

Innovation in Regulation: Broadband Quality monitoring

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Agenda

1. Broadband Quality of Service Experience (QoSE)
2. QoSE Monitoring approaches
3. LIRNEasia's Broadband QoSE research
4. Policy Interventions
5. What next?

This work was carried out with the aid of a grant from the International Development Research Centre, Canada and the Department for International Development, UK.



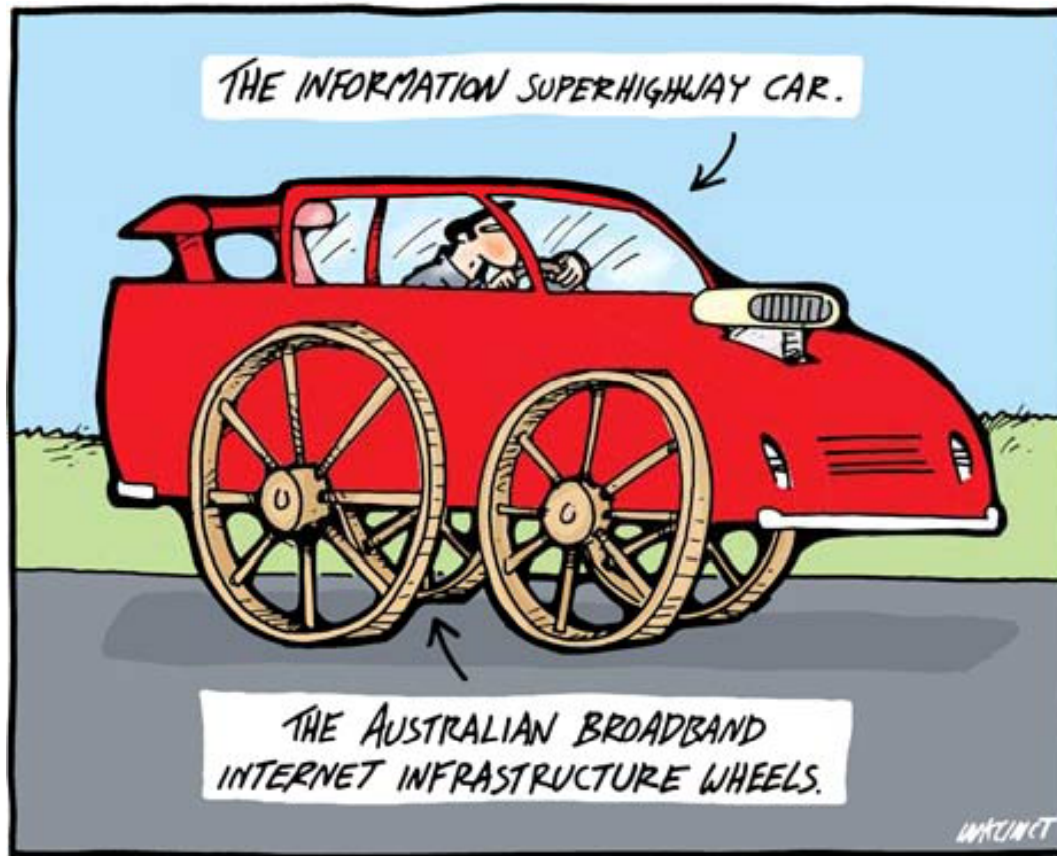
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Broadband Quality : An evasive goal?



QoSE is like World Peace

- It is a worthy goal
- It is difficult to achieve
- And progress is made in small steps

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Last Updated: Thursday, 2 August 2007, 02:04 GMT 03:04 UK

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Britain 'failing' net speed tests

There is a huge gap between advertised broadband speeds and the actual speeds users can achieve, research has shown.

A survey by consumer group Which? found that broadband packages promising speeds of up to 8Mbps (megabits per second) actually achieved far less.

Tests of 300 customers' net co average download speed they v

Which? has called on regulator to launch a fresh investigation

Misleading ad

The speed tests were promoted of the public, unhappy with connections.

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Canada's broadband networks not ready for future: report

Last Updated: Monday, September 15, 2008 | 3:41 PM ET Comments 79 Recommend 80

By Peter Nowak, CBC News

Not just in developing countries!



Canada has slipped from its early broadband leadership position to barely ranking in the OECD's Top 10. (Associated Press)

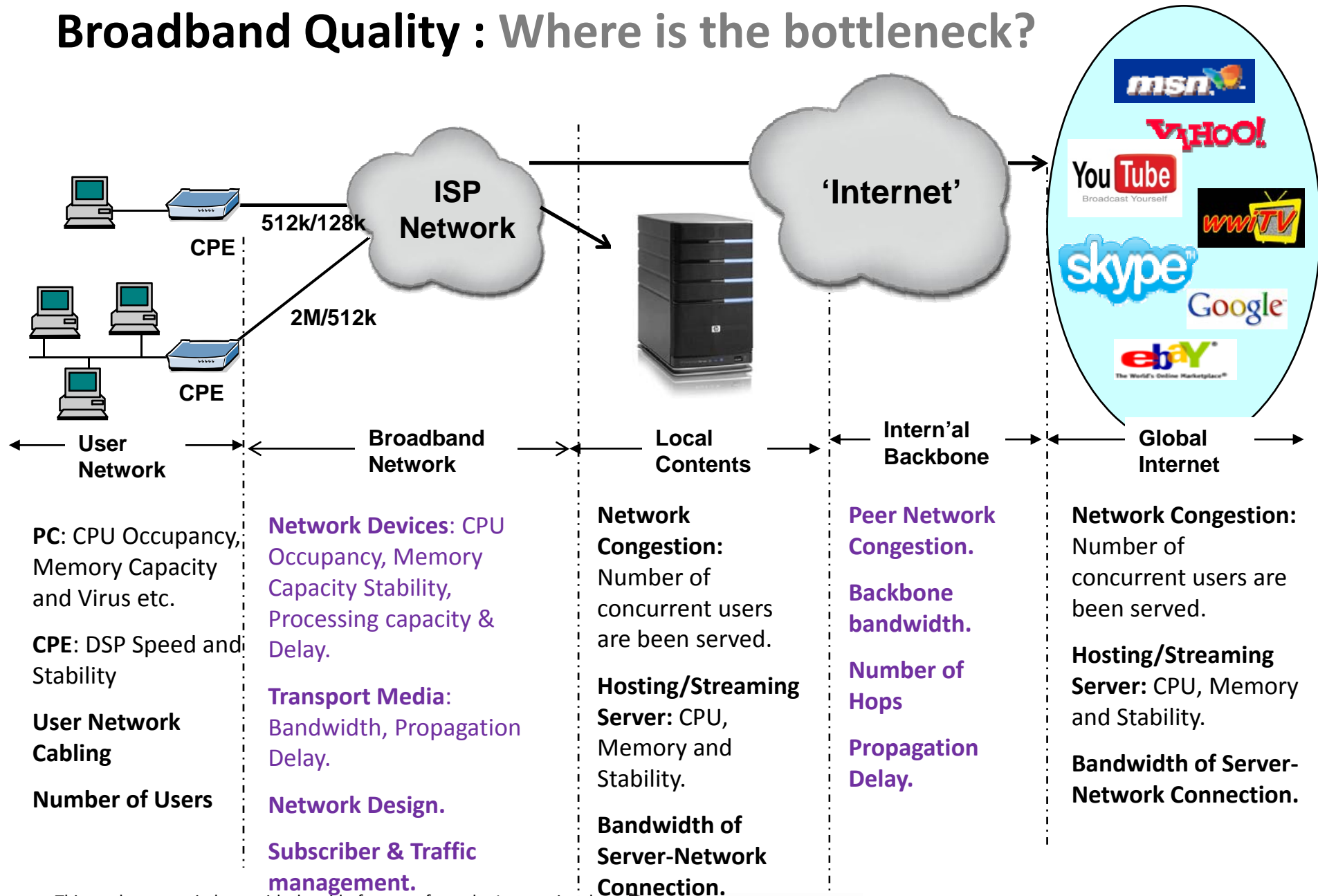
Canada is woefully positioned for future internet usage and the quality of current broadband networks is barely enough to cope with current traffic because of a lack of investment by providers, according to a new study.

The survey, conducted by the Oxford Said Business School in London and the Universidad de Oviedo in Spain and released Friday, found that Canada is below the global broadband quality threshold, which measures the proliferation of high-speed internet in a country, as well as the speeds available and the reliability of connections.

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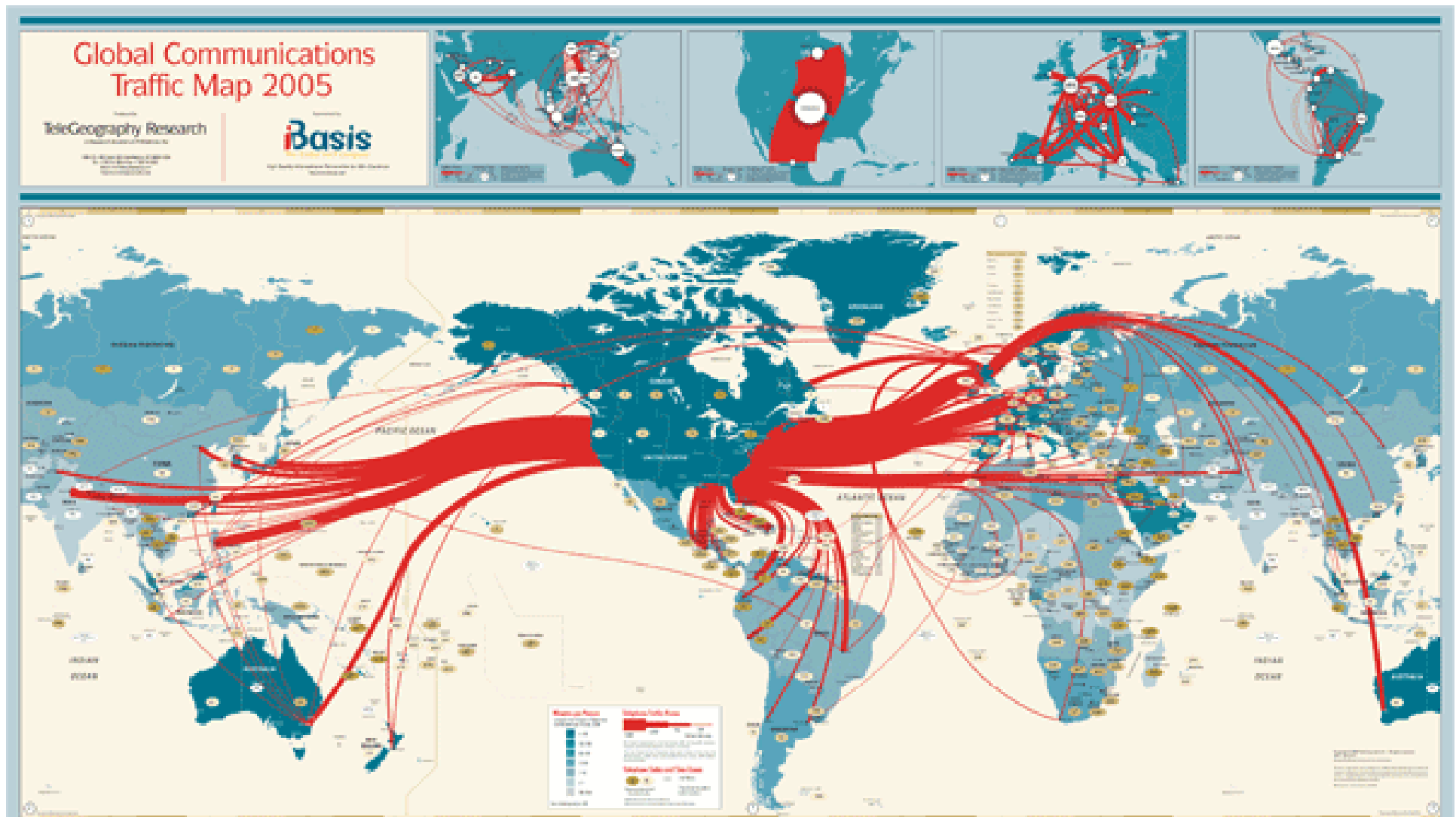


Broadband Quality : Where is the bottleneck?



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International bandwidth



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Approaches of monitoring QoSE

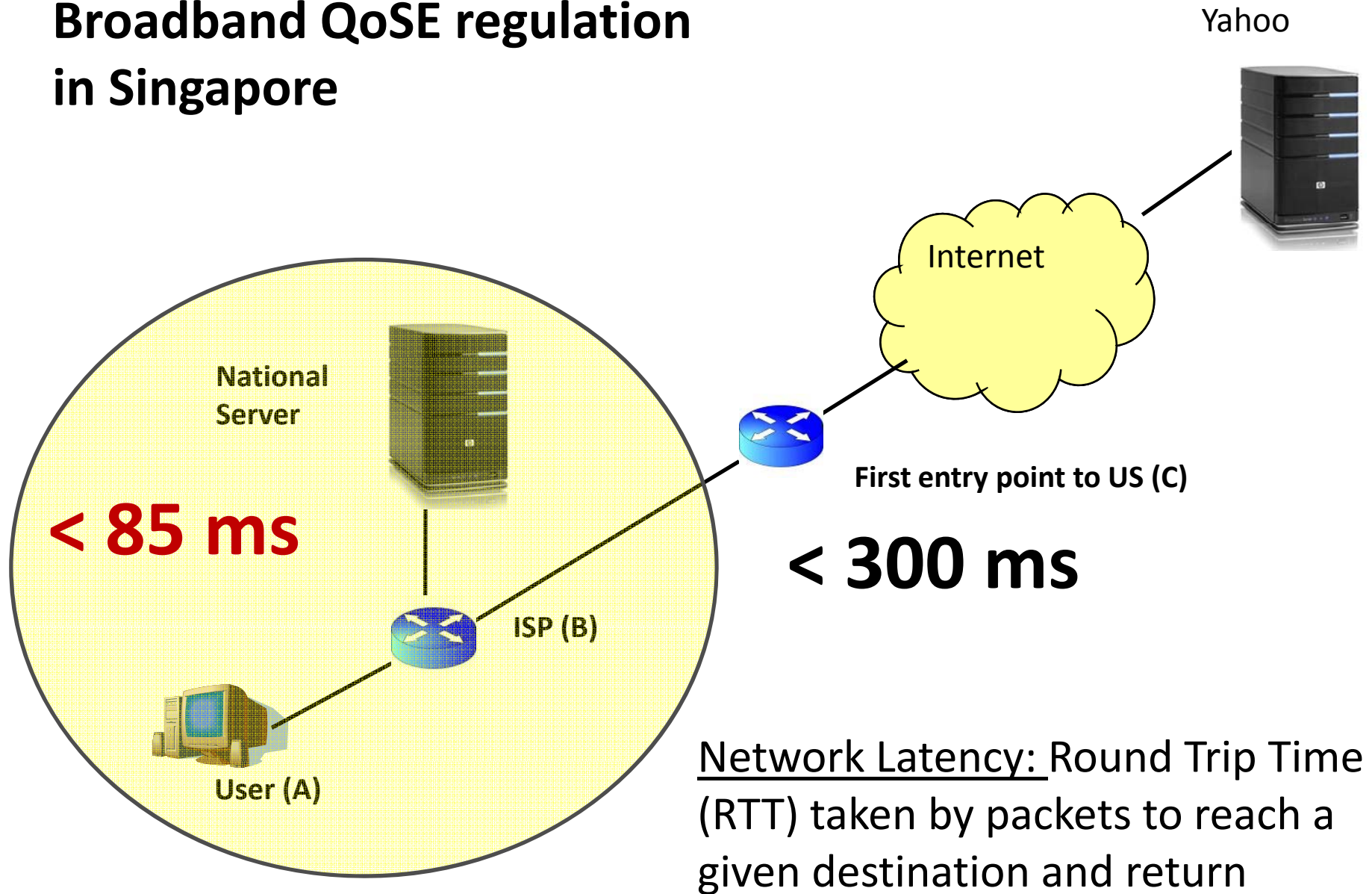
	Voluntary mechanisms	User satisfaction surveys	Monitoring by regulators	User testing
Intrusiveness on network	-	-	+++	+
Regulator participation	++	Depends on surveyor	+++	-
Operator participation	+++	Depends on surveyor	+++	-
User participation	-	+++	+	+++
Subjectivity of results	N/A	+++	+	+

+++ High ++ Medium + low - none

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Broadband QoSE regulation in Singapore



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Regulation in India and Singapore

Parameter	Singapore 	India 
Network Availability	> 99%	> 98%
Latency (Local)	< 85ms	< 120 ms
Latency (Intl)	< 300ms	< 350 ms (ter) < 800 ms (sat)
Bandwidth Utilisation	90% during peak time	< 80% during peak time
Broadband Connection Speed (download)	Not Specified	> 80% of specified from user to ISP
Service Activation	Not Specified	100% in 15 working days
Customer Support	Not Specified	60% calls in 60 sec 80% calls in 90 sec

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User Testing

- Requires a software
- A few already exist (speedtest.net, speedtest.com)

Measures metrics:

- Throughput:
an amount of user information transferred in a period of time
- Latency or Round Trip Time (RTT):
taken by packets to reach a given destination and return

LIRNEasia's QoSE work: AT-Tester and Methodology

- Developed at Indian Institute of Technology Madras (IIT-M), India.
- Measures additional metrics such as
 - Jitter: Short-term non-cumulative variations of the significant instants of a digital signal from their ideal positions in time
 - Packet loss: The packets that does not reach the destination to the ratio the sent
 - Availability: Is network up?

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Metrics

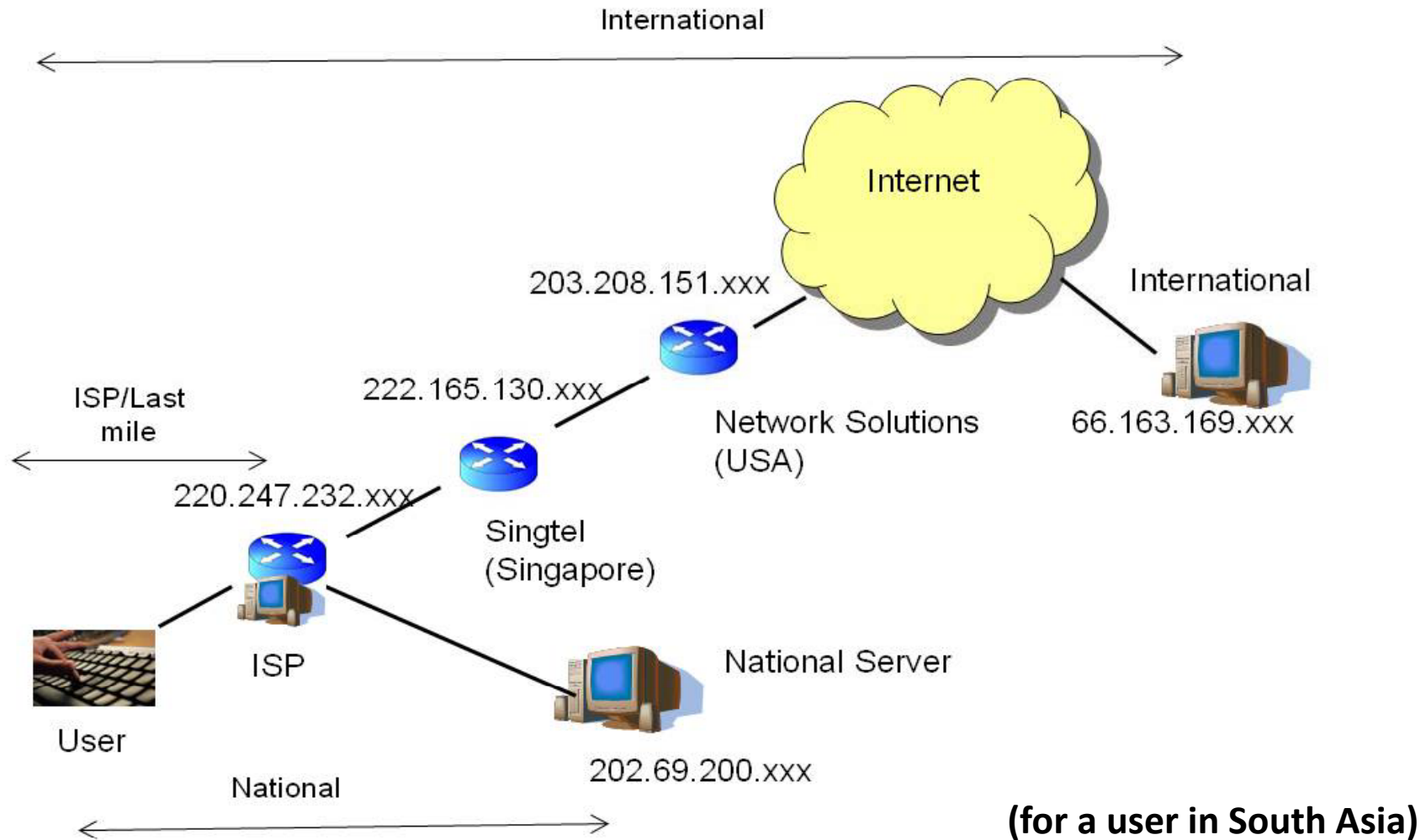
Service	Throughput		Delay		Loss
	Down	Up	RTT	Jitter	
Browse (text)	++	-	+	-	-
Browse (media)	+++	-	+	+	+
Download file	+++	-	-	-	-
Upload File	-	+++	-	-	-
Transactions	+	+	++	+	+
Streaming media	+++	-	+	++	++
VOIP	+	+	+++	+++	+++
Games	++	+	+++	++	++

+++ Highly Relevant ++ very relevant + relevant - not relevant

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LIRNEasia's QoSE work: The three test domains...



(for a user in South Asia)

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LIRNEasia's QoSE work: Methodology contd...

- The time and day is recorded and reported to check for Peak/Off peak variations
- Distinction between business and residential connections
- Location is recorded to measure regional variations
- The metrics are measured in three domains; ISP, National, International

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LIRNEasia's QoSE work: www.broadbandasia.info



Do you get quality Broadband?



Funded by



Home ISP Summary Report **ISP Detailed Report** Download

ISP Detailed Report

Country: Region:

ISP Name: Download speed:

Type of Test:

Total number of test(s) executed: 39

Week End(Sat-Sun)

Time of Day	Download Speed (kbps)	Upload Speed (kbps)	RTT (ms)	Jitter (ms)	Availability (%)	Packet Loss (%)
8:00 AM	397.53	52.16	289.5	4.1	100	0
11:00 AM	247.77	105.44	302	4.25	100	0
3:00 PM	210.52	100.05	311.5	3	100	0
6:00 PM	276.09	104.65	304	9	100	0
8:00 PM	338.36	106.12	63	2	100	0
11:00 PM	317.25	35.11	373.33	8.9	100	0

Week Day(Mon-Fri)

Time of Day	Download Speed (kbps)	Upload Speed (kbps)	RTT (ms)	Jitter (ms)	Availability (%)	Packet Loss (%)
8:00 AM	271.08	108.19	296.25	1.35	100	0

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LIRNEasia's QoSE work: User awareness



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Policy Interventions: Annual event at Institution of Engineers, Sri Lanka



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Bangladesh: Response to the paper on 'BROADBAND WIRELESS ACCESS SERVICES'

- Operators should guarantee QoSE for not within ISP only, but till first entry point to US ✓
- Operators should publish contention ratios ✓
- Assurance at launch is inadequate; QoSE should be regularly monitored ✓
- “Broadband = 128 kbps +” definition should change

India: Response to the paper on 'ISP BANDWIDTH REQUIREMENTS'

- Suggested contention ratios 1:20 (business) and 1: 50 (residential) – Adopted 1:30 and 1:50 ✓
- Information on contention ratios should be made public ✓
- Broadband QoSE is not just speed; need a holistic view
- Operator obligation should be till first entry point to US

What Next?

Broadband QoSE in rural areas



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What Next?

Innovation: Mobile Broadband QoSE



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Thank You!

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