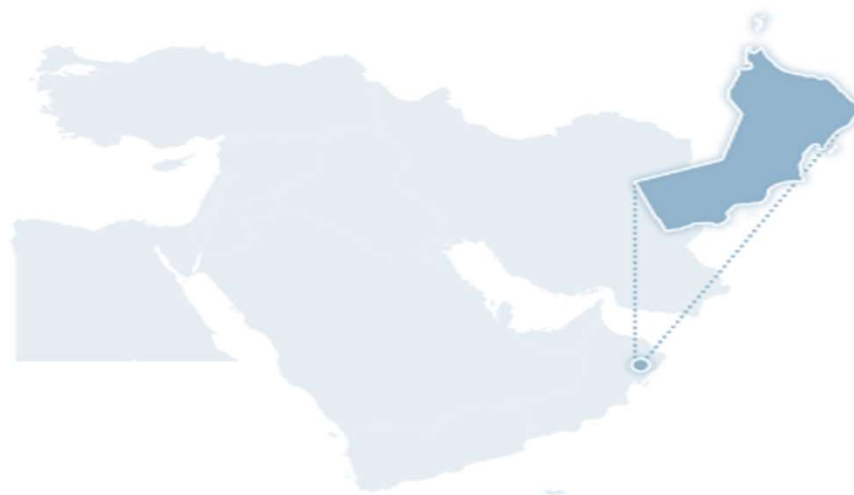




QoS Indicators Sub-group

EGTI / September 2020



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Introduction

- The EGTI-2019 meeting concluded and recommended that the QoS sub-group will extend its work for the 2020 to include more QoS indicators for fixed- and mobile-broadband.
- The sub-group conducted remote meeting on 27th of July 2020 including representatives of **Oman, Morocco, Ghana, LIRNEasia, and the ITU Secretariat**. Three Indicators have been agreed to study:
 1. Average Download/Upload Throughput: Fixed broadband and Mobile broadband
 2. Packet Latency
 3. Fault Resolution Period for FBB service
- Other countries and international institutions' methodologies have been incorporated in the study: **ETSI, GSMA, Bahrain, KSA, UAE, Seychelles**.

Average Download/Upload Throughput: Fixed broadband and Mobile broadband

➤ Definition:

The volume of data (in bits) uploaded/downloaded in one second. (Bits)

➤ Clarification on the Scope:

- The upload or download speed should be taken frequently in regular basis at different location and time, and then it will be averaged out to obtain the overall average percentage. In addition, the size of the downloaded file shall be big enough to give the peak performance of the network.
- **For Mobile:** The download/upload throughput for mobile should be measured for all mobile network technologies used to deliver broadband service using a mobile telecommunications network i.e. GSM, UMTS, LTE, 5G etc.
- **For Fixed:** The download/upload throughput for fixed should be measurable for all fixed network technologies, i.e. xDSL, WFBB, GPON, 5G, DTH Satellite etc.
- **Equation:** Upload/Download throughput = \sum transferred data volume (bits) / \sum timeframe (s).

Packet Latency

➤ **Definition:**

**The round trip time taken for a packet to reach its destination and return to the source.
(Millisecond)**

➤ **Clarification on the Scope:**

- The sample values taken at a any location will be averaged out to obtain the Network Latency for that location
- Then the Network Latencies at every user locations will be averaged out to obtain the overall Mean Packet Delay
- It can be measured for both local latency and international latency.
- It can be measured for both fixed and mobile.
- Recommended to ITU to collect only local latency since measurements of international latency can be influenced by other parameters beyond the control of operators (i.e., which international routes are used)”

➤ **Equation:** Average Packet Latency (ms) = \sum packet latency / Number of tests



Customer Fault Resolution Period for FBB Service

➤ **Definition:**

The average time in hours taken to clear customer fault reports. (Hours)

➤ **Clarification on the Scope:**

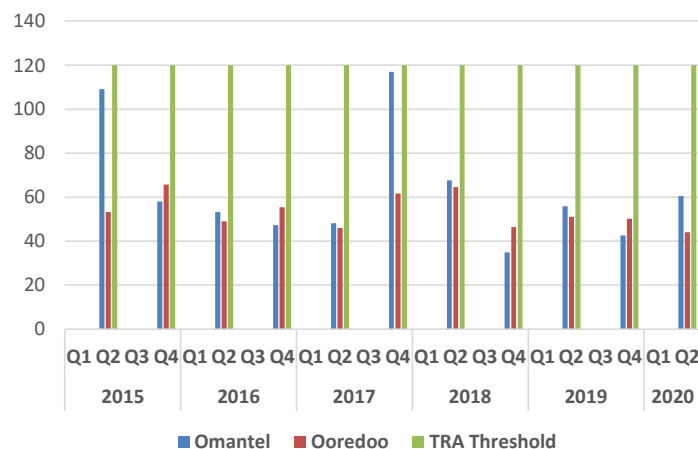
Measuring the duration from the instant a fault report has been notified by the End User (to the published point of contact of the Licensed Operator) to the instant when the service element or service has been restored to normal working order.

➤ **Equation:** $\frac{\sum \text{number of working hours taken for all faults cleared}}{\sum \text{number of faults}}$

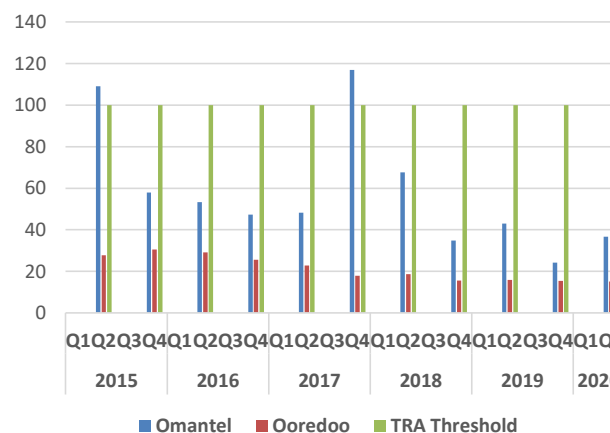
Country Example: Oman

- ❖ Telecom service providers of mobile and/or fixed, report their QoS achievements to TRA every quarter.
- ❖ QoS achievements are published by TRA on its website and on the service provider's websites and local newspapers.
- ❖ The value of the indicator is an aggregation of the entire network traffic during the course of the quarter.

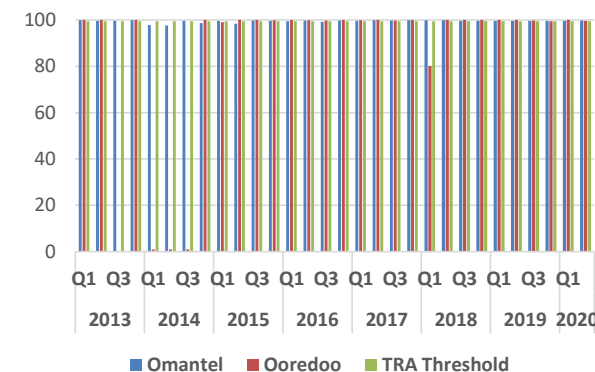
Packet Latency (mobile)



Packet Latency (fixed)



Percentage of faults cleared within 72 hours



The Way Forward

Further Discussion:

1. Should countries report based on one standard method of measurements?
2. Is there one best cost effective method countries can follow?

QoS measurement results are subjective to some common challenges:

- Interpretation by the service providers
- Technologies used for measurements
- Location of the contents : locally vs. internationally
- Time of measurements
- Regulator affordability for self-monitoring and auditing
- Regulator enforcement



The End

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