Fixed and Mobile Broadband Auditing

TRA Bahrain

Menog 10 / 30 Apr - 01 May 2012

3 Mobile operators

4 Fixed national operators with a form of independent access infrastructure based on Copper, Fiber or WiMax
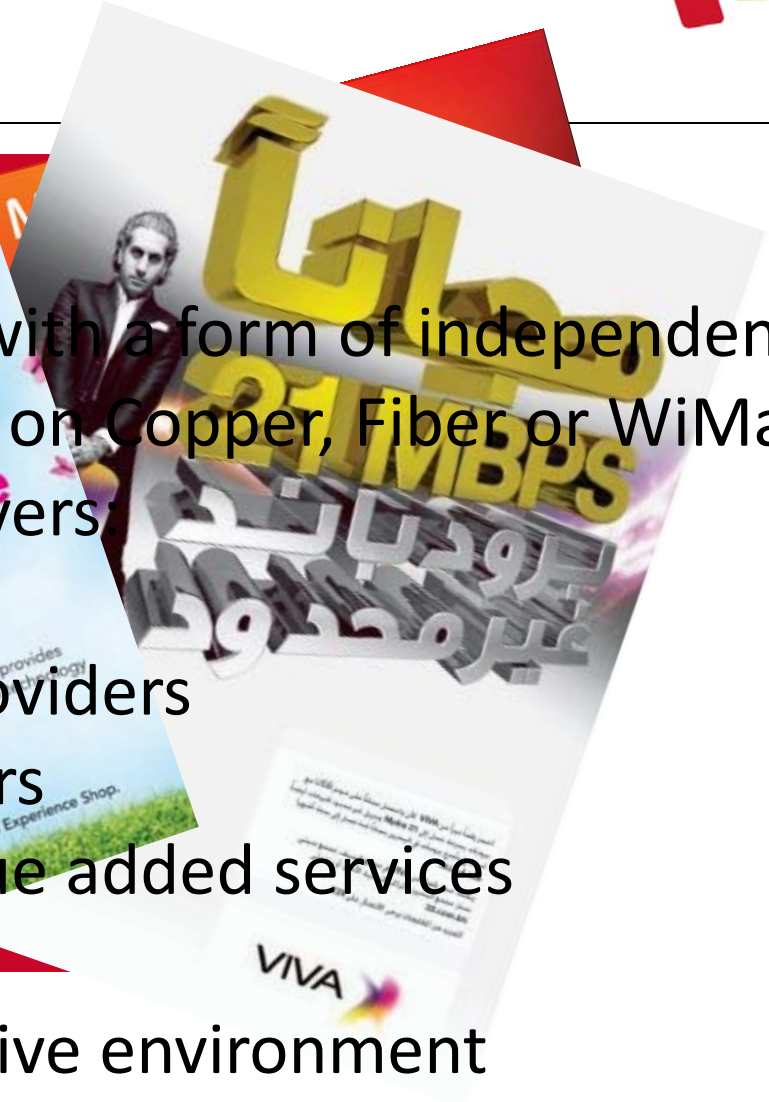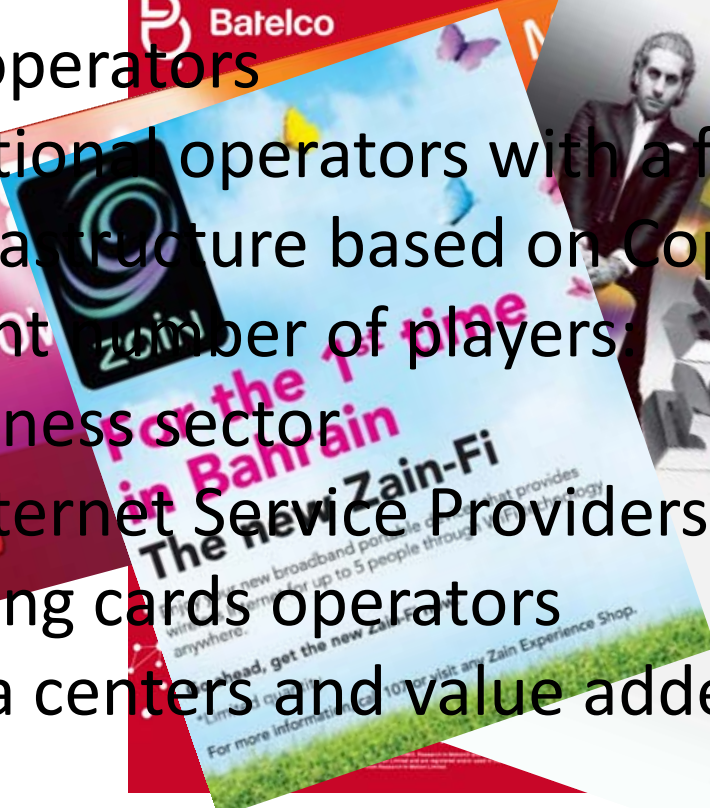
A significant number of players:

    Business sector

    8 Internet Service Providers

    Calling cards operators

    Data centers and value added services

    Highly competitive environment

Background

Quality of Experience (QoE)
ITU-T Recommendation P.10/G.100

The overall acceptability of an application or service, as perceived subjectively by the end-user.

QoE includes complete end-to-end system effects (client, terminal, network, services infrastructure, etc).

QoE acceptability may be influenced by user expectations and context.

Quality of Service (QoS)
ITU-T Recommendation E. 800

The collective effect of service performance which determines the degree of satisfaction of a user of the service.

QoS includes performance of service support, operability, serveability, security, and other service specific factors (i.e. Technical)

| INTERNATIONAL TELECOMMUNICATION UNION		COM 12 – LS 62 – E
TELECOMMUNICATION STANDARDIZATION SECTOR STUDY PERIOD 2005-2008		English only Original: English
Question(s):	15/12	Geneva, 16-25 January 2007
	Ref. : TD 109rev2 (PLEN/12)	
Source:	ITU-T Study Group 12 (Geneva, 16-25 January 2007)	
Title:	Definition of Quality of Experience (QoE)	

TRA's approach

Internal
External
Operators

Benchmark

No Target
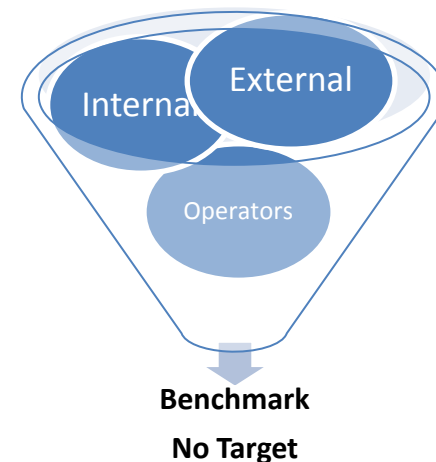
Modular approach

External

3rd party one off auditing countrywide = Mobile Broadband
One internal report in 2009 and
Two published reports in 2010 and 2011

Internal

Continuous sample auditing = Fixed Broadband
8 published quarterly reports since Q2 2010

Operators

QoS Regulation placing obligations on Operators
Quarterly internal reports since Q4 2008

Mobile Broadband

| Measurement	Unit	Comments
Successful radio connection	%	Attempt to set up a radio connection within 1 minute timeout
Successful FTP data transfer	%	FTP download within 10 minutes time out 5 Mo for FTP DL and 1Mo for FTP UL
Successful Web / mail data transfer	%	5 most visited public homepages + operator Homepage, sending and receiving an e-mail with an attachment , 2 minutes time out
Average download time once connected	Seconds	Observed download time
Average download time standard deviation	Seconds	Observed Std deviation
Derived Throughput	Kb/s	

Test metrics
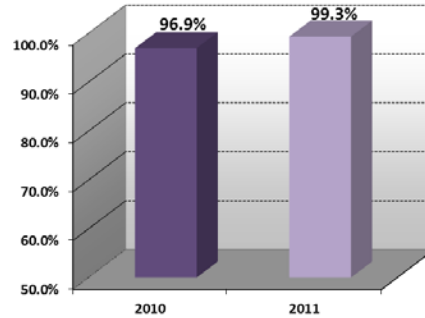
Mobile Broadband
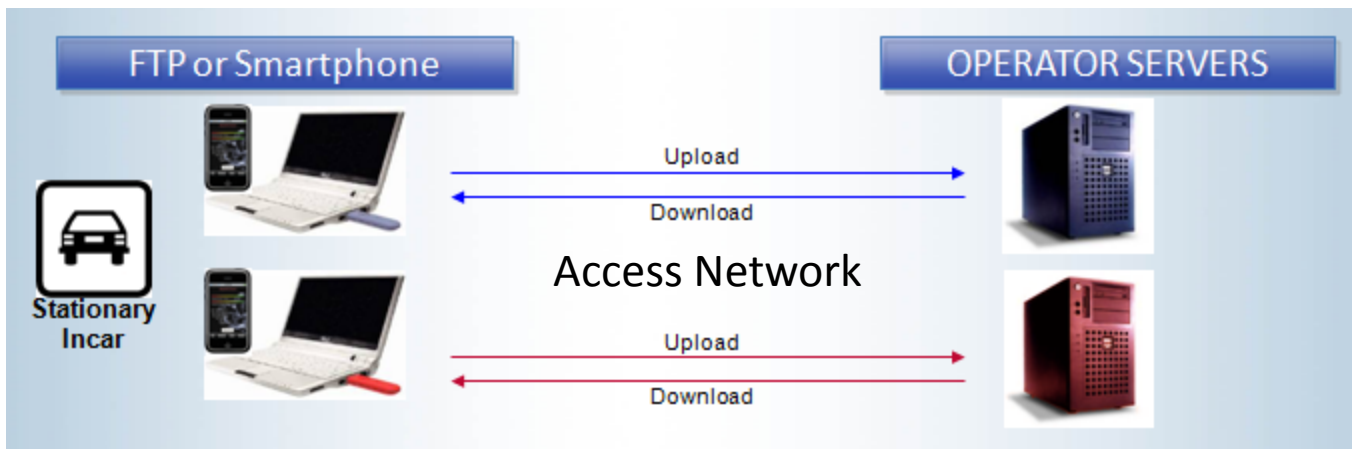
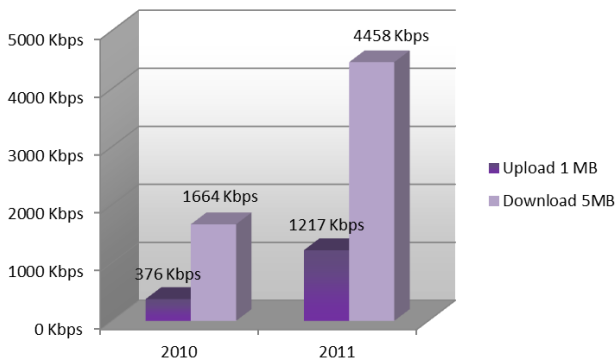Test setup
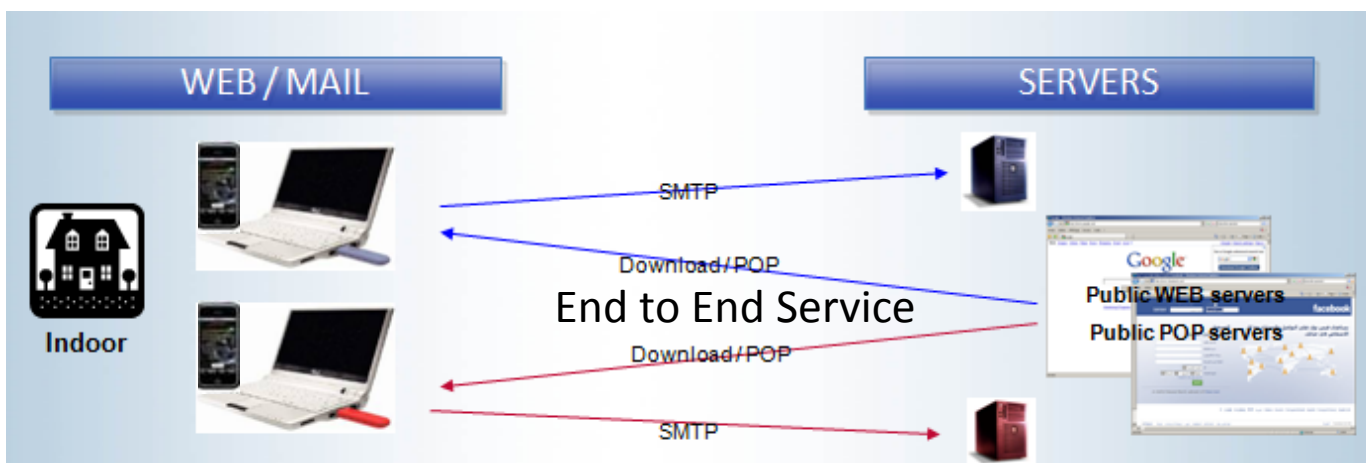
Mobile Voice, SMS & Broadband

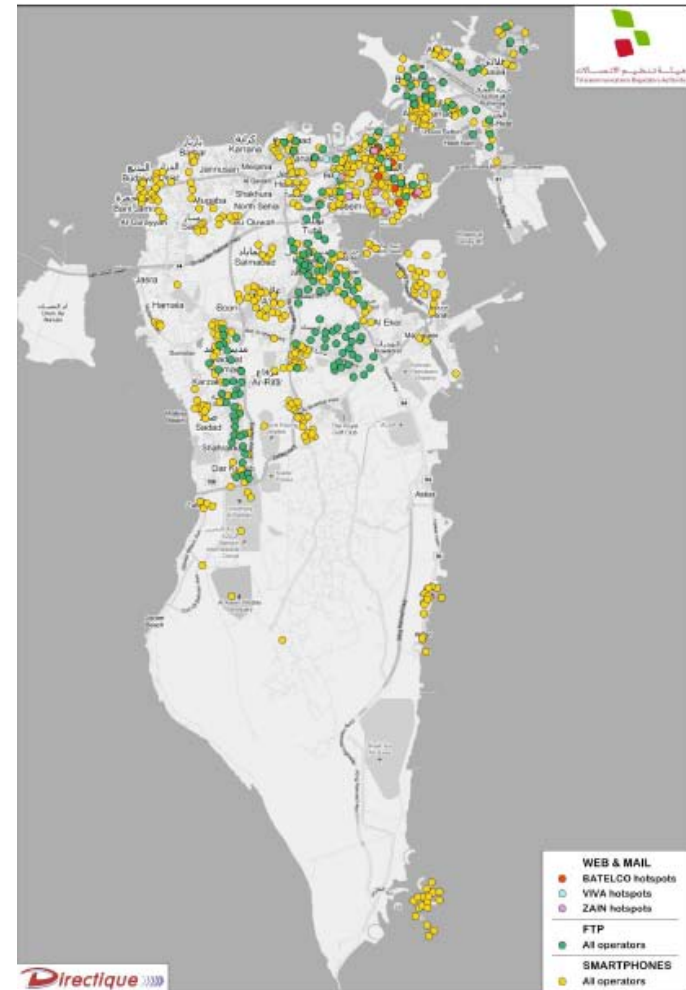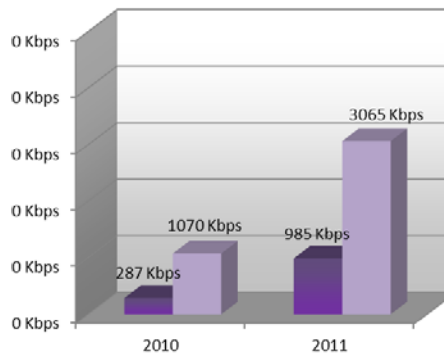Voice Service: Rate of call setup and held for 2 min.
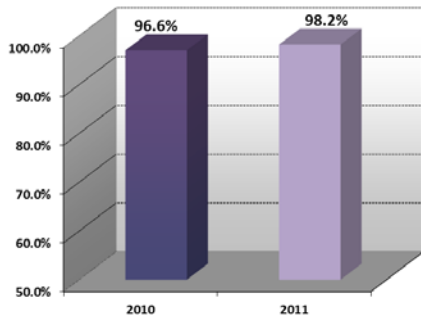
SMS service: received message rate within 30 sec.

2010 Vs 2011 Throughtput DONGLE FTP
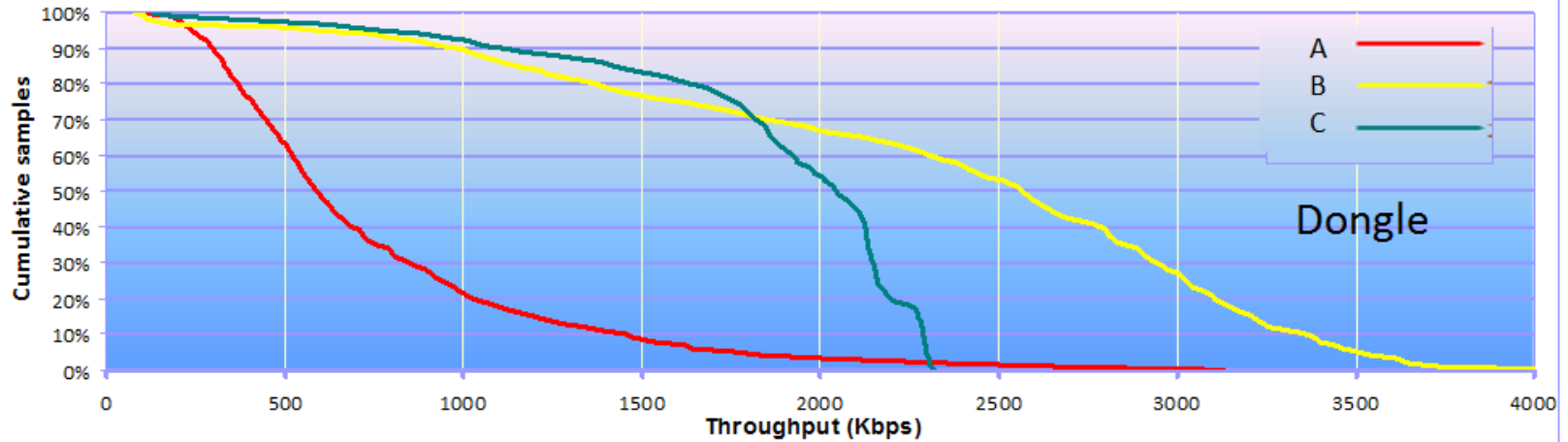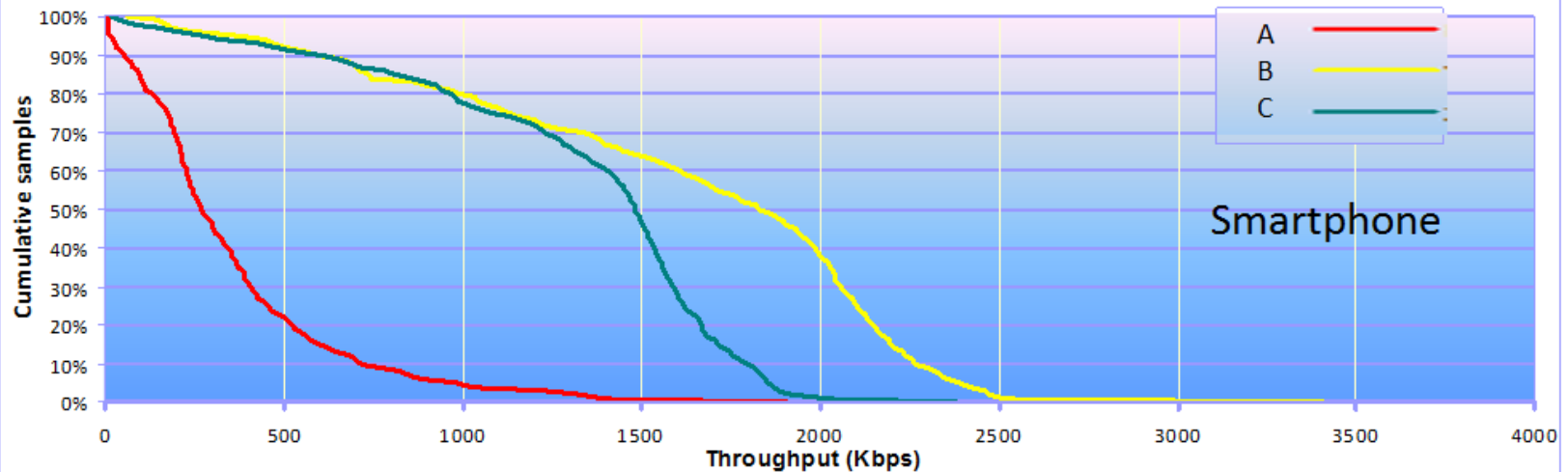

2010 Vs 2011 Throughtput Smartphone FTP

Full report available at www.tra.org.bh

Mobile Broadband

Distribution of download throughput (Kbps) — 2010 — Dongle

Distribution of download throughput (Kbps) — 2010 — Smartphone

Mobile Broadband

Distribution of download throughput (Kbps) — 2010 — Dongle
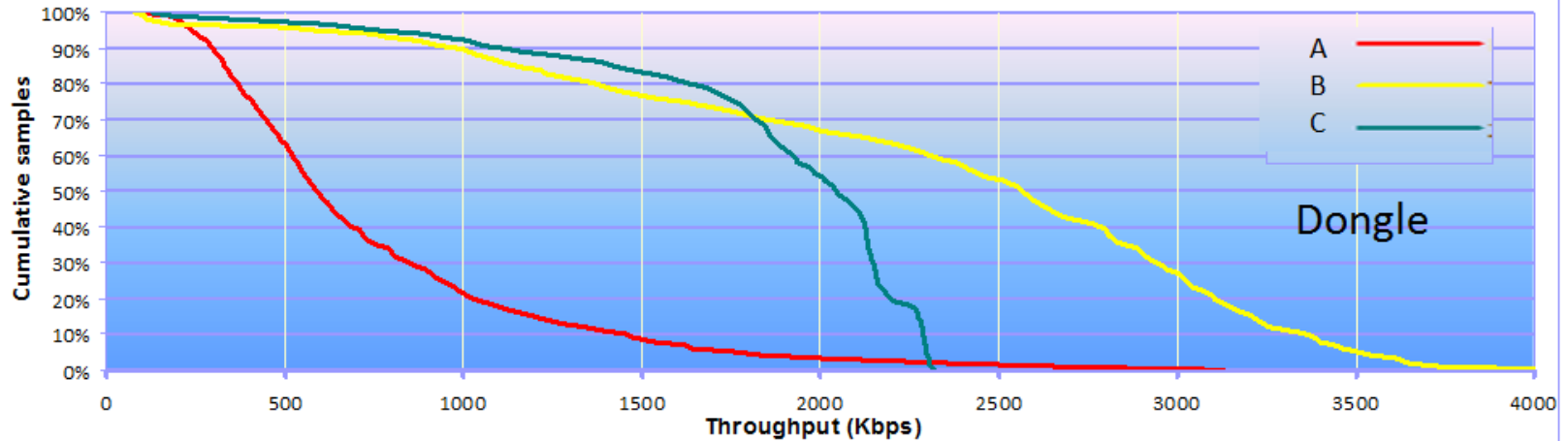

Distribution of download throughput (Kbps) — 2011 — Dongle
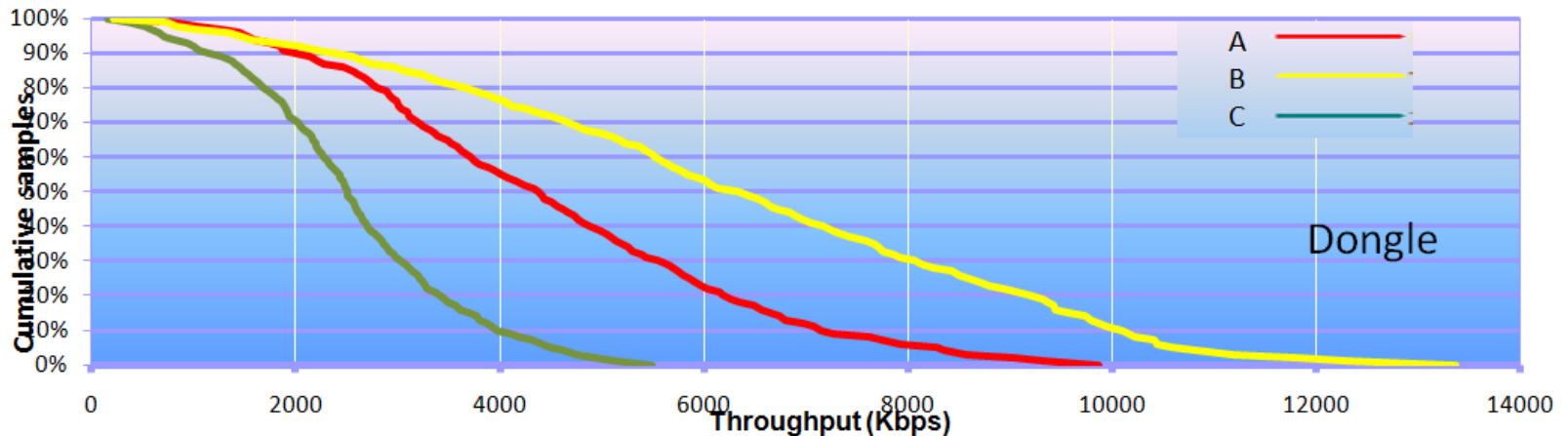
Fixed Broadband

Measurement	Unit	Comments
TCP download / upload – average	Mbps	3 test servers located in Bahrain, US & EU
HTTP download / upload average - Cache	KBytes/s	10 test URLs selected with ISPs
HTTP download / upload average - Non cache	KBytes/s	10 test URLs selected with ISPs
DNS resolution time	Milliseconds	10 test URLs selected with ISPs
Ping time	Milliseconds	10 test URLs selected with ISPs

Test metrics

Fixed Broadband

System Overview
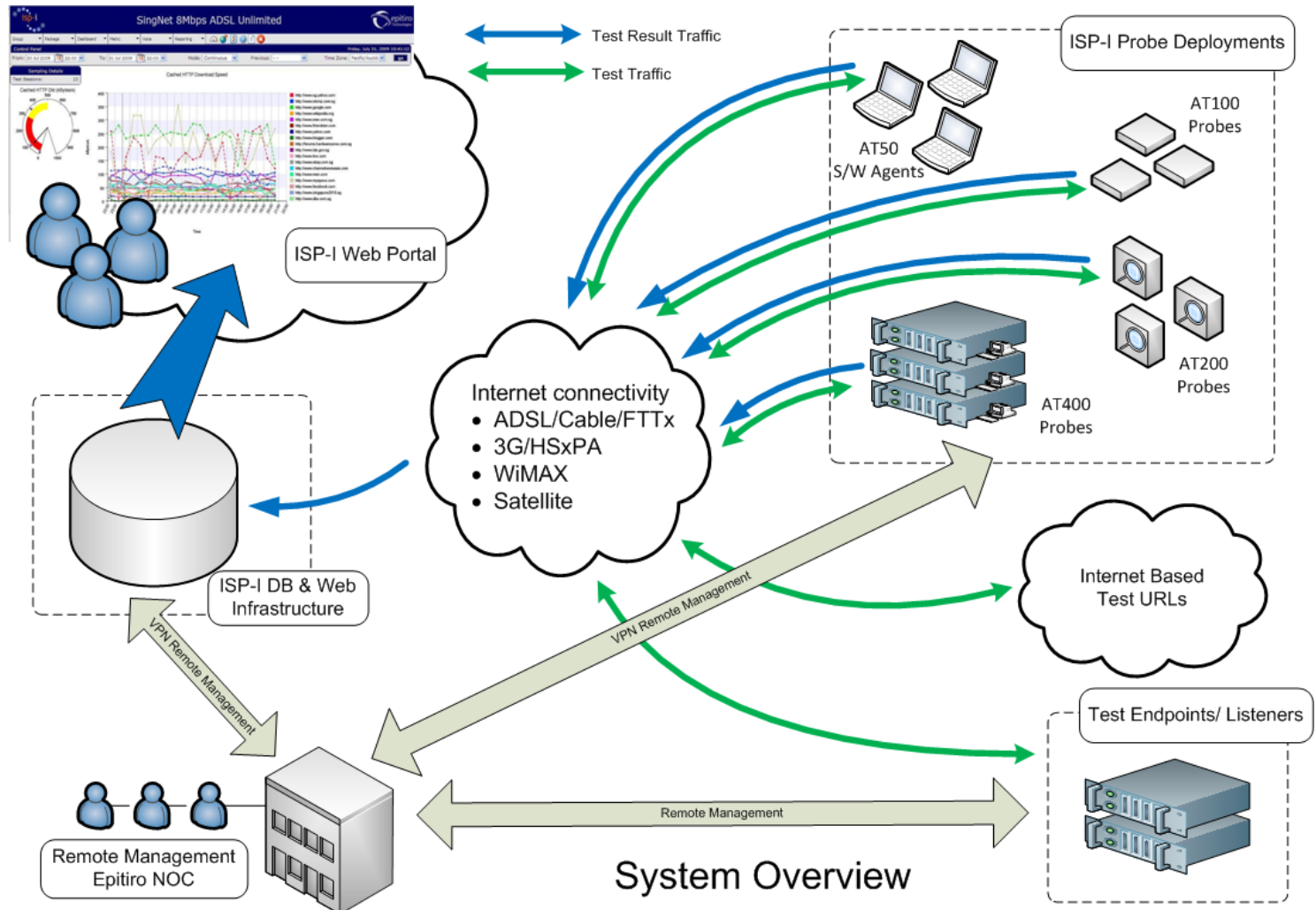
Fixed Broadband

1 Reporting

Fixed Broadband Analysis Report
01 October 2011 – 31 December 2011 between 00:00:00 and 24:00:00 Bahrain
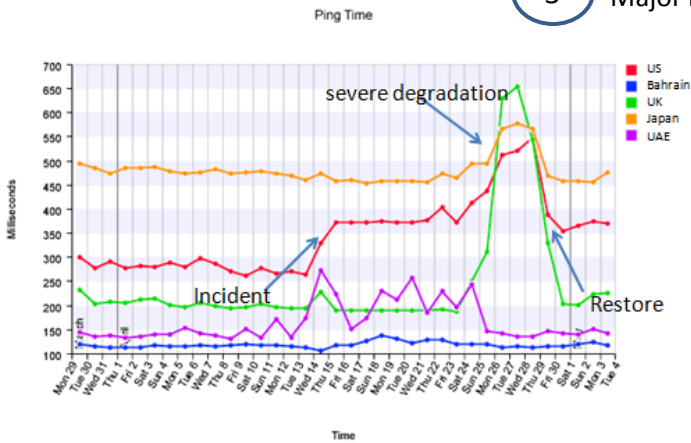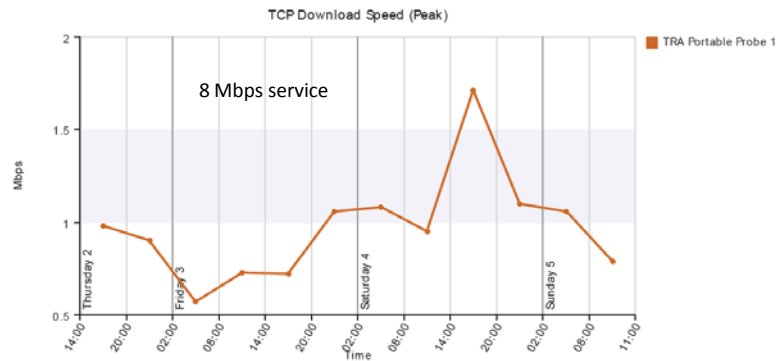
Published 15 January 2012

Public Document

2 Compliance

Upgrade

3 Major incident

Ping Time

severe degradation

Incident

Restore
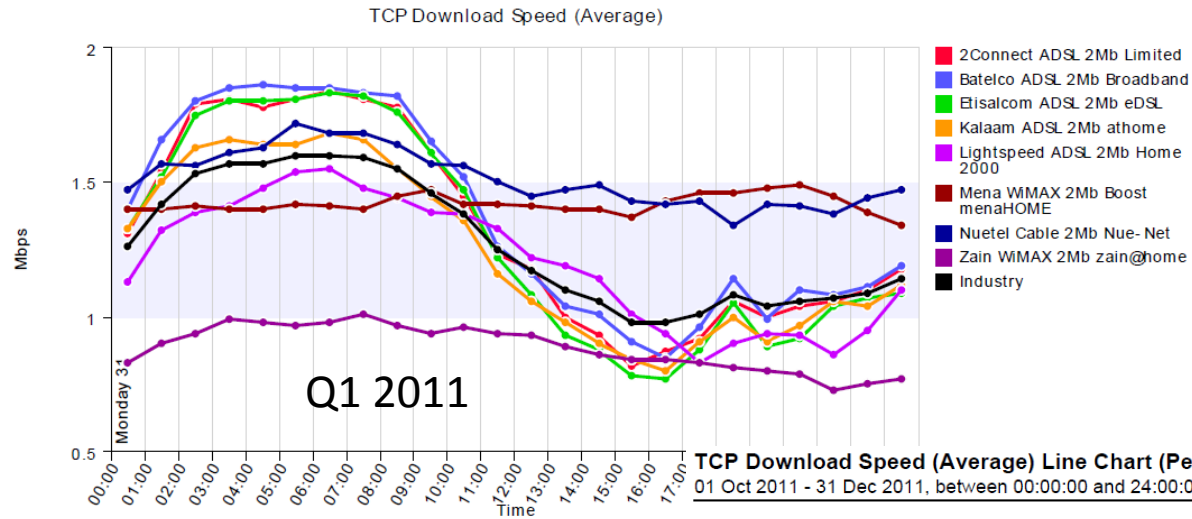
4 Investigation

TCP Download Speed (Peak)

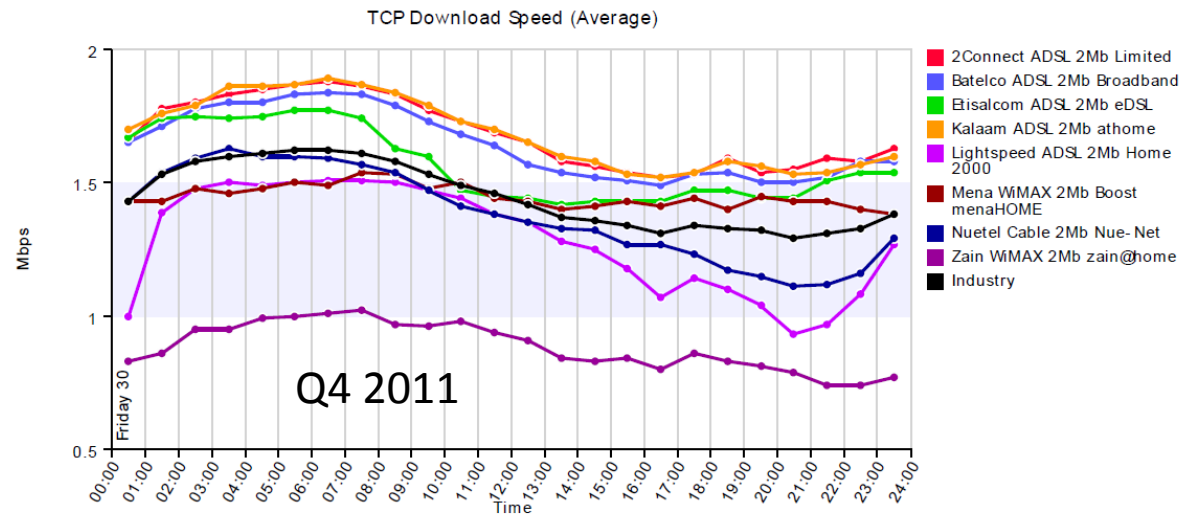8 Mbps service

Fixed Broadband

TCP Download Speed (Average) Line Chart (Peer view)
01 Feb 2011 - 31 Mar 2011, between 00:00:00 and 24:00:00 Asia/Bahrain

Q1 2011

Sample measurements

TCP download speed 24h average view

TCP Download Speed (Average) Line Chart (Peer view)
01 Oct 2011 - 31 Dec 2011, between 00:00:00 and 24:00:00 Asia/Bahrain
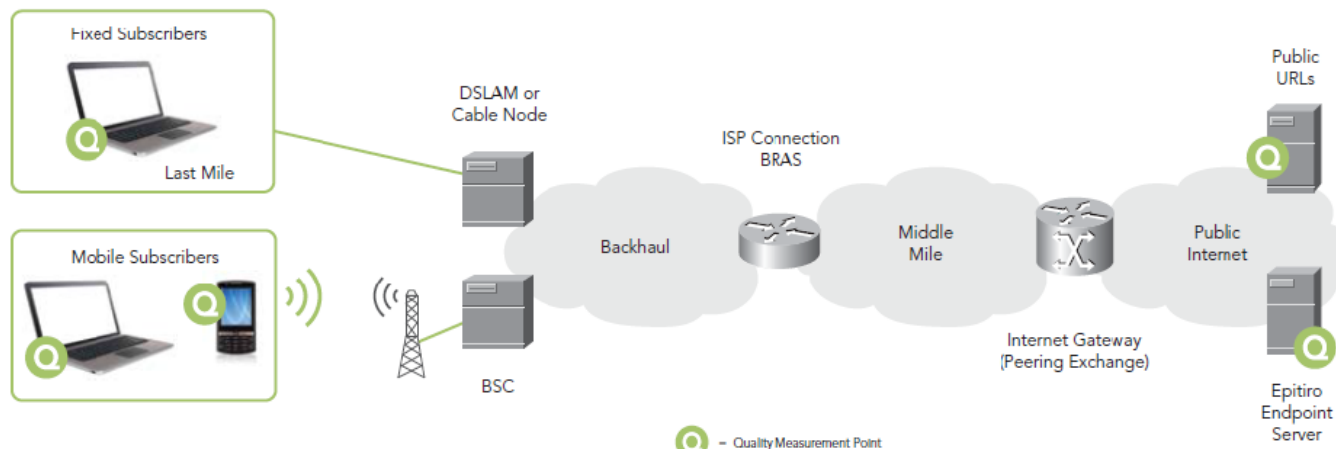

Q4 2011

Platform evolution

Hardware based to software

Customer Experience Measurement from end user devices: PC, laptop, tablet or smartphone

New flexible tools

Sample test measurements

Published reports

Market Information

Bahrain in Figures | Market Statistics | **Quality of Service (QoS)** | Surveys | Market

Indicators Report | Price Benchmarking

Page Tools

Protecting the interests of subscribers and consumers in respect of quality of service is one of the major duties of TRA as set in the telecommunications Law.

The TRA aims to maintain high level of quality of service delivered to customers in Bahrain, by monitoring key performance indicators (KPI) of licensed operators and publishing reports regularly on the quality of service of telecommunications services offered in Bahrain.

Link http://www.tra.org.bh/en/marketQuality.asp

Mobile Quality of Service Report
Mobile Quality of Service Report (2011). English

Mobile Quality of Service Report (2010). English

Mobile Networks Coverage Audit Report (2010) English

Fixed Broadband Quality of Service
Broadband Quality of Service Report (Q1 2012). English

Broadband Quality of Service Report (Q4 2011). English

Broadband Quality of Service Report (Q3 2011). English

Broadband Quality of Service Report (Q2 2011). English

Broadband Quality of Service Report (Q1 2011). English , Arabic.

Broadband Quality of Service Report (January 2011). English.

Broadband Quality of Service Report (October 2010). English.

Broadband Quality of Service Report (July 2010). English.

Internet Ecosystem
Bahrain Internet Ecosystem Report (December 2011). English

Bahrain Internet Ecosystem Report (June 2011). English

Bahrain Internet Ecosystem Report (December 2010). English

Bahrain Internet Ecosystem Report (July 2010). English

Bahrain Internet Ecosystem Report (August 2009). English

Shukran – Thank You

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