

Collaborative Measurement of Internet Quality in Lebanon

http://comiqual.usj.edu.lb

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Lebanon Case

- Small country: 10k sqkm, 4M+ inhabitants
 Internet users : around 70%
 - NRI (2012 rank 95, 2014 rank 97)
- Average throughput (Mar. 2015): 3.2 Mbps
- 1 incumbent public operator (monopoly MoT)
- Enough International capacity but obstacles ...
 - Technical : last mile and backbone
 - "Non technical": spare capacity allocation to ISPs
- Mobile : Late 2G/3G deployments, Recent 4G deployments



COMIQUAL

- Large scale measurement platform
- Independent and transparent Internet observatory

Mobile and fixed access

- Collaborative : crowd-sourcing
- Generic platform
- Supported by :
 - Saint-Joseph University of Beirut
 - Internet Society community grants programme

COMIQUAL : a tool for ...

- End user :
 - -Assess, diagnose, compare
- Provider/Operator
 - -Get user perspective, compare to others
- Regulator
 - Quantitative control, transparent information to users, competitive market.



COMIQUAL Architecture



Deployment



Control protocol

- JSON messages
- via HTTP through REST calls.
- HTTPS secured
- Communication initiated by MAs (behind NAT)
- Two modes
 - Authenticated mode: the MA is identified prior to communication and all subsequent measurements will be related to that MA
 - Anonymous mode

How to use the platform?

Public portal	 View quality results on map Access raw data
Contribute to measurements	 Install the comiqual APP Use it as a speed test APP Let it run alone
Do measurements	 Anonymously Using a google/facebook/comiqual account
Personal page	 View your own measurements

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8

Mobile App

🔇 comiqual	
🔂 Home 🖸 Map	Defined II Results
Comiqua 163 comple	l is running. eted, 107 failed
Last Measurement Tue Ma	ay 12 10:24:15 EEST 2015
Latency: 183.7 ms	M
Download: 11.84 Mbps	
Upload: 1.58 Mbps	
т	est

🔇 comiqua	ŧ		
ය Home	9 Map	User Defined	Results
16	Comiqual 3 comple	l is running. ted, 107 failed	
Measurement Type		Latency	
Where to ping?	Latency Speed HTTP DNS loc Tracero Beirut D	okup oute X	
	Beirut	x	

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9

Measurements on map (1)



Measurements on map (2)

Wi-Fi Mobile Technologies 2G 3G	Download speed	(kb/s) ▼			Na	hrh Ibra ہر ایراھید Safra صفرا Gł
Carriers		Provider	Average(*)	Best(*)	Count	\times
alfa		touch	1577.4	4752.6	57	
rl mtc lebanon		rl mtc lebanon	2647.4	4921.4	16	
touch		ogeronet	927.6	927.6	1	
100-		idm	539.7	953.2	6	
ISPS		inco	1480.2	1707.3	5	
idm			1692.2	4921.4	85	
inco					* kb/s	
moscanet				برج	المحمر الم	برومان
ogeronet			Chiyan Chiyan	ansouriy	yeh	スト
terranet			TAHT,	منصورية	and the	Ras E

User measurements interface (1)



Results for Measurement Agent 417

Show 10 🔻	entries	Search:				
Date	Task ID	¢ Type ≑	Status 🛊	Arguments	Metrics	Provider
2/26/2015 2:38:24 PM	91	TCP Down (Mlab)	OK	Target=1.michigan.mlab1.ath01.measurement- lab.org	throughput=1,412.19 kbps	touch
2/26/2015 2:38:32 PM	92	TCP UP (Mlab)	ОК	Target=1.michigan.mlab3.ath02.measurement- lab.org	throughput=218.19 kbps	touch



User measurements interface (2)

Measurement Details

Measurement Information

Measurement Key	17852
Measurement Name	RTT
Measurement Descri	ICMP
task ID	97
MA ID	417
Status	OK

Arguments

target 1.michigan.mlab1.ath02.measurement-lab.org timeout 10 sec packet size 56 byte number of sent packets 10 measurement tool /system/bin/ping

Metrics

target IP	"83.212.5.142"
max RTT	153.0 ms
min RTT	128.0 ms
stddev RTT	9.221713506718803 ms
mean RTT	139.4 ms
loss ratio	0.0 %

Context

app version	2.0
battery level	80 %
is battery charging	false
carrier	touch
network type	3G
mobile country code	415
mobile network code	03
location area code	932
cell id	19855123
RSSI	1 dB
network technology	HSPA+
DNS resolvability	IPv4 only
IP connectivity	IPv4 only
ISP	TERRANET
initial longitue	35.56373221 deg
initial latitue	33.86568644 deg
final longitue	35.56373221 deg
final latitude	33.86568644 deg
initial location type	gps
final location type	gps
start date	02-26-2015 02:38:48 PM
end date	02-26-2015 02:38:48 PM



Platform management interface

	CoMIQua	Qual Home Admin Tools -		Downloa	ds +		Hi, Marc Ibrahim	(marc.ibrahim@gma	iil.com - go	ogle account)		
	G	Create Parameter Create Scenario Create Task			eter io					9		
		Manage Measurements Manage Parameters Manage Tasks										
		Manage Tasks										
		Create N	ew							Show	Valid Tasks Only	
		TCP Down (Mlab) [Delete]										
		Version Date of Creation		Creation	End Date		Is Valid?	Repeat Interval	Scenario Name			
	1 7/31/20		14 5:17:43 PM 7/31/2024 12:0		00:00 AM	×.	none	default	Details	Unvalidate		
		DNS lookup [Delete]										
		Version	Date of	Creation	End Date		Is Valid?	Repeat Interval	t Interval Scenario Name	•		
		1	7/31/2014 4:16:04 PM		7/30/2024 12:00:00 AM			none	default	Details	Validate	
		RTT [Delete]										
		Version	Date of	Creation	End Date		Is Valid?	Repeat Interval	Scenario Name			
		1	7/31/20	14 4:15:16 PM	7/31/2024 12	00:00 AM	•	none	default	Details	Validate	
									http://co	omiqua	l.usj.edu.lb	

Online Statistics tool



Conclusion

- Working on
 - Performing throughput measurement with minimum TCP traffic
 - combining active measurements with passive byte count)
 - Finding incentives to make people contribute
 - -Anonymization of the data on the server.
 - Mobile App for iPhone.

THANK YOU

