Problems of evidence-based policy and regulation in PICs

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PiRRC
Pacific ICT Regulatory Resource Center

LIRNEasia
www.lirneasia.net

"Without adequate information, as experience has shown, regulation cannot be effective."

Foster, C. (1992), *Privatisation, public ownership and regulation of natural monopoly*. Oxford: Blackwell

Principal-agent problem

- How to get the employee or contractor (agent) to act in the best interests of the principal (the employer) when the employee or contractor has an informational advantage over the principal and has interests different from those of the principal

Regulator as principal

- Regulator is at a perennial information disadvantage vis-à-vis regulated companies
- National Regulatory Authorities (NRAs) are therefore given legal powers to obtain information from regulated entities
  - In some cases, embedded in license conditions
- It is normally an offence to refuse without due cause, information requested by NRA within its powers

Recommendation

- In light of PIC NRAs' repeated statements re difficulties in obtaining required information from operators, there may be merit in developing a best-practice statement on the information practices of regulators, including an analysis of Pacific legislation to see if there are any lacunae

Maintaining the balance

- In practice, NRAs must find the mid-point between asking for too little (and regulating in the dark or not acting) and asking for too much (and becoming micro managers)
  - In reality, asking for too much is not likely to yield results
- They must also give consumers enough information without harming competition

Example: Market size & shares

- All operators report subscriber numbers to NRA/Ministry who then reports to ITU
  - Exceptions in PICs
    - Is this justifiable?
- Many NRAs report only aggregate numbers, not market shares
  - Is this justifiable?

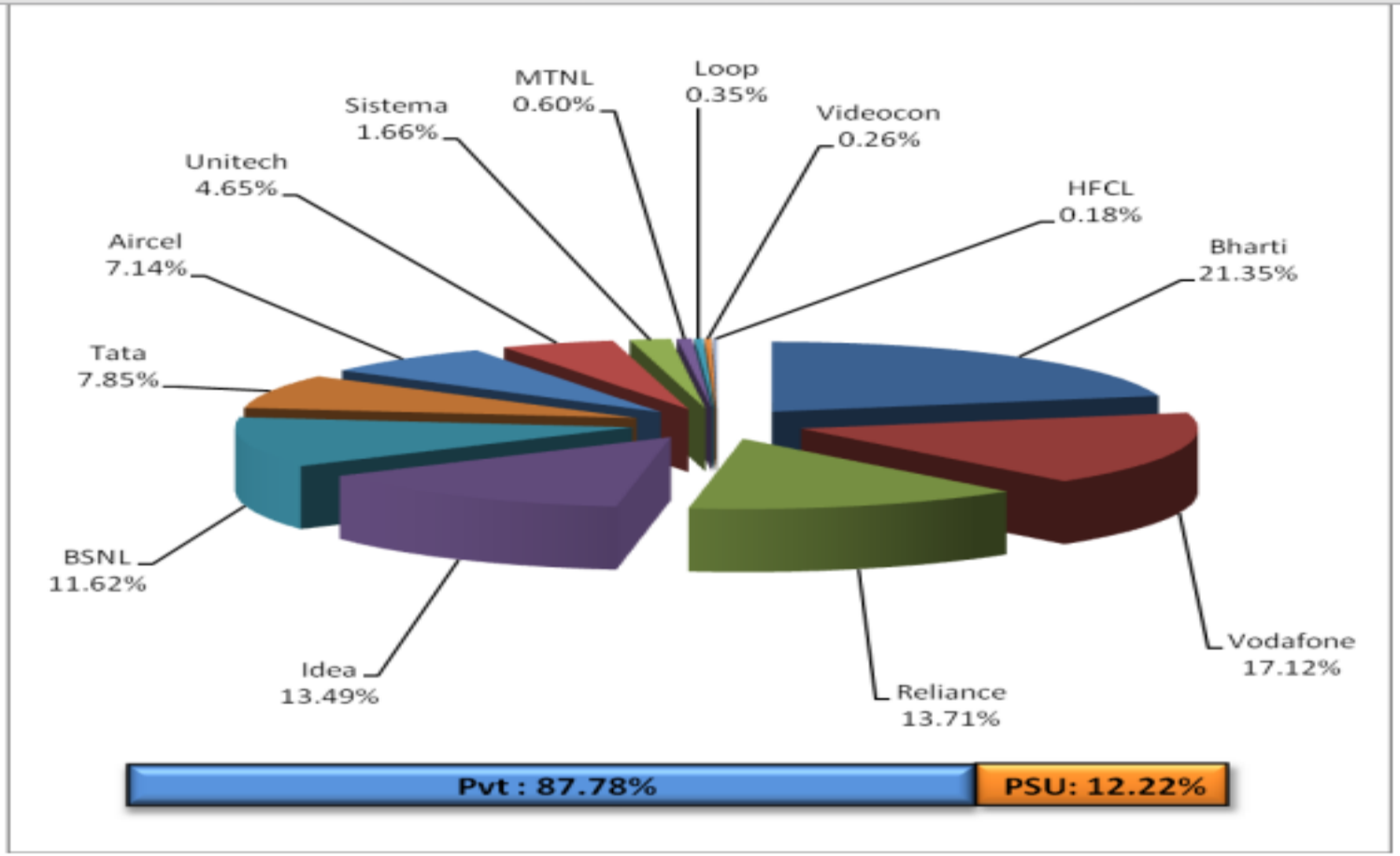
What is market share?

- Percentage of total subscribers? Active SIMs?
  - ITU uses above, even though it's inaccurate
- Percentage of minutes? Traffic?
- In most other industries, market shares calculated on basis of revenues

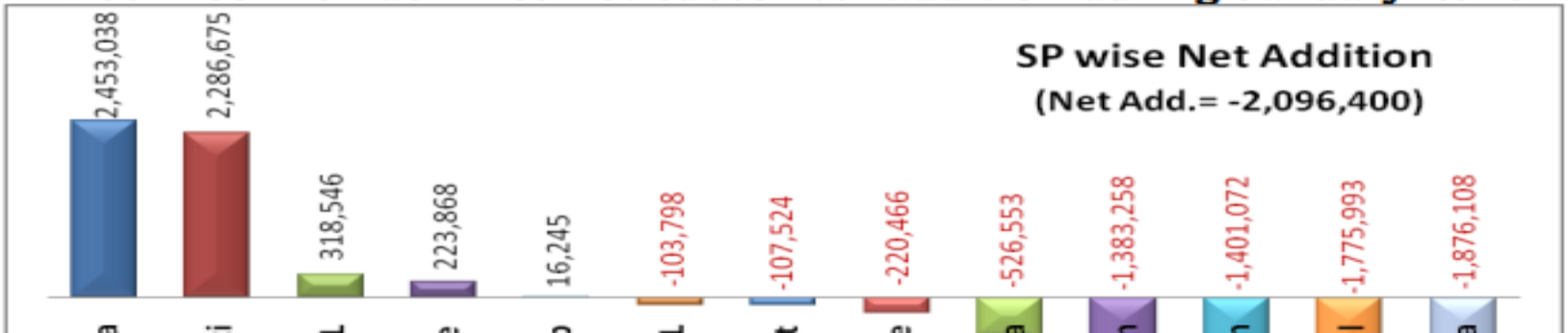
- Are there any negatives to publishing market shares even based on sub-optimal measures?
- What is harmed by non-publication?

Contrasting approaches from highly competitive markets

- Hong Kong's OFCA provides only aggregate information; no data by operator
- India's TRAI provides detailed information



B. Service Provider wise net subscriber addition during January 2013



Small markets with 2-3 suppliers

- In a market with two suppliers, easy to figure out market shares if aggregate numbers are known
  - Even this is difficult in some Pacific Island Countries
  - PiRRC commissioned Network Strategies to collect information which provided additional evidence on the difficulties
- In most markets, unofficial estimates abound; is it not better to provide official data?

Internet
Mobile telephone
Mobile-cellular subscri...
Mobile-cellular subscripti...

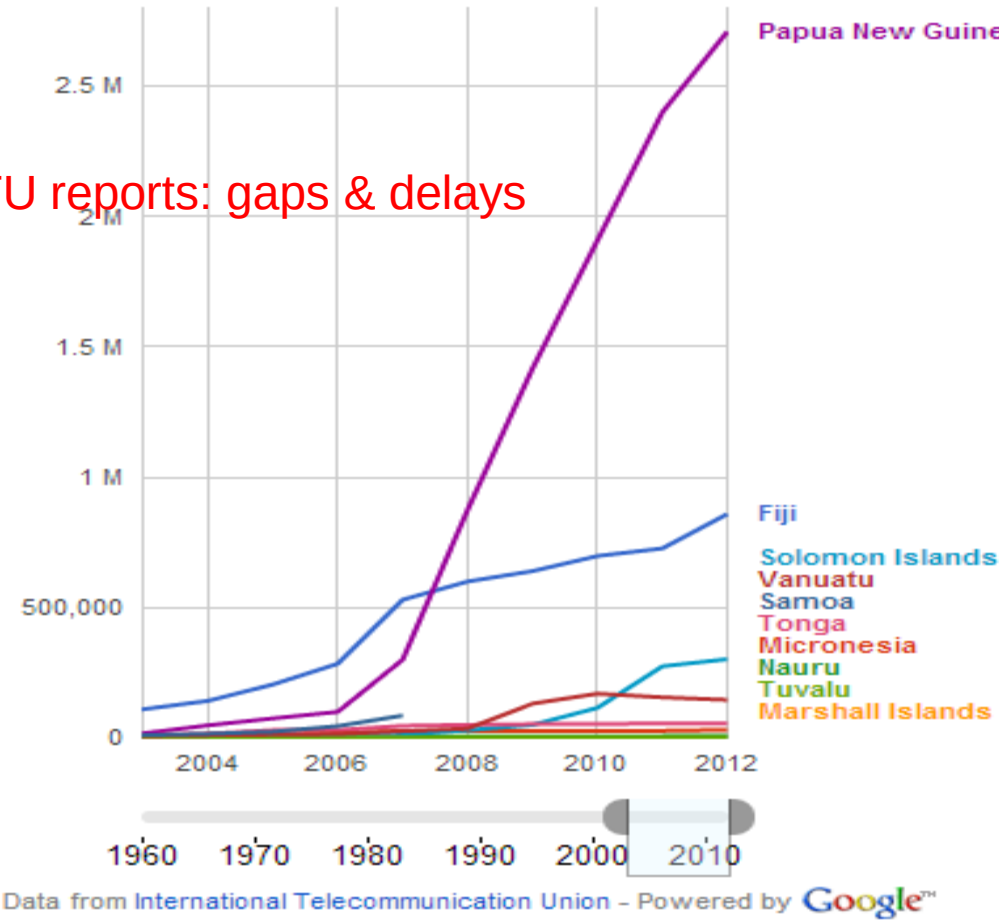
Clear

Compare by **Country**

- Afghanistan
- Albania
- Algeria
- Andorra
- Angola
- Antigua and Barbuda
- Argentina
- Armenia
- Australia
- Austria
- Azerbaijan
- Bahamas
- Bahrain
- Bangladesh
- Barbados
- Belarus
- Belgium
- Belize
- Benin
- Bhutan

Clear selections

What ITU reports: gaps & delays



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What can be done?

- Define narrow set of indicators that will be collected and submitted through PiRRC to ITU
  - Important to count using standard definitions, so that data are comparable
  - As stated by Network Strategies, important to obtain standard data from standard sources
- Define a broader set of data that are needed for regulatory purposes such as market shares (ideally defined more accurately than using subscriber numbers) that will be subject to strict confidentiality rules

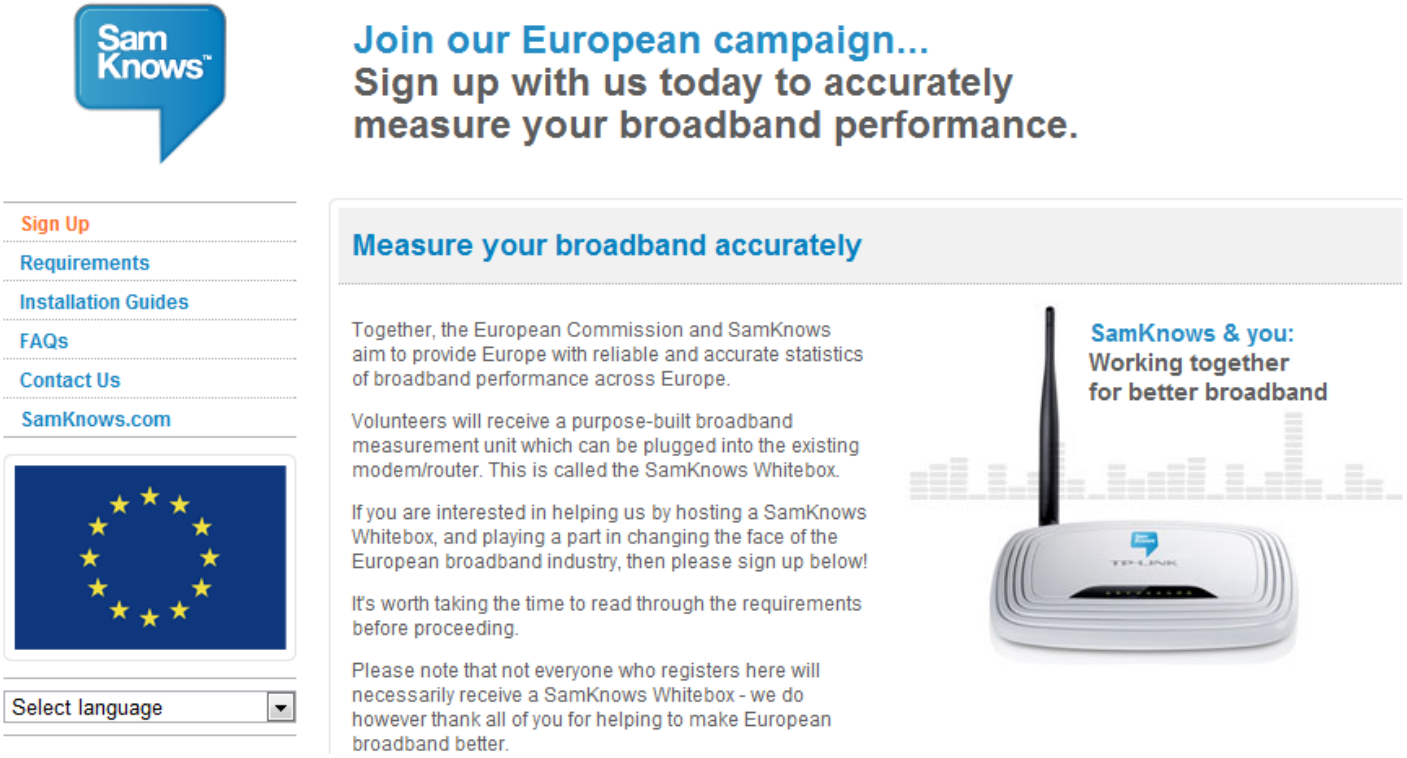
Example: Quality of service (QoS) or QoS experience (QoSE)

- Directly regulation- and competition-relevant data needed by NRA, e.g.,
  - QoS at interconnection points
    - Can only be obtained from operators; no alternative to regulatory action
- QoS affecting customers/competition, important in imperfectly competitive markets
  - Also from operators
  - But workarounds exist
    - Surveys
    - Hardware and software based solutions

Quality testing can be done by different parties – regulator is well positioned

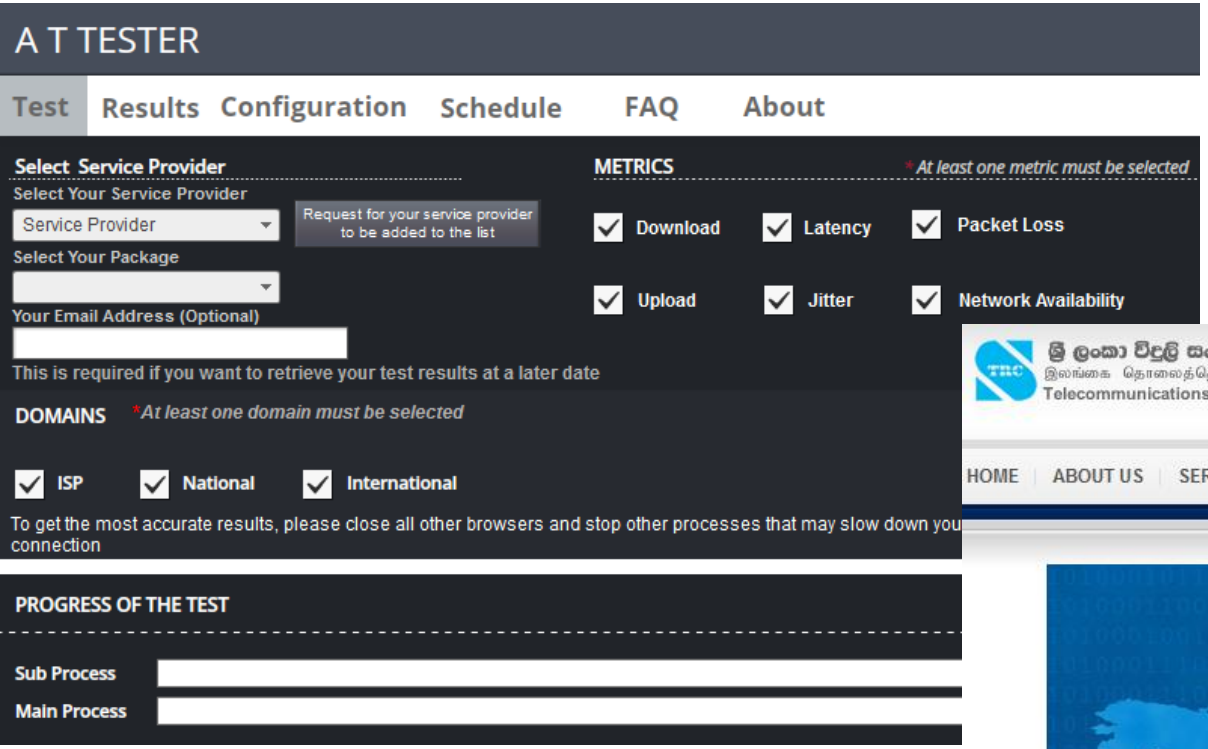
Diagnostics conducted by	Pros	Cons
Service Providers (ISPs/operators)	• Easy to implement	• Results based on equipment placed in the most optimized points of the network • Not representative of the 'actual' speeds
Users	• Represents actual user experiences	• Assumes user's PC is virus-free, with no parallel process running etc. • Dependant on user's willingness to participate • Large files impact user's data limits
National Regulatory Authorities (NRAs)	• In a position to request operator involvement when necessary	• Known test locations will prompt operators to optimize networks in selected areas

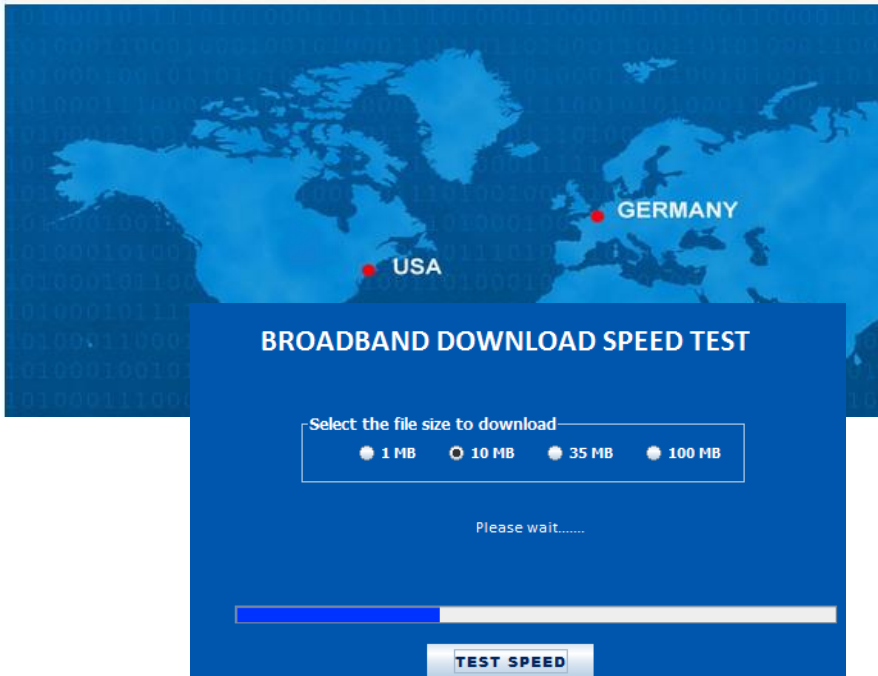
Hardware offers accuracy, but may be expensive



- 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





- Levels of accuracy can vary
- Cost effective
- E.g: TRCSL (Sri Lanka | Implemented),
- LIRNE*asia* - since 2008

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What to measure? Think beyond download speed

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	+			++	++

With increased use of cloud resources, this matrix changes. E.g. upload as important as download

+++ Highly relevant; ++ V ant; - Irrelevant

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

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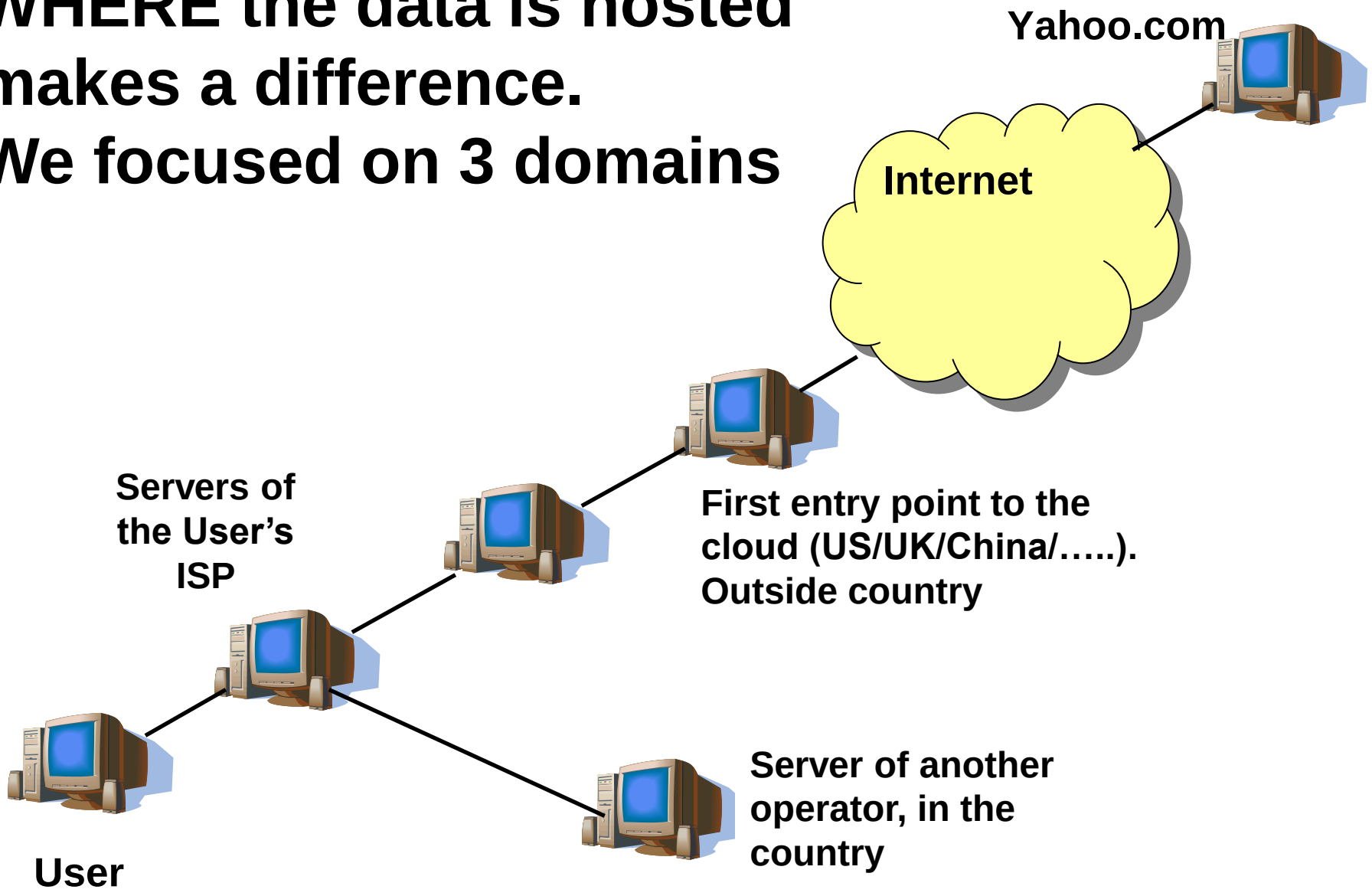
Source: Gonsalves, T.A & Bharadwaj, A. (2009)

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: • Up to 1 Mbps • 2 Mbps – 4 Mbps • 5 Mbps – 10 Mbps • Above 10 Mbps
File size	Accurate results are obtained by using a large file that maximises use of the channel capacity. Example of file sizes: • 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	

WHERE the data is hosted makes a difference.
We focused on 3 domains

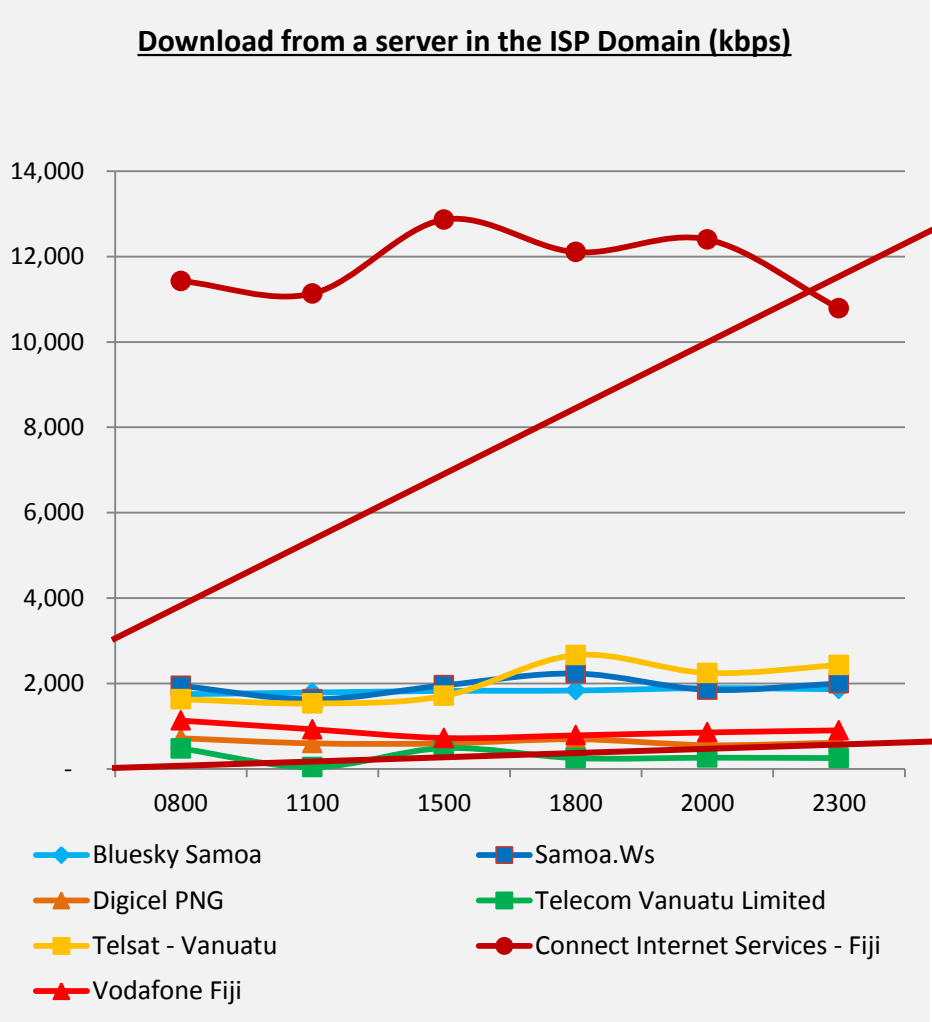


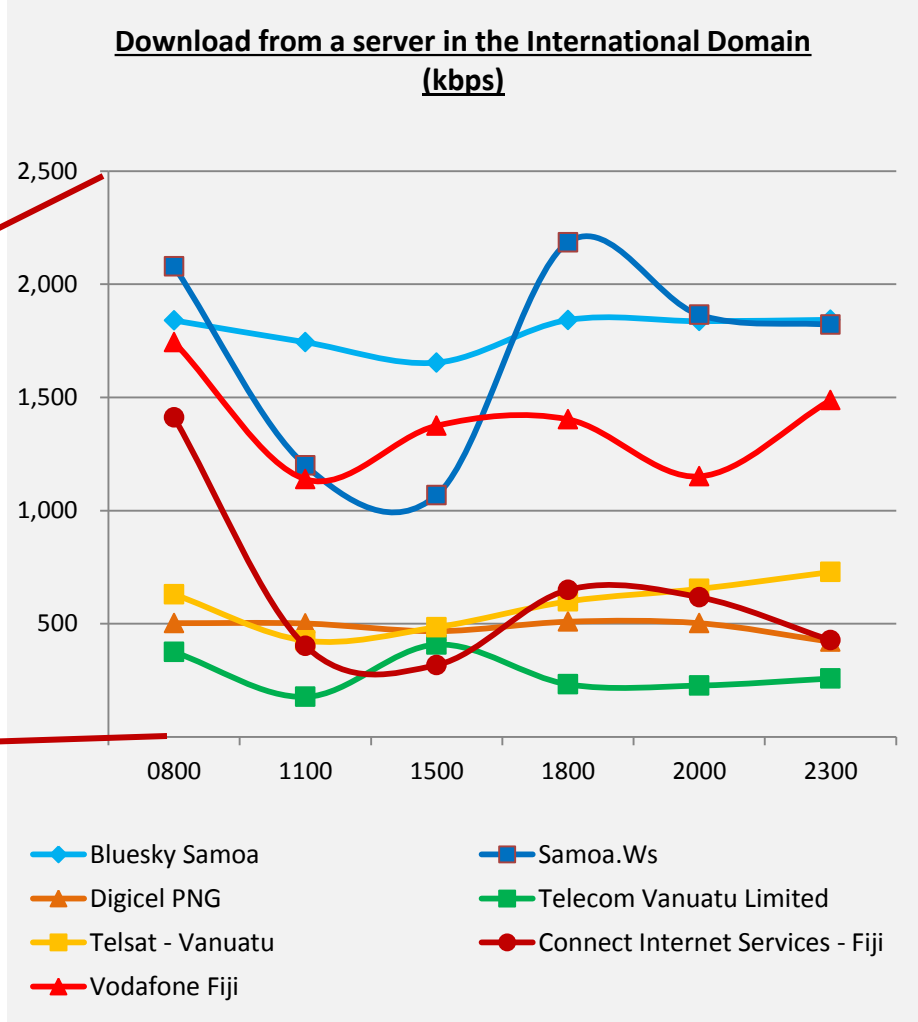
Software based, new testing methodology

- Developed methodology and software in partnership with Indian Institute of Technology (IIT), Madras
- Testing in multiple domains

  - ISP, National and International (yahoo)
- Multiple broadband packages or links
  - 256kbps – 2Mbps
- Multiple times a day
  - 6 times a day; ranging from peak to off peak
- Multiple Locations (cities)

Download performance deteriorates : ISP v International, 2013 December





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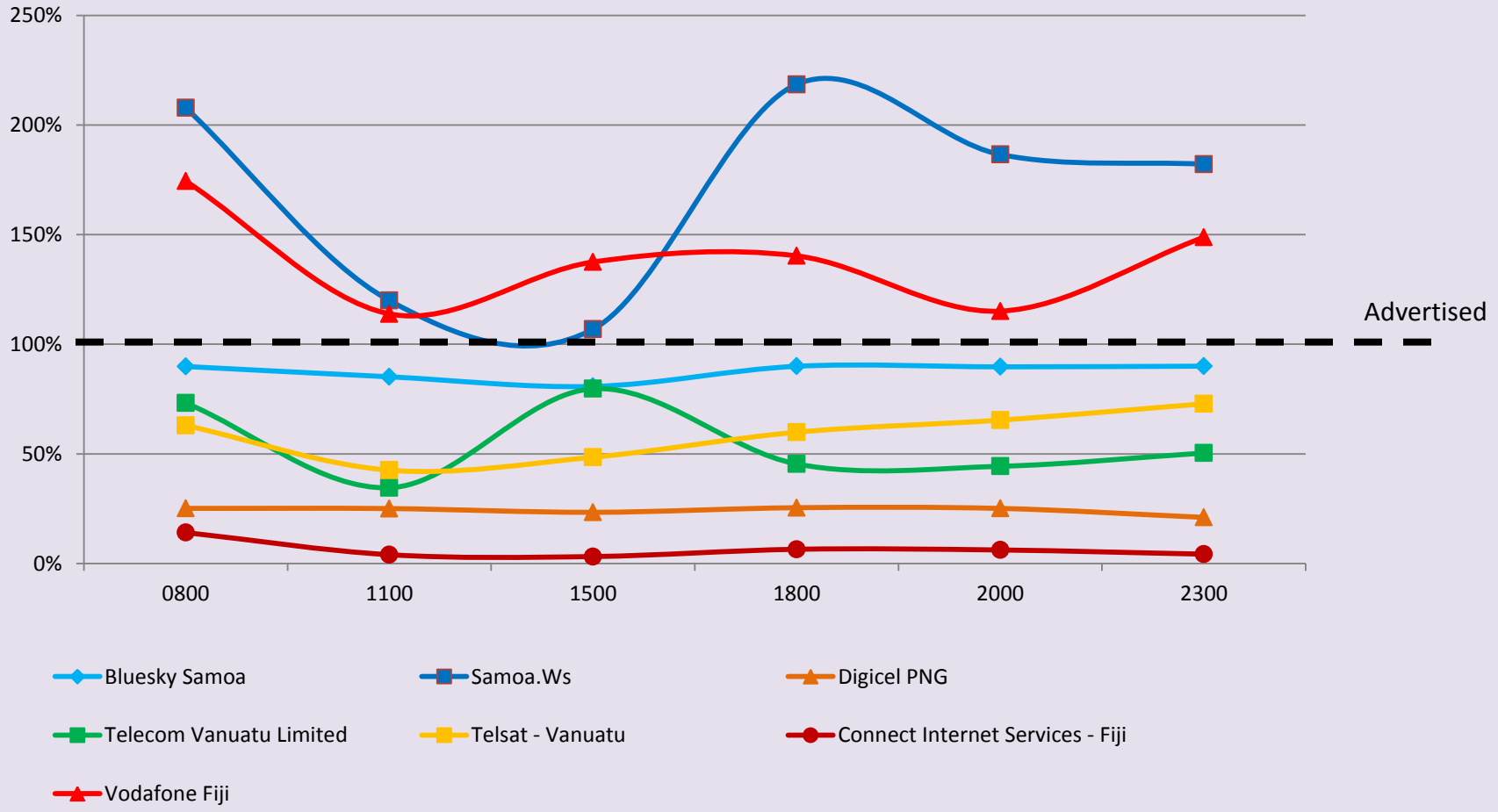
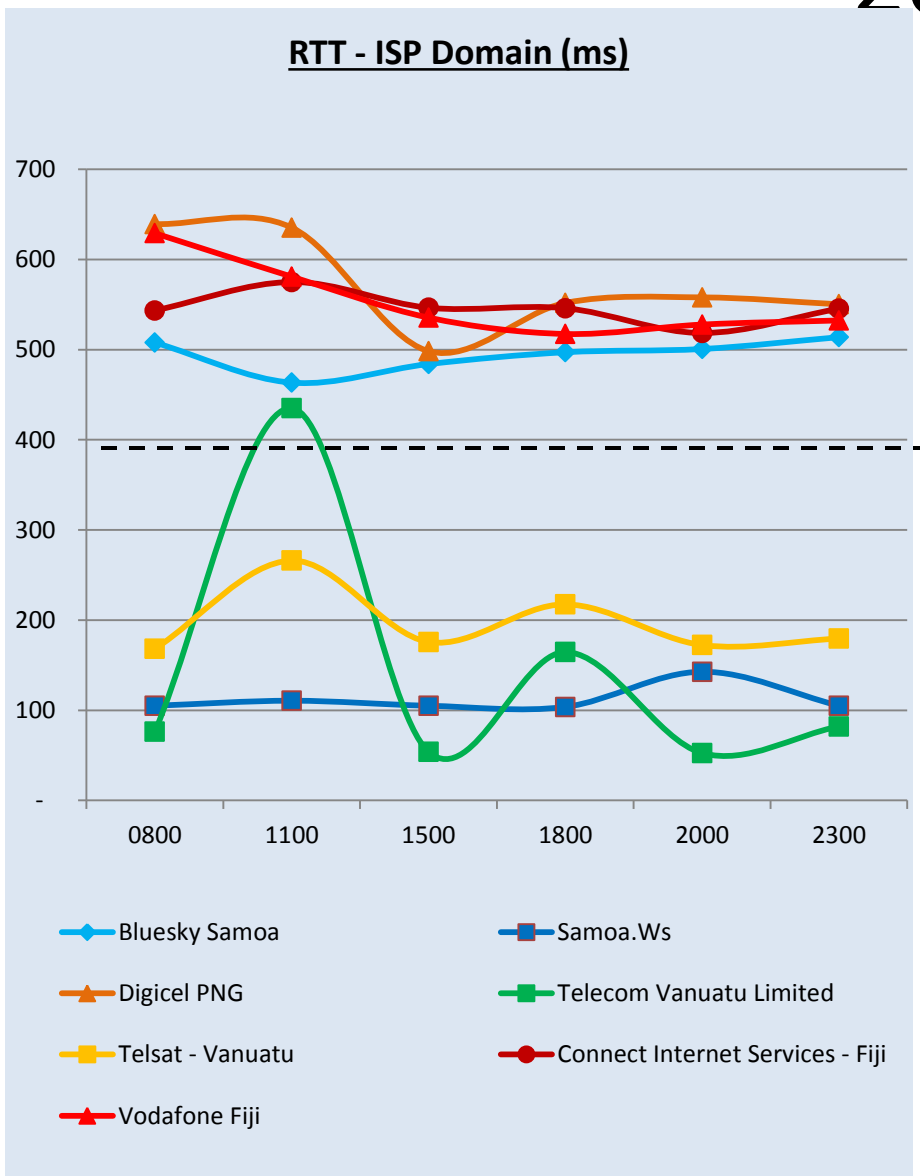
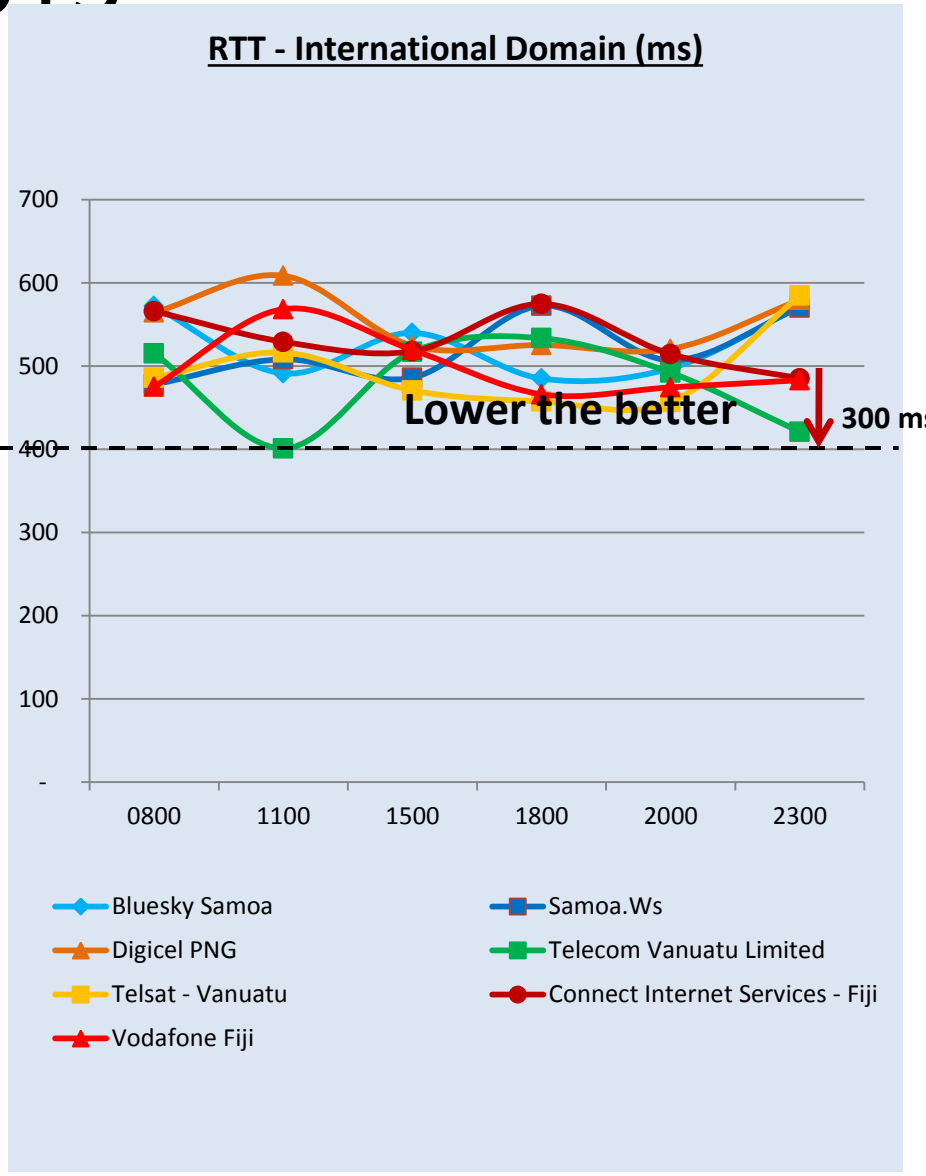
Download performance, advertised v delivered, Dec 2013



Latency, ISP v international, December 2013