

# Smartphone based active testing for OTT service QoE evaluation and benchmarking with native services

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App Experience

Roaming and Interconnect

Professional Services

Quality of Service & Quality of Experience

Revenue Assurance

Interconnect Fraud Detection

**SIGOS**  
testing is our competence

# SIGOS Testing & Monitoring for Business Optimization



Quality of Service & Quality of Experience

## QoS & QoE Testing

- Multiple Use Cases with one platform; SITE
- Proactive Service Assurance
- With latest technologies

## App Experience

- Testing & Monitoring Apps
- Largest global device bank
- Used by over 600 enterprises & MNOs

## Roaming and Interconnect

- World's largest roaming test system
- GSMA 4G reference system
- #1 roaming rollout and services

## Fraud Management

- #1 fraud detection solution used
- Most innovative & certified solution
- Fastest fraud detection available

## Revenue Assurance

- Most comprehensive active RA
- Any stage, any tariff, any promo
- National and roaming RA

# OTT Apps – Most Popular Android Apps

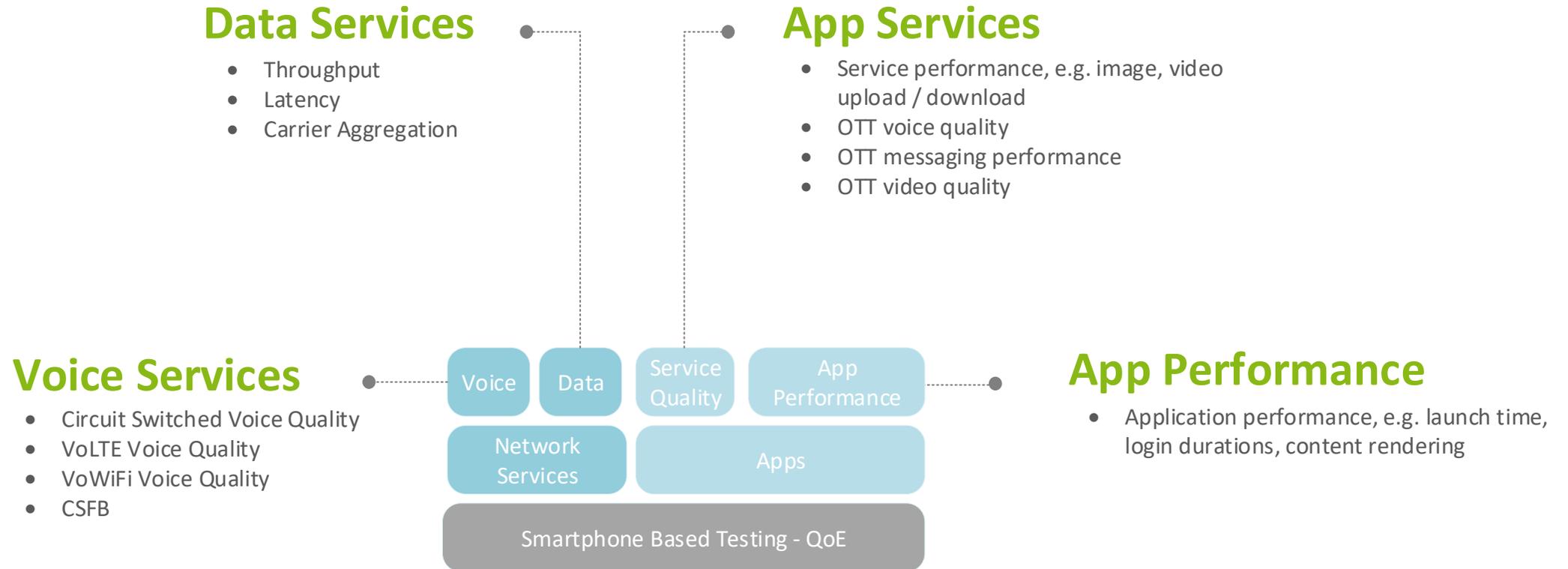
Quality of Service & Quality of Experience

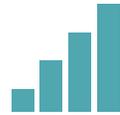
1 Facebook	4 Instagram	7 Twitter	10 Snapchat	13 Dropbox
2 Facebook Messenger	5 Skype	8 Clean Master	11 SHAREit	14 Line
3 WhatsApp	6 Subway Surfers	9 Candy Crush Saga	12 Facebook Lite	15 Viber

Top 15 most downloaded  
Android Apps:

- 5 are **Social Media Apps**
- 5 are **Communication Apps**

Data From: [androidrank.org](http://androidrank.org)





## OTT App Service Performance

- Reflects the service provided by the App
- KPIs: **voice quality, end-to-end message durations, file transfer durations**
- Associated more with **network** performance

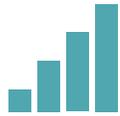


## OTT App Performance

- Reflects the performance of the App itself
- KPIs: **app launch time, login durations, layout matching**
- Associated more with the performance of the **device**

# Smartphone Based Testing – Test Scenarios

Quality of Service & Quality of Experience



## Smartphone Network Services

- **Voice Quality** –for CS Voice, VoLTE or VoWiFi
- **Messaging** - SMS
- **SpeedTest** – throughput and latency measurements
- **HTTP\_Download/Upload**



## OTT App Services

- **WhatsApp** – voice and messaging
- **Viber** – voice and messaging
- **Line** – voice and messaging
- **WeChat** – voice and messaging
- **Skype** – voice
- **YouTube** – video streaming
- **Instagram** – image upload
- **Facebook** – post status, post photo or video



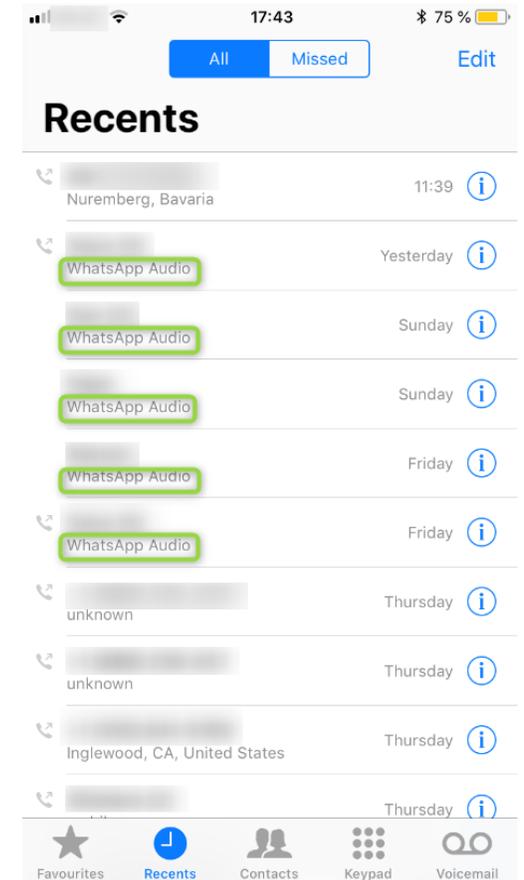
## OTT App Performance

- Depends on scenario and type of application
- Examples: login, element identification, navigation through menus

# Benchmarking with Native Voice Services

## Quality of Service & Quality of Experience

- The most popular communication apps provide also voice services
- Operators still have significant investments in supporting Voice, in particular with IMS services – VoLTE or VoWiF
- Users in most case do not know (or care) how the call is being made
- Understanding and Benchmarking Voice Service performance directly on Smartphone between OTT Apps and Native Service performance is essential



# Call Setup Durations

## Skype and Line

Highest OTT Call Setup Duration: 3,84 s

## VoWiFi

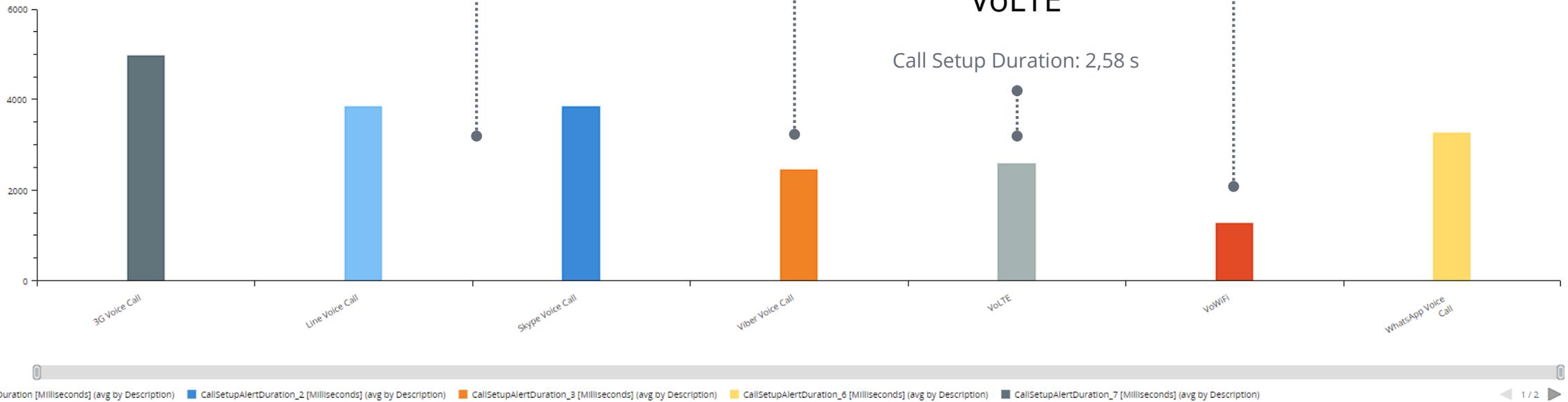
Call Setup Duration: 2,12 s

## Viber

Lowest OTT Call Setup Duration: 3,24 s

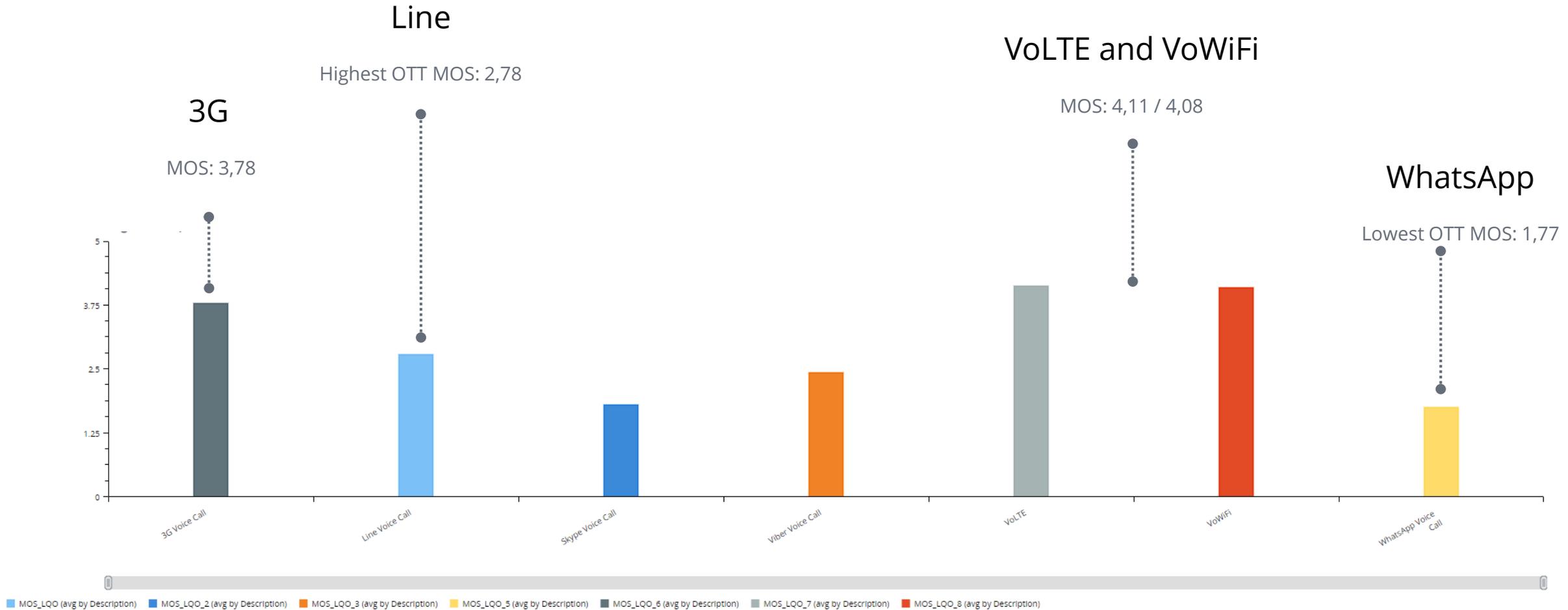
## VoLTE

Call Setup Duration: 2,58 s

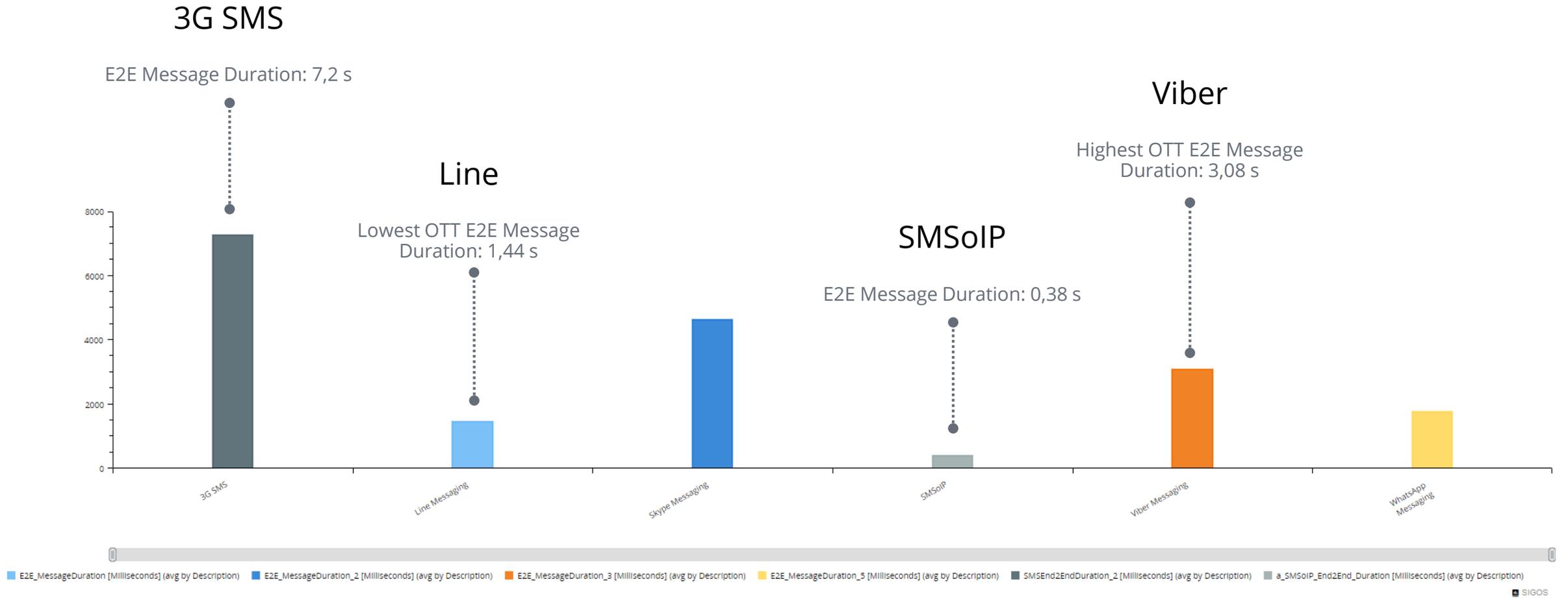


CallSetupAlertDuration [Milliseconds] (avg by Description) CallSetupAlertDuration\_2 [Milliseconds] (avg by Description) CallSetupAlertDuration\_3 [Milliseconds] (avg by Description) CallSetupAlertDuration\_6 [Milliseconds] (avg by Description) CallSetupAlertDuration\_7 [Milliseconds] (avg by Description)

# Voice Quality – MOS

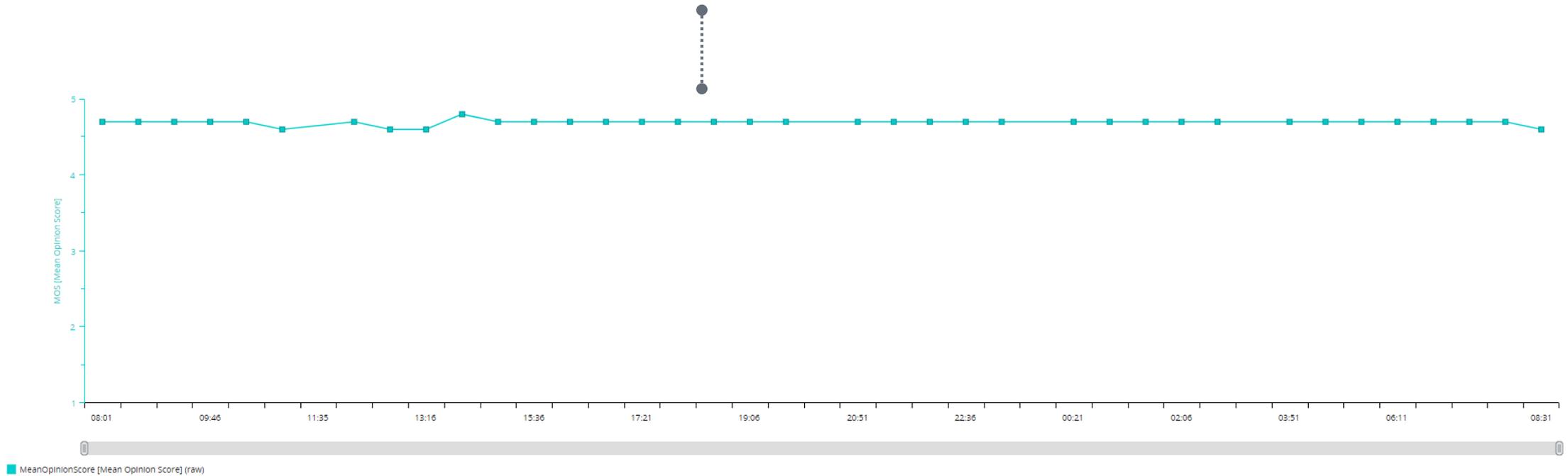


# E2E Message Durations

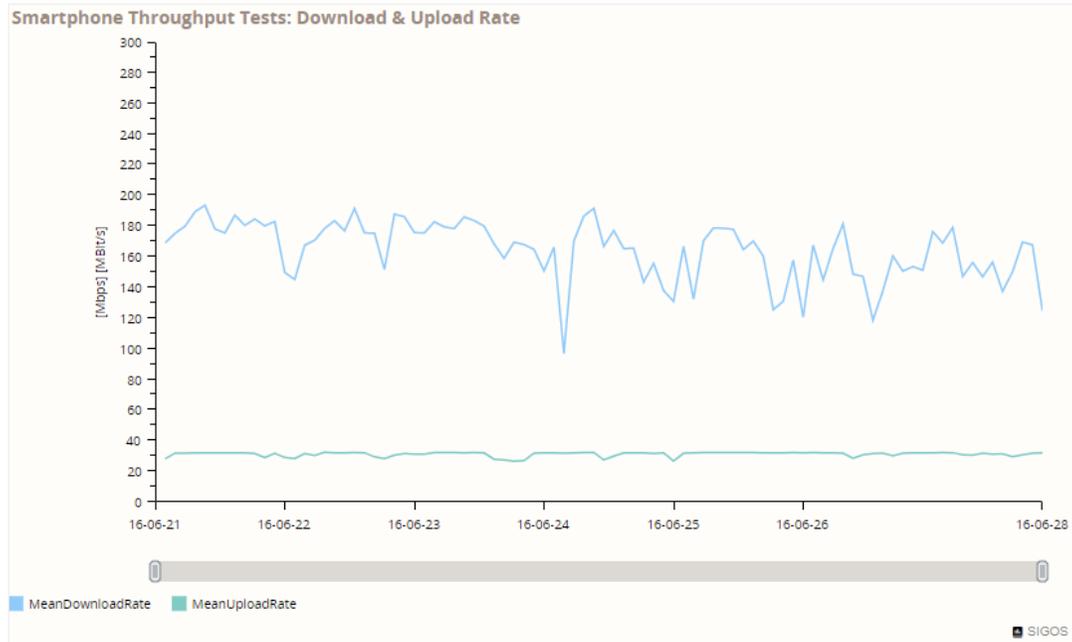


## YouTube App

MOS-B (measured on encrypted streams) - average 4,7



# Throughput Measurements

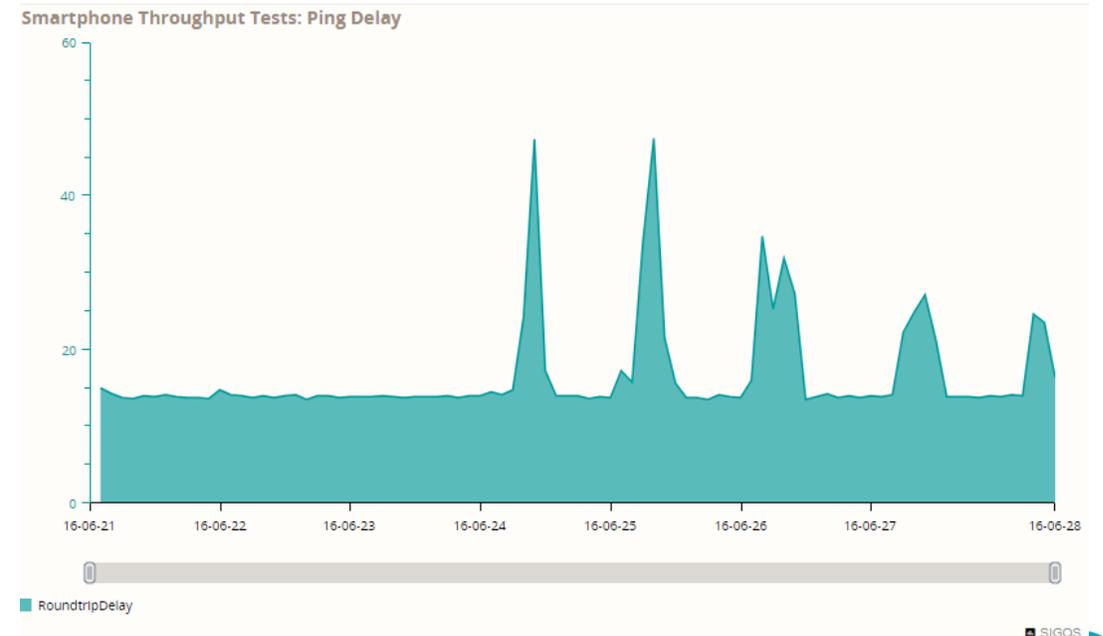


## SpeedTest App (LTE-A Network)

Max DL Throughput: 191Mbps

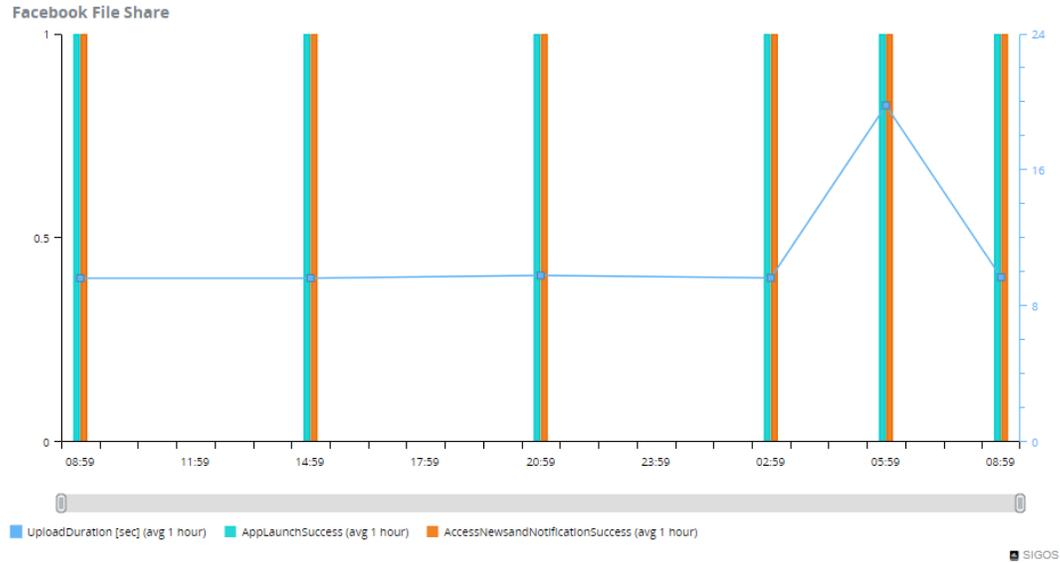
Max UL Throughput: 32Mbps

RTT Average: 15ms



# Facebook and Instagram – Image Sharing

Quality of Service & Quality of Experience



## Facebook App

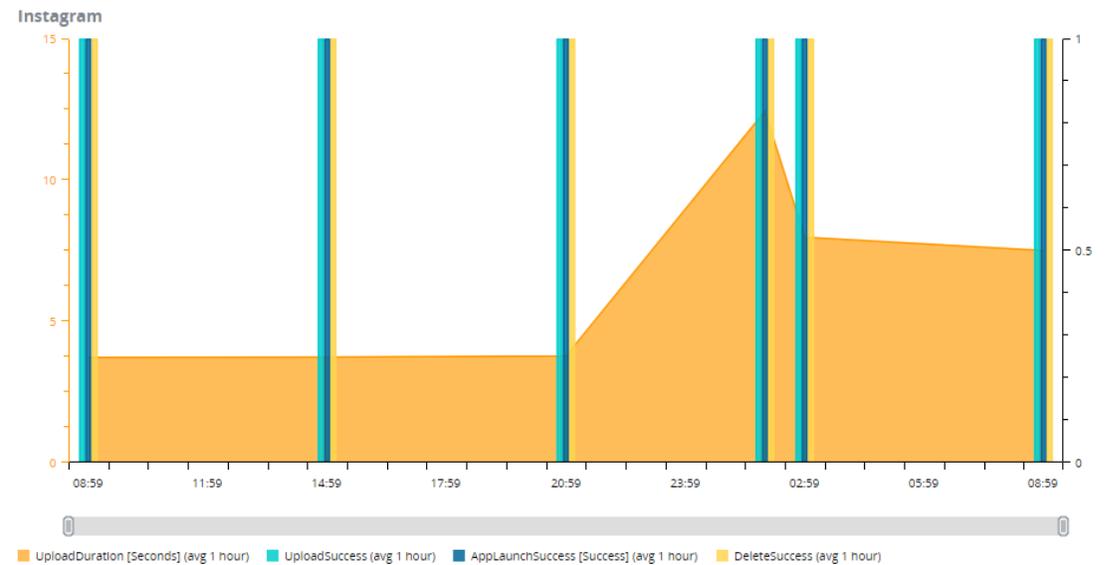
Scenario: Share Image on Timeline

Upload Duration: 9, 6 s

## Instagram App

Scenario: Share Image

Upload Duration: 6,5 s



- There are two levels that need to be evaluated to determine OTT App QoE:
  - App Service Performance
  - App Performance
- Many OTT Apps provide communication services – degradation in performance is typically associated with the network provider
- VoLTE and VoWiFi show better performance in Call Setup times and Voice Quality compared to OTTs – is this enough ?
- Integration in native dialers blurs the line between OTT and network provided service from the subscriber perspective
- OTT Apps provide additional value, e.g. cross-platform applications

# Thank you

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