • 35 MB for connections above 10 Mbps 	
Domains	Local, National and International	International
Test times	Multiple times of the day, multiple days of the week (including weekends) to account for off peak / peak variations	

Trade-offs also exist in Aggregating and Reporting

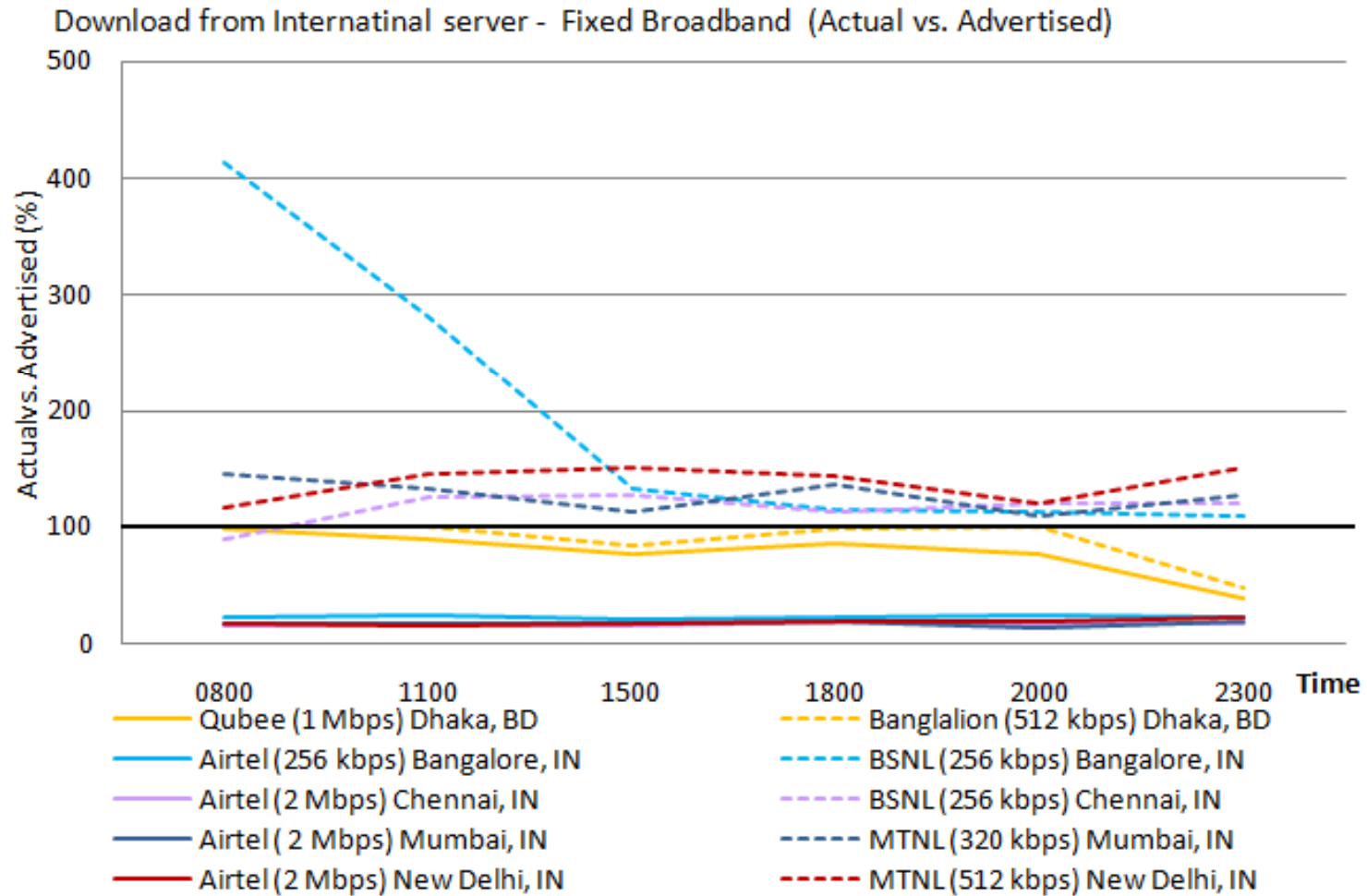
- Aggregating from a rich data set will provide consumers with the ability to make informed decisions
 - Measure as many locations / times
 - If granular level data is reported, allow the consumer of the data to determine level of aggregation
- For international comparison, one aggregated number per country is good
 - But less accurate and will distort true scenario (results from urban and rural settings)
 - Not helpful for users
- City-level (or urban agglomeration level) provides for more realistic comparisons
 - Likely to be most helpful to users

Example of reporting format used by LIRNEasia since 2008 to report QoSE in South & South East Asia

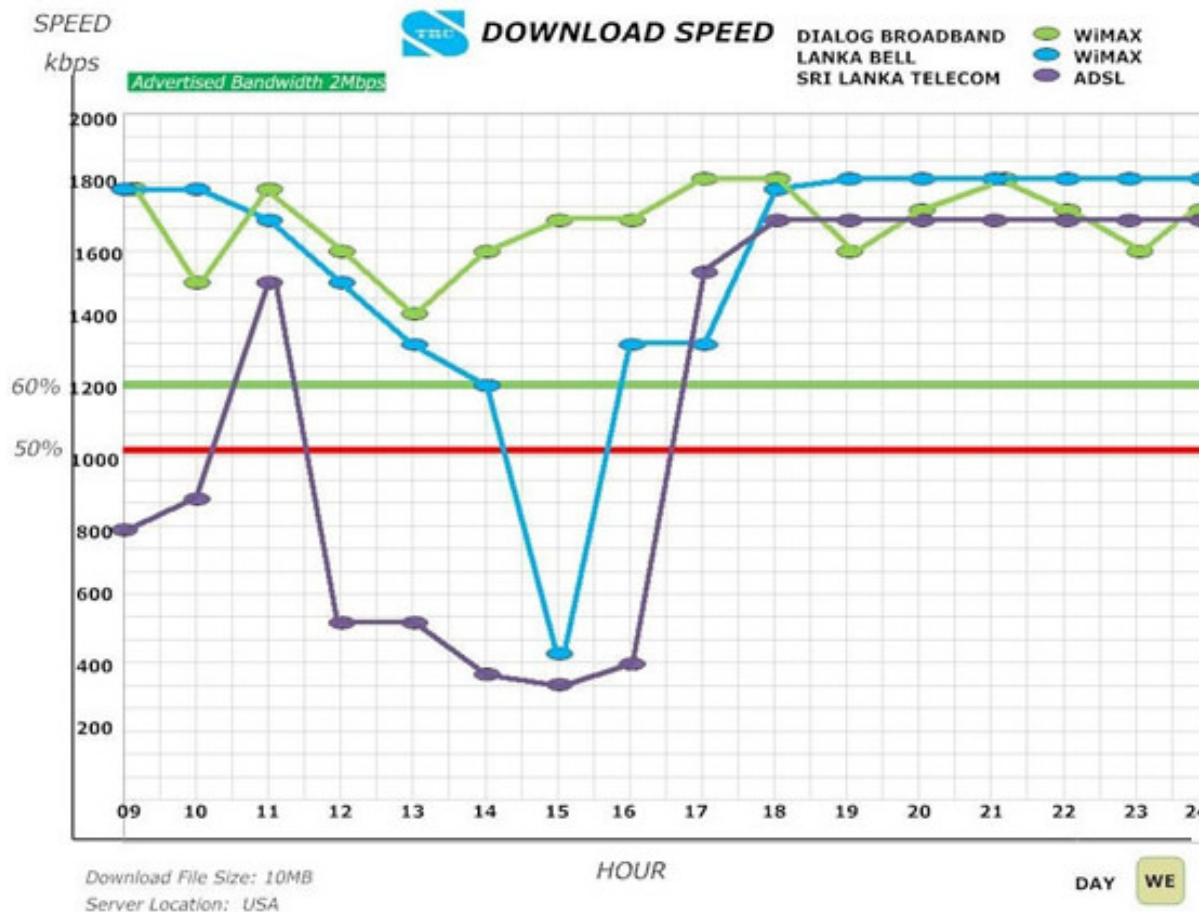
- City-level averages across times of the day and days of the week for each broadband plan reported
- Value for money reported, not pure download speed for upload (because packages are not comparable)



We also report actual vs. advertised speeds



QoSE implementation by Telecommunication Regulatory Commission of Sri Lanka



- On-line, installation-free
- Measures end-to-end Internet download speeds from servers in Germany and the USA
- Random locations in Colombo
- Laptop is left at test locations for 24 hours
- Download speeds from a local server and Latency are measured but not publicly shared

Ongoing implementation by ICTA Mauritius

A T Tester Desktop

Test Past Results Schedule FAQ About

09/18/2012 09/18/2012

11:25 AM 11:45 AM 11:55 AM 0:00 AM 0:00 PM 0:00 PM

Metrics

- Download
- Upload
- Latency
- Jitter
- Packet Loss
- Network Availability

Domains

- ISP
- National
- International

SLT Web Pro

Run test in every hour

ranmalee@lirneasia.net

Email address is required if you want to retrieve your test results at a later date

Save the schedule

September 2012

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

ISP Name : SLT
Package Name : Web Pro

11:21:32 AM
Tuesday, September 18, 2012
Automated Schedule is online

Selected Metrics
Download Speed
Upload Speed
Latency
Jitter
Packet Loss
Network Availability

Selected Domains
ISP
National
International

Selected Times
11:25:00 AM
11:45:00 AM
11:55:00 AM

Remove Automation

- Using LIRNEasia software
- Software includes both a web version and downloadable version
- ICTA to:
 - organise a workshop to inform the public about their initiative
 - Phase 1: Operators to report QoSE results
 - Phase 2: Request for public QoSE results
- On selecting test locations: Various options are being considered, including statistically representative samples

Key Takeaways

- The software approach is more cost effective
- Download speed shouldn't be the only focus of testing a user's experience
- Diagnostics are best conducted by NRAs
- The indicator should be measured with a consumer focus
- While the ideal scenario will be to have an aggregated value representing a country's level of broadband QoSE, what is useful to the consumer is data at city / major urban agglomeration level

Thank You

Further information:
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