

Broadband Quality of Service Experience (QoSE) Case Study

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Singapore

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IDRC
International Development
Research Centre



CRDI
Centre de recherches pour le
développement international

DFID Department for
International
Development

A simple team exercise to get you into the practice of thinking about communicating for policy influence

Why Broadband QoSE?

- **The need for connectivity and growth in usage**
 - ~ 251 Million Internet subscribers in Asia Pacific of this ~**128 Million Broadband subscribers**– ITU 2007
- **Lack of Quality**
 - Complaints by users
 - Broadband Quality of Service Standards undefined by many regulators
- **Importance of Quality**
 - Applications and platforms may require higher quality in connectivity for better performance

Ways to improve BB QoSE

- Convince regulator to measure QoSE and regulate it
- Measure it ourselves, show evidence to regulator, get it regulated (improved)
- Measure it ourselves, educate users to pick highest performing BB provider
 - As long as there's sufficient competition and switching costs are low, this can work
- Convince user community to measure it, WITH us. Publicize the results. Get users to pick/switch to highest performer

Methods of measuring BB QoSE

Existing methods - speednet

- Emphasis on limited metrics – throughput (upload and download speed)

New Method and new software

- Methodology and software (AT-Tester) developed with the Indian Institute of Technology, Madras
- Other than throughput it takes into account additional metrics
 - E.g. Round Trip Time (RTT), Jitter and Packet Loss
- Software available (freely) at www.broadbandasia.info for anyone to download and use

Metrics explained

- **Round Trip Time :**

Time taken for a packet to reach a destination and return

- **Jitter :**

Average Variation of RTT

- **Packet Loss :**

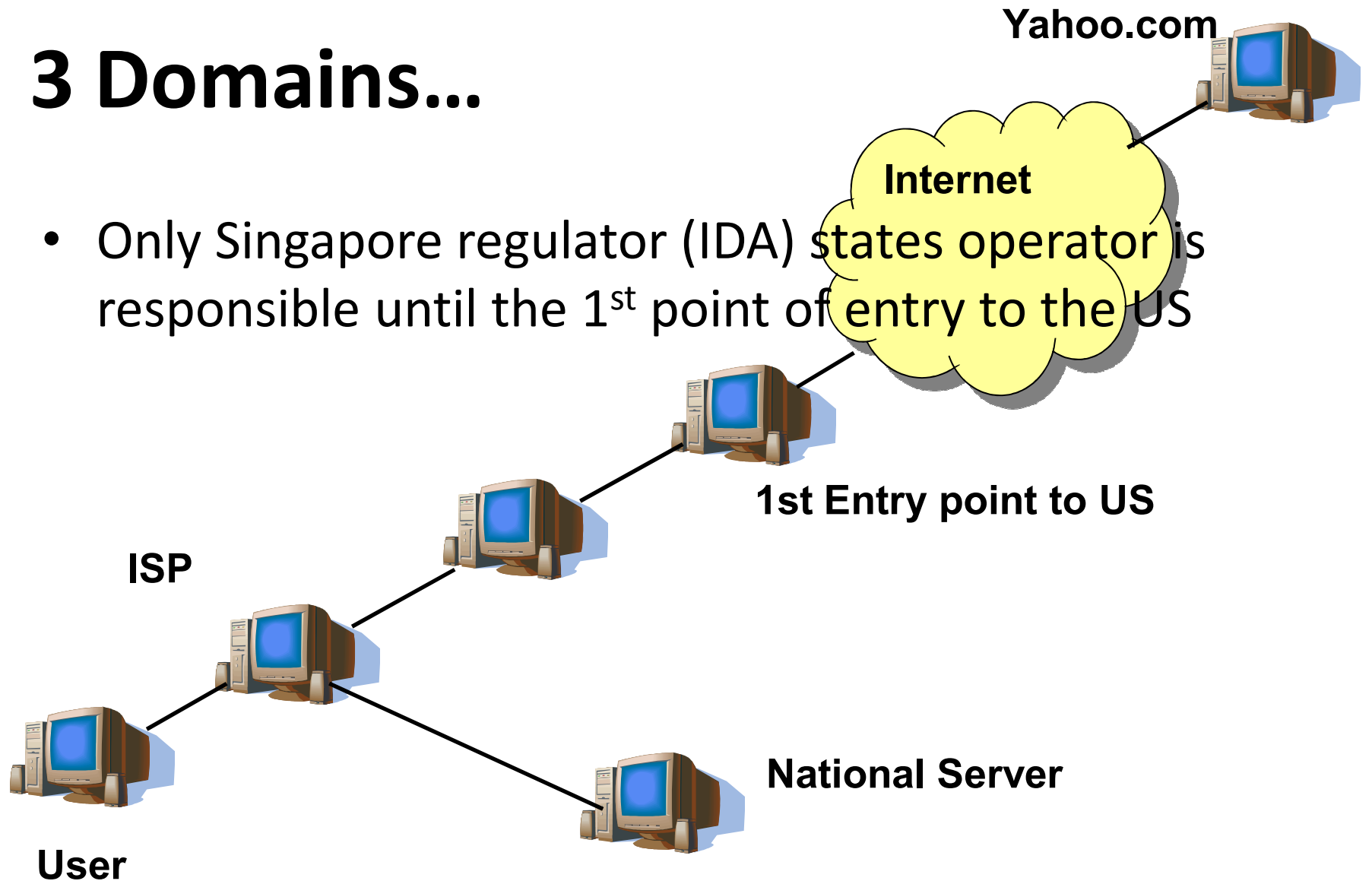
Number of packets (in %) which do not reach the destination

Relative importance of metrics

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

3 Domains...

- Only Singapore regulator (IDA) states operator is responsible until the 1st point of entry to the US



Testing BBQoSE

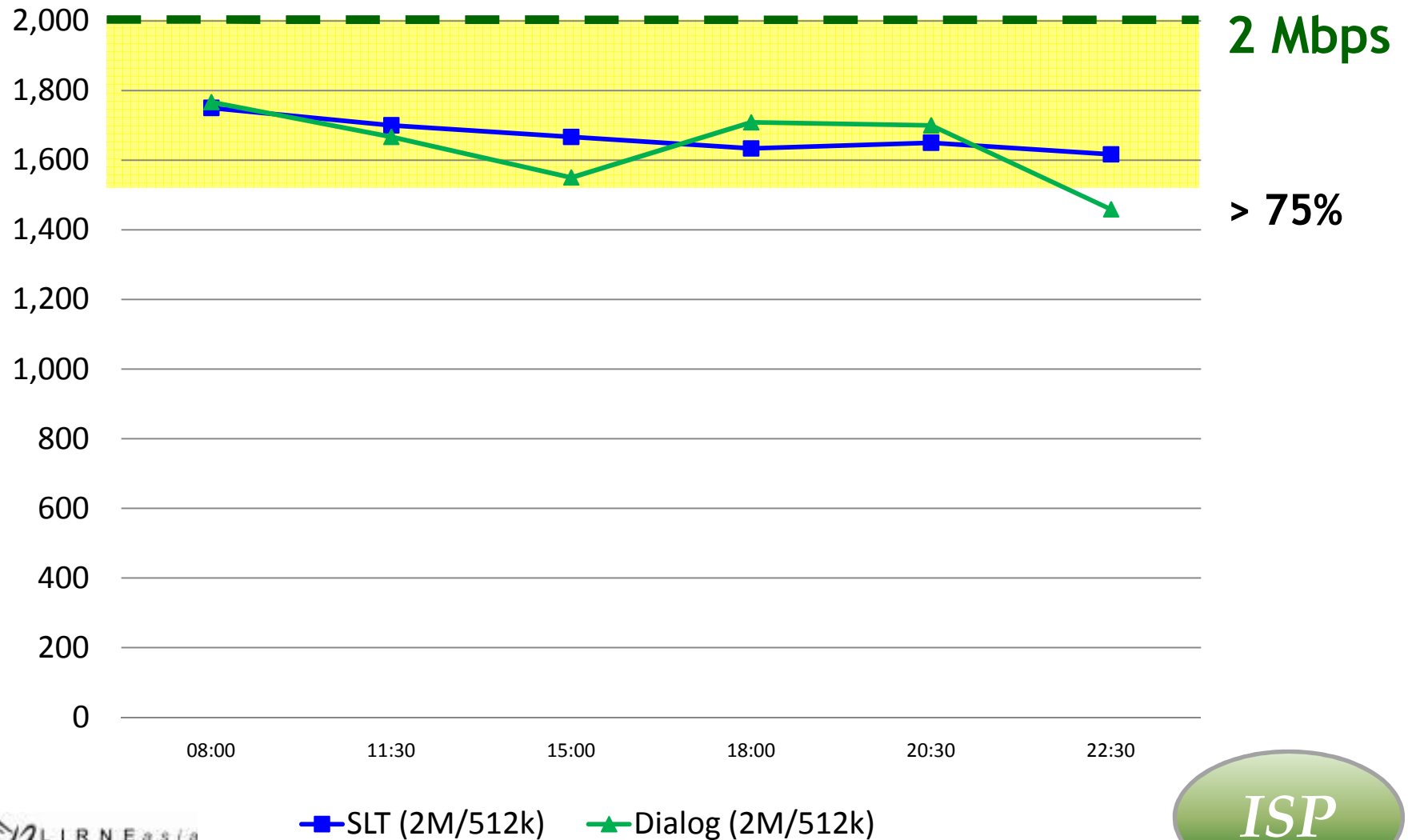
- Testing conducted using AT-Tester Software
- Testing in multiple domains
 - ISP, National and International (yahoo.com)
- Multiple broadband packages or links
 - 256kbps – 2Mbps
- Multiple times a day
 - 6 times a day; ranging from peak to off peak
- Multiple Locations (cities) in Sri Lanka, India, Bangladesh (and just once in US & Canada)

Results uploaded (automatically) to website

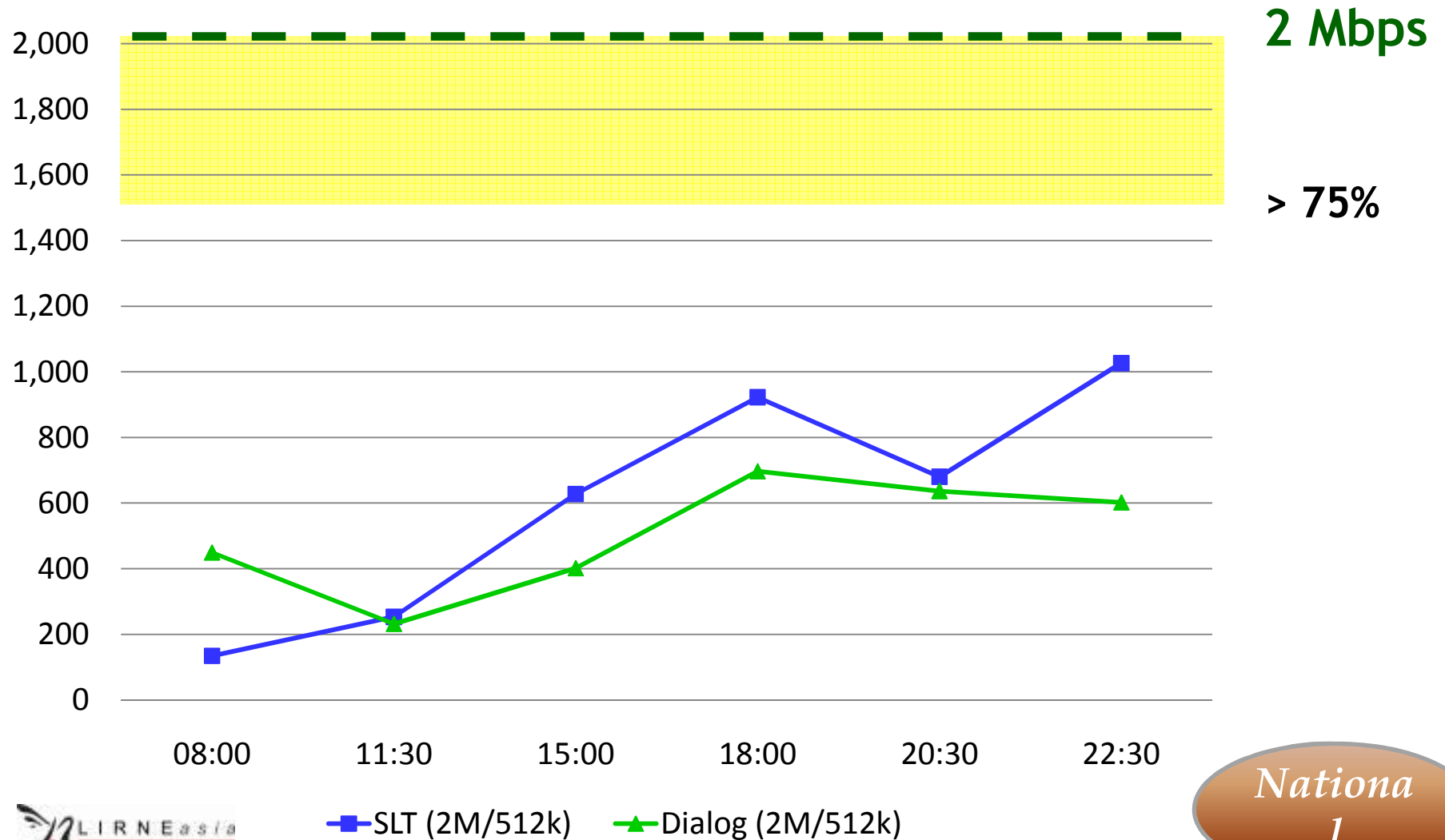
- Each reading uploaded to www.broadbandasia.info where calculations are done and results displayed
- Viewable by all (by country, by operator, by city)
 - Developed with the Indian Institute of Technology, Madras

Some Results

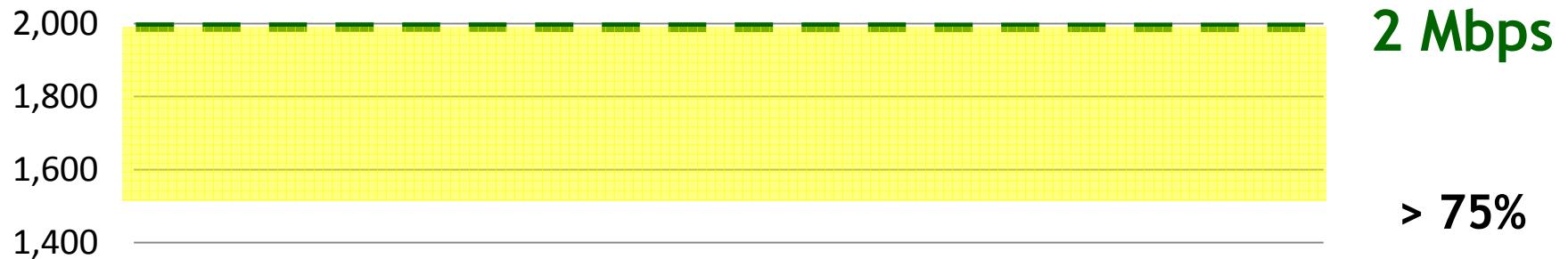
Download speed (Colombo Business Packages): Relatively healthy in ISP domain...



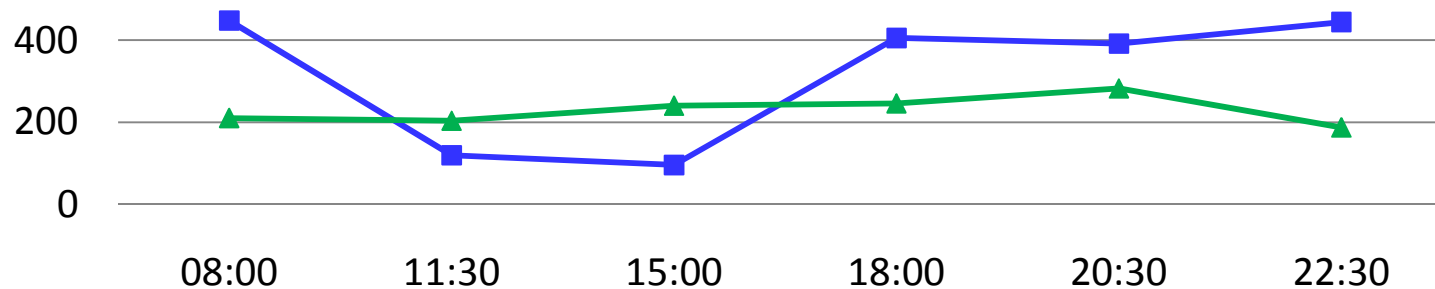
Download speed (Colombo Business Packages): ...poor in national domain



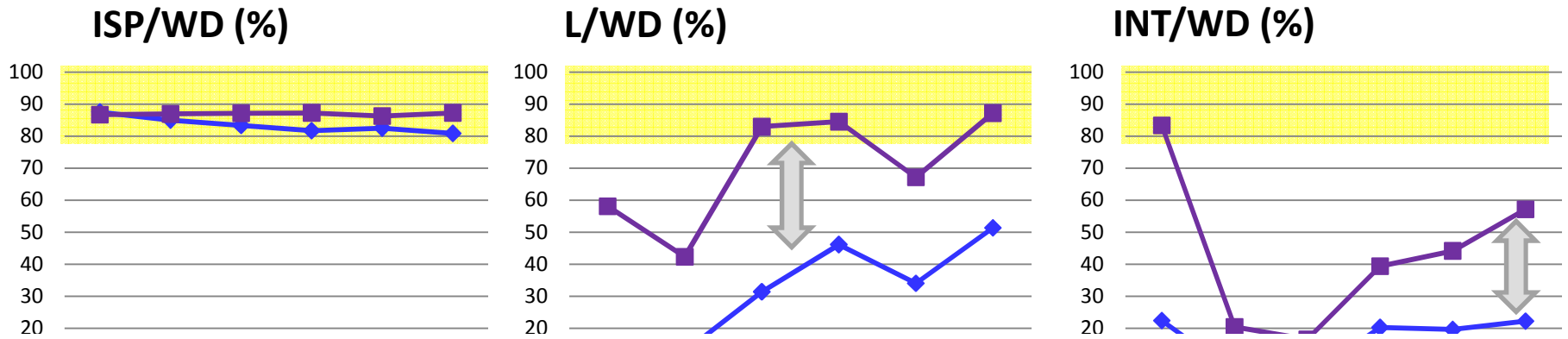
Download speed (Colombo Business Packages): ...even poorer when accessing International sites



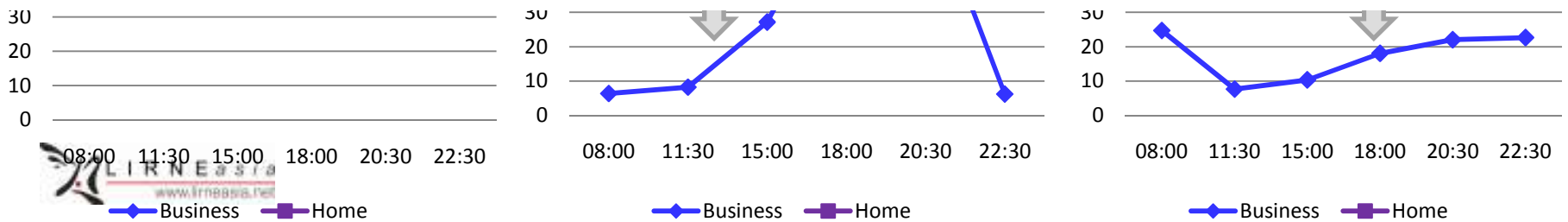
Message 1: For countries with little local content, availability of sufficient international bandwidth by each operator is key, as are local mirroring and other strategies to minimize use of international bandwidth



Download speed (SLT Business vs. SLT Home packages): ...in % terms, home is better than business

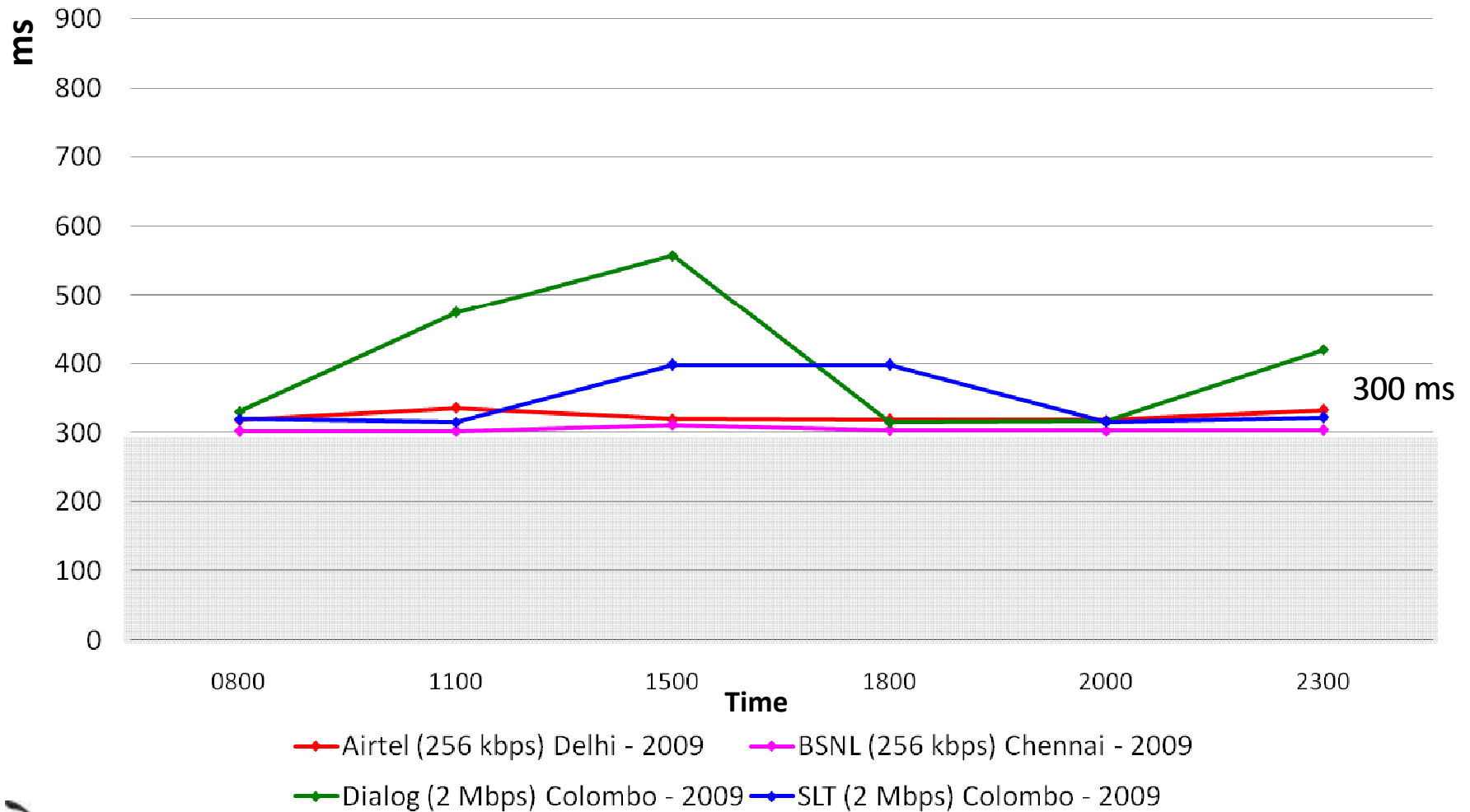


Message 2: Lower cost “Home” packages with lower advertised bandwidth may deliver better throughput than more expensive “Business” packages that have high advertised bandwidth. Consumers should look beyond labels



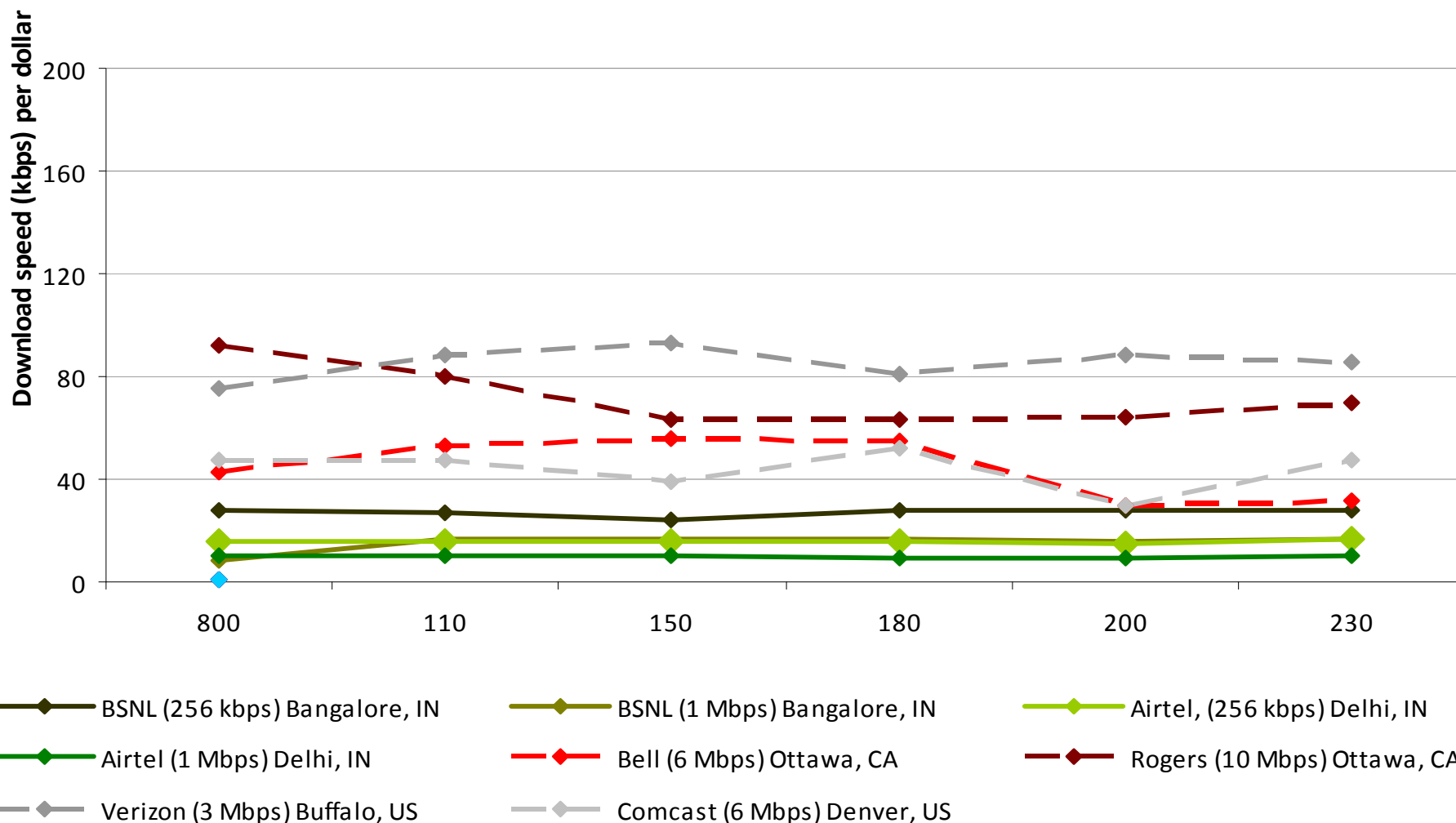
Return Trip Time from Delhi, Chennai and Colombo to yahoo.com

Yet to meet Singapore (IDA) standard

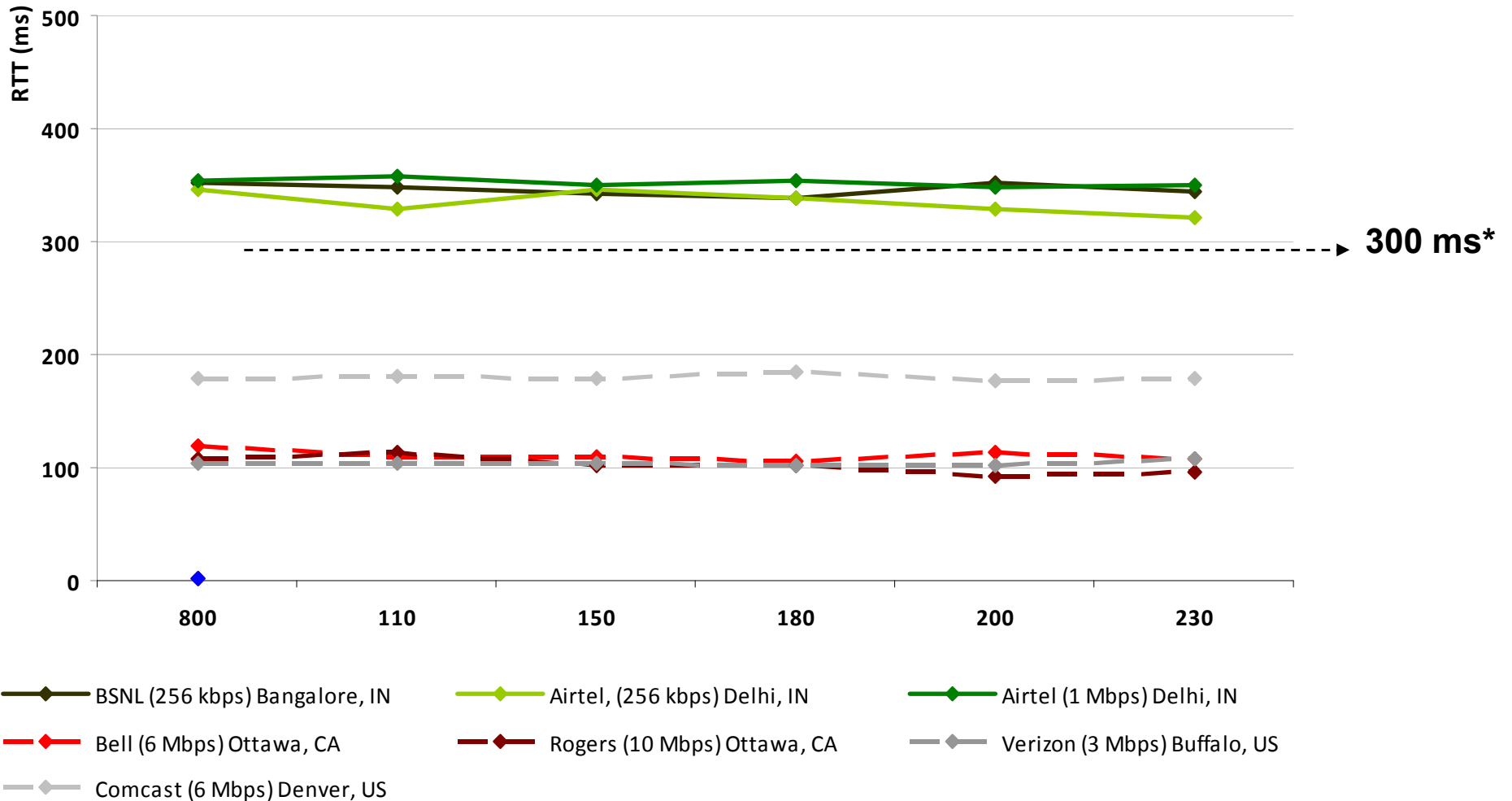


Users in North America get more value for money

Value for Money - Reaching International servers



International Bandwidth issues as reflected in high RTT

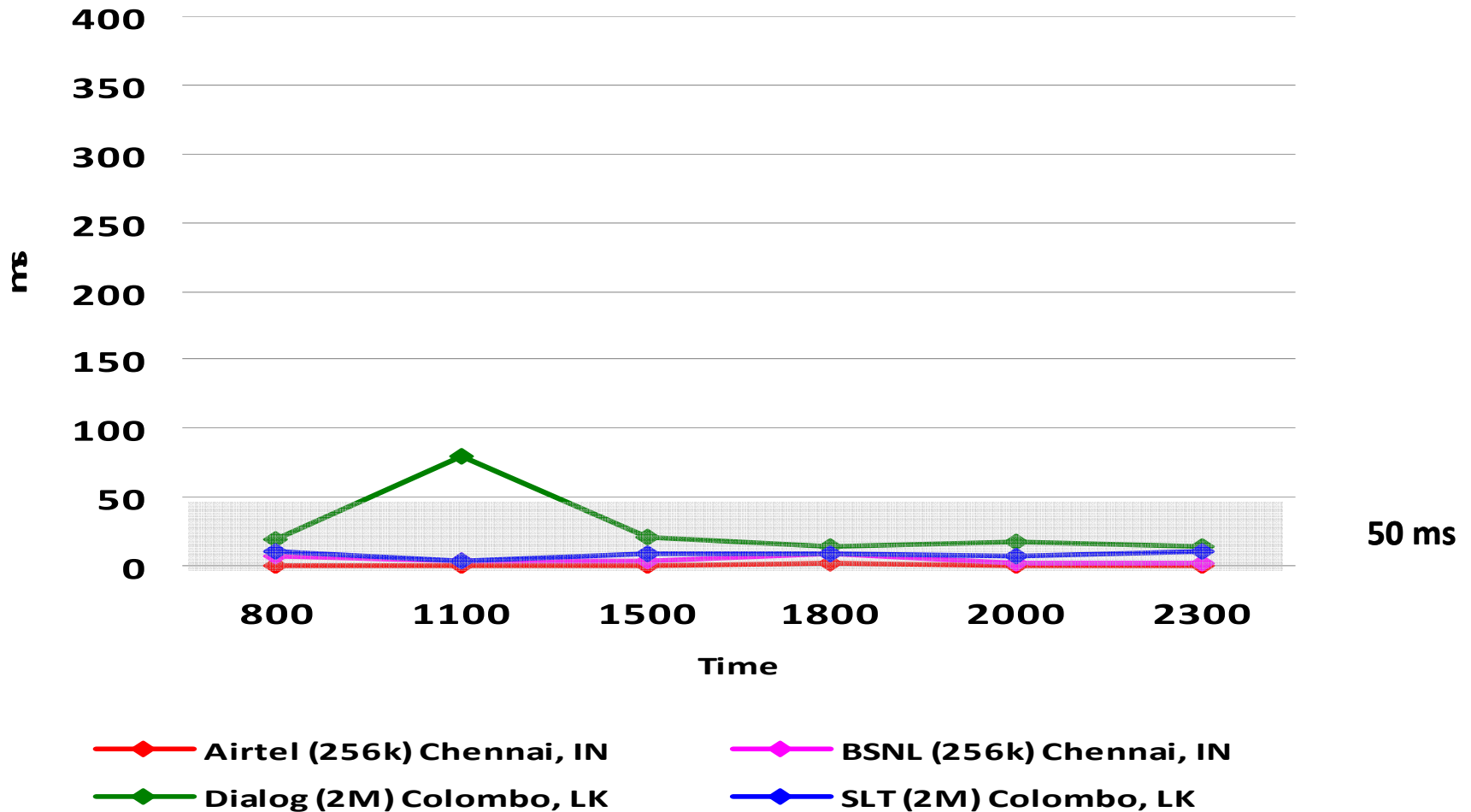


– * Limits specified by the Singapore Regulator IDA for national and International network latency



Jitter – pinged to yahoo.com

Almost within acceptable levels



Importance of location...

Rest of TN has better broadband quality than Chennai

26 May 2009, 1354 hrs IST, Niranjana Ramesh, ET Bureau

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Circle	Download speeds – within ISP (kbps)	Download speeds – National (kbps)	Download speeds – International (kbps)
Chennai	366.21	318.46	243.94
Rest of TN	1300.32	1281.66	1045.19
Bangalore	309.38	264.51	279.03
Delhi	424.48	393.63	331.32

(All above speeds are for broadband connections advertised for speeds of 256 kbps)



that they presently serve," said Prof Timothy A Gonsalves, IIT-M.

TeNeT - Telecommunications and computer Networks group of IIT-M, has conducted tests on broadband quality of service in Chennai and

RoTN circles as part of a project by Asian telecom policy thinktank LIRNEasia. The study which focuses mainly on metros, spilled over to non-metro areas in Tamil Nadu, with the surprising result that broadband speeds in RoTN are nearly three times the advertised speeds.



Group Assignment

Description of task

- Separate into 3 groups
- Each group plays the role of a policy research organization in one particular country
 - Pick one country per group
- Assume you have completed similar testing (using AT-Tester or similar tools) and you have the data
 - Free to say you want to do more testing using other tools etc

- You are attempting to influence 4 different stakeholders;
 - Group 1: Government (including regulators, policy makers)
 - Group 2: Private Sector
 - Group 3: Citizens/consumers

Group 1: needs to influence Government

- Focus on policy and regulatory issues
- May seek to convince policymakers and regulators to give higher priority to QoS issues.
- It may not limit its activities to the AT tester, but may want to implement additional quality testing methods.

Group 2: needs to influence the Private-sector in your country

- Focus on market mechanisms
- May seek to influence broadband operators
 - Get them to improve BB quality
 - Pay more attention to BB quality
- Assume limited engagement with policy makers and regulators

Group 3: needs to influence NGOs

- Considers BBQoSE as key to good performance of all ICT-based NGOs
- May involve other NGOs in improving BB QoSE and implementing AT tester in multiple facilities
- May consider NGOs as proxies for the many disempowered citizens who use the Internet through their telecenters
- Involved in the testing process
- May exert pressure on both Operators and on government authorities
- Concentration of NGOs implementing ICT4D projects for citizens

Group 3: Citizen group

- Citizens may not be aware of what they are buying
 - Advertising may leave them confused
 - Too much “fine print”
- Many may not be able to afford expensive BB packages
 - But adoption of BB among citizens is important to increase the benefits of ICT4D
- May be paying high prices for low-performing BB packages

Task: Formulate a communications strategy for the Broadband QoSE project

- Identify your audience: in detail
 - Segments/sub-segments
- What is/are the message(s) for your audience
- What format/s & tools will you use with each?
- When is the best time?
- What kind of budget will you need?
- What partners will you work with?
- [assume market, regulatory, social & economic conditions are as of today, in the country you picked]

Each team makes a 10 minute presentation

- Appoint a speaker/presenter
- Leave time for questions from audience
- Need answers to all questions in the checklist

Group work - 40 minutes

Group presentations
- Strictly 10 minutes per
group

Debrief

(and what WE did)

Chronology (green = activities with policy communication components)

- Exploration of the concept – prior to Oct 2007
- Discussion of methodology with experts – Oct 2007:Nov 2007
- Selection of IIT-M to formulate methodology – Nov 2007
- Formulation of test methodology – Dec 2007
- 1st round of testing (Chennai, Colombo) – Dec 2007:Jan 2008
- Publication of Broadband Benchmarks – March 2008
- Results presented at Public Lecture, Sri Lanka: March 2008
- Rapid Response, Bangladesh: July 2008

Chronology continued

- Development of software, AT Tester – May/June 2008
- Development of website and server -
- 2nd Round of Testing – Sept/Oct 2008
- Publication of Broadband Quality Benchmarks – Oct 2008
- Training of NGO sector and bloggers (introducing AT Tester) – Nov 2008
- TV interview on Biz First in Sri Lanka – Dec 2008
- Rapid Response, India – Jan 2009
- Changes to advertising re Mobile BB – Jan 2009

Chronology Contd

- 3rd round of testing, India (Chennai, Delhi), Sri Lanka (Colombo), Bangladesh (Dhaka) – Feb 2009
- Publication of Broadband Benchmarks – March 2009
- Rapid Response, Bangladesh – March 2009
- Results presented at Public Lecture, Sri Lanka – April 2009
- Interviews with Print Media at their request, India – May 2009
- Workshop on Mobile Broadband Methodology – April 2009
- 4th Round of Testing, India (multiple locations) Sri Lanka, Bangladesh, USA: Sept-Oct 2009

- Development of software to test mobile BB: Sept-Nov 2009
- Press event for journalists, India – Nov 2009 (planned)
- Dissemination of the tool to Bloggers in Sri Lanka – Feb 2010