

# تقرير مختصر عن نتائج قياس جودة خدمات شبكات المحمول عن شهر مايو 2020

إصدار 1 يوليو 2020

ملخص تقرير قياس مؤشرات جودة خدمات المحمول عن شهر مايو 2020 حودة خدمات الصوت

81 منطقة قياس

18

منطقة متأثرة

بلغ مجموع المناطق التي تم فيها تحسن الخدمة 18 منطقة من إجمالي 57 منطقة كانت تعانى من سوء

الخدمة في شهر إبريل، موزعة نسبتها وفقا للمشفلين كالتالي: 31% فودافون، 27% اورانج، 24% وي. 18% اتصالات.

بلغ مجموع الناطق التي لوحظ فيها تأثر في جودة خدمات الاتصالات 55 منطقة.

المناطق الجغرافية التي تم فيها رصد تأثر جودة الخدمات الصوتية لشبكات المحمول







رسم توضيحي "انفوجراف" لمؤشرات جودة الخدمات الصوتية المحمول في شهر مايو ٢٠٢٠





عدار 1 بوليو

سرعة تنزيل البيانات (Download)





سرعة تحميل البيانات (Upload)

من اجمالي 81 منطقة قياس على مستوى الجمهورية تم رصد تعيز لشركة اورانج في 45 منطقة، بينما تميزت شركة اتصالات في 29 منطقة، وشركة وي في 7 مناطق.

جميع السرعات بوحدة ميجابت/ثانية Mbps







رسم توضيحي "انفوجراف" لمؤشرات جودة خدمات البيانات المحمول في شهر مايو ٢٠٢٠



- في إطار حرص الجهاز القومي لتنظيم الإتصالات على تحسين جودة خدمات الاتصالات المقدمة للمواطنين؛ أصدر اليوم المركز القومي لمراقبة جودة خدمات الاتصالات التابع للجهاز القومي تقريره لنتائج قياسات شهر مايو لجودة خدمات الصوت والانترنت المقدمة من شركات الاتصالات العاملة في مصر؛ حيث تم اجراء اختبارات جودة الخدمة خلال الشهر لما يقرب من 26 الف كيلو متر من المناطق المأهولة بالسكان في جمهورية مصر العربية، والمقسمة إلى ما يقرب من 81 مدينة وحي؛ حيث تمت القياسات لخدمات الصوت والبيانات بإجراء مئات الآلاف من المكالمات الاختبارية بالإضافة إلى اختبارات خدمات البيانات للمحمول.
  - يتم تقييم جودة الخدمات الصوتية وفقا للمعايير الدولية والتي من أهمها:
  - O مؤشر عدم بدء المكالمة (Call block) وهو يعبر عن عدم قدرة العميل على بدء المكالمة الصوتية.
    - مؤشر انقطاع المكالمة (Call drop) وهو يعبر عن انقطاع الخط اثناء المكالمة الصوتية.
  - O مؤشر جودة صوت الكالمة ( Voice quality) وهو يعبر عن متوسط مستوى جودة الصوت اثناء المكالمة الصوتية.
    - فيما يتم تقييم جودة اختبارات خدمات البيانات للمحمول وفقا لمعايير أهمها :
    - O سرعة تنزيل البيانات (Download Throughput) وهي سرعة تنزيل المحتوى من الشبكة للعميل.
    - سرعة تحميل البيانات (Upload Throughput) وهي سرعة تحميل المحتوى من العميل الى الشبكة.



فيا يلي اعداد المناطق (مدن وأحياء) التي تم رصد انها تعاني من مشاكل في جودة الخدمات الصوتية في شهر مايو:

- لشركة فودافون: من أصل (81) مدينة وحي تم اجراء اختبارات القياس عليهم تم رصد عدد (8) مدينة وحي تعاني من تأثر في مؤشر عدم بدء المكالمات، من أهمها مصر الجديدة والعباسية في القاهرة، ومن حيث عدم أكتال أو انقطاع المكالمات عدد (1) مدينه وحي وأهمها في القاهرة مدينتي، ومن حيث جوده صوت المكالمات عدد (7) مدينه وحي أهمها في القاهرة الرحاب و في الاسكندرية مناطق غرب الاسكندرية.
- ولشركة اورانج: من أصل (81) مدينة وحي تم اجراء اختبارات القياس عليهم تم رصد عدد (22) مدينة وحي تعانى من تأثر في مؤشر عدم بدء المكالمات، من أهمها العبور والرحاب ومصر الجديدة والسام في القاهرة والسادس من اكتوبر والشيخ زايد في الجيزة، وفي الإسكندرية، مناطق في شرق وغرب الاسكندرية ومرسى مطروح، ومن حيث جوده صوت المكالمات عدد (11) مدينه وحي أهمها عين شمس في القاهرة ومناطق في شرق وغرب الاسكندرية.
- ولشركة اتصالات: من أصل (81) مدينة وحي تم اجراء اختبارات القياس عليهم تم رصد عدد (20) مدينة وحي تعانى من تأثر في مؤشر عدم بدء المكالمات، من أهمها مدينتي والعبور والعبور ومدينة نصرو المنيلو شبرا وشبرا الخيمة و المقطم في القاهرة والساحل الشهالي، ومن حيث عدم أكتال أو انقطاع المكالمات عدد (6) مدينه وحي وأهمها مدينتي والعبور والمنيل في القاهرة.
- ولشركة وي: من أصل (81) مدينة وحي تم اجراء اختبارات القياس عليهم تم رصد عدد (33) مدينة وحي تعانى من تأثر في مؤشر عدم بدء المكالمات، من أهمها مدينتي والمعبور والعبور والرحاب ومدينة نصر والعباسية وشبرا وشبرا الخيمة وحلوان والمعادي والمقطم في القاهرة، وفي الجيزة الشيخ زايد وفي الإسكندرية مناطق في شرق وغرب الإسكندرية ، ومن حيث عدم أكتال أو انقطاع المكالمات عدد (3) مدينه وحي وأهمها في القاهرة مدينتي، ومن حيث جوده صوت المكالمات عدد (5) مدينه وحي وأهمها في القاهرة مدينتي، ومن حيث جوده صوت المكالمات عدد (5) مدينه وحي أهمها في الخيزة .



#### <u> جودة خدمة البيانات :</u>

- بالنسبة لسرعة تنزيل البيانات يتضح من التقرير التفصيلي أنه من اجالي 81 منطقة قياس على مستوى الجمهورية تم رصد تميز لشركة اورانج في 22 منطقة وبلغ متوسط منطقة وبلغ متوسط السرعة لشركة اورانج على مستوى الجمهورية 32 ميجا بيت في الثانية، بينا تم رصد تميز لشركة فودافون في 7 مناطق وبلغ متوسط السرعة لشركة السرعة لشركة اتصالات على مستوى الجمهورية 28 ميجا بيت في الثانية، و تم رصد تميز لشركة وي في منطقة واحدة وبلغ متوسط السرعة لشركة وي على مستوى الجمهورية 22 ميجا بيت في الثانية، و تم رصد تميز لشركة وي في منطقة واحدة وبلغ متوسط السرعة لشركة وي على مستوى الجمهورية 24 ميجا بيت في الثانية
- ويأتي هذا التقرير في إطار متابعة الجهاز القومي لتنظيم الاتصالات لجودة الخدمات المقدمة من مشغلي شبكات الاتصالات في السوق المصري للمستخدمين ورفع وعي المستخدمين بمؤشرات جودة هذه الخدمات.
  - وفيما يلي قائمة بالمناطق التي تم رصد بها تحسن أو سوء للخدمة حسب كل مشغل ومنطقة جغرافية:

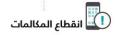




#### تقرير جودة خدمة شركة فودافون

شهر مایو ۲۰۲۰

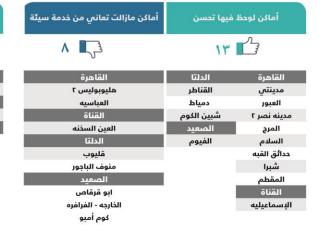






أماكن مازالت تعاني من خدمة سيئة	أماكن لوحظ فيها تحسن
V 3	٣ 🖺
الاسكندرية	القاهرة
غرب ۲	مدينتي
القاهرة	الدلتا
الرحاب	دمياط
القناة	الصعيد
القنطره	إسنا
الدلتا	
دمنهور	
دسوق	
ve all	

أماكن مازالت تعاني من خدمة سيئة	أماكن لوحظ فيها تحسن
1	٤ 📑
القاهرة	القاهرة
مدينتي	المعادي
	القناة
	العين السخنه
	الدلتا
	بنها القناطر



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ابو قرقاص

نجع حمادی - فرشوط





#### تقرير جودة خدمة شركة أورنج

شهر مایو ۲.۲۰







أماكن مازالت تعانى من خدمة سيئة

أماكن لوحظ فيها تحسن

أماكن مازالت تعانى من خدمة سيئة

الصعيد ابو قرقاص أماكن لوحظ فيها تحسن



أماكن لوحظ فيها تحسن











15	13

الجيزة	الاسكندرية
٦ اكتوبر ١	شرق ا
٦ اكتوبر ٢	شرق ه
الشيخ زايد ٢	غرب ا
الصعيد	غرب ۲
الواسطه	مرسي مطروح
ابو قرقاص	القاهرة
الخارجه- الفرافره	العبور
قنا	الرحاب
إسنا	هلیوبولیس ۲
الأقصر	السلام
	القناة
	العين السخنه
	الدلتا
	فقوس
	طنطا- المحله
	دمياط

الجيزة	سكندرية
الشيخ زايد ا	غرب ا
الهرم	غرب ۲
الصعيد	لقاهرة
بني سويف	التجمع
طهطا أخميم	ینه نصر ۲
نجع حمادي - فرشوط	لعباسيه
	حلوان ۲
	القناة
	سماعيلية

الدلتا كفر الدوار شبين الكوم

0	
0	3

الاستدري	الاستندرية	
شرق ۳	شرق ا	
شرق ٤	الدلتا	
شرق ه	كفر الدوار	
غرب ۲	السينبلاوين	
الساحل الشم	دمياط	
القاهرة	الصعيد	
عين شمس	الواسطه	
القناة		

بمالي

بورسعيد دلتا

كفر الزبات طنطا- المحله

الصعيد كفر الشيخ ابو قرقاص

مايو ۲.۲.

تقرير جودة الخدمة

الجهاز القومى لتنظيم الاتصالات





#### تقرير جودة خدمة شركة اتصالات

شهر مایو ۲۰۲۰







أماكن مازالت تعاني من خدمة سيئة	أماكن لوحظ فيها تحسن
٣ 🎝	٤ 🖒
الدلتا	الدلتا
قليوب	قليوب
كفر الزيات	شبين الكوم
الصعيد	الجيزة
سينيورس ترسا	السادس من اكتوبر ٢
50° 50° 100° 100° 100° 100° 100° 100° 10	الصعيد
	الواسطه



ي من خدمة سيئة	أماكن مازالت تعان	أماكن لوحظ فيها تحسن
۲٠	Ŗ	٧ 🖺
الدلتا	الاسكندرية	القاهرة
فقوس	الساحل الشمالي	شبرا
كفر الزيات	القاهرة	الزمالك
الصعيد	مدينتي	المعادي
منوف الباجور	العبور	الدلتا
شبين الكوم	مدینه نصر ا	قليوب
الفيوم	المنيل	المنصوره
سينيورس ترسا	شبرا	السينبلاوين
الواسطه	شبرا الخيمه	الصعيد
طهطا أخميم	المقطم	ابو قرقاص
الخارجه- الفرافره	القناة	
إسنا	فايد ابو سلطان	
	القنطره	

الجهاز القومي لتنظيم الاتصالات | تقرير جودة الخدمة | مايو ٢٠٢٠



أماكن مازالت تعانى من خدمة سيئة

قليوب

كفر الزيات الجيزة

فيصل

الصعيد

سينيورس ترسا الواسطه

0



#### تقرير جودة خدمة شركة وي

شهر مایو ۲۰۲۰



مدينتي العين السخنه الدلتا الدلتا قليوب بنها الصعيد كفر الزيات الواسطه

أماكن لوحظ فيها تحسن

الحبزة

٦ اکتوبر ٢

أماكن مازالت تعانى من خدمة سيئة

أماكن لوحظ فيها تحسن ۳ **آ** 

القناة القاهرة

انقطاع المكالمات

فشل الاتصال

أماكن مازالت تعانى من خدمة سيئة أماكن لوحظ فيها تحسن

القنطره

العين السخنه

mm 3

الخارجه- الفرافره

إسنا

أسوان

, ,	7	1 • 3
الدلتا	الاسكندرية	الاسكندرية
قليوب	شرق ۲	شرق ۳
فقوس	شرق ه	القاهرة
كفر الزيات	غرب ا	هليوبوليس ٢
دسوق	الساحل الشمالي	حدائق القبه
كفر الشيخ	القاهرة	المنيل
دمياط	مدينتي	الزمالك
رأس البر	العبور	حلوان ۲
منوف الباجور	الرحاب	الصعيد
الجيزة	مدینه نصر ۲	ابو قرقاص
الشيخ زايد ٢	العباسيه	المنيا
الصعيد	شبرا	الدلتا
الفيوم	شبرا الخيمه	طنطا- المحله
سينيورس ترسا	حلوان ۱	السينبلاوين
بني سويف	المعادي	
الواسطه	المقطم	
طهطا أخميم	القناة	

مايو ۲۰۲۰ | تقرير جودة الخدمة الجهاز القومى لتنظيم الاتصالات



## **Benchmarking Report No. 11**

MAY 2020

### **AGENDA**

#### 1. Quantitative Information

- 2. Voice Service Quality & Performance Cairo
- 3. Data Service Quality & Performance Cairo
- 4. Voice Service Quality & Performance Giza
- 5. Data Service Quality & Performance Giza
- 6. Voice Service Quality & Performance Alexandria
- 7. Data Service Quality & Performance Alexandria
- 8. Voice Service Quality & Performance Delta
- 9. Data Service Quality & Performance Delta
- 10. Voice Service Quality & Performance Canal
- 11. Data Service Quality & Performance Canal
- 12. Voice Service Quality & Performance Upper Egypt
- 13. Data Service Quality & Performance Upper Egypt
- 14. Annexes

## **Executive Summary**

Due to the fact that **NTRA** in **Egypt** is concerned about maintaining the highest standards of the quality of the network and getting the market insight about how operators are performing in the market from a **QoS/QoE** perspective. **NTRA** along with Rohde and Schwarz carried out an extensive benchmarking survey of the Mobile networks in **Egypt** with focus on the performance of the four operator's network.

The full scope of measurements performed covers **Egypt** on monthly basis. Measurement is divided over seven main regions, Cairo, Giza, Alexandria, Delta, Canal, Red Sea and Upper Egypt. Each area is consisting of some clusters that will be measured during each month. And the results of each month will be discussed on this presentation.

This presentation gives a summary view of **May-20** measurements that took place in May 2020 for **Egypt** as defined in later slides of this presentation, during this survey, a distance of ~ **26,000 KM's** were driven. All measurements were done in Window time from 8AM to 8PM.

This presentation addressed 2nd, 3rd and 4th generation mobile networks (2G,3G,4G) for the Four licensees **Etisalat, Orange, Vodafone** and **WE** (sorted alphabetically) in outdoors measurements. Key performance indicators used in the survey are included in Annexes slides at the end of this presentation. For this campaign, Mobile to Mobile voice scenario approach was followed to better represent customer experience in a modernized manner.

## **Quantitative Information**

Voice Measurements	Number of Tests
Total Number of Voice Calls	63,532

Data Measurements	Number of Tests
HTTP Download	68,115
HTTP Upload	68,038
HTTP Browsing - Facebook	67,855
HTTP Browsing – Twitter	67,671
HTTP Browsing – Google	67,971
HTTP Browsing – YouTube	67,901
HTTP Browsing – Yahoo	67,707
YouTube - Video Stream	67,428
Total Ping Attempts	3,434,159

## Methodology

**NTRA** has preformed drive test that cover all governorates and major highways across the country. The tests were in same time and condition for the four operators to ensure fair comparison.

**NTRA** measures the major "key performance indicators" (**KPI**) that directly relate to the public's experience through Outdoor (in-car user experience). These include block, dropped calls, voice quality, data throughput. (all details will be found on annexes slides)

The drive test results represent a snapshot of the mobile service provider's network in-car user experience and using a particular type of smartphones to simulate end user. The reported level of service quality may therefore not be exactly comparable with the consumer's own experience;

The threshold for each **KPI** in license is mentioned in the legend of each graph. (and it is included in the annexes slides) For better understand the results in reference to the threshold value:

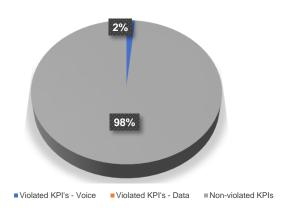
- Every result exceeds the threshold value is considered as a violation to the license terms for Voice KPI's.
- Every result exceeds the threshold value is considered as a violation to the license terms for Data KPI's except for Download Throughput and Upload throughput.
- **Download Throughput** and **Upload throughput** violation counted when the result is lower than the threshold value.
- We Denotes the violations where penalties are applied as dashed Dark RED Line
- · We Denotes the violations where penalties are not applied as Solid Black Line



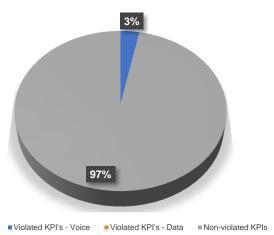


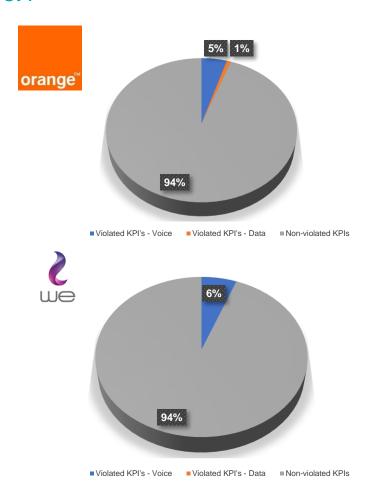
#### Licensed-KPI's Violation Percentage over Egypt (32 zones \* 8 KPIs in license = 256 possible violations)







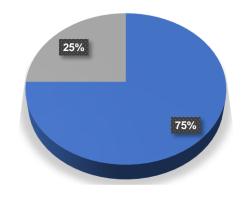




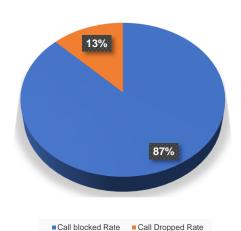
#### Licensed-KPI's Violation Percentage over Egypt



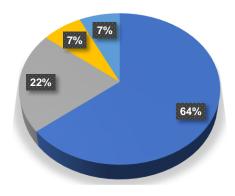
اتصالات etisalat





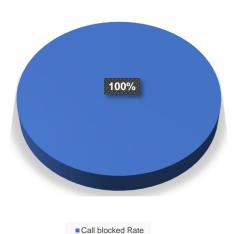




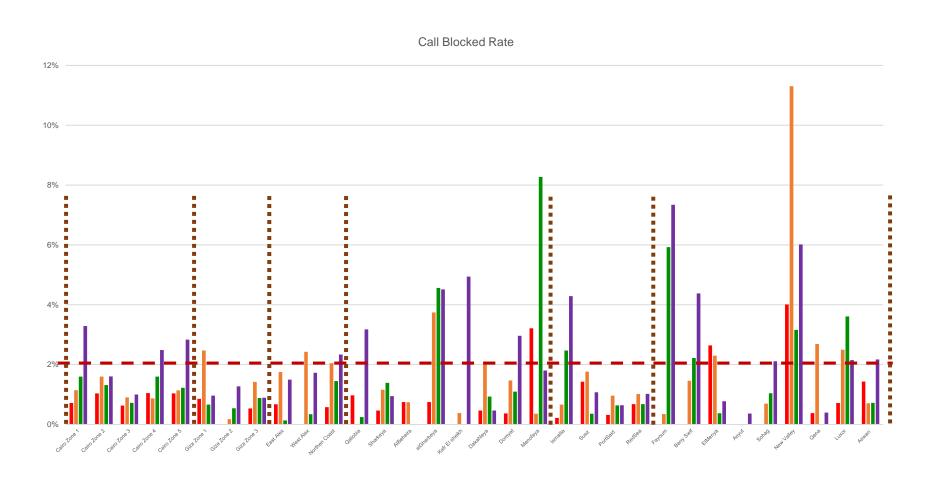


■Call blocked Rate ■ MOS < 2.8 ■ SBR DL ■ SBR UL



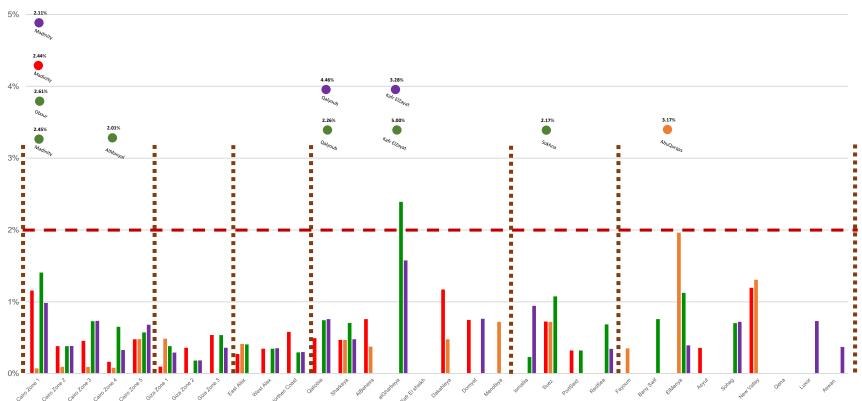


#### Call Blocked Rate - Zones

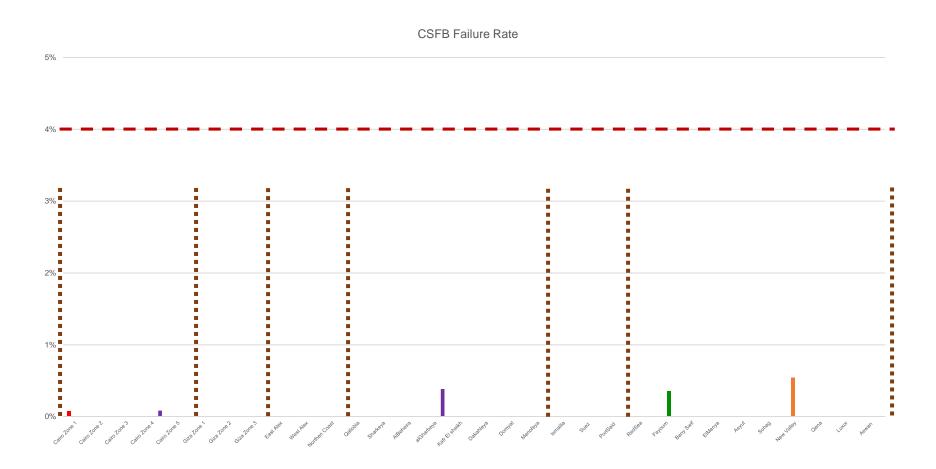


#### Call Dropped Rate - Zones

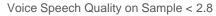


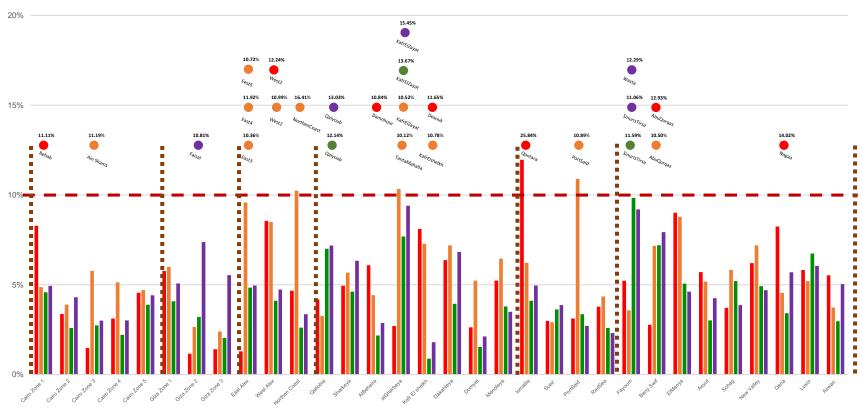


#### **CSFB** Failure Rate - Zones

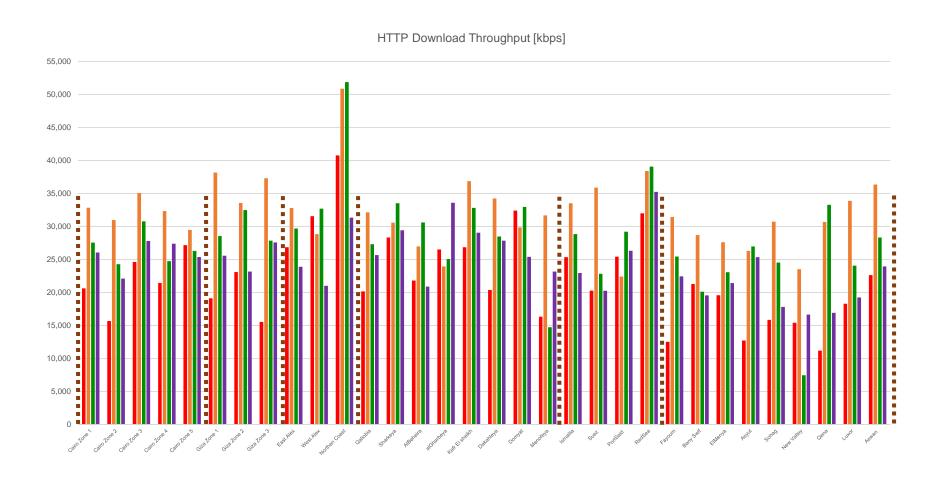


#### Voice Speech Quality - Zones

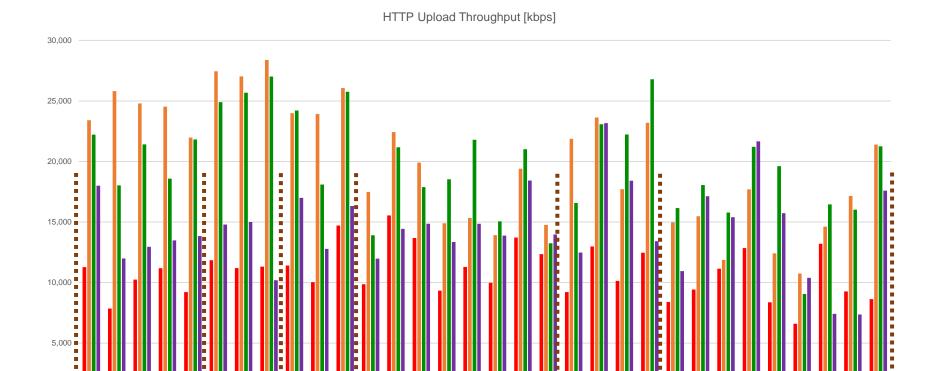




#### Download Throughput [kbps] - Zones



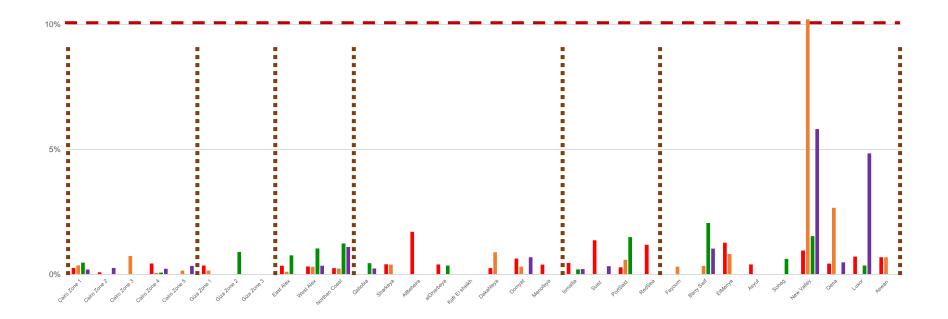
#### Upload Throughput [kbps] - Zones



#### Download Session Blocked Ratio - Zones

Download Session Block Ratio

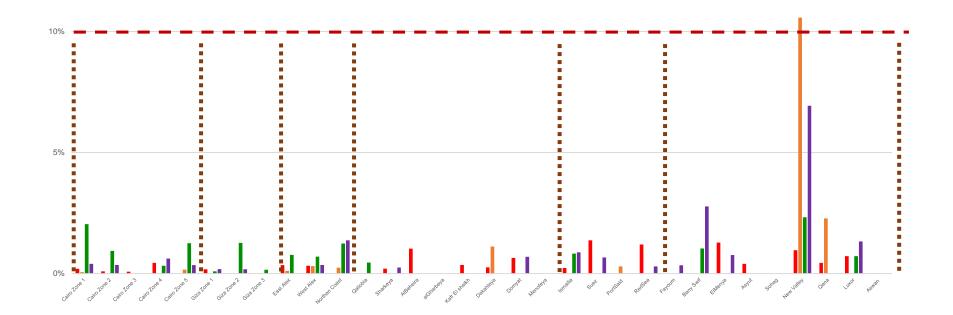




#### Upload Session Blocked Ratio - Zones

Upload Session Failure Ratio

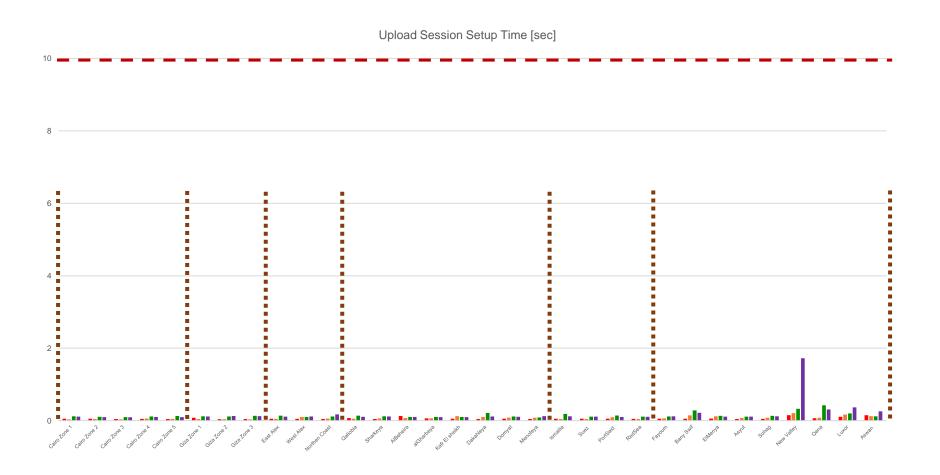




#### Download Session Setup Time - Zones



#### Upload Session Setup Time - Zones



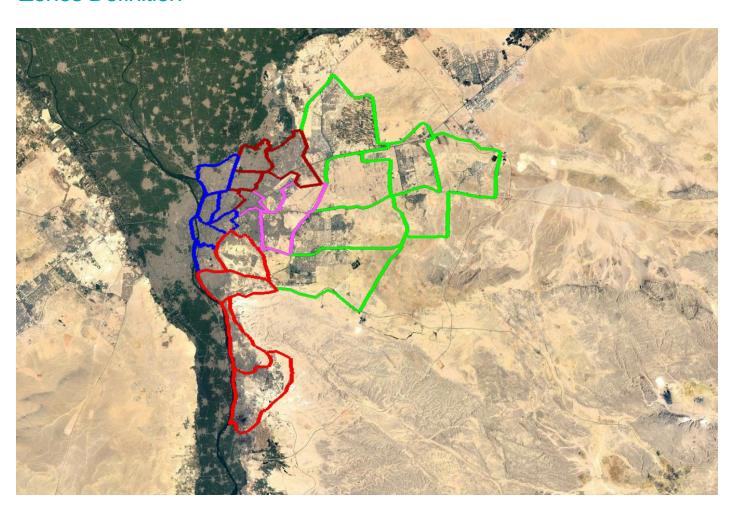
## **AGENDA**

1. Quantitative Information

#### 2. Voice Service Quality & Performance - Cairo

- 3. Data Service Quality & Performance Cairo
- 4. Voice Service Quality & Performance Giza
- 5. Data Service Quality & Performance Giza
- 6. Voice Service Quality & Performance Alexandria
- 7. Data Service Quality & Performance Alexandria
- 8. Voice Service Quality & Performance Delta
- 9. Data Service Quality & Performance Delta
- 10. Voice Service Quality & Performance Canal
- 11. Data Service Quality & Performance Canal
- 12. Voice Service Quality & Performance Upper Egypt
- 13. Data Service Quality & Performance Upper Egypt
- 14. Annexes

#### **Zones Definition**

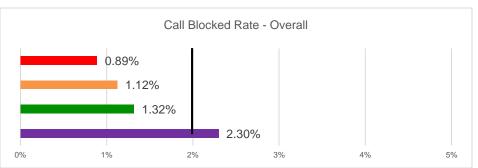


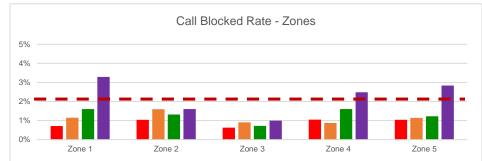
Cairo	
Cairo Z1	Madinity
	Obour
	Rehab
ပ္မ	Sherouk
	Tagamoaa
2	Heliopolis 1
Cairo Z2	Heliopolis 2
ai	Nasr City 1
0	Nasr City 2
_	Ain Shams
Ñ	ElMarg
Cairo Z3	ElSalam
ပိ	Qobba Gardens
	Abbasia
Z4	AlManyal
2	Shobra
Cairo Z4	Shobra ElKhamia
	Zamalek
55	Helwan 1
0.2	Helwan 2
Cairo Z5	Maadi
	Mokattam



#### Accessibility: Call Blocked Rate

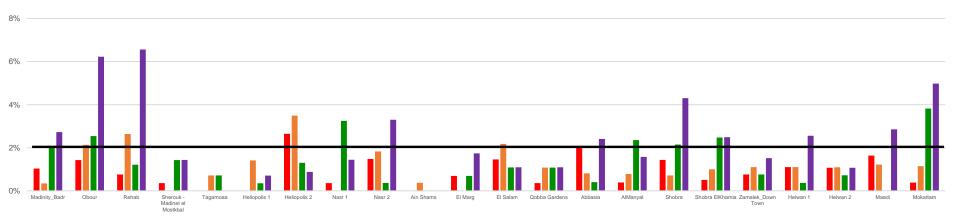






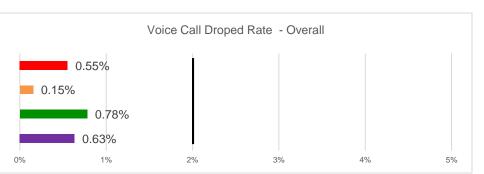
Call Blocked Rate represents the ratio between unsuccessful call attempts and all calls made (both successful & unsuccessful).

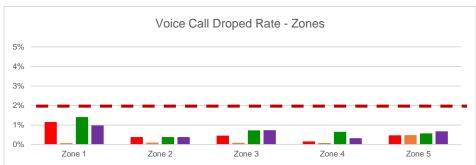




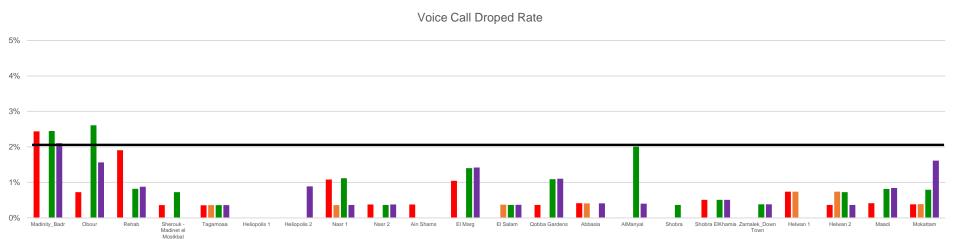
#### Retainability: Call Dropped Rate







Voice Call Retainability is represented by call drop rates.



#### Accessibility: CSFB Failure Rate [%]

Madinet el







**CSFB Failure Rate** represents the ratio between unsuccessful fall back attempt to lower technology than 4G (LTE) and all calls made (both successful & unsuccessful). When there is 4G (LTE) present before starting the session.

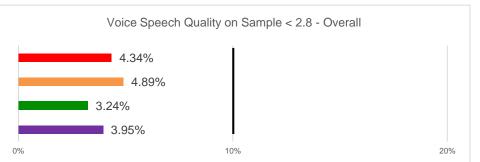


Shobra Shobra ElKhamia Zamalek\_Down Helwan 1

#### Speech Quality: MOS Voice Speech Quality < 2.8



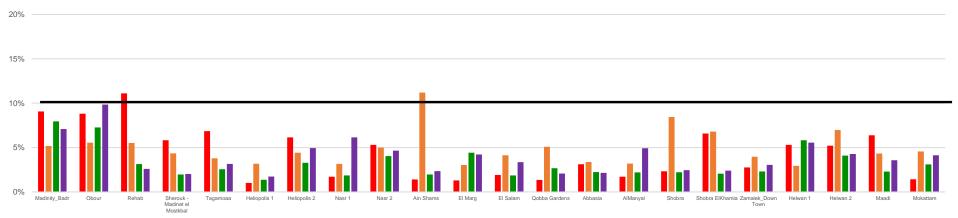






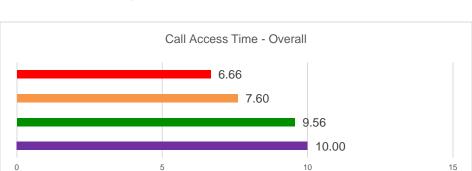
MOS Voice Speech Quality < 2.8 represents the ratio between total number of MOS samples less than 2.8 all collected MOS samples





#### Accessibility: Call Access Time [sec.]

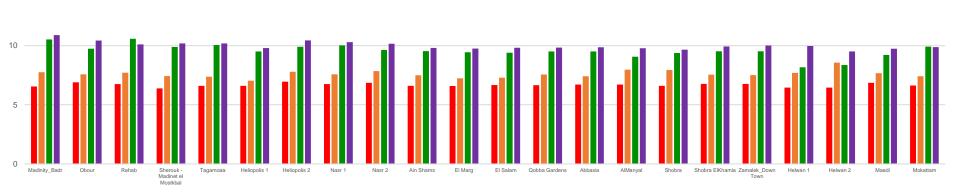






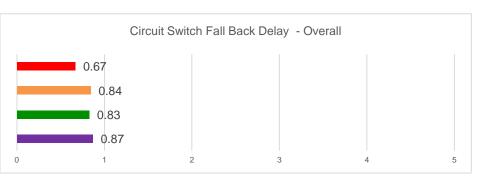
**Call Access Time** represents the period of time elapsed from the sending of a complete destination address (target number) to the setting up of a call to the receiving terminal.

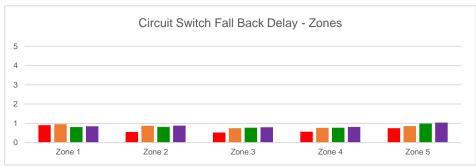
Call Access Time



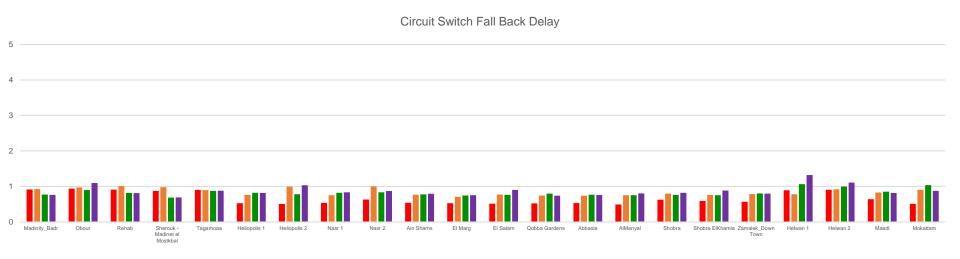
## Accessibility: CSFB Delay [sec.]



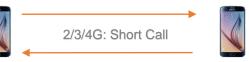


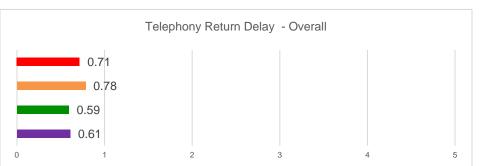


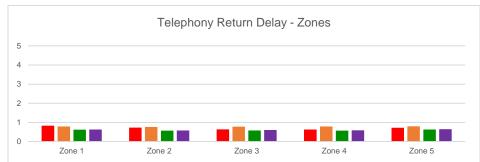
CSFB Delay represents the period of time to overlay 3G/2G environment instead of handling calls in 4G (LTE). Depending on the CSFB strategy.



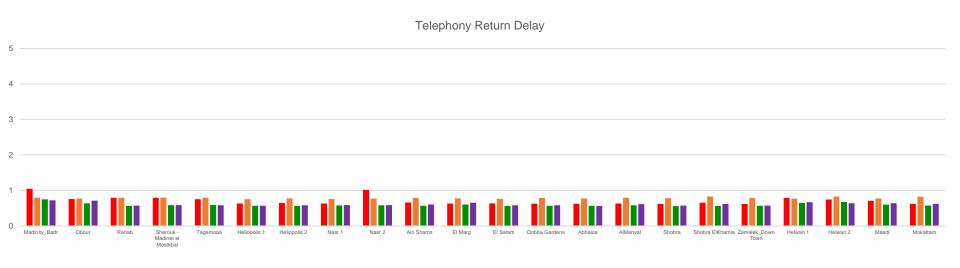
## Accessibility: Telephony Return Delay [sec.]





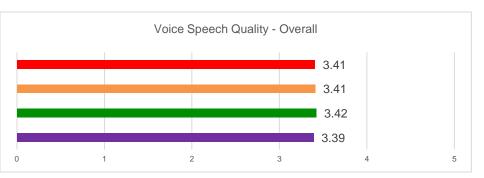


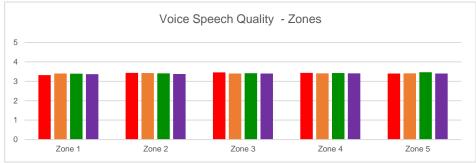
**Telephony Return Delay** measures the time that a UE uses to re-join the LTE (4G) network after call end



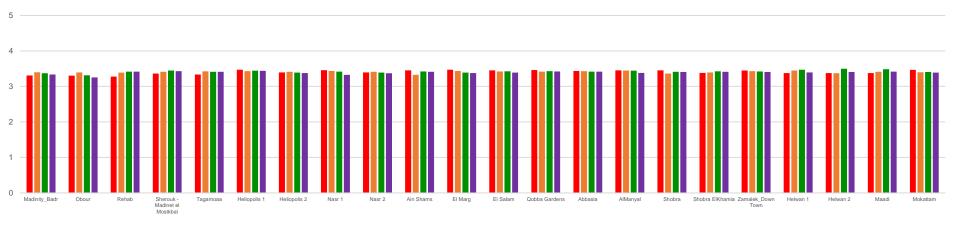


## Speech Quality: MOS Scores

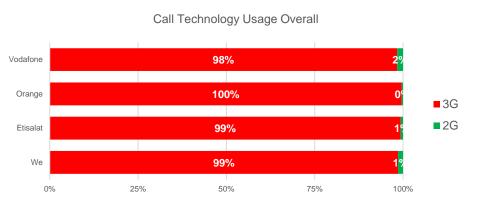




#### Voice Speech Quality

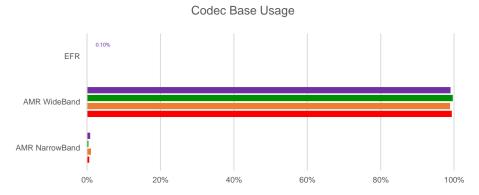


#### Speech Quality: Call technology Usage & Codec Base Usage



**Call technology Usage** represents the call technology used over call period. The more calls on 3G (UMTS) the better MOS served.

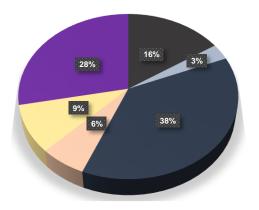
Codec Base Usage represents the codec used over the call where AMR wideband (AMR WB) leads to better voice quality experience by the end user than the AMR Narrowband (AMR NB)





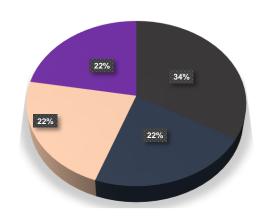
## **Analysis: Dropped Calls Causes**





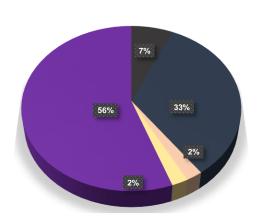






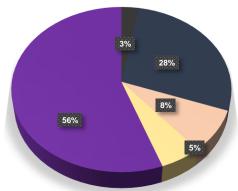


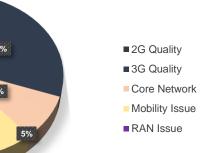






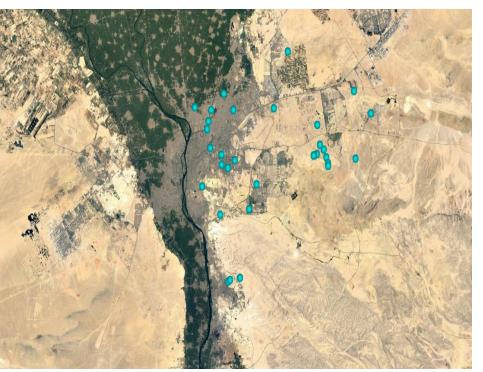






# All Operators: Dropped Calls Locations 1/2







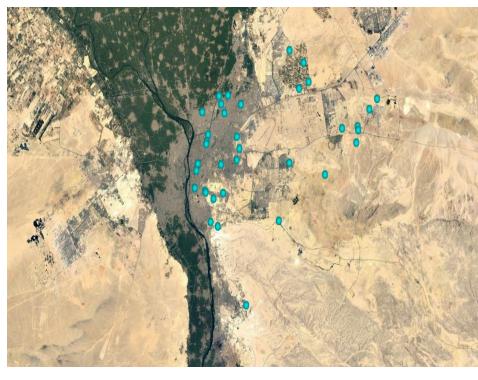


# All Operators: Dropped Calls Locations 2/2



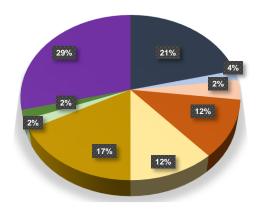






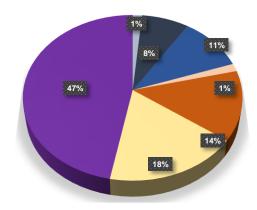
#### **Analysis: Failed Calls Causes**





- ■3G Quality
- ■4G Coverage
- Core Network
- ■CSFB Issue
- Mobility Issue
- No service
- Other
- Paging Issue
- RAN Issue

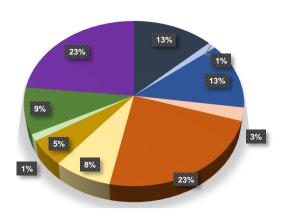






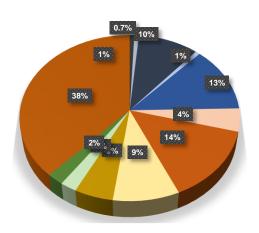
- ■3G Quality
- ■4G Quality
- Core Network
- CSFB Issue
- Mobility Issue
- RAN Issue





- ■3G Quality
- ■4G Coverage
- ■4G Quality
- Core Network
- ■CSFB Issue
- Mobility Issue
- No service
- Other
- Paging Issue
- RAN Issue

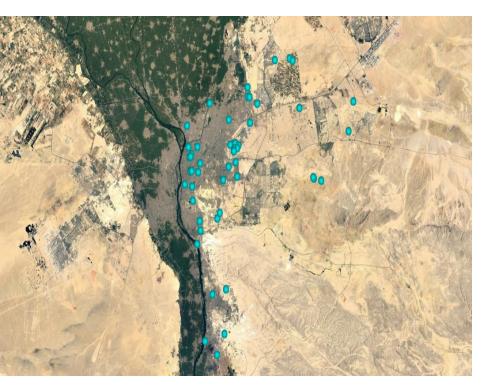




- ■2G Quality
- 3G Coverage
- ■3G Quality
- ■4G Coverage
- ■4G Quality
- Core Network
- CSFB Issue
- \_ 001 D 10000
- Mobility Issue
- No service
   Other
- Paging Issue

## All Operators: Blocked Calls Locations 1/2







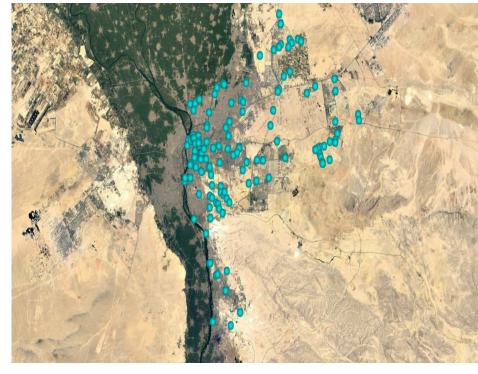


## All Operators: Blocked Calls Locations 2/2









# **AGENDA**

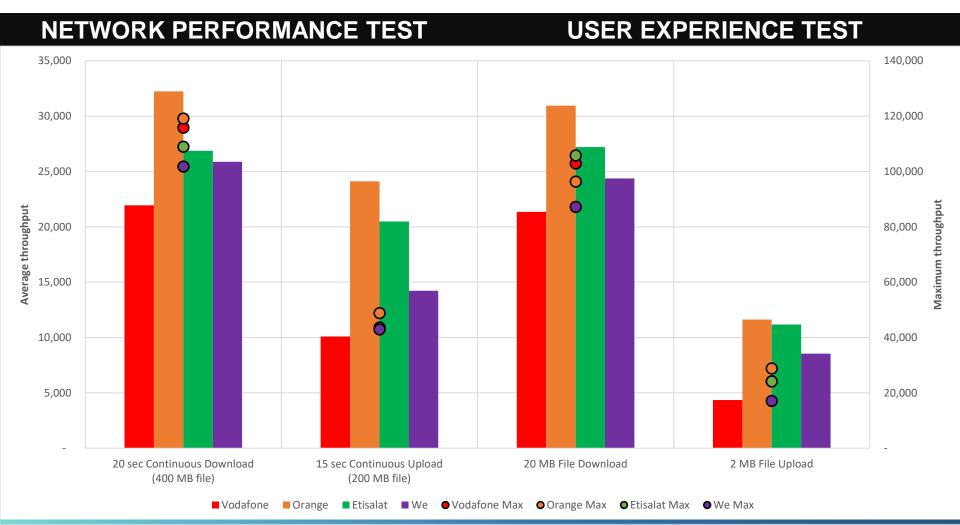
- 1. Quantitative Information
- 2. Voice Service Quality & Performance Cairo

#### 3. Data Service Quality & Performance – Cairo

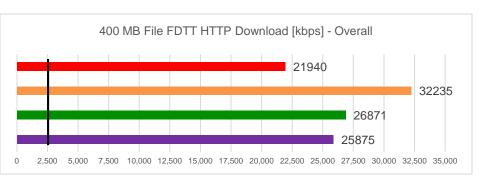
- 4. Voice Service Quality & Performance Giza
- 5. Data Service Quality & Performance Giza
- 6. Voice Service Quality & Performance Alexandria
- 7. Data Service Quality & Performance Alexandria
- 8. Voice Service Quality & Performance Delta
- 9. Data Service Quality & Performance Delta
- 10. Voice Service Quality & Performance Canal
- 11. Data Service Quality & Performance Canal
- 12. Voice Service Quality & Performance Upper Egypt
- 13. Data Service Quality & Performance Upper Egypt
- 14. Annexes

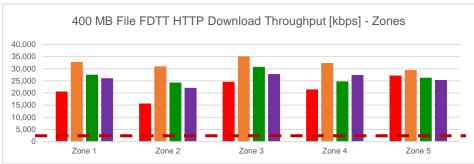


## Free Mode Throughput Per Test Type

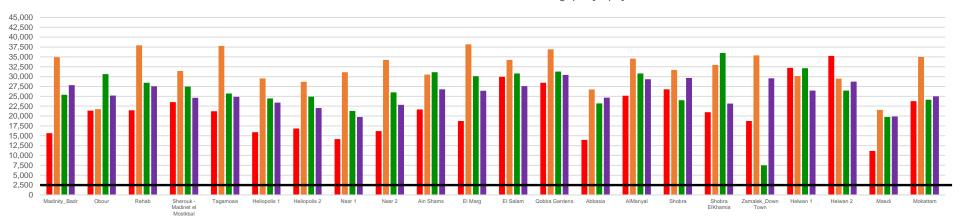


#### FDTT HTTP Download Transfer Throughput – Network Performance

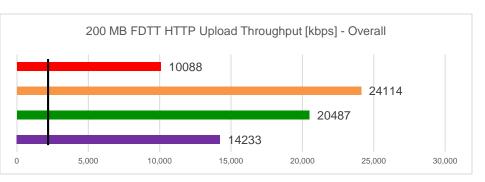


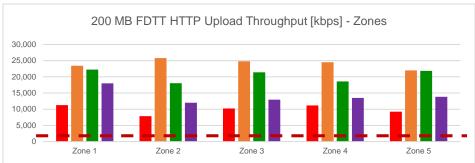


#### 400 MB File FDTT HTTP Download Throughput [kbps]

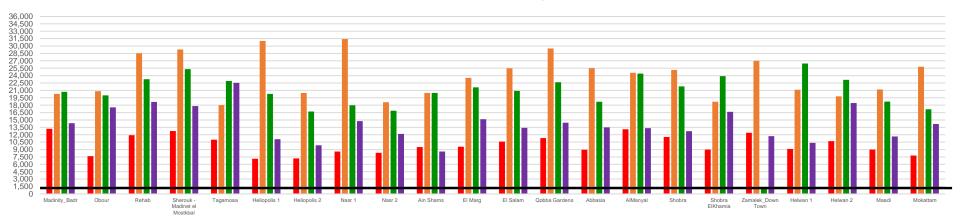


## FDTT HTTP Upload Transfer Throughput – Network Performance

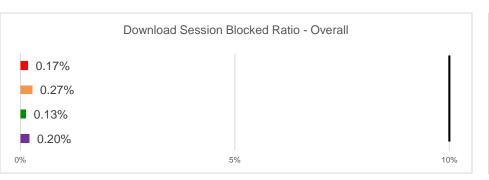


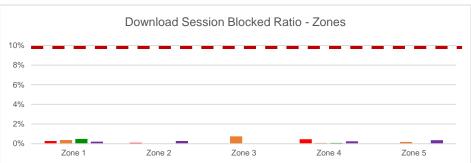


#### 200 MB FDTT HTTP Upload Throughput [kbps]

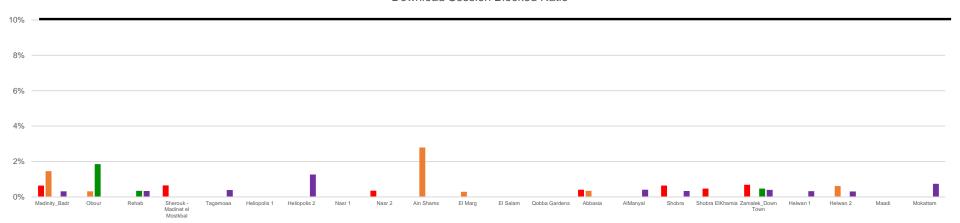


#### HTTP Download Session Blocked Rates

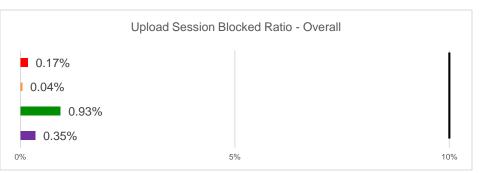


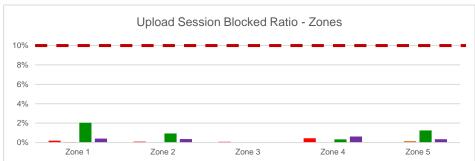


#### Download Session Blocked Ratio

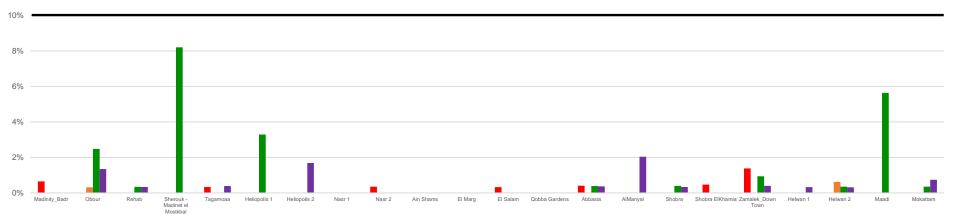


#### HTTP Upload Session Blocked Rates

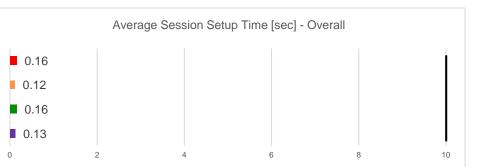


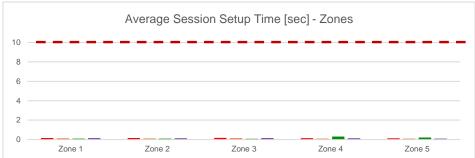


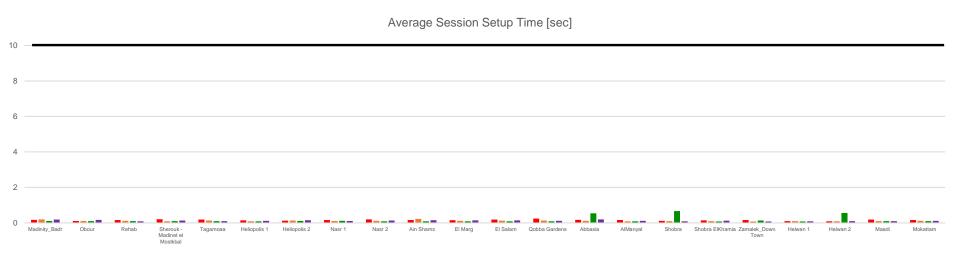
#### Upload Session Blocked Ratio



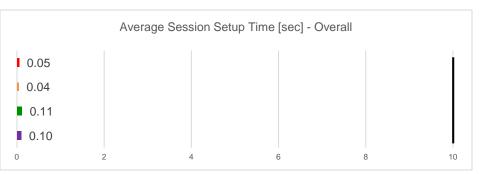
## HTTP Download Average Session Setup Time

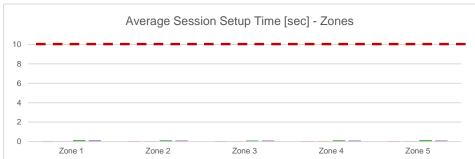


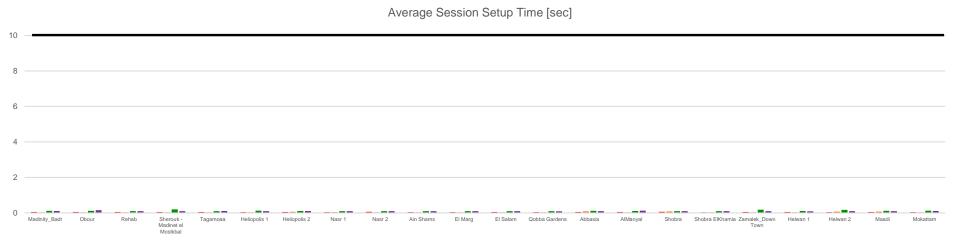




#### HTTP Upload Average Session Setup Time

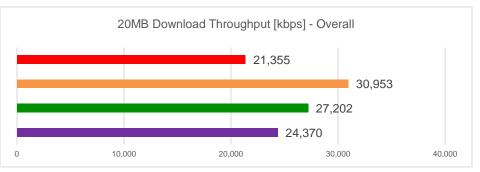


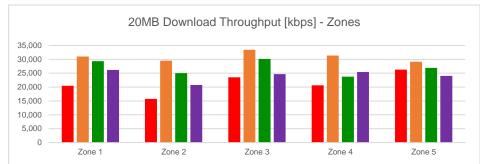




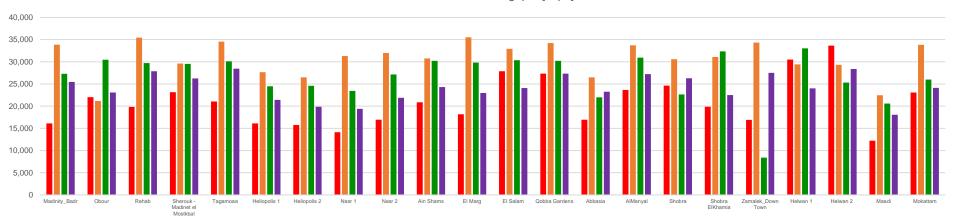


### HTTP Download Throughput – Customer Experience

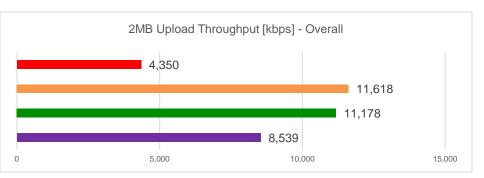


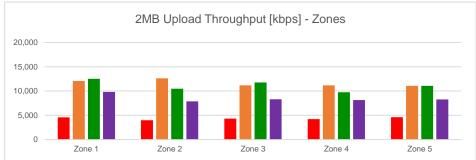


#### 20MB Download Throughput [kbps]

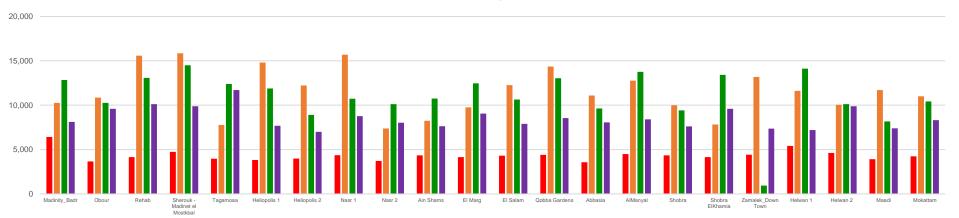


#### HTTP Upload Throughput – Customer Experience



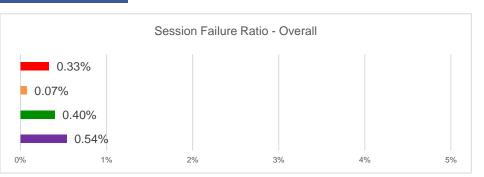


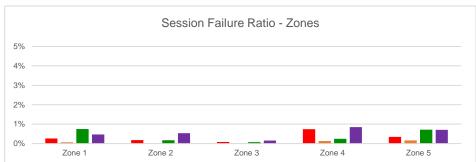
#### 2MB Upload Throughput [kbps]



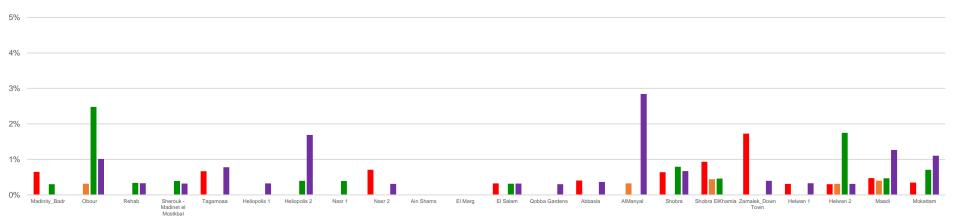


## facebook Session Failure Ratio

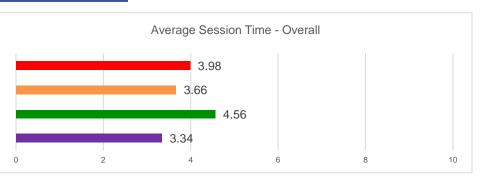




#### Session Failure Ratio

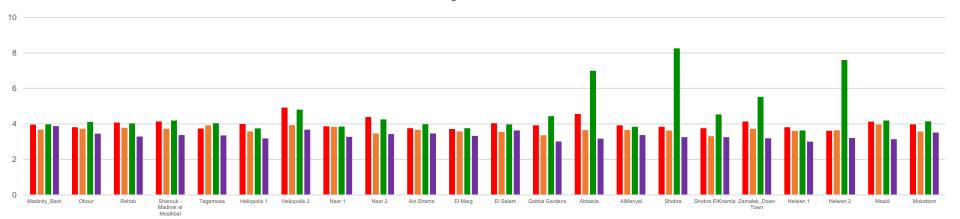


# facebook. Session Time

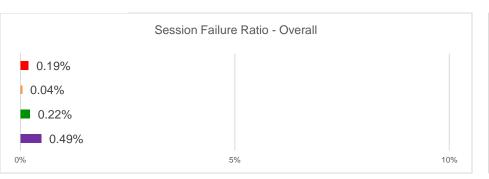


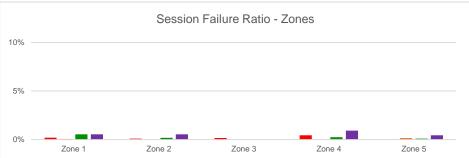


#### Average Session Time

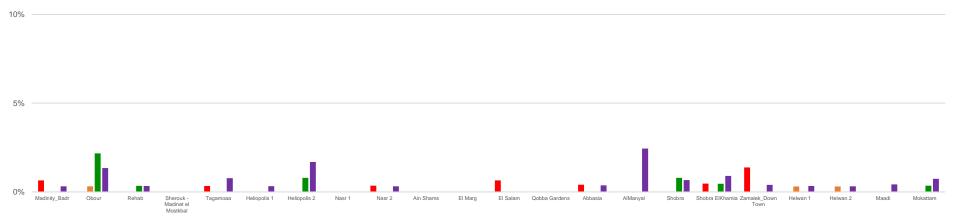


# Google Session Failure Ratio

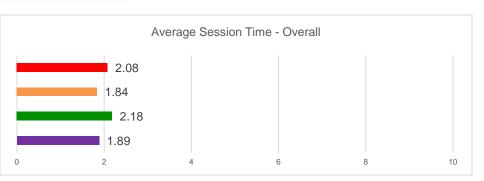


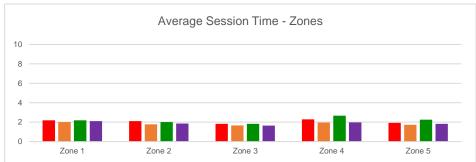




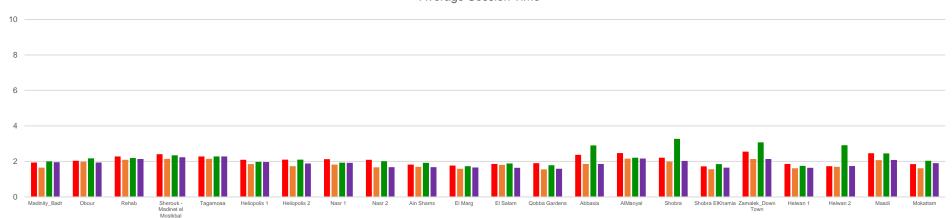


# Google Session Time

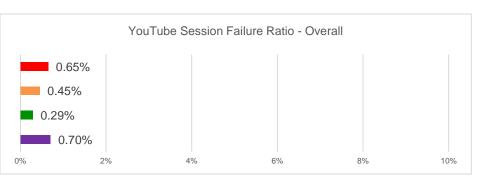


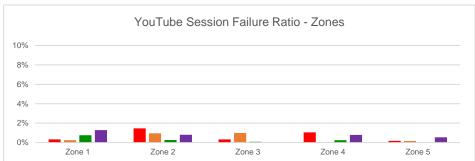


#### Average Session Time

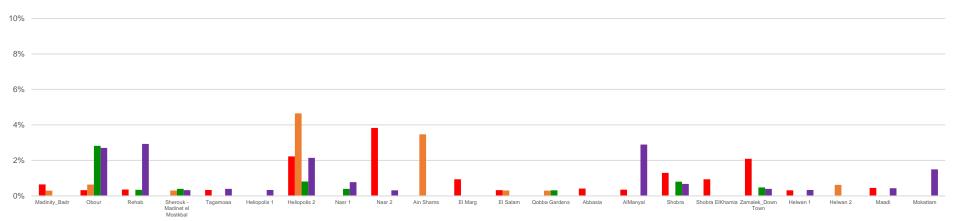


#### **► YouTube** Session Failure Ratio

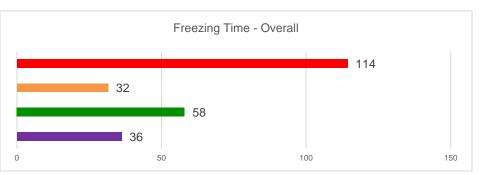


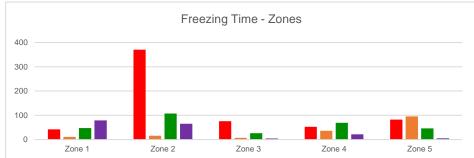


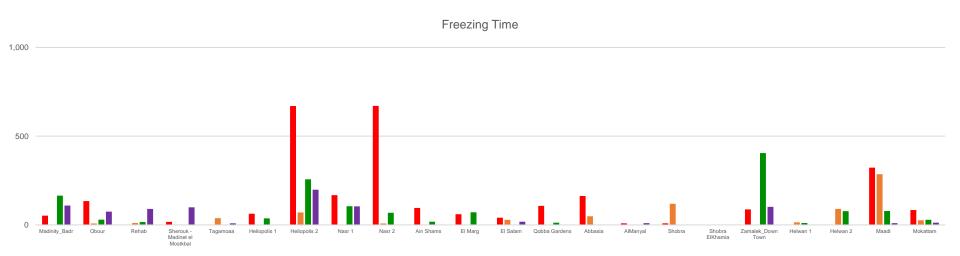
#### YouTube Session Failure Ratio



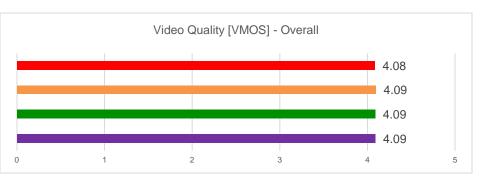
## ► YouTube Freezing Time [msec]

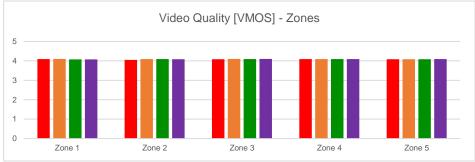




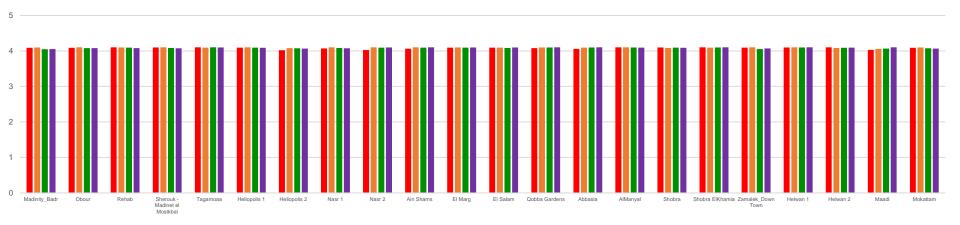


## ■ YouTube Video Quality

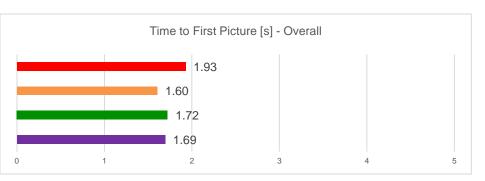




Video Quality - VMOS

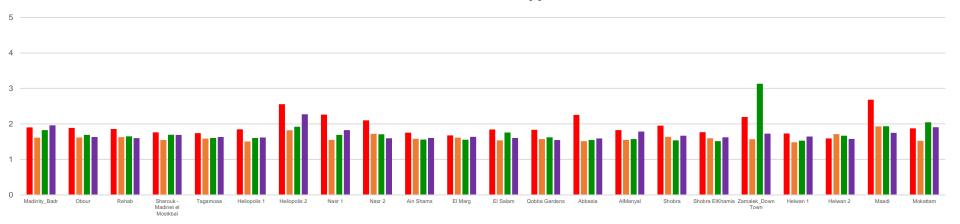


#### **► YouTube** Time to 1st Picture



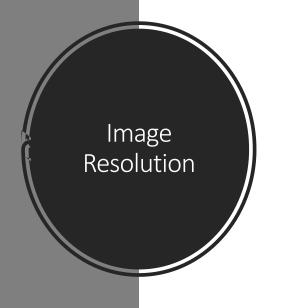


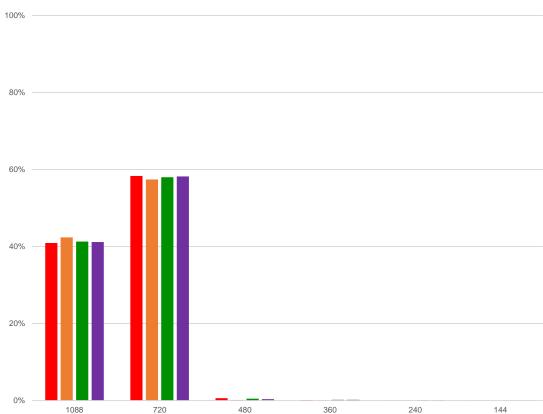
#### Time to First Picture [s]











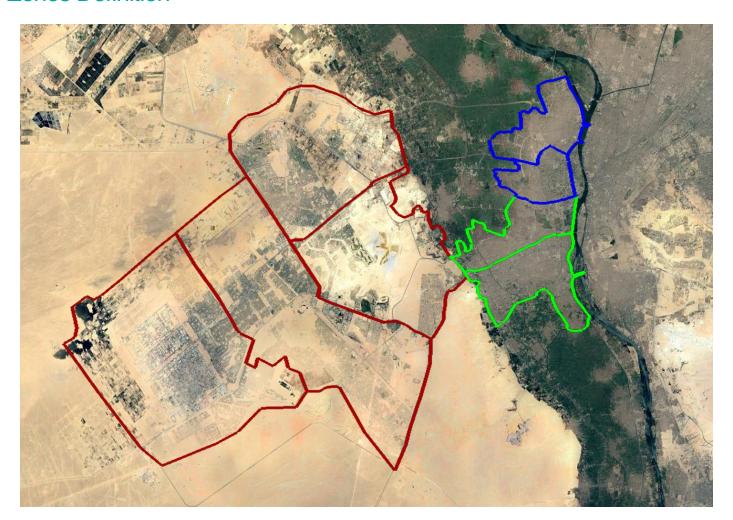
# **AGENDA**

- 1. Quantitative Information
- 2. Voice Service Quality & Performance Cairo
- 3. Data Service Quality & Performance Cairo

#### 4. Voice Service Quality & Performance - Giza

- 5. Data Service Quality & Performance Giza
- 6. Voice Service Quality & Performance Alexandria
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## **Zones Definition**

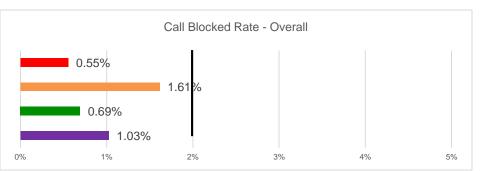


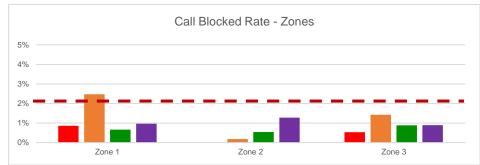
Giza	
	Zayed 1
Z1	Zayed 2
Giza	6th of Oct 1
Gi	6th of Oct 2
<b>Z</b> Z	Faisal
Giza	Haram
<b>Z</b> 3	Embaba
Giza	Mohandseen



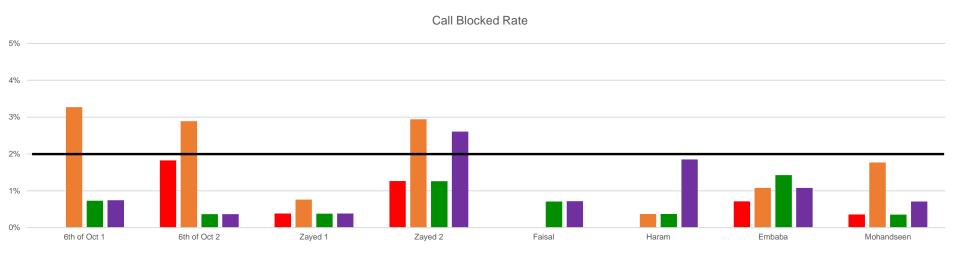
### Accessibility: Call Blocked Rate





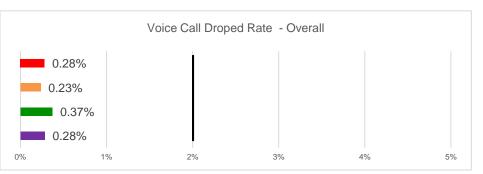


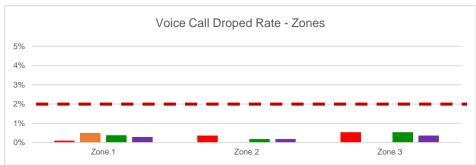
Call Blocked Rate represents the ratio between unsuccessful call attempts and all calls made (both successful & unsuccessful).



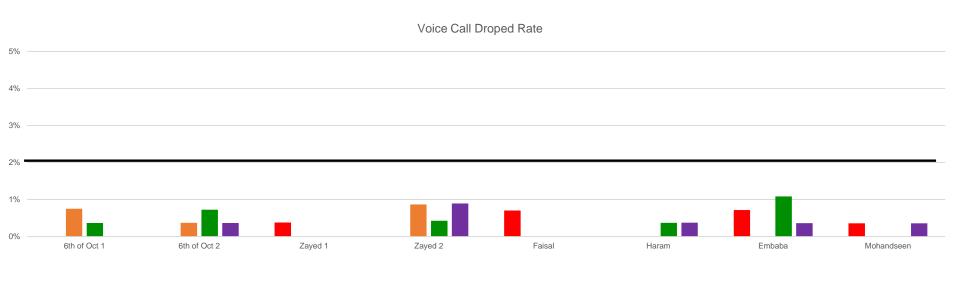
### Retainability: Call Dropped Rate







**Voice Call Retainability** *is represented by call drop rates.* 



### Accessibility: CSFB Failure Rate [%]





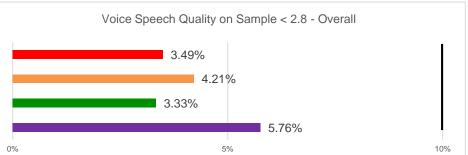


**CSFB Failure Rate** represents the ratio between unsuccessful fall back attempt to lower technology than 4G (LTE) and all calls made (both successful & unsuccessful). When there is 4G (LTE) present before starting the session.



### Speech Quality: MOS Voice Speech Quality < 2.8

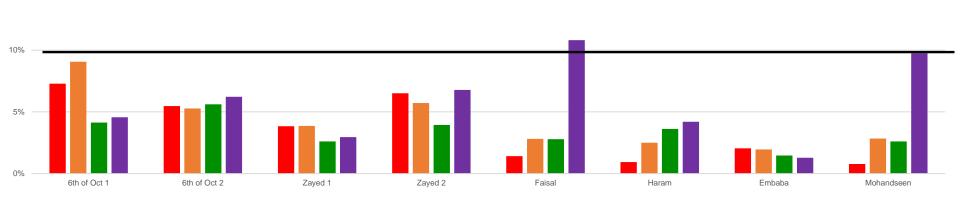






MOS Voice Speech Quality < 2.8 represents the ratio between total number of MOS samples less than 2.8 all collected MOS samples

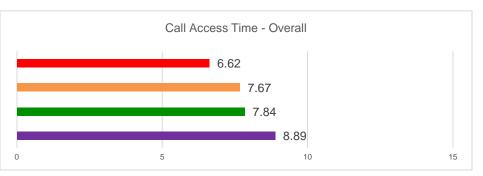




15%

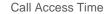
### Accessibility: Call Access Time [sec.]

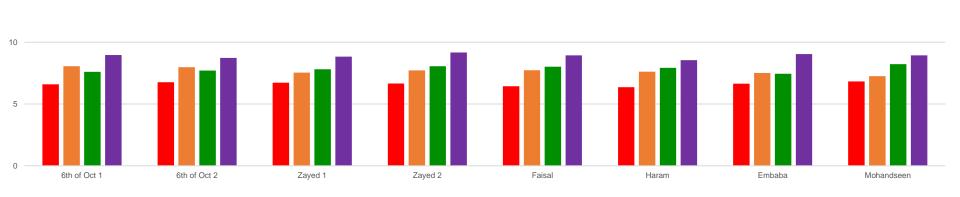






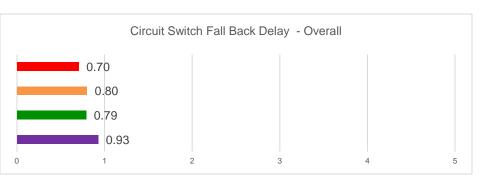
**Call Access** represents the period of time elapsed from the sending of a complete destination address (target number) to the setting up of a call to the receiving terminal.

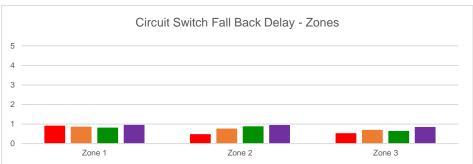




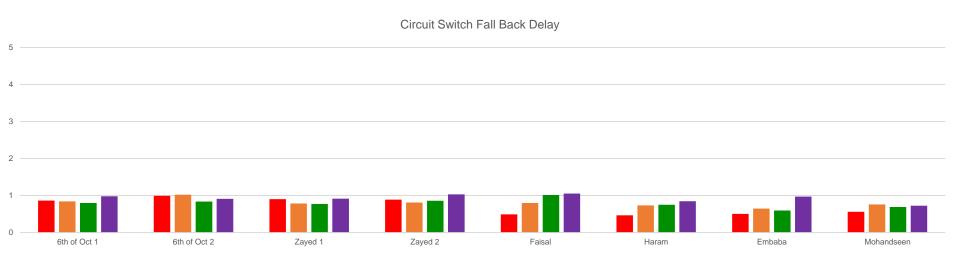
### Accessibility: CSFB Delay [sec.]





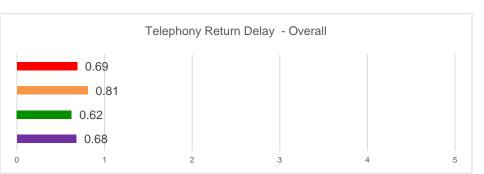


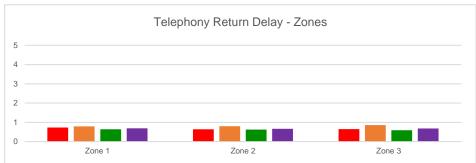
CSFB Delay represents the period of time to overlay 3G/2G environment instead of handling calls in 4G (LTE). Depending on the CSFB strategy.



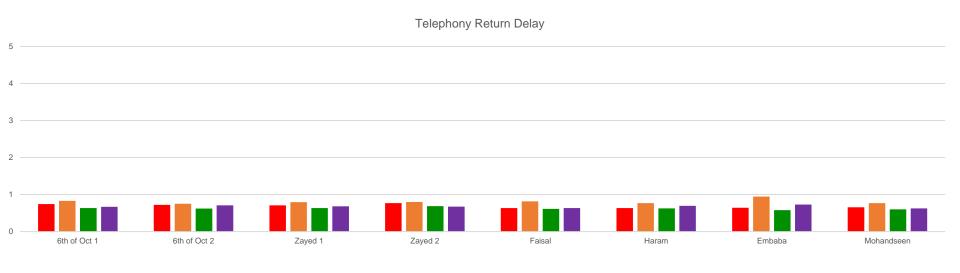
### Accessibility: Telephony Return Delay [sec.]





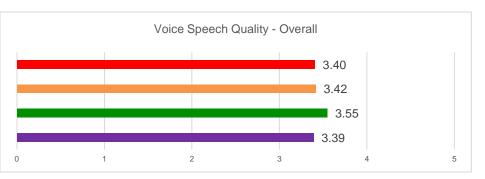


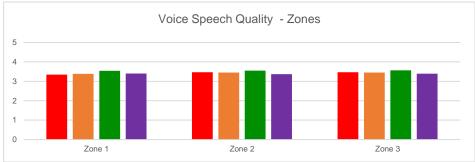
Telephony Return Delay measures the time that a UE uses to re-join the LTE (4G) network after call end



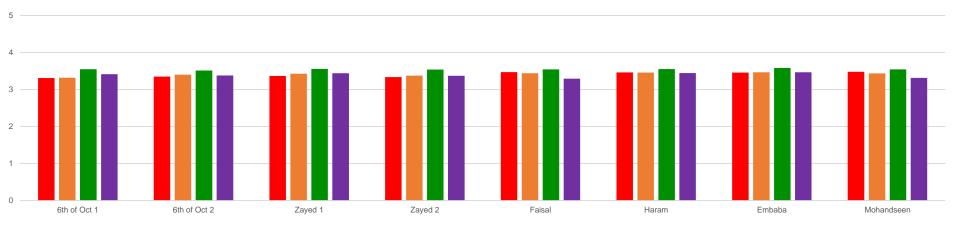


### Speech Quality: MOS Scores

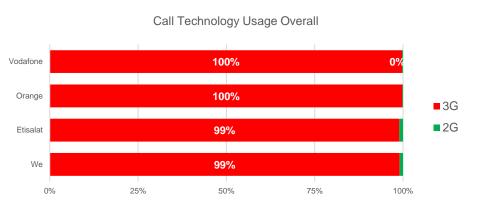






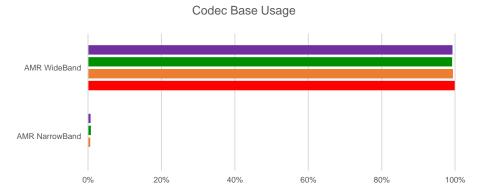


### Speech Quality: Call technology Usage & Codec Base Usage



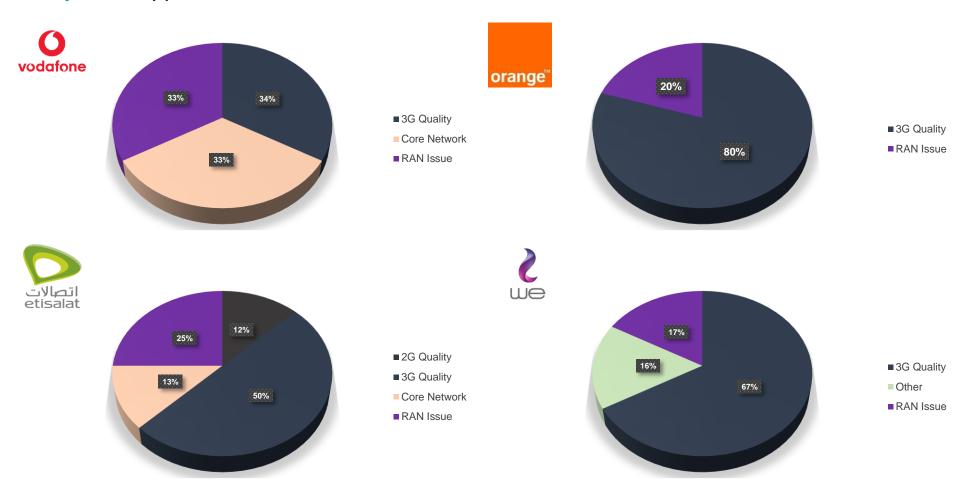
**Call technology Usage** represents the call technology used over call period. The more calls on 3G (UMTS) the better MOS served.

Codec Base Usage represents the codec used over the call where AMR wideband (AMR WB) leads to better voice quality experience by the end user than the AMR Narrowband (AMR NB)





### **Analysis: Dropped Calls Causes**



# All Operators: Dropped Calls Locations 1/2









# All Operators: Dropped Calls Locations 2/2



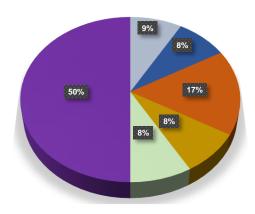






### **Analysis: Failed Calls Causes**









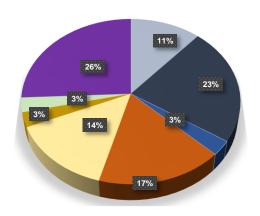
■3G Quality

■4G Quality

■CSFB Issue

Mobility Issue

■ RAN Issue

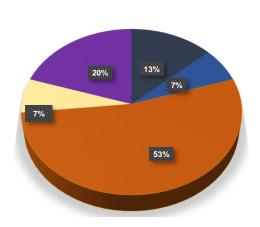




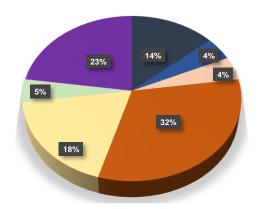


- No service
- Other
- RAN Issue













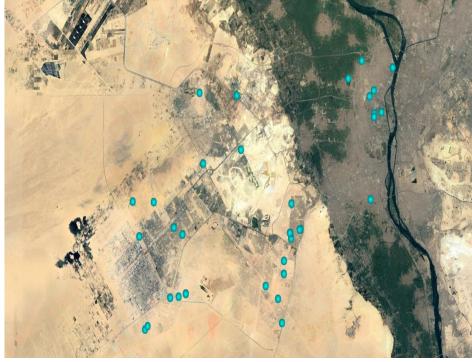
- Mobility Issue
- Other
- RAN Issue

### All Operators: Blocked Calls Locations 1/2







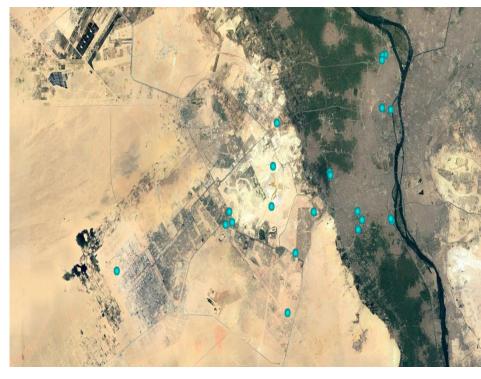


### All Operators: Blocked Calls Locations 2/2









# **AGENDA**

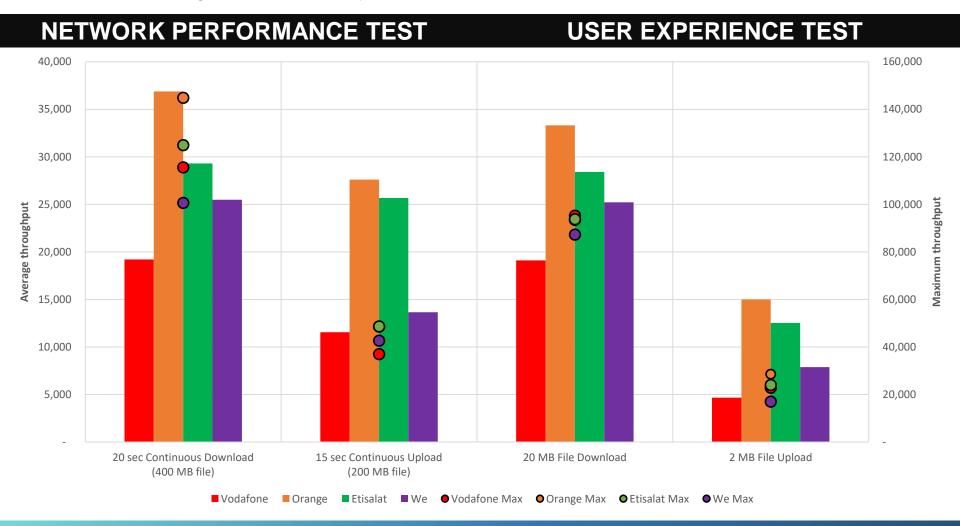
- 1. Quantitative Information
- 2. Voice Service Quality & Performance Cairo
- 3. Data Service Quality & Performance Cairo
- 4. Voice Service Quality & Performance Giza

### 5. Data Service Quality & Performance – Giza

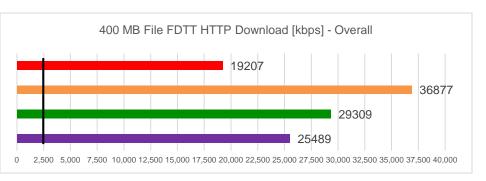
- 6. Voice Service Quality & Performance Alexandria
- 7. Data Service Quality & Performance Alexandria
- 8. Voice Service Quality & Performance Delta
- 9. Data Service Quality & Performance Delta
- 10. Voice Service Quality & Performance Canal
- 11. Data Service Quality & Performance Canal
- 12. Voice Service Quality & Performance Upper Egypt
- 13. Data Service Quality & Performance Upper Egypt
- 14. Annexes

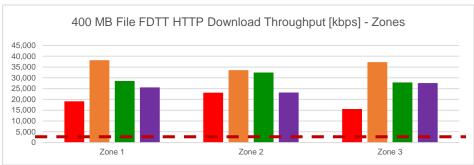


### Free Mode Throughput Per Test Type

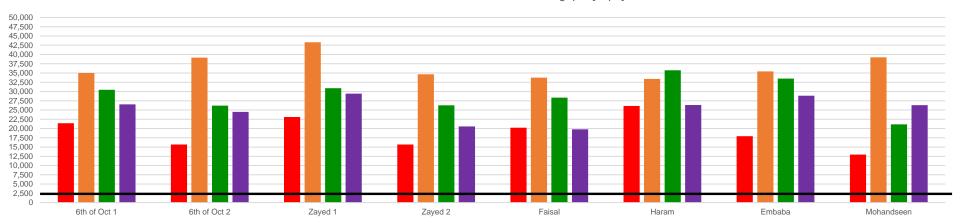


### FDTT HTTP Download Transfer Throughput – Network Performance

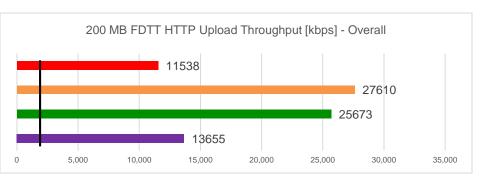


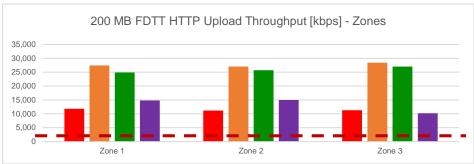


#### 400 MB File FDTT HTTP Download Throughput [kbps]

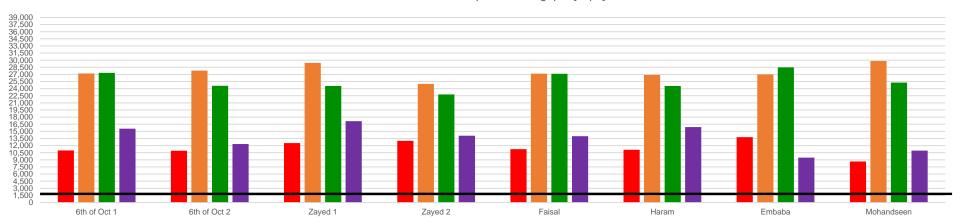


### FDTT HTTP Upload Transfer Throughput – Network Performance

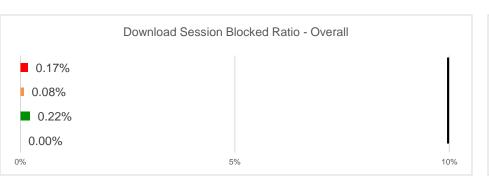




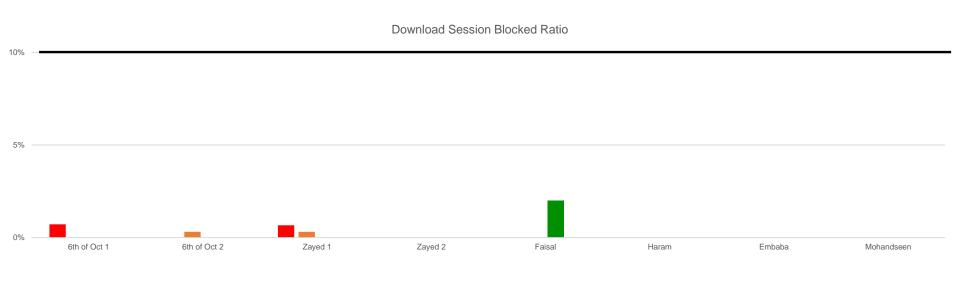
#### 200 MB FDTT HTTP Upload Throughput [kbps]



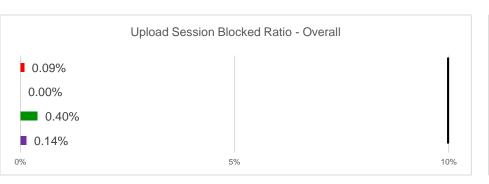
### HTTP Download Session Blocked Rates

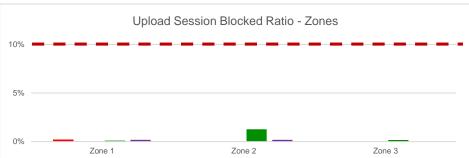


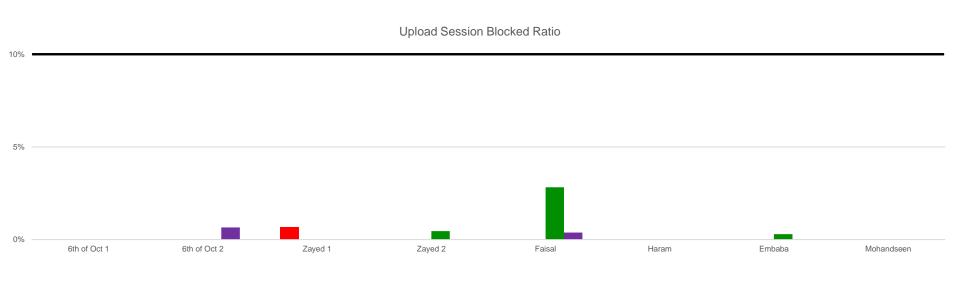




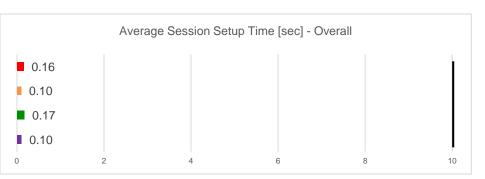
### HTTP Upload Session Blocked Rates

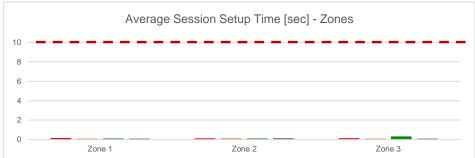




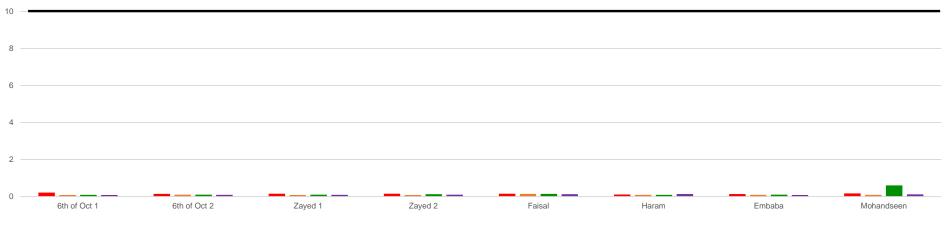


### HTTP Download Average Session Setup Time

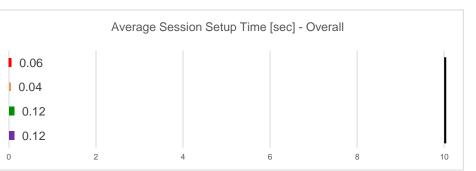




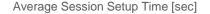


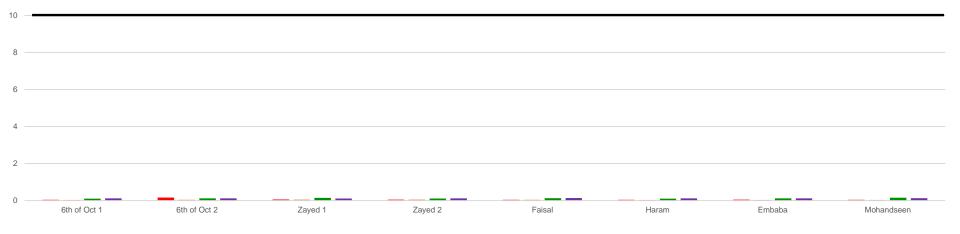


### HTTP Upload Average Session Setup Time [sec]



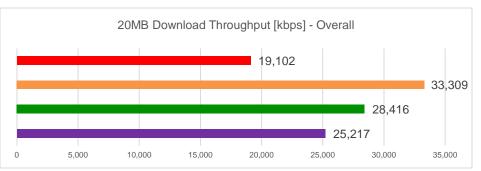


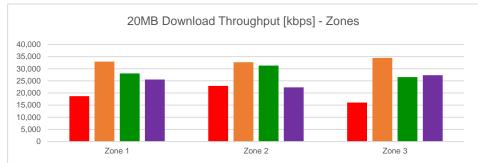




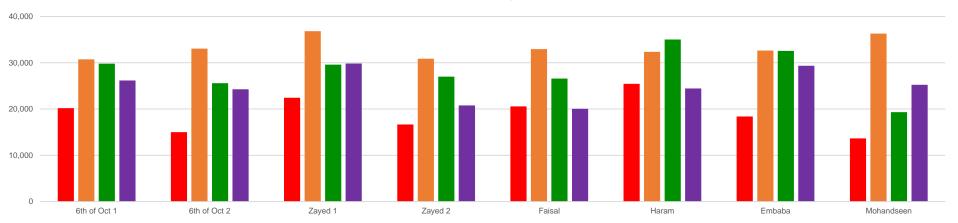


### HTTP Download Throughput – Customer Experience

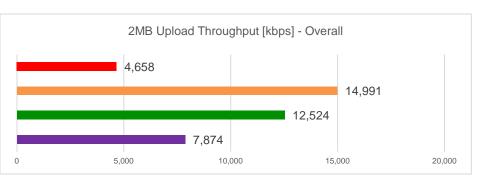


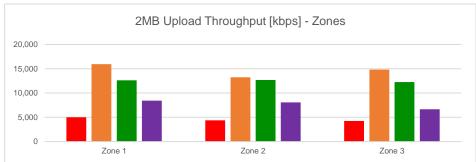


#### 20MB Download Throughput [kbps]

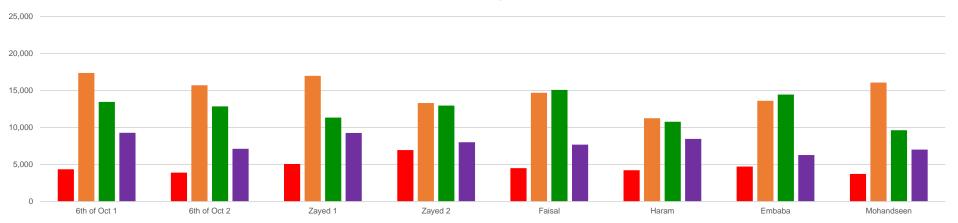


### HTTP Upload Throughput – Customer Experience



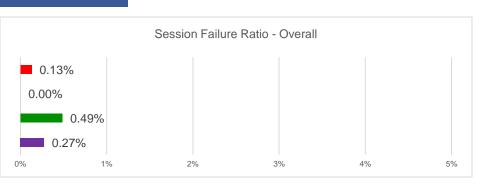


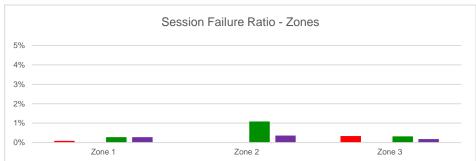
#### 2MB Upload Throughput [kbps]



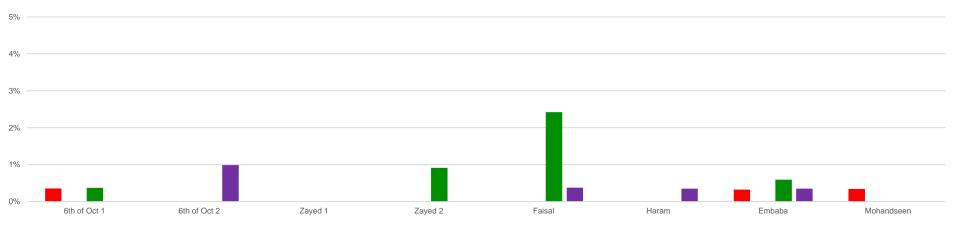


# facebook. Session Failure Ratio

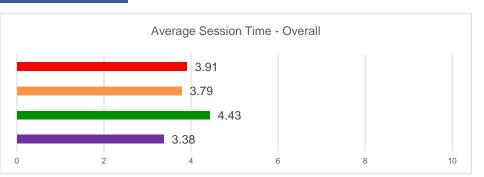


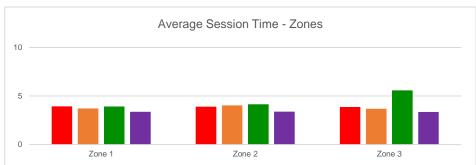


#### Session Failure Ratio

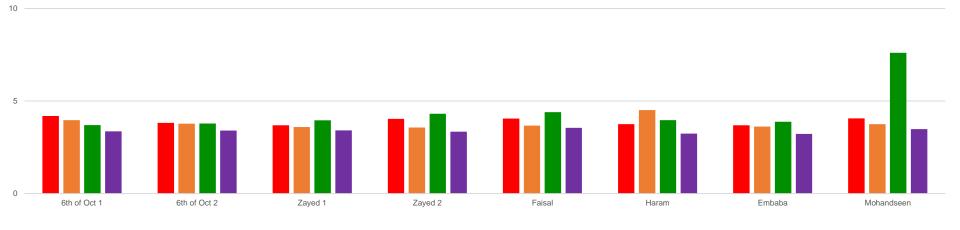


# facebook. Session Time

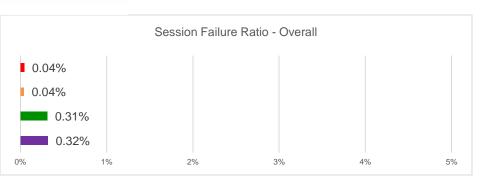


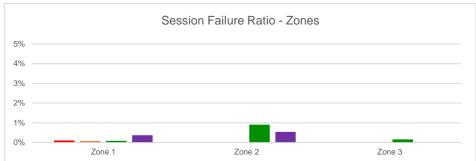


#### Average Session Time

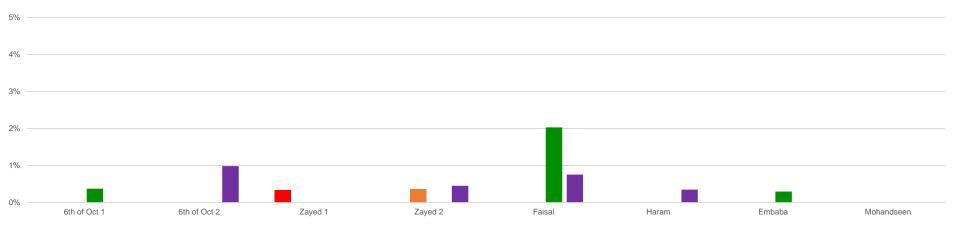


# Google Session Failure Ratio

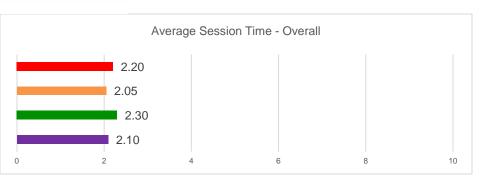


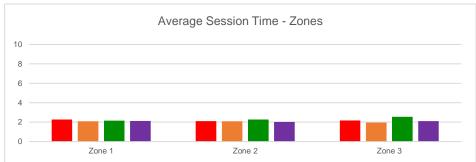


#### Session Failure Ratio

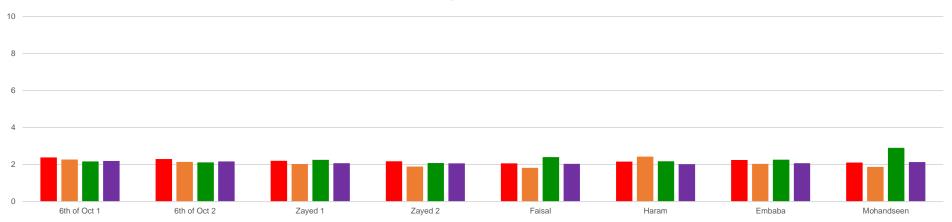


# Google Session Time

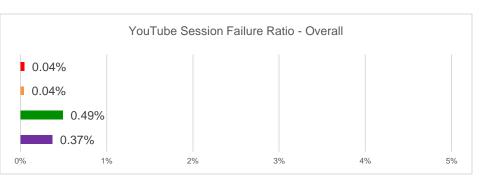


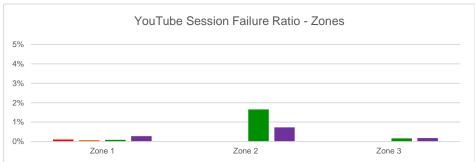


#### Average Session Time

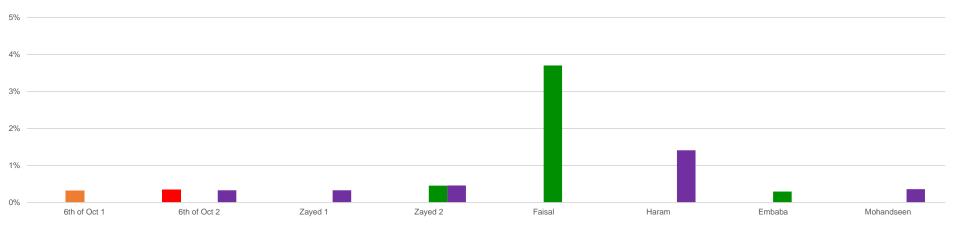


### **► YouTube** Session Failure Ratio

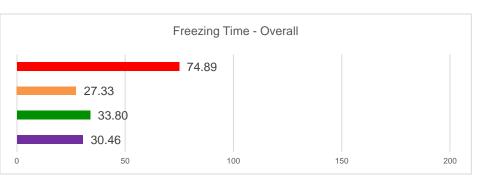




#### YouTube Session Failure Ratio

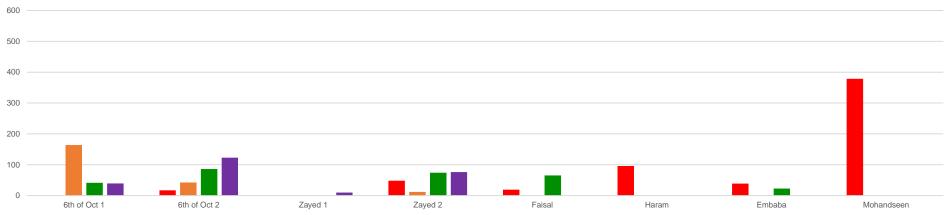


## ► YouTube Freezing Time [msec]

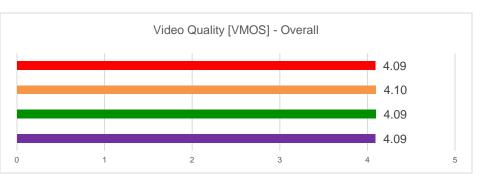


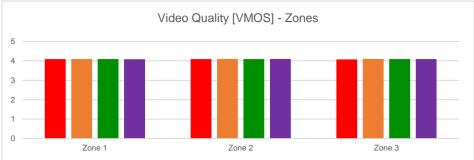


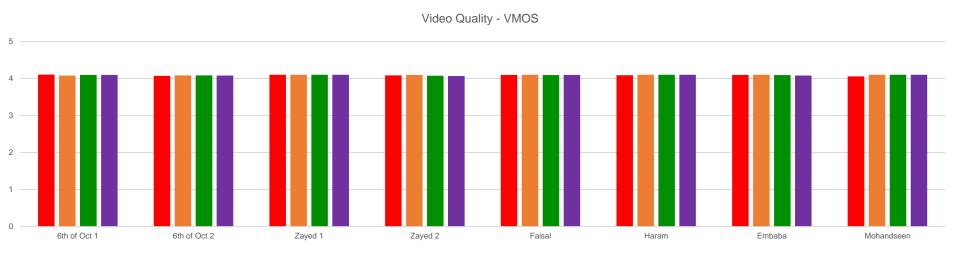




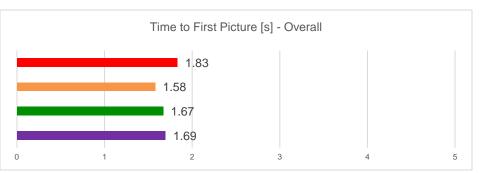
## **► YouTube** Video Quality





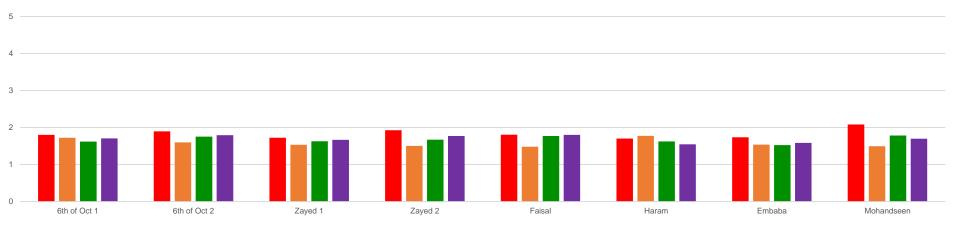


#### **► YouTube** Time to 1<sup>st</sup> Picture





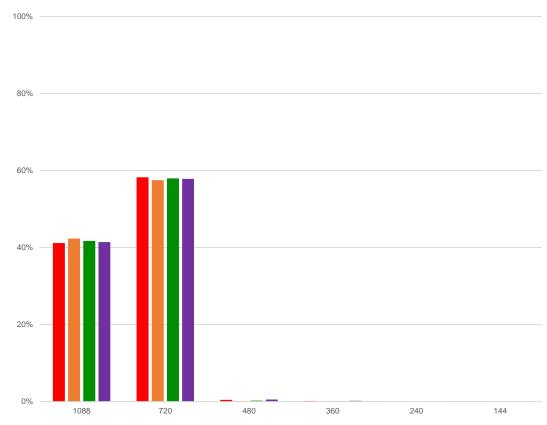








#### Youtube - Image Resolution



# **AGENDA**

- 1. Quantitative Information
- 2. Voice Service Quality & Performance Cairo
- 3. Data Service Quality & Performance Cairo
- 4. Voice Service Quality & Performance Giza
- 5. Data Service Quality & Performance Giza

#### 6. Voice Service Quality & Performance - Alexandria

- 7. Data Service Quality & Performance Alexandria
- 8. Voice Service Quality & Performance Delta
- 9. Data Service Quality & Performance Delta
- 10. Voice Service Quality & Performance Canal
- 11. Data Service Quality & Performance Canal
- 12. Voice Service Quality & Performance Upper Egypt
- 13. Data Service Quality & Performance Upper Egypt
- 14. Annexes

#### **Zones Definition**



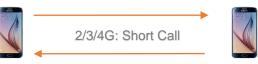


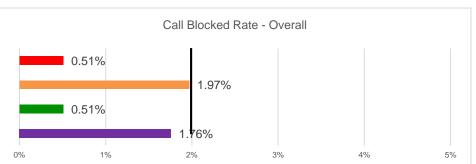
Alexandria	
Alex Z1	East1
	East2
	East3
	East4
	East5
22	West 1
Alex	West 2
23	Matrouh
Alex	Northencoast

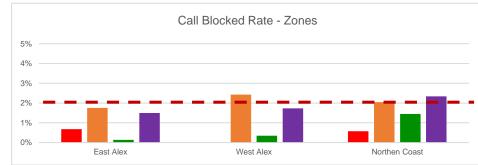




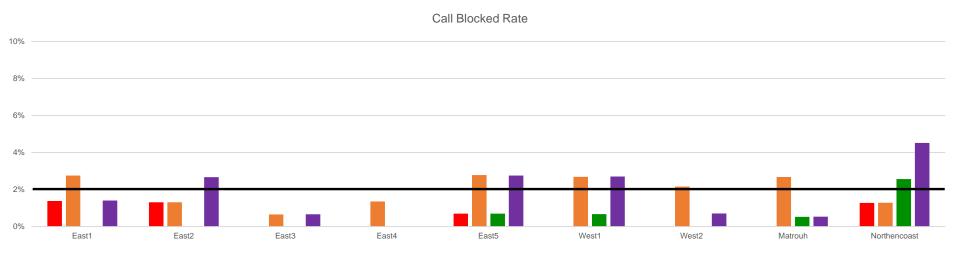
## Accessibility: Call Blocked Rate





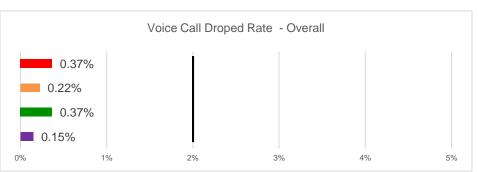


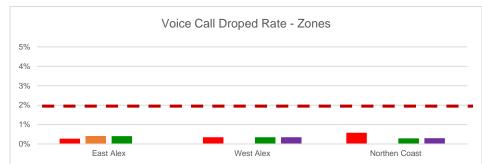
Call Blocked Rate represents the ratio between unsuccessful call attempts and all calls made (both successful & unsuccessful).



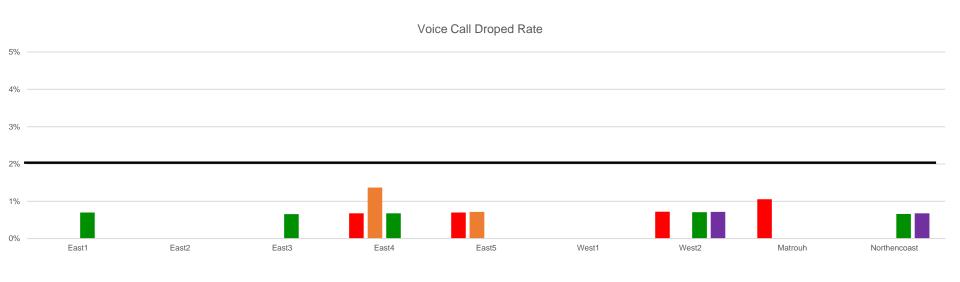
## Retainability: Call Dropped Rate







**Voice Call Retainability** is represented by call drop rates.



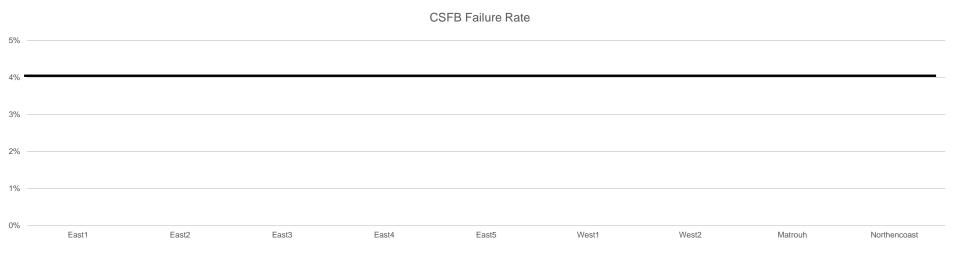
## Accessibility: CSFB Failure Rate [%]







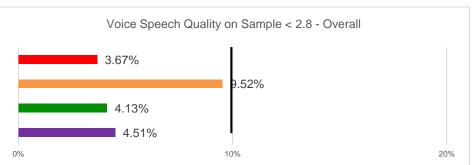
**CSFB Failure Rate** represents the ratio between unsuccessful fall back attempt to lower technology than 4G (LTE) and all calls made (both successful & unsuccessful). When there is 4G (LTE) present before starting the session.

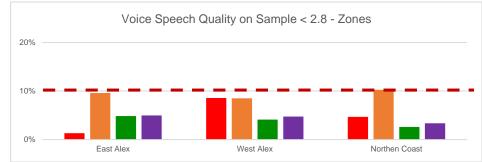


## Speech Quality: MOS Voice Speech Quality < 2.8



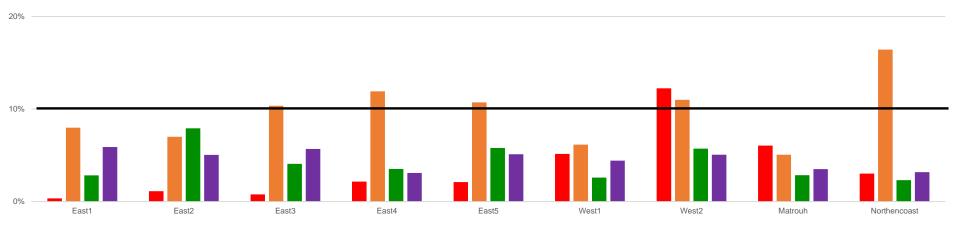






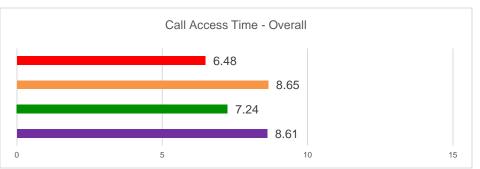
MOS Voice Speech Quality < 2.8 represents the ratio between total number of MOS samples less than 2.8 all collected MOS samples





## Accessibility: Call Access Time [sec.]

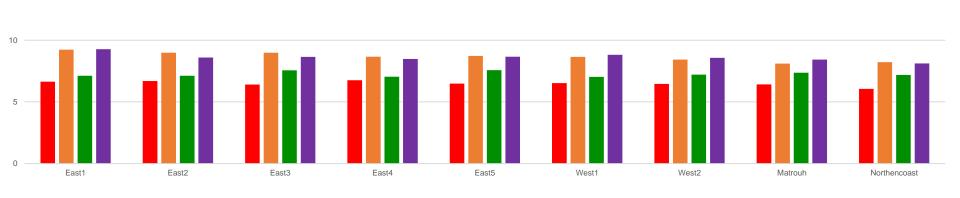






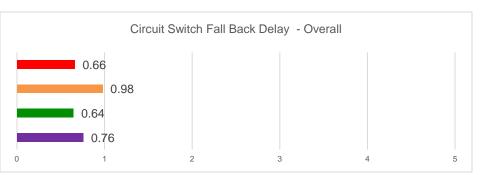
**Call Access Time** represents the period of time elapsed from the sending of a complete destination address (target number) to the setting up of a call to the receiving terminal.

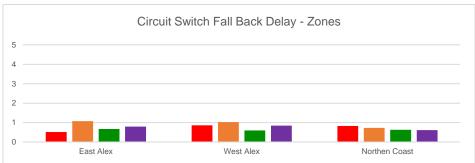




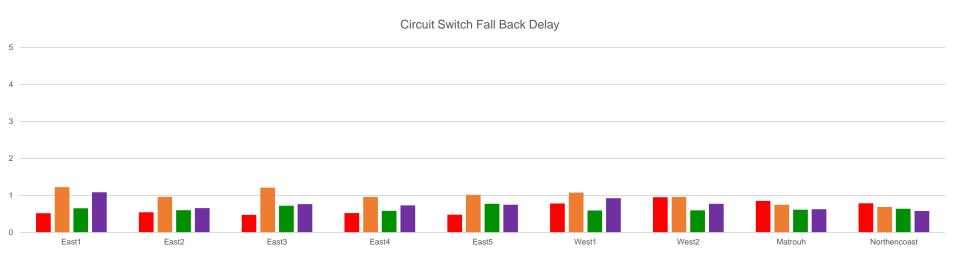
## Accessibility: CSFB Delay [sec.]







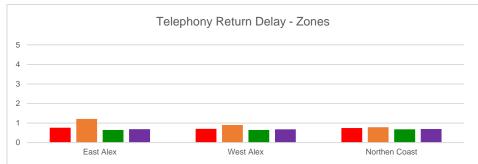
CSFB Delay represents the period of time to overlay 3G/2G environment instead of handling calls in 4G (LTE). Depending on the CSFB strategy.



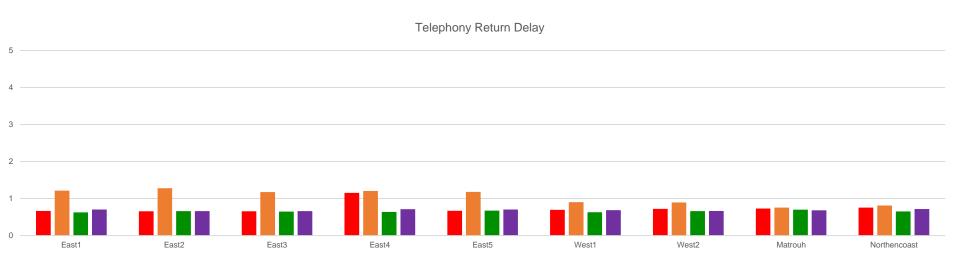
## Accessibility: Telephony Return Delay [sec.]





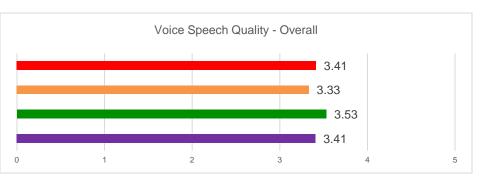


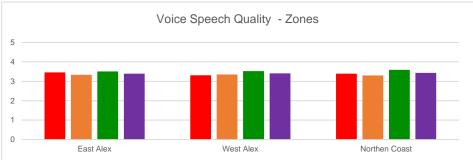
Telephony Return Delay measures the time that a UE uses to re-join the LTE (4G) network after call end



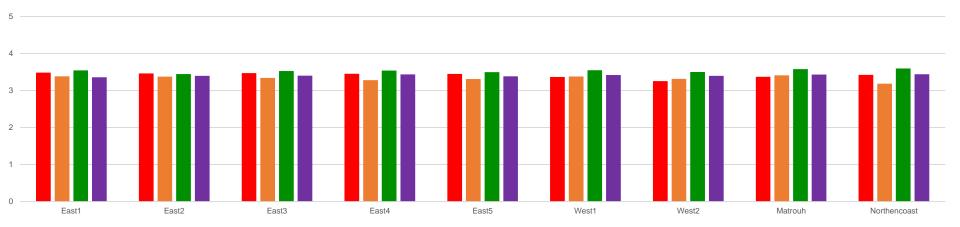


## Speech Quality: MOS Scores

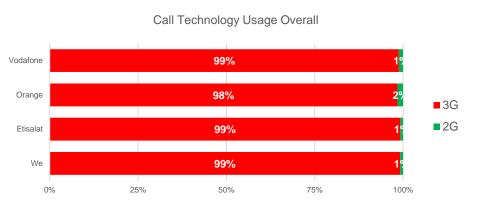






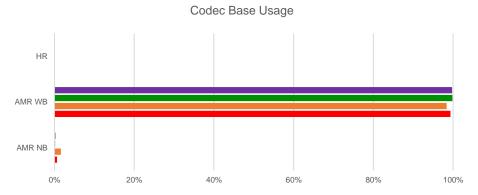


#### Speech Quality: Call technology Usage & Codec Base Usage



**Call technology Usage** represents the call technology used over call period. The more calls on 3G (UMTS) the better MOS served.

**Codec Base Usage** represents the codec used over the call where AMR wideband (AMR WB) leads to better voice quality experience by the end user than the AMR Narrowband (AMR NB)





#### Analysis: Dropped Calls Causes



## All Operators: Dropped Calls Locations 1/2









## All Operators: Dropped Calls Locations 2/2



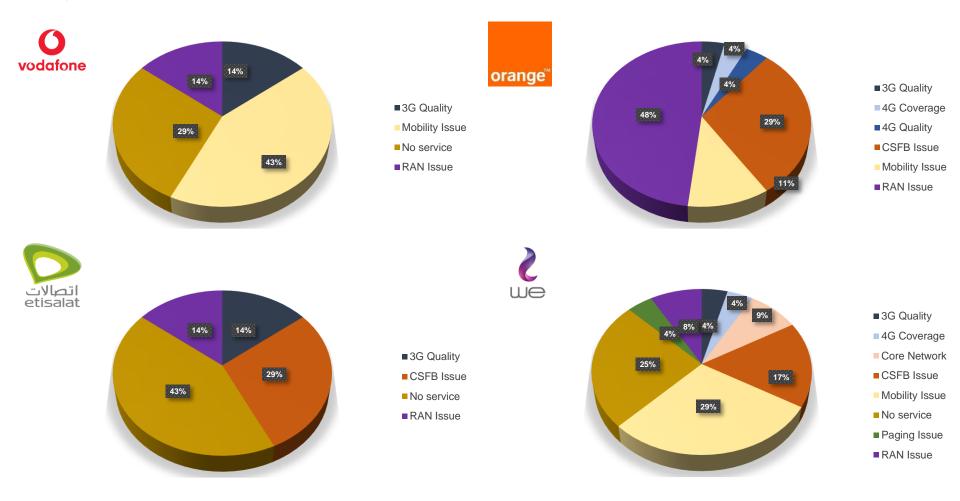








## Analysis: Failed Calls Causes



## All Operators: Blocked Calls Locations 1/2









## All Operators: Blocked Calls Locations 2/2











# **AGENDA**

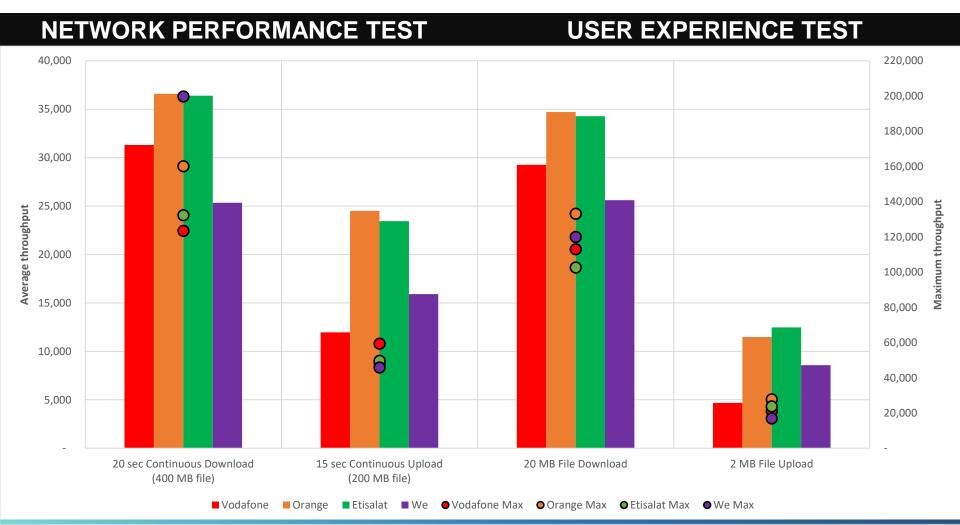
- 1. Quantitative Information
- 2. Voice Service Quality & Performance Cairo
- 3. Data Service Quality & Performance Cairo
- 4. Voice Service Quality & Performance Giza
- 5. Data Service Quality & Performance Giza
- 6. Voice Service Quality & Performance Alexandria

#### 7. Data Service Quality & Performance - Alexandria

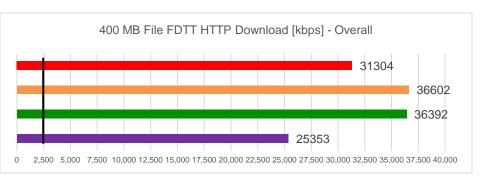
- 8. Voice Service Quality & Performance Delta
- 9. Data Service Quality & Performance Delta
- 10. Voice Service Quality & Performance Canal
- 11. Data Service Quality & Performance Canal
- 12. Voice Service Quality & Performance Upper Egypt
- 13. Data Service Quality & Performance Upper Egypt
- 14. Annexes

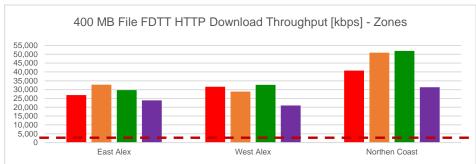


#### Free Mode Throughput Per Test Type

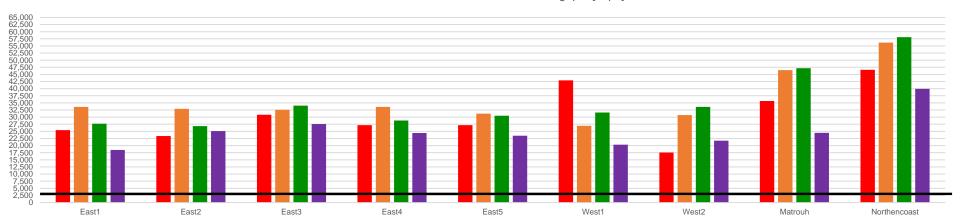


#### FDTT HTTP Download Transfer Throughput – Network Performance

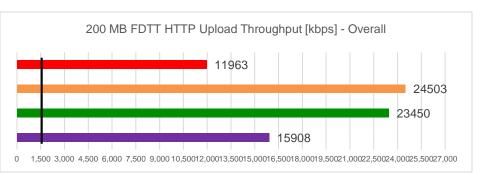


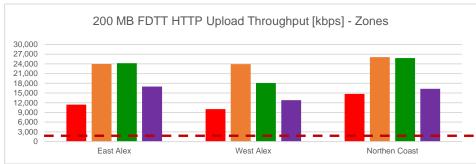


#### 400 MB File FDTT HTTP Download Throughput [kbps]

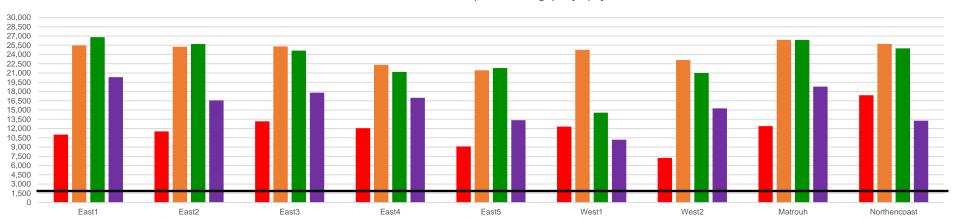


#### FDTT HTTP Upload Transfer Throughput – Network Performance

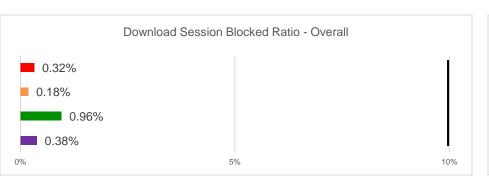




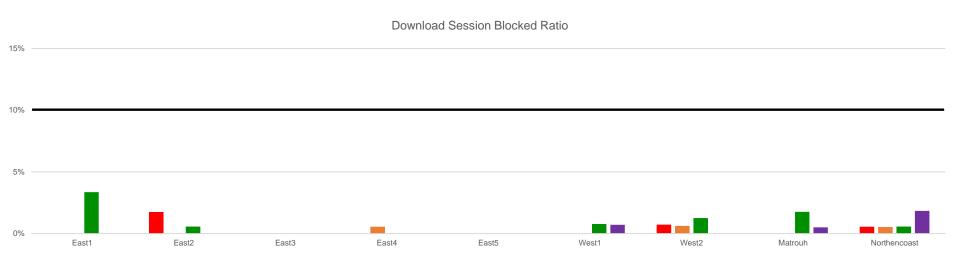
#### 200 MB FDTT HTTP Upload Throughput [kbps]



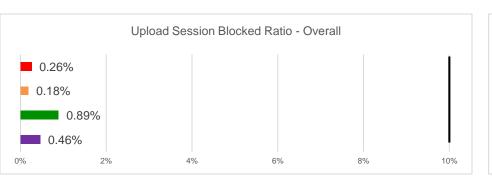
#### HTTP Download Session Blocked Rates

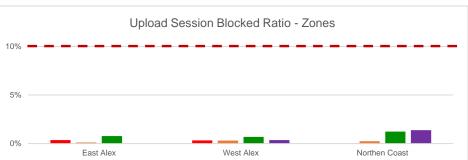




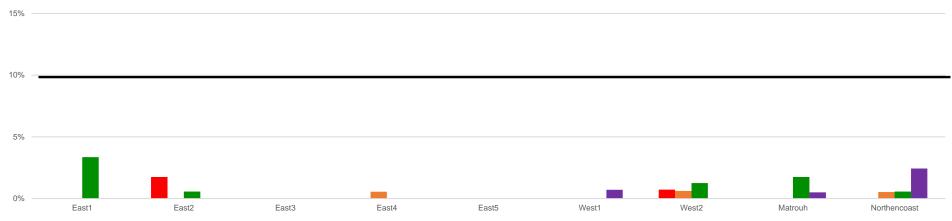


#### HTTP Upload Session Blocked Rates

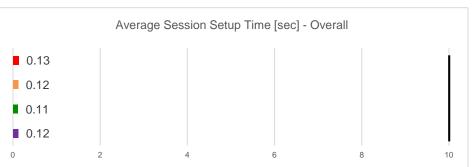


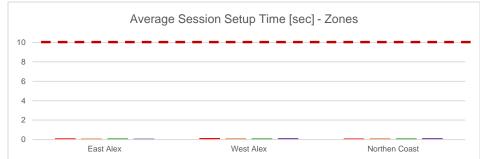




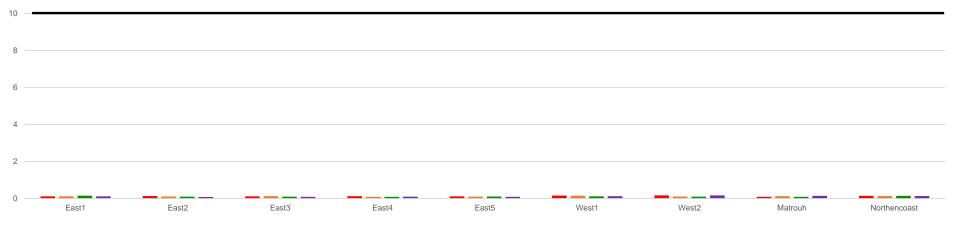


#### HTTP Download Average Session Setup Time

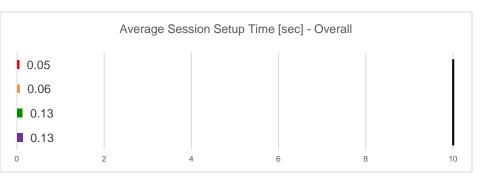


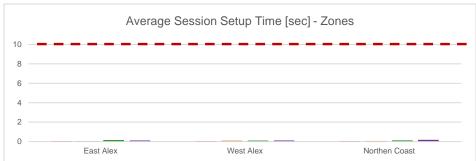


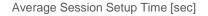


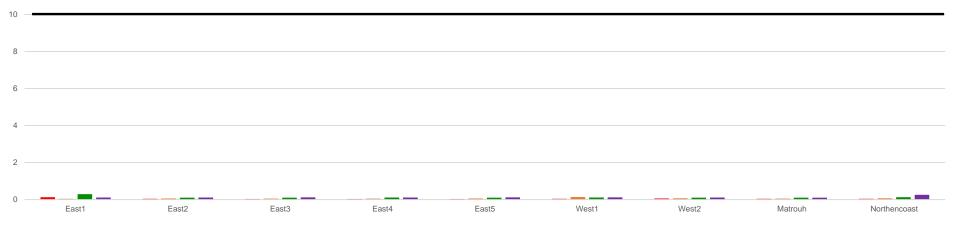


#### HTTP Upload Average Session Setup Time



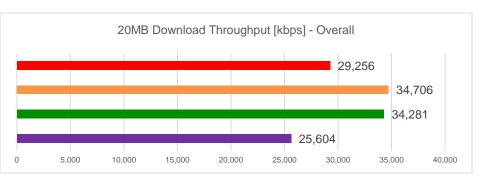


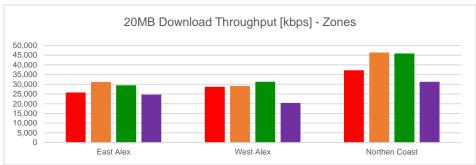




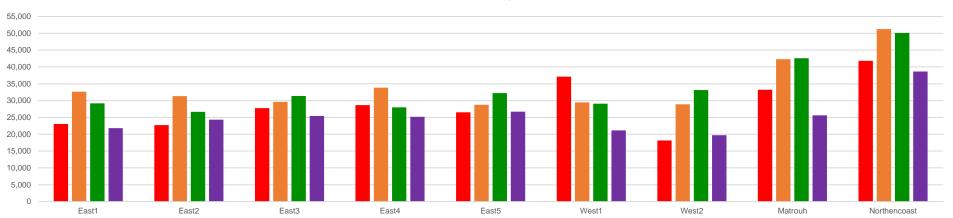


#### HTTP Download Throughput – Customer Experience

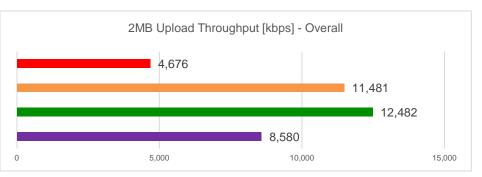




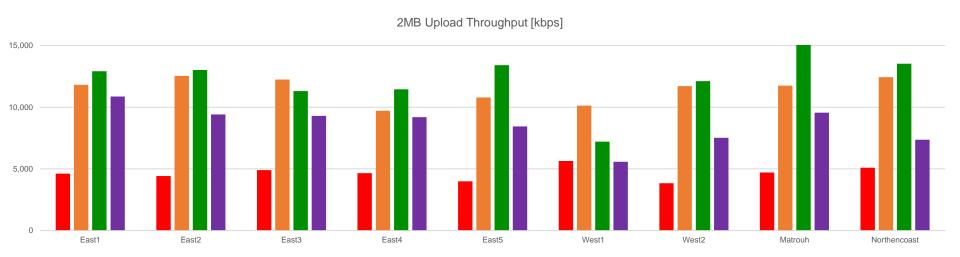
#### 20MB Download Throughput [kbps]



#### HTTP Upload Throughput – Customer Experience

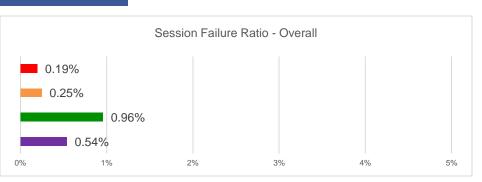


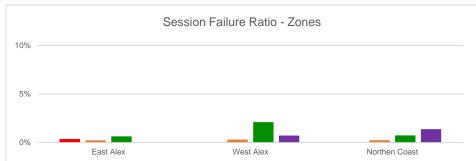




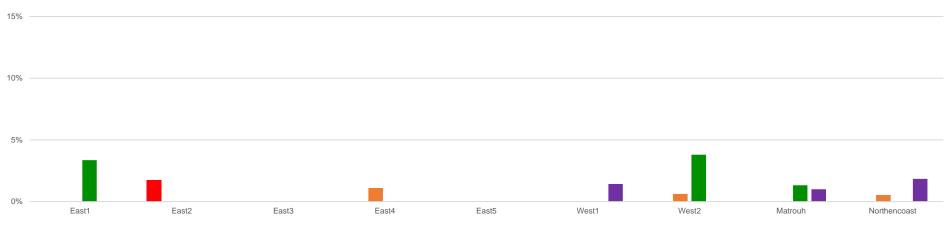


# facebook Session Failure Ratio

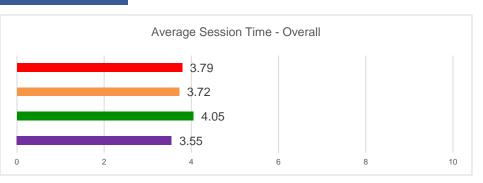


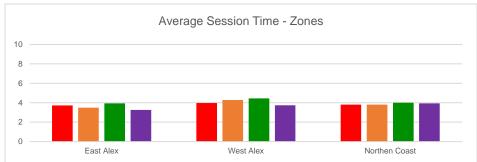




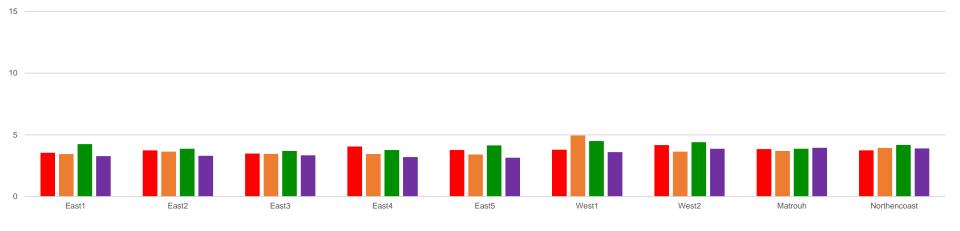


# facebook. Session Time

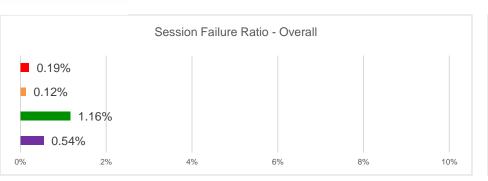


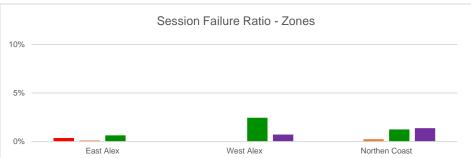


#### Average Session Time

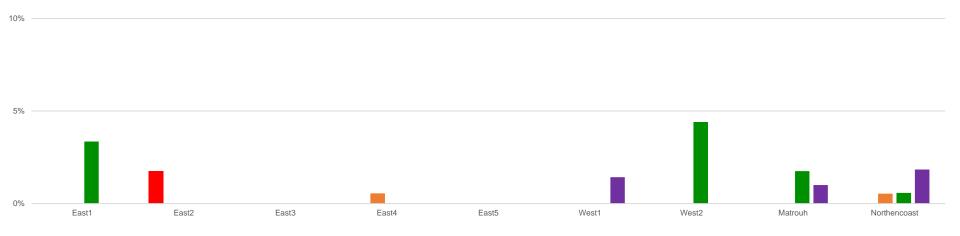


# Google Session Failure Ratio

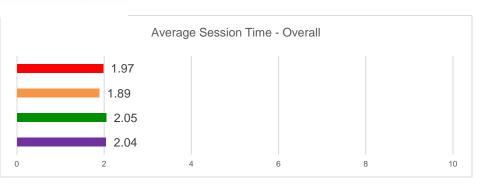


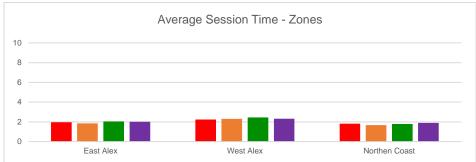


#### Session Failure Ratio

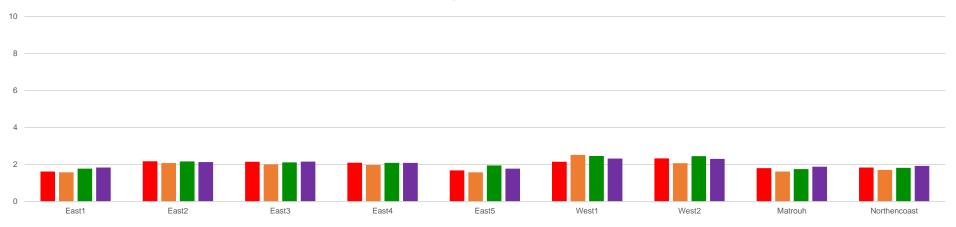


# Google Session Time

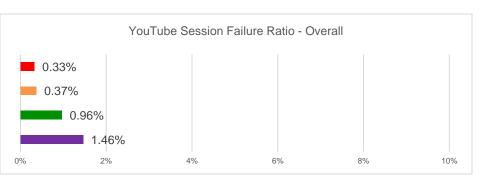


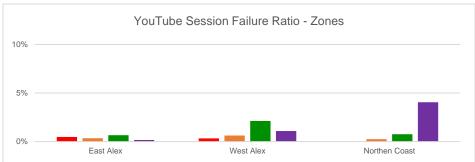


#### Average Session Time

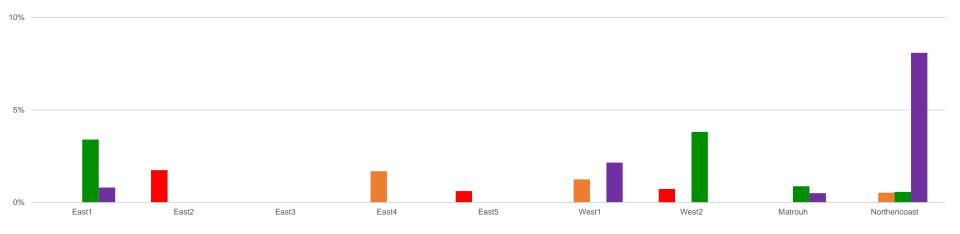


#### **► YouTube** Session Failure Ratio

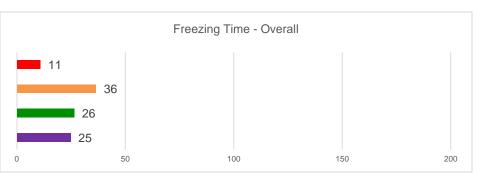




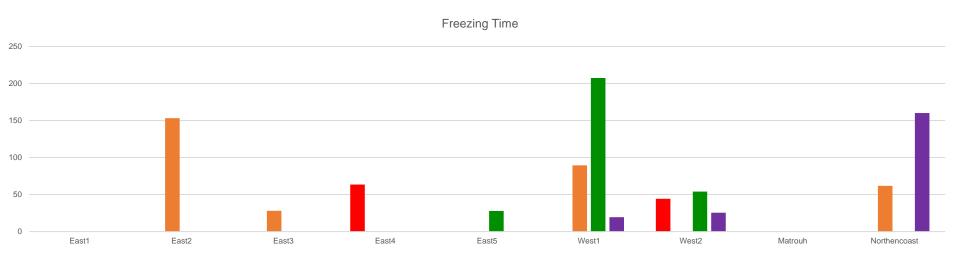
#### YouTube Session Failure Ratio



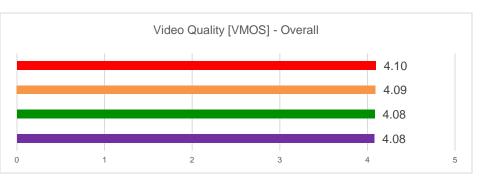
### ► YouTube Freezing Time [msec]



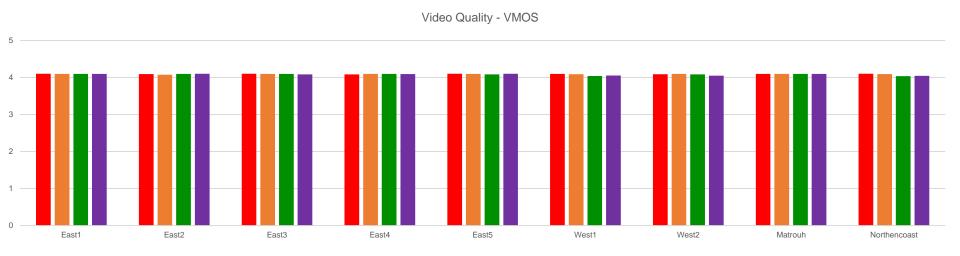




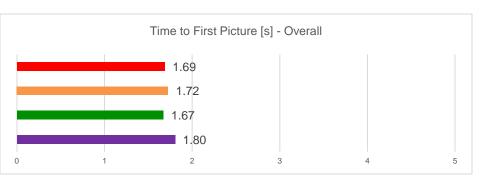
### ■ YouTube Video Quality





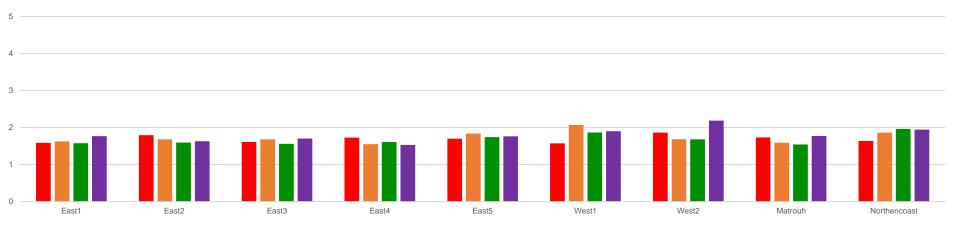


#### ■ YouTube Time to 1<sup>st</sup> Picture



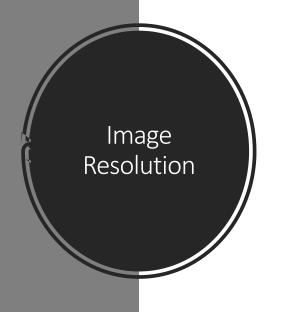


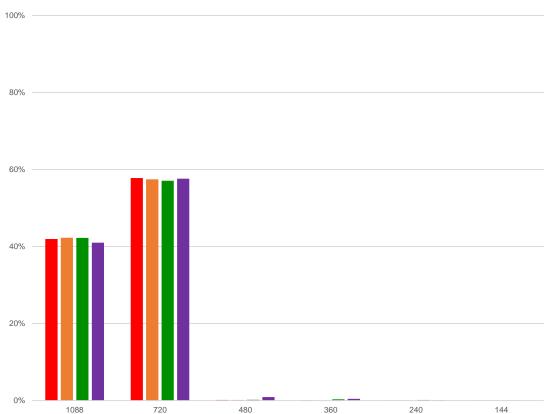












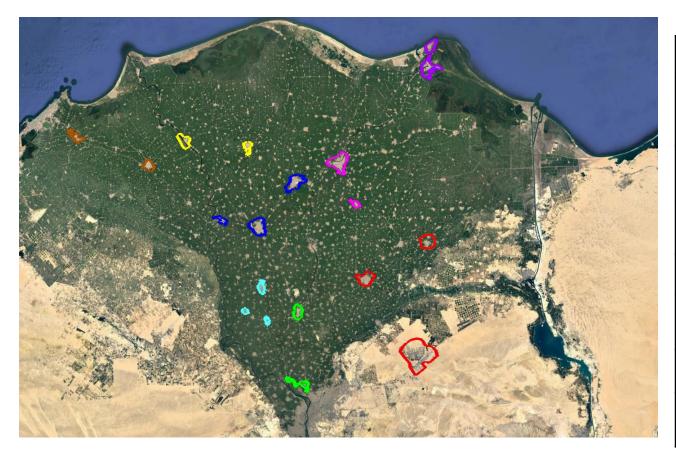
# **AGENDA**

- 1. Quantitative Information
- 2. Voice Service Quality & Performance Cairo
- 3. Data Service Quality & Performance Cairo
- 4. Voice Service Quality & Performance Giza
- 5. Data Service Quality & Performance Giza
- 6. Voice Service Quality & Performance Alexandria
- 7. Data Service Quality & Performance Alexandria

#### 8. Voice Service Quality & Performance - Delta

- 9. Data Service Quality & Performance Delta
- 10. Voice Service Quality & Performance Canal
- 11. Data Service Quality & Performance Canal
- 12. Voice Service Quality & Performance Upper Egypt
- 13. Data Service Quality & Performance Upper Egypt
- 14. Annexes

#### **Zones Definition**

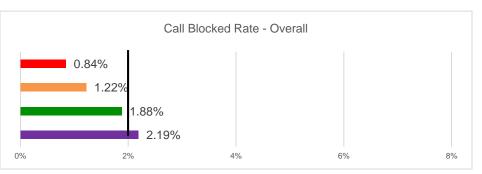


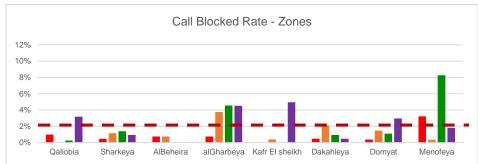
Delta Cities	
Z1	Banha
Delta Z1	Qalyoub
De	Qanatir
Delta Z2	10th of ramadan
Delt	Fagous
_	Zagazig
Delta Z3	Damnhour
Delt	Kafr Eldawar
Delta Z4	Kafr el Zayat
) Delta	Tanta - Mahalla
52	Desouk
Delta	Kafr El sheikh
Delta Z6	Mansoura
	Senbelawen
72	Domyat
Delta	Ras El bar
Delta Z8 Delta Z7	Menoufbagour
	Shebin el Koum



### Accessibility: Call Blocked Rate

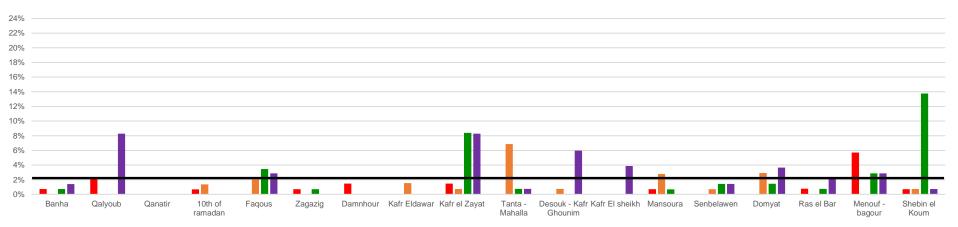






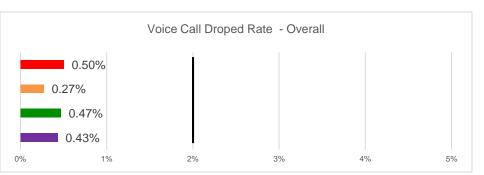
Call Blocked Rate represents the ratio between unsuccessful call attempts and all calls made (both successful & unsuccessful).

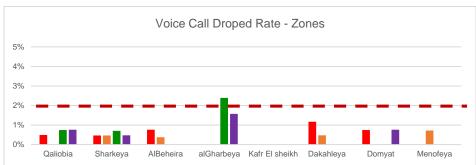




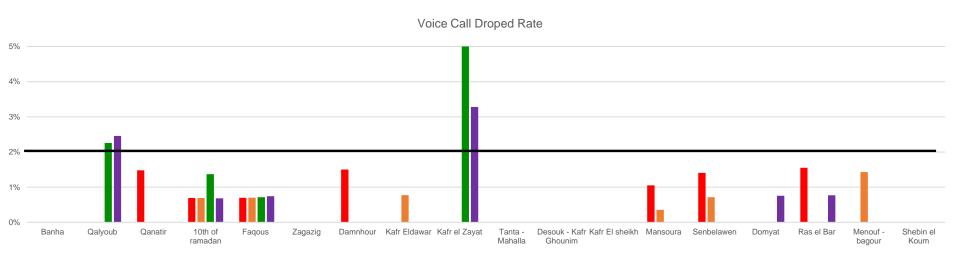
### Retainability: Call Dropped Rate





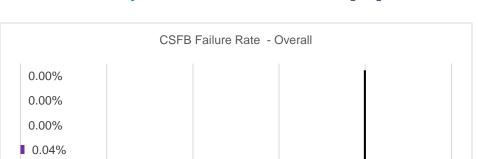


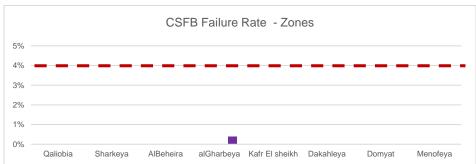
**Voice Call Retainability** *is represented by call drop rates.* 



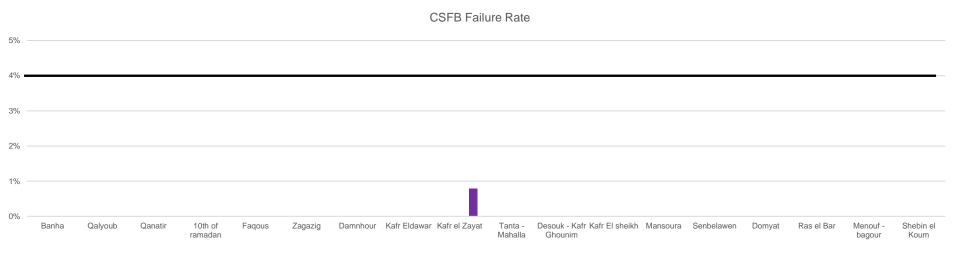
### Accessibility: CSFB Failure Rate [%]





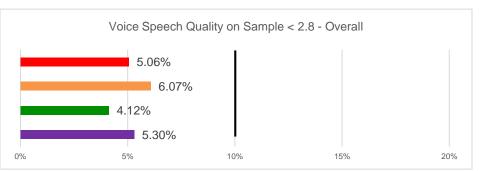


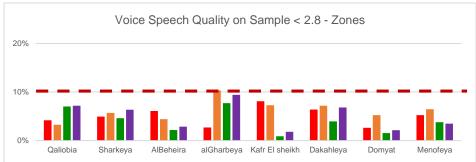
**CSFB Failure Rate** represents the ratio between unsuccessful fall back attempt to lower technology than 4G (LTE) and all calls made (both successful & unsuccessful). When there is 4G (LTE) present before starting the session.



#### Speech Quality: MOS Voice Speech Quality < 2.8

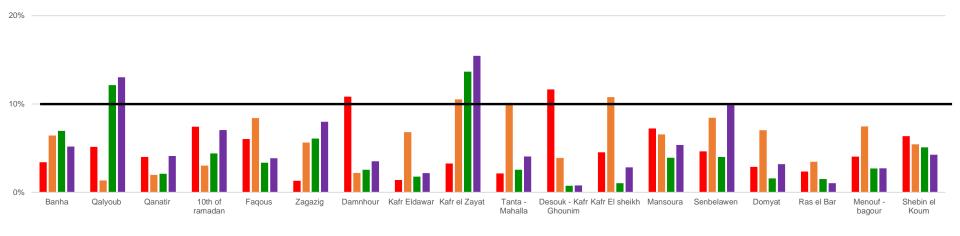






MOS Voice Speech Quality < 2.8 represents the ratio between total number of MOS samples less than 2.8 all collected MOS samples

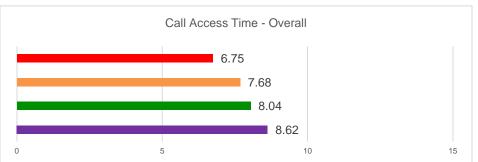


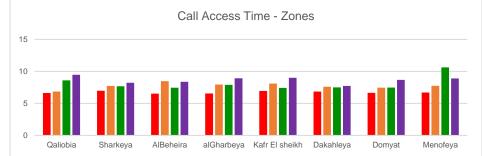


### Accessibility: Call Access Time [sec.]



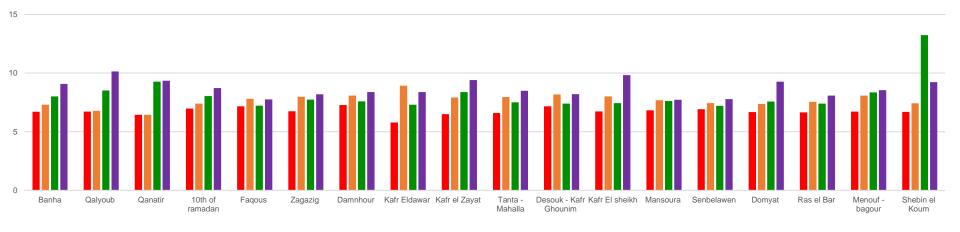






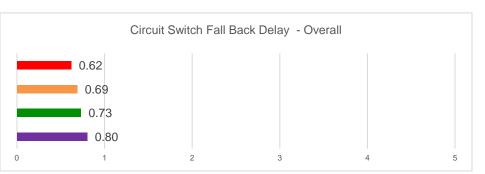
Call Access represents the period of time elapsed from the sending of a complete destination address (target number) to the setting up of a call to the receiving terminal.

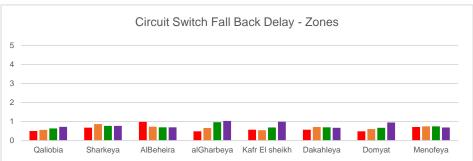




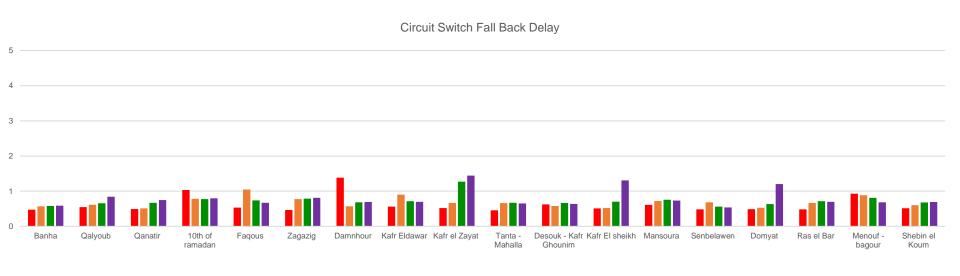
### Accessibility: CSFB Delay [sec.]





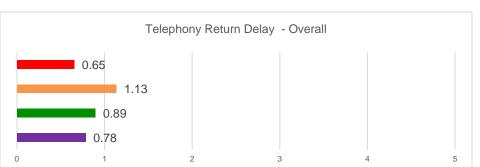


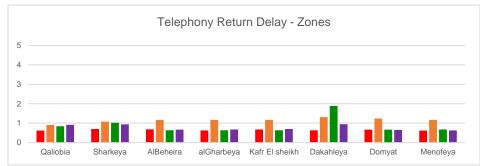
CSFB Delay represents the period of time to overlay 3G/2G environment instead of handling calls in 4G (LTE). Depending on the CSFB strategy.



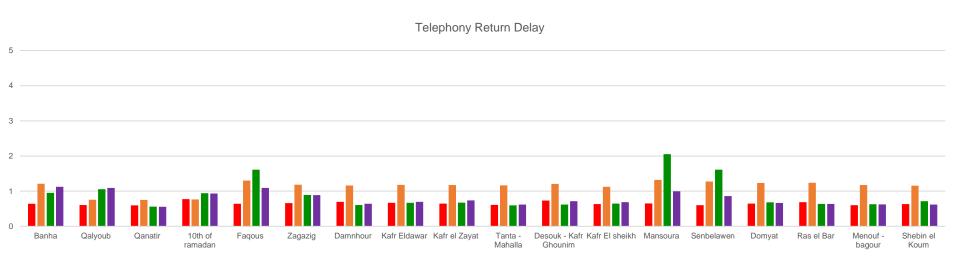
### Accessibility: Telephony Return Delay [sec.]





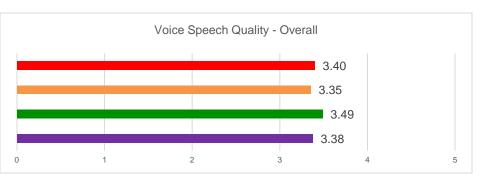


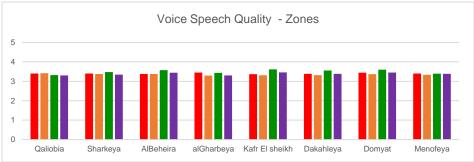
Telephony Return Delay measures the time that a UE uses to re-join the LTE (4G) network after call end



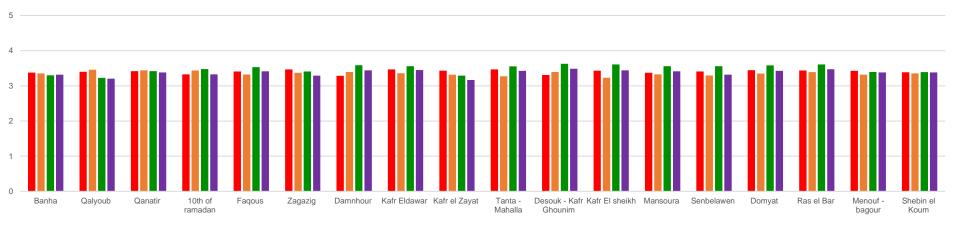


#### Speech Quality: MOS Scores

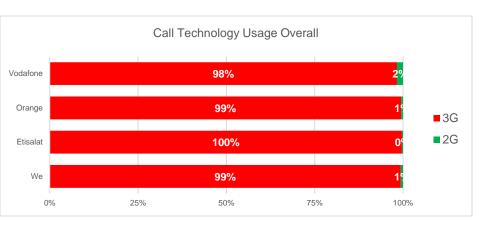




#### Voice Speech Quality

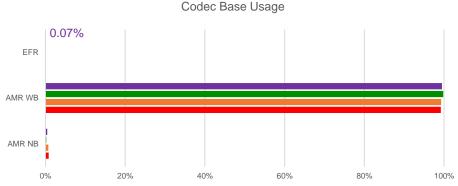


#### Speech Quality: Call technology Usage & Codec Base Usage



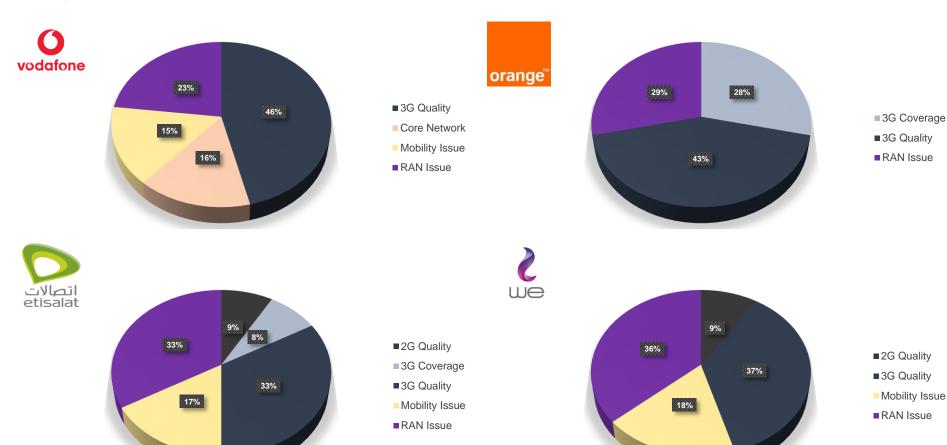
**Call technology Usage** represents the call technology used over call period. The more calls on 3G (UMTS) the better MOS served.

Codec Base Usage represents the codec used over the call where AMR wideband (AMR WB) leads to better voice quality experience by the end user than the AMR Narrowband (AMR NB)





#### **Analysis: Dropped Calls Causes**

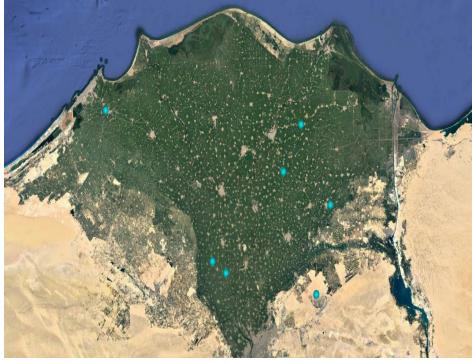


## All Operators: Dropped Calls Locations 1/2









## All Operators: Dropped Calls Locations 2/2





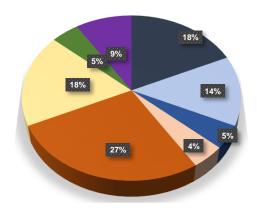






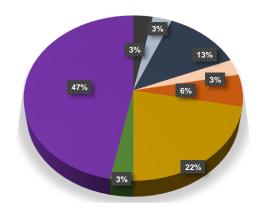
#### **Analysis: Failed Calls Causes**













■ 3G Coverage



Core Network

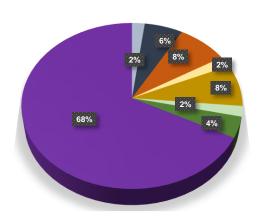
#### ■ CSFB Issue

■ No service

#### ■ Paging Issue

■ RAN Issue









■3G Quality

■3G Quality

■4G Quality

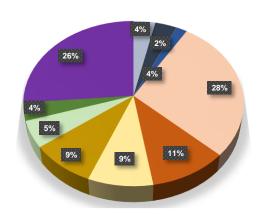
Core Network

■CSFB Issue Mobility Issue

■ Paging Issue

■ RAN Issue

- **■**CSFB Issue
- Mobility Issue
- No service
- Other
- Paging Issue
- RAN Issue







- Core Network
- **■** CSFB Issue
- Mobility Issue
- No service
- Other
- Paging Issue
- RAN Issue

### All Operators: Blocked Calls Locations 1/2







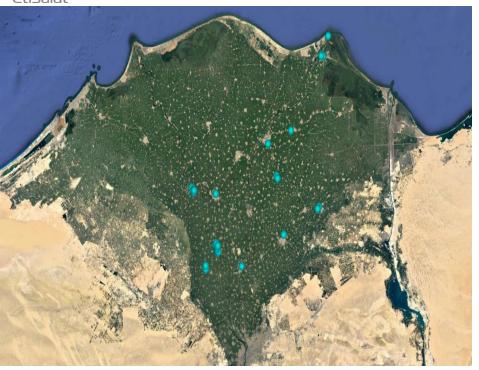


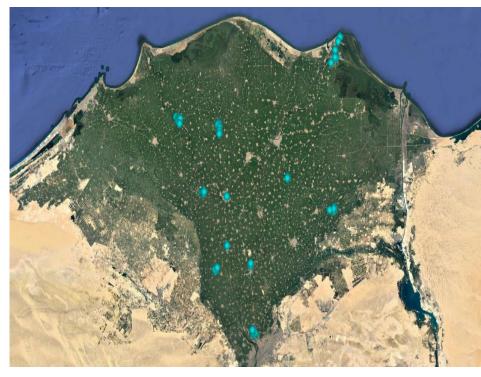
### All Operators: Blocked Calls Locations 2/2











# **AGENDA**

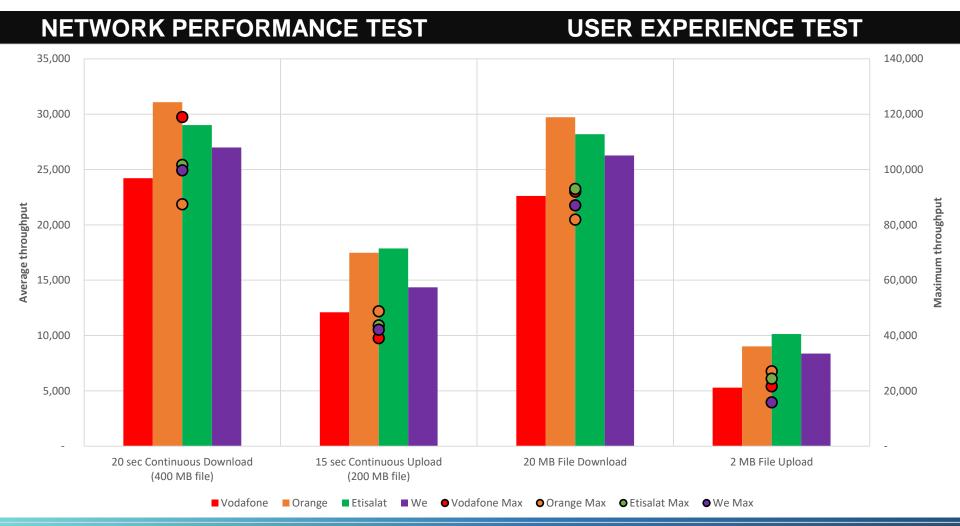
- 1. Quantitative Information
- 2. Voice Service Quality & Performance Cairo
- 3. Data Service Quality & Performance Cairo
- 4. Voice Service Quality & Performance Giza
- 5. Data Service Quality & Performance Giza
- 6. Voice Service Quality & Performance Alexandria
- 7. Data Service Quality & Performance Alexandria
- 8. Voice Service Quality & Performance Delta

#### 9. Data Service Quality & Performance - Delta

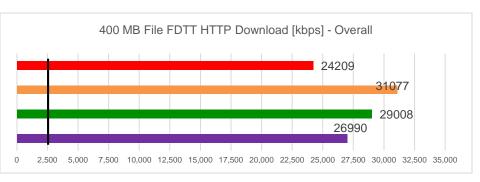
- 10. Voice Service Quality & Performance Canal
- 11. Data Service Quality & Performance Canal
- 12. Voice Service Quality & Performance Upper Egypt
- 13. Data Service Quality & Performance Upper Egypt
- 14. Annexes

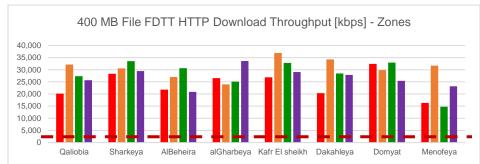


#### Free Mode Throughput Per Test Type

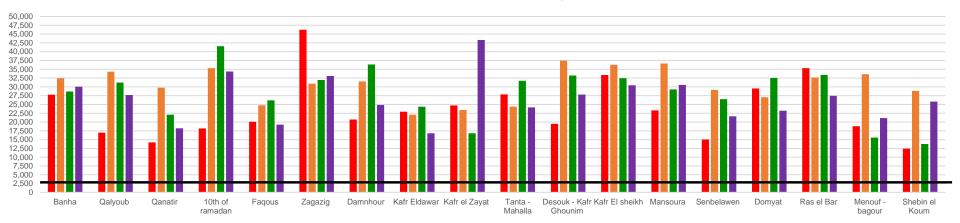


#### FDTT HTTP Download Transfer Throughput – Network Performance

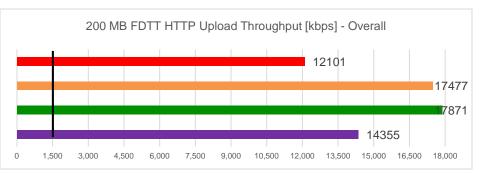


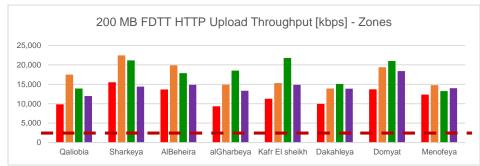


#### 400 MB File FDTT HTTP Download Throughput [kbps]

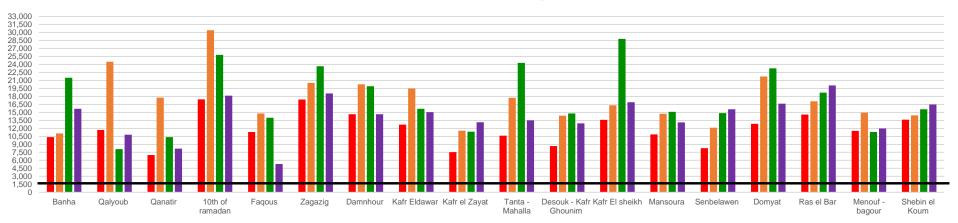


#### FDTT HTTP Upload Transfer Throughput – Network Performance

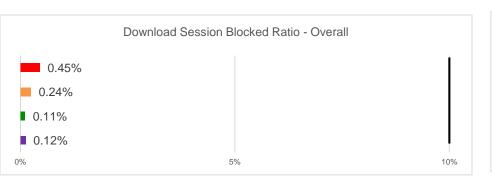


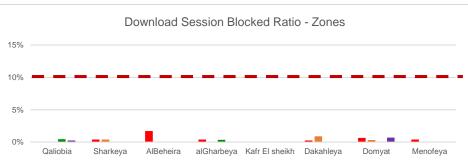


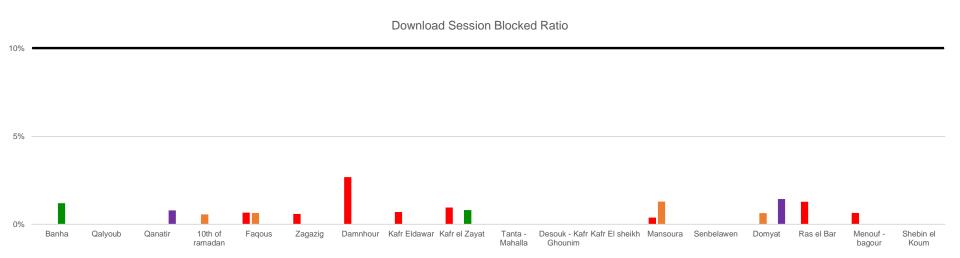
#### 200 MB FDTT HTTP Upload Throughput [kbps]



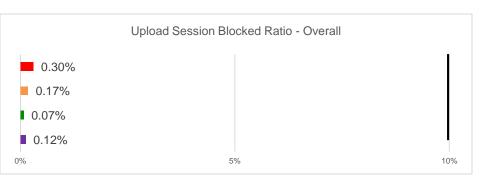
#### HTTP Download Session Blocked Rates

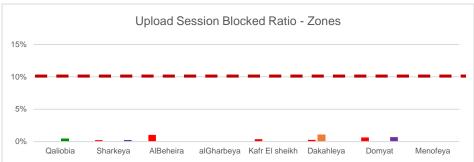


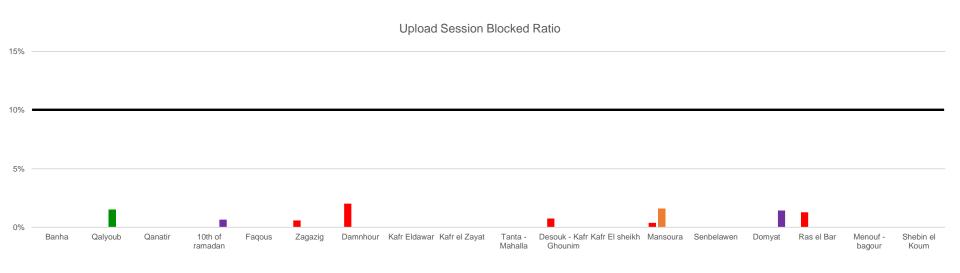




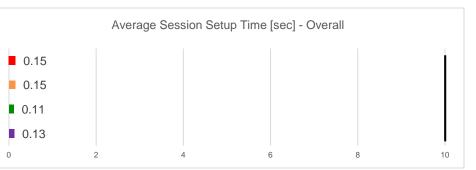
### HTTP Upload Session Blocked Rates

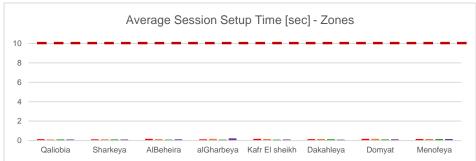


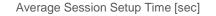


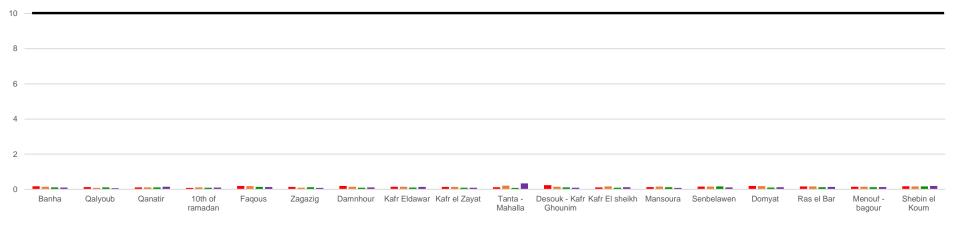


### HTTP Download Average Session Setup Time

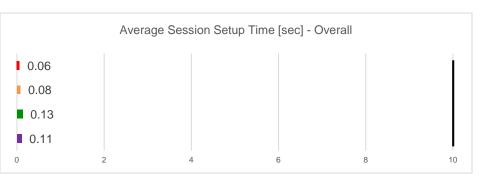




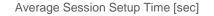


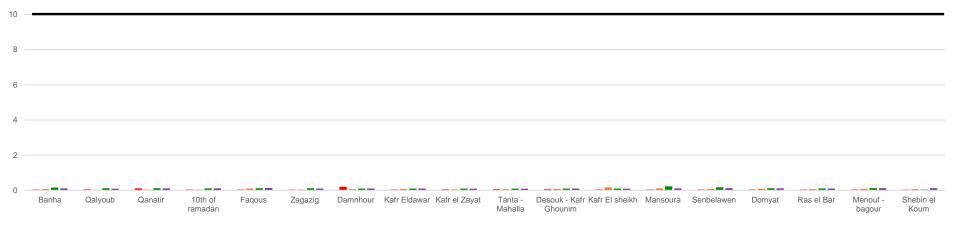


### HTTP Upload Average Session Setup Time



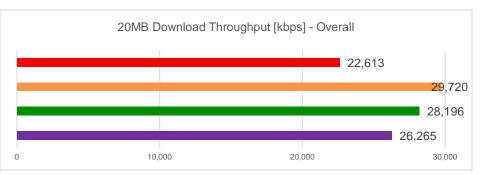


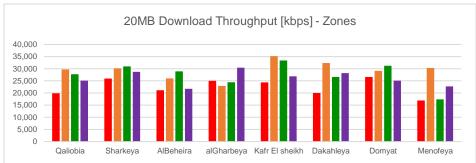




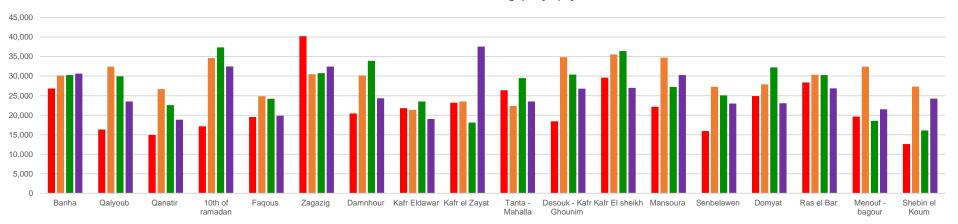


### HTTP Download Throughput – Customer Experience

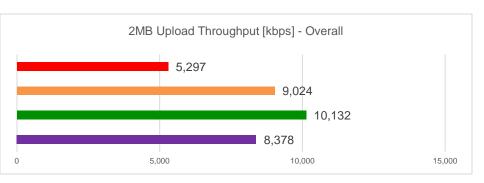


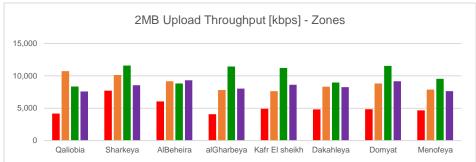


#### 20MB Download Throughput [kbps]

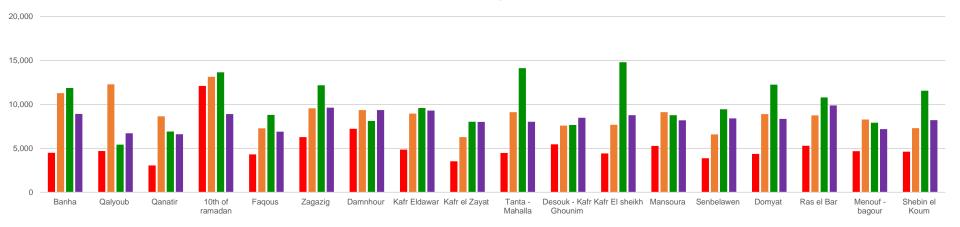


### HTTP Upload Throughput – Customer Experience



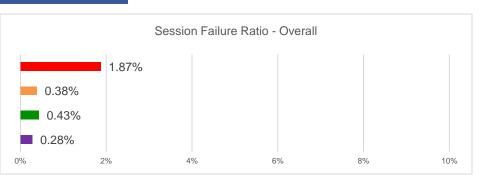


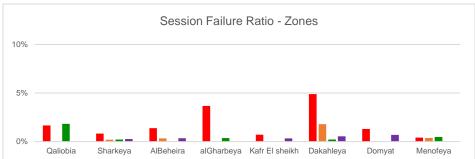
#### 2MB Upload Throughput [kbps]



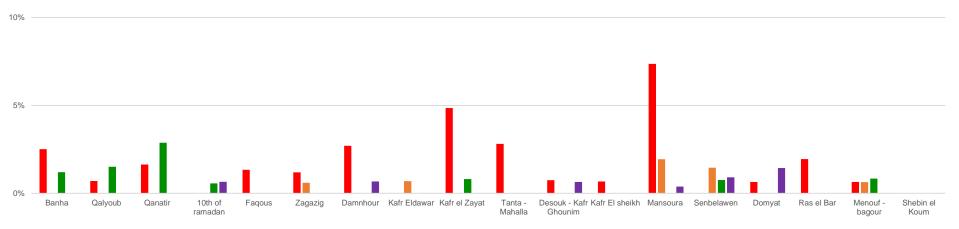


### facebook Session Failure Ratio

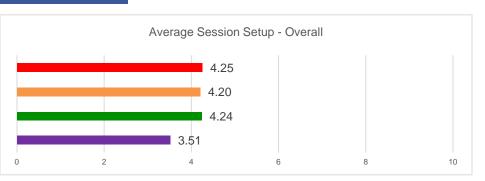


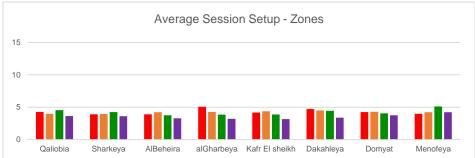


#### Session Failure Ratio

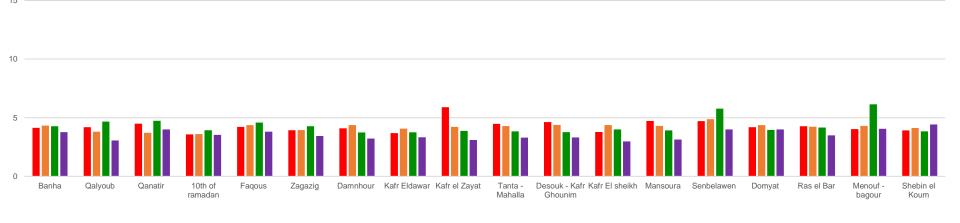


# facebook. Session Time

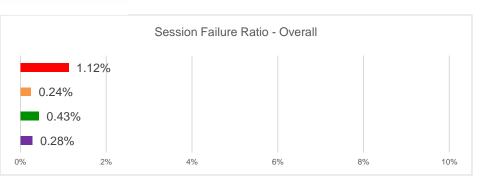


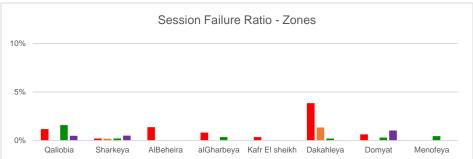


#### Average Session Time

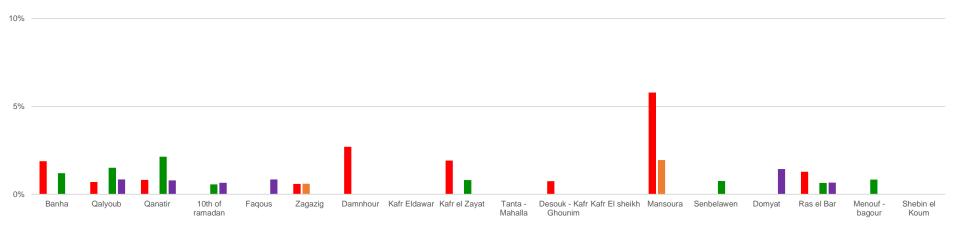


### Google Session Failure Ratio

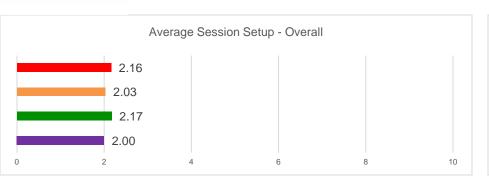


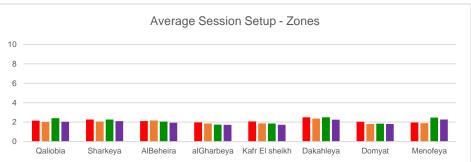


#### Session Failure Ratio

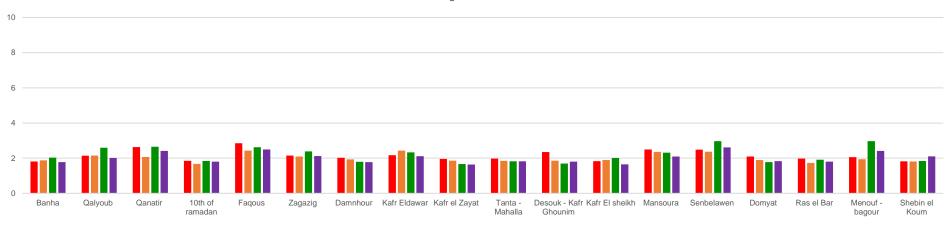


### Google Session Time

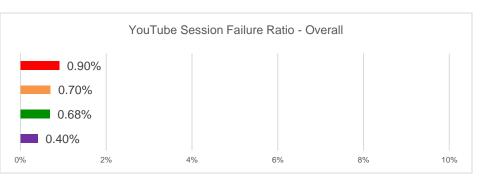


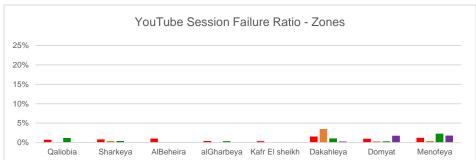


#### Average Session Time

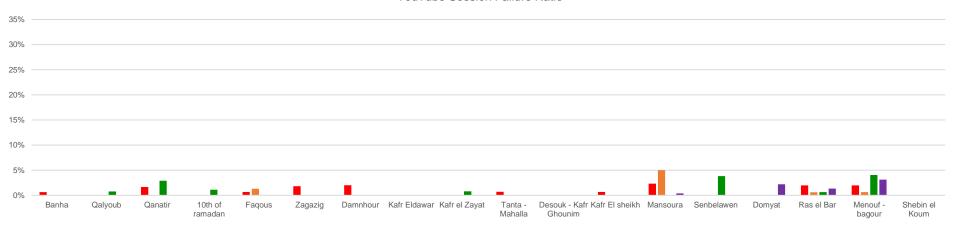


### ■ YouTube Session Failure Ratio

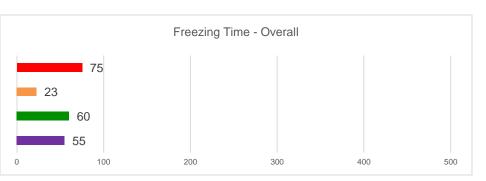


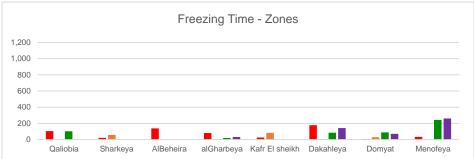


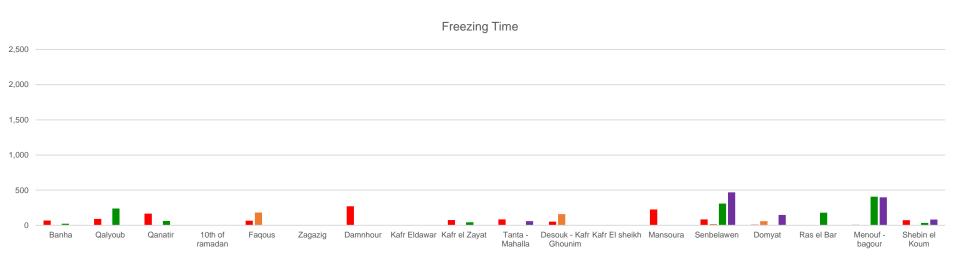
#### YouTube Session Failure Ratio



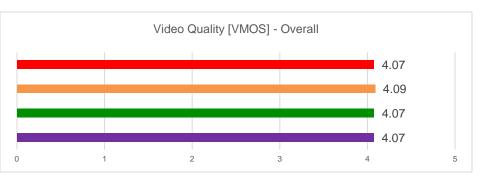
### YouTube Freezing Time [msec]

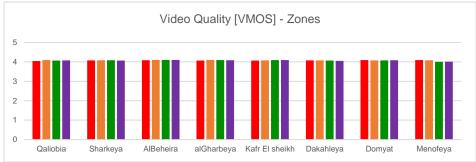




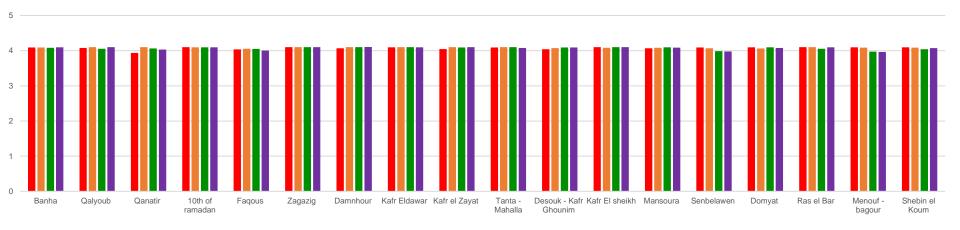


### ► YouTube Video Quality

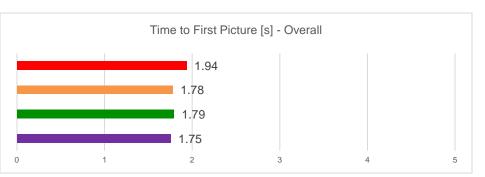




Video Quality - VMOS

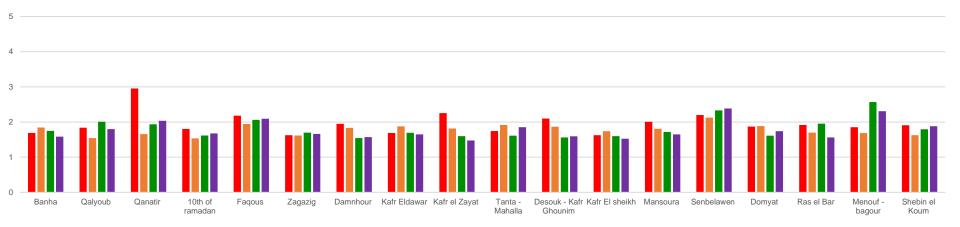


### ■ YouTube Time to 1<sup>st</sup> Picture





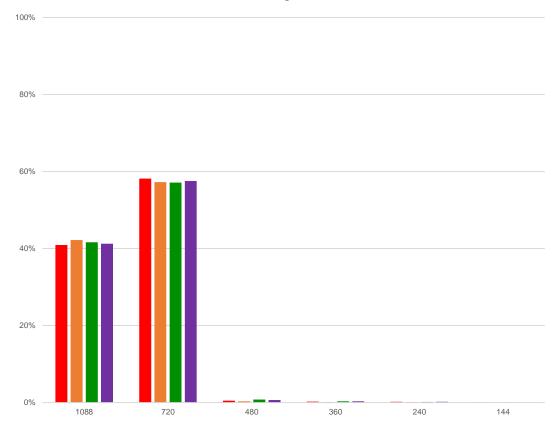








### Youtube - Image Resolution



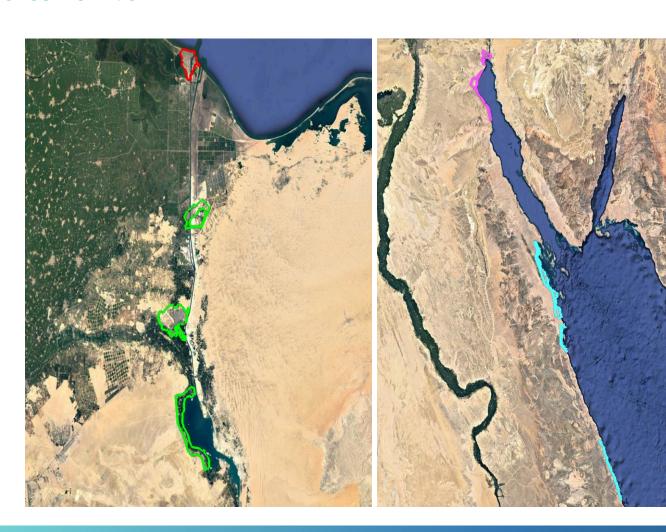
## **AGENDA**

- 1. Quantitative Information
- 2. Voice Service Quality & Performance Cairo
- 3. Data Service Quality & Performance Cairo
- 4. Voice Service Quality & Performance Giza
- 5. Data Service Quality & Performance Giza
- 6. Voice Service Quality & Performance Alexandria
- 7. Data Service Quality & Performance Alexandria
- 8. Voice Service Quality & Performance Delta
- 9. Data Service Quality & Performance Delta

### 10. Voice Service Quality & Performance - Canal

- 11. Data Service Quality & Performance Canal
- 12. Voice Service Quality & Performance Upper Egypt
- 13. Data Service Quality & Performance Upper Egypt
- 14. Annexes

### **Zones Definition**

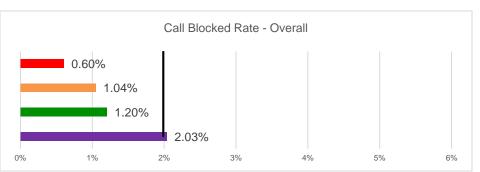


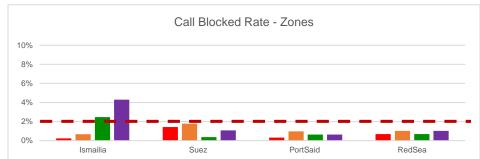
	Canal City
١Z	Fayed Abou Sultan
Sanal Z1	Ismailia
٥	Qantara
Canal Z2	Sokhna
Car	Suez
Canal Z3	PortSaid
Canal Z4	Hurghada



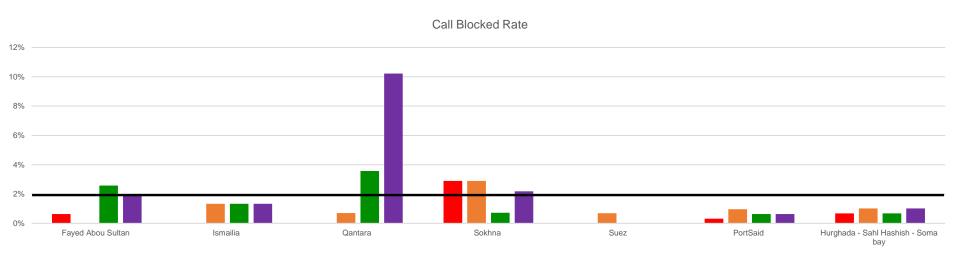
### Accessibility: Call Blocked Rate







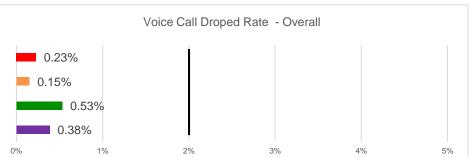
Call Blocked Rate represents the ratio between unsuccessful call attempts and all calls made (both successful & unsuccessful).

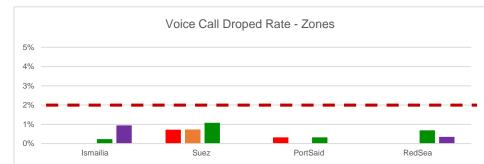


### Retainability: Call Dropped Rate

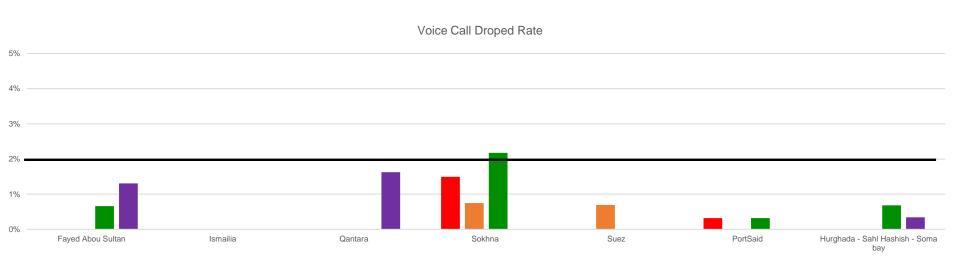








Voice Call Retainability is represented by call drop rates.



### Accessibility: CSFB Failure Rate [%]

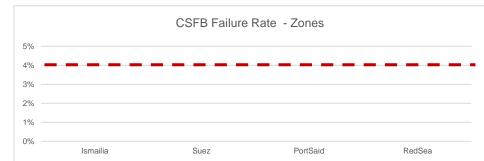






Ismailia

Qantara



CSFB Failure Rate represents the ratio between unsuccessful fall back attempt to lower technology than 4G (LTE) and all calls made (both successful & unsuccessful). When there is 4G (LTE) present before starting the session.

**CSFB** Failure Rate

Sokhna



Suez

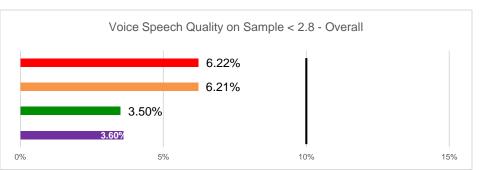
PortSaid

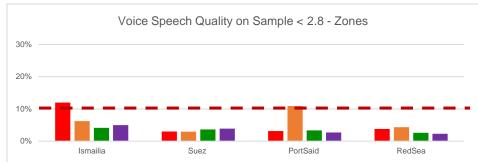
Hurghada - Sahl Hashish - Soma

Fayed Abou Sultan

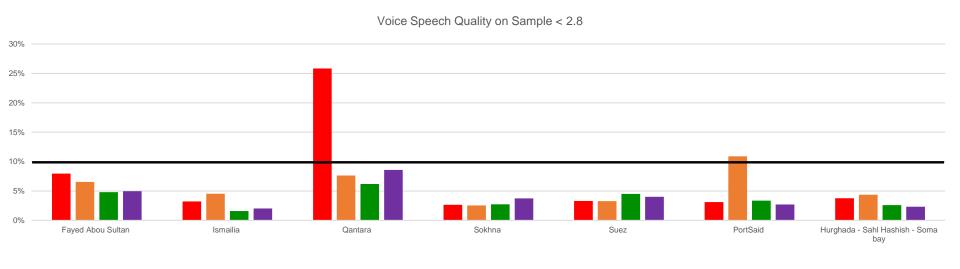
### Speech Quality: MOS Voice Speech Quality < 2.8





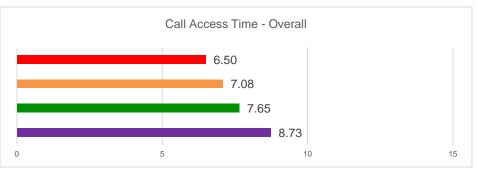


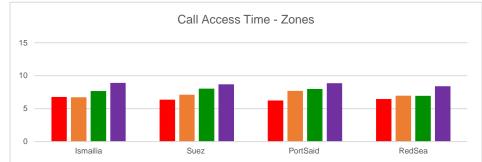
MOS Voice Speech Quality < 2.8 represents the ratio between total number of MOS samples less than 2.8 all collected MOS samples



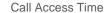
### Accessibility: Call Access Time [sec.]

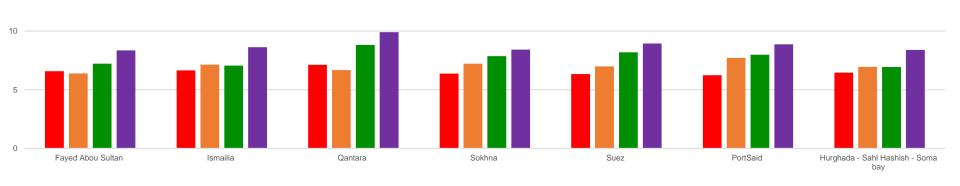




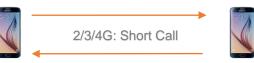


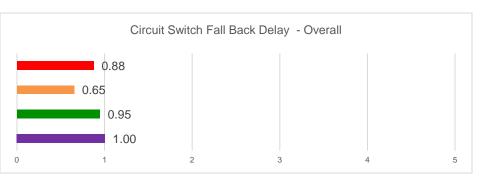
**Call Access** represents the period of time elapsed from the sending of a complete destination address (target number) to the setting up of a call to the receiving terminal.

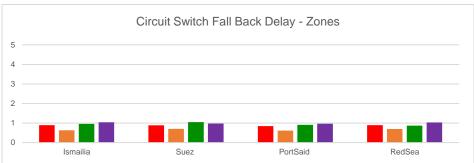




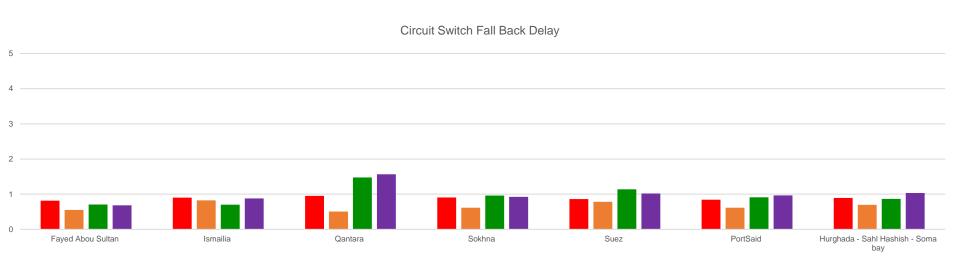
### Accessibility: CSFB Delay [sec.]







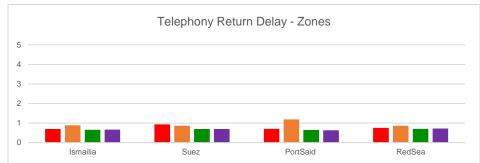
CSFB Delay represents the period of time to overlay 3G/2G environment instead of handling calls in 4G (LTE). Depending on the CSFB strategy.



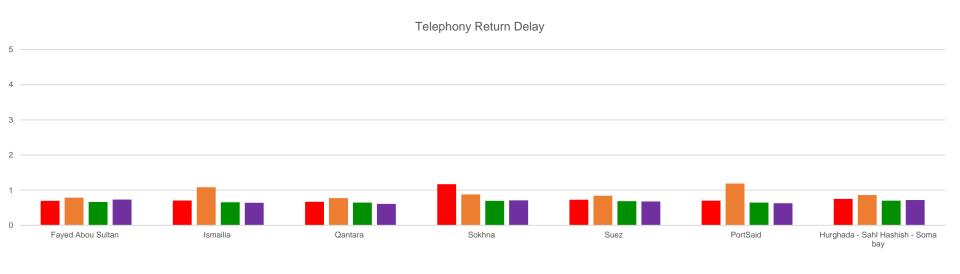
### Accessibility: Telephony Return Delay [sec.]





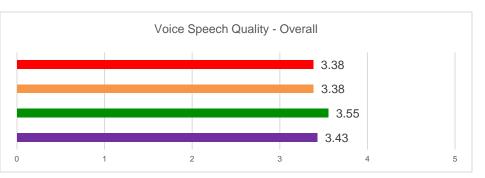


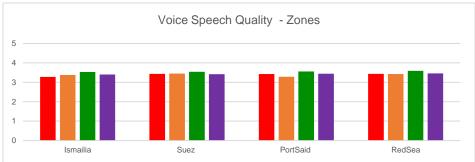
Telephony Return Delay measures the time that a UE uses to re-join the LTE (4G) network after call end



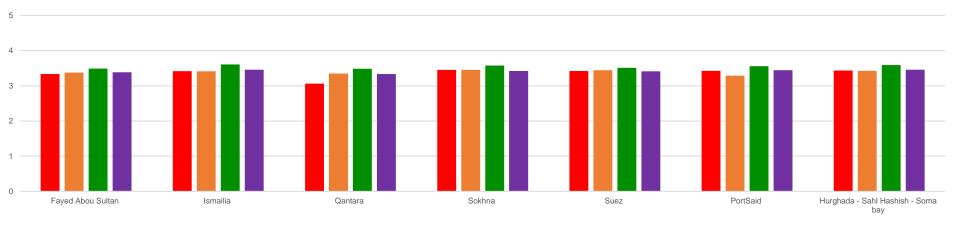


### Speech Quality: MOS Scores

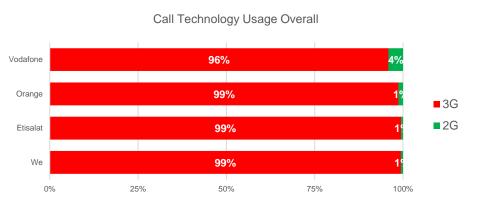






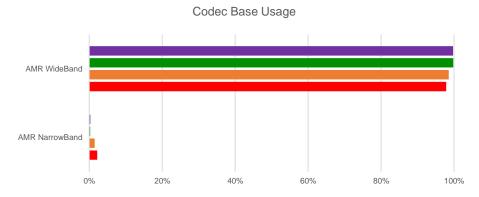


### Speech Quality: Call technology Usage & Codec Base Usage



**Call technology Usage** represents the call technology used over call period. The more calls on 3G (UMTS) the better MOS served.

**Codec Base Usage** represents the codec used over the call where AMR wideband (AMR WB) leads to better voice quality experience by the end user than the AMR Narrowband (AMR NB)





### Analysis: Dropped Calls Causes



### All Operators: Dropped Calls Locations 1/2









### All Operators: Dropped Calls Locations 2/2



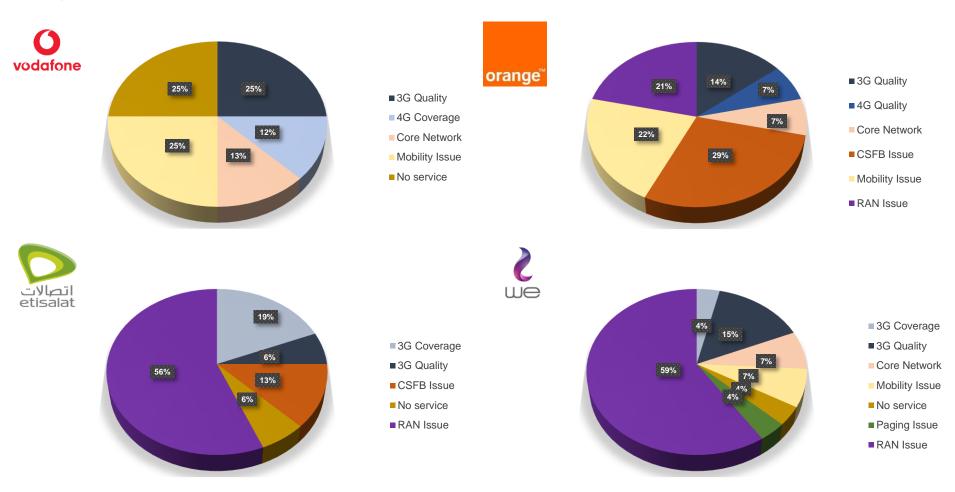








### **Analysis: Failed Calls Causes**



### All Operators: Blocked Calls Locations 1/2









### All Operators: Blocked Calls Locations 2/2









# **AGENDA**

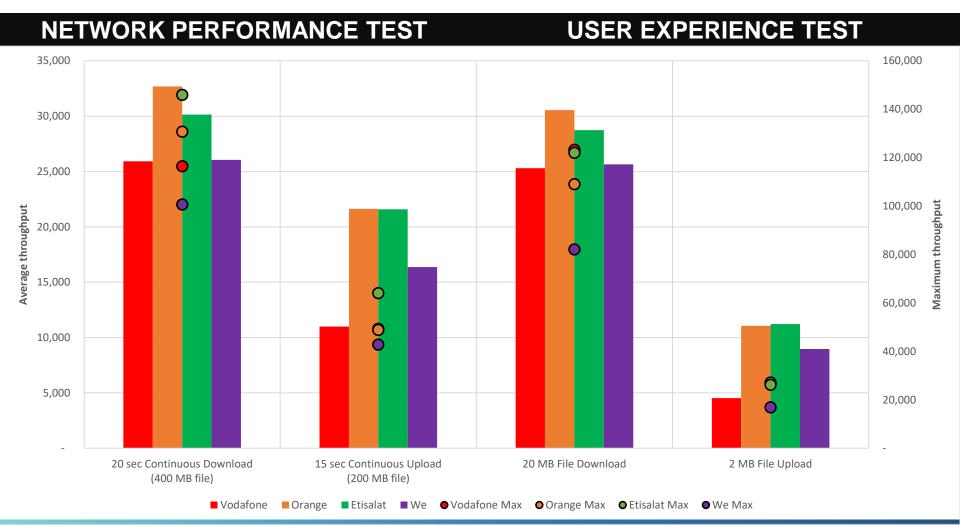
- 1. Quantitative Information
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- 9. Data Service Quality & Performance Delta
- 10. Voice Service Quality & Performance Canal

### 11. Data Service Quality & Performance – Canal

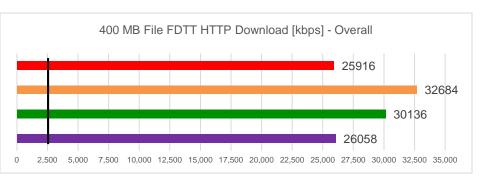
- 12. Voice Service Quality & Performance Upper Egypt
- 13. Data Service Quality & Performance Upper Egypt
- 14. Annexes

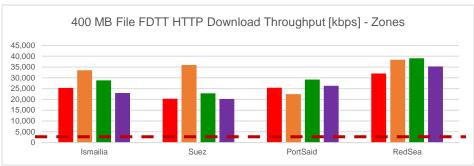


### Free Mode Throughput Per Test Type

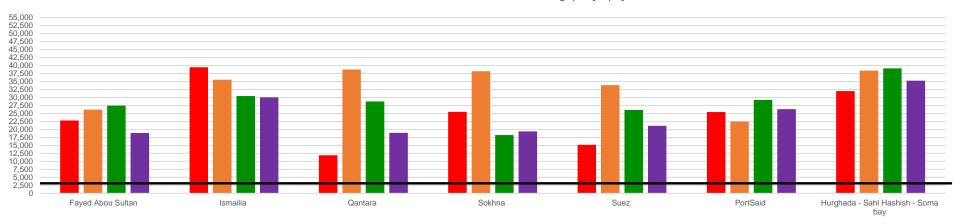


### FDTT HTTP Download Transfer Throughput – Network Performance

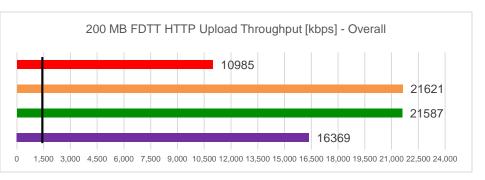


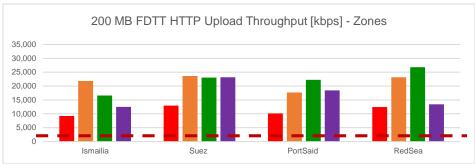


#### 400 MB File FDTT HTTP Download Throughput [kbps]

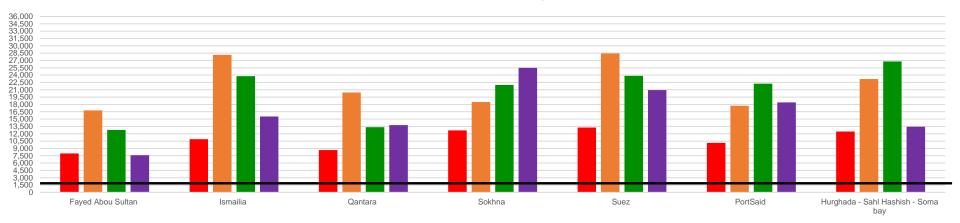


### FDTT HTTP Upload Transfer Throughput – Network Performance

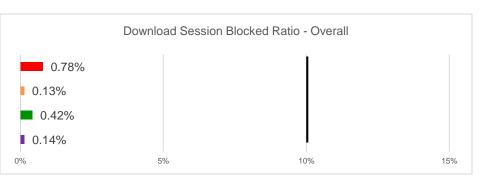


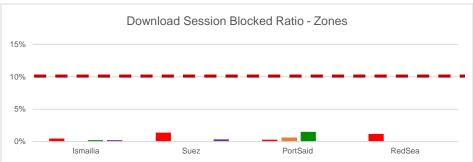


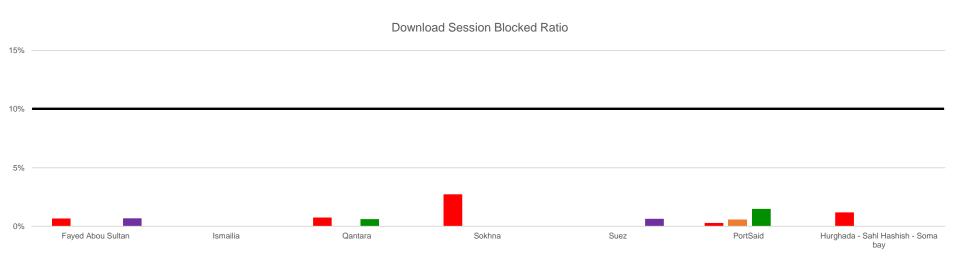
#### 200 MB FDTT HTTP Upload Throughput [kbps]



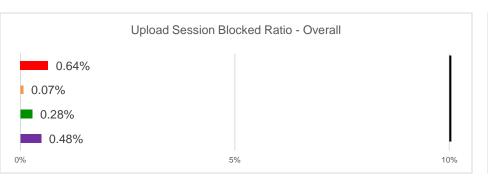
### HTTP Download Session Blocked Rates

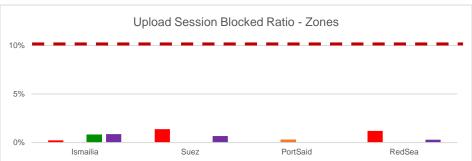


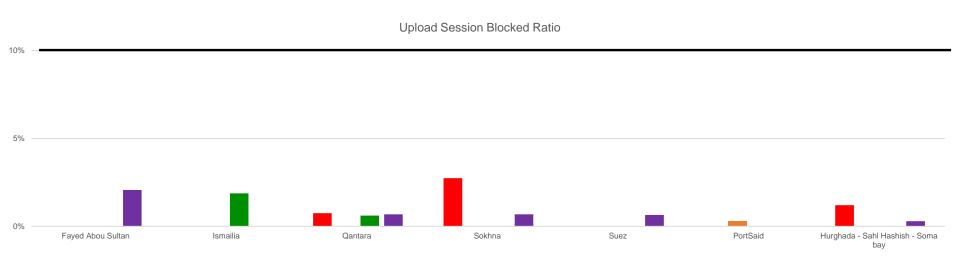




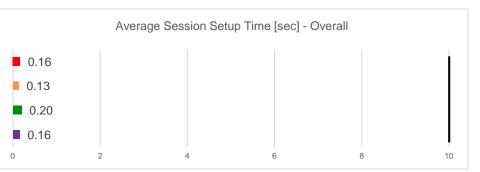
### HTTP Upload Session Blocked Rates

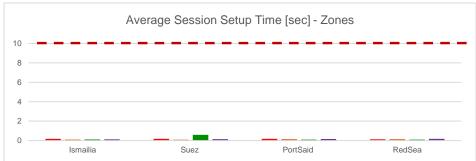


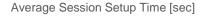


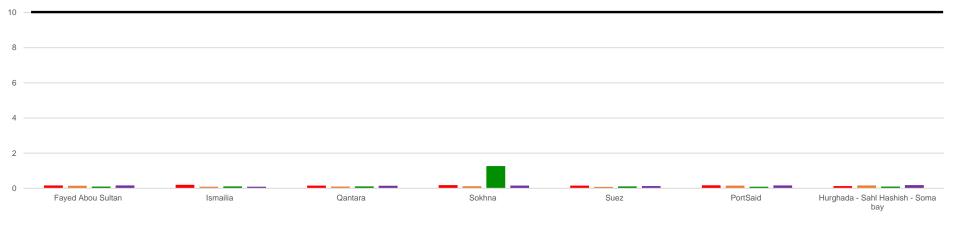


### HTTP Download Average Session Setup Time

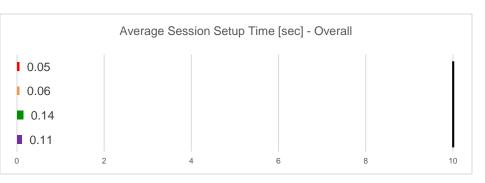


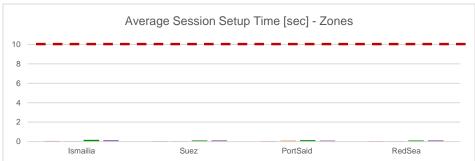




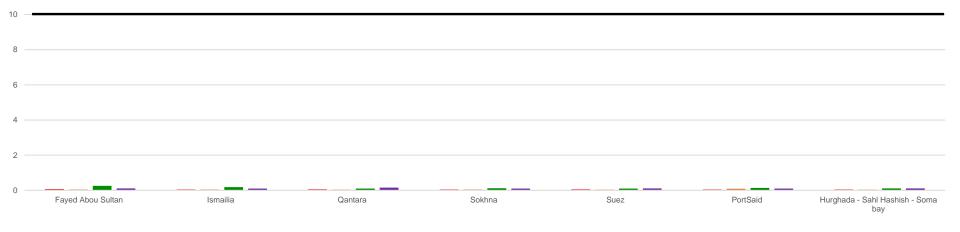


### HTTP Upload Average Session Setup Time



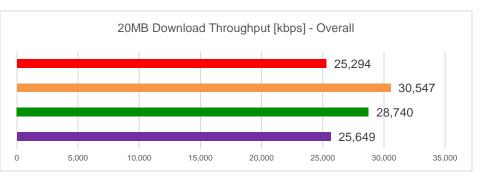


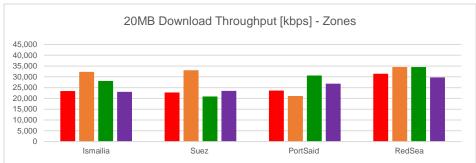




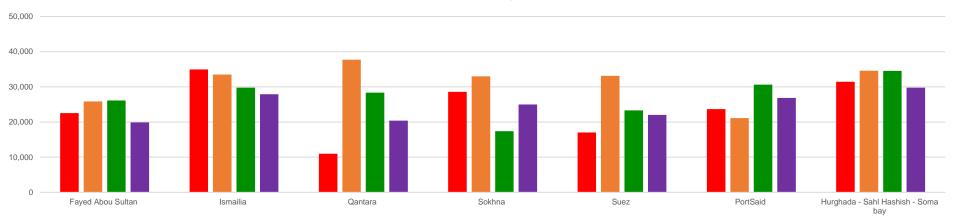


### HTTP Download Throughput – Customer Experience

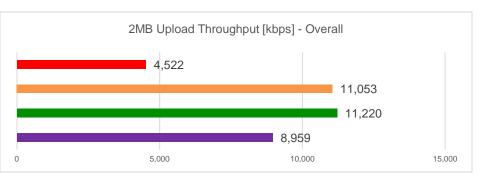


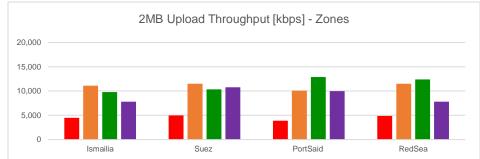


#### 20MB Download Throughput [kbps]

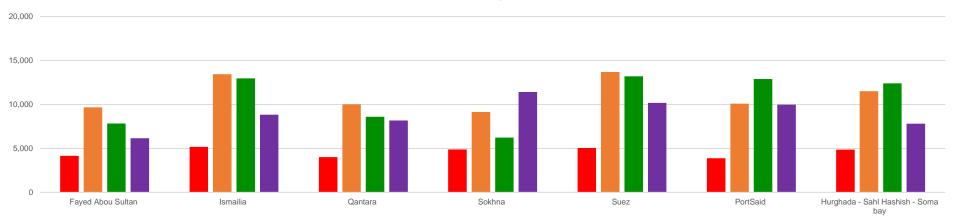


### HTTP Upload Throughput – Customer Experience



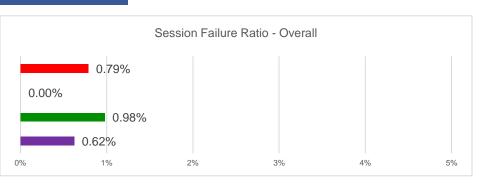


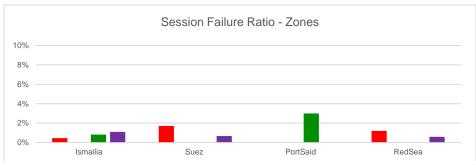
#### 2MB Upload Throughput [kbps]



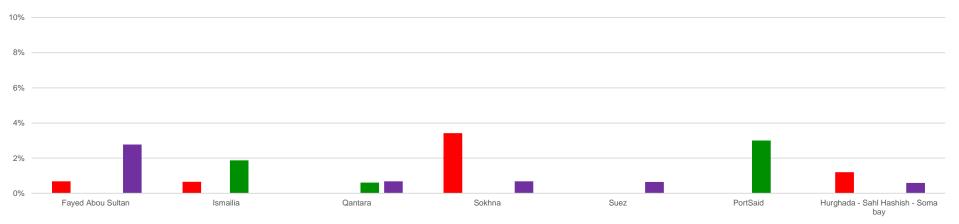


# facebook Session Failure Ratio



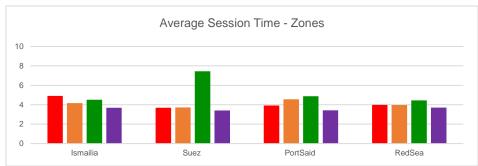


#### Session Failure Ratio

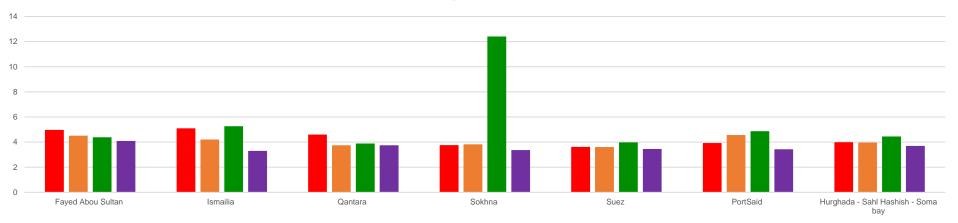


# facebook. Session Time

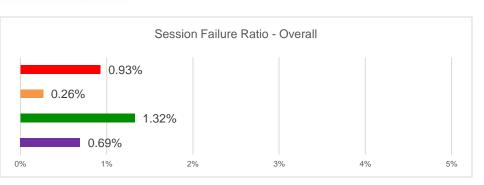


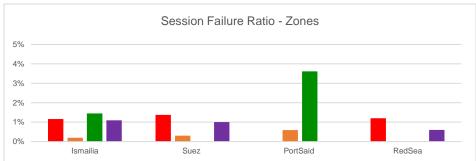


#### Average Session Time

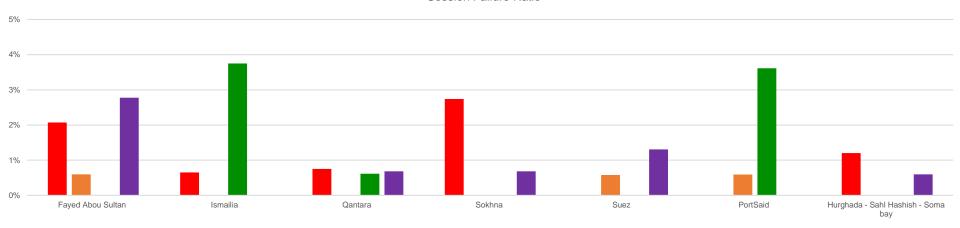


## Google Session Failure Ratio

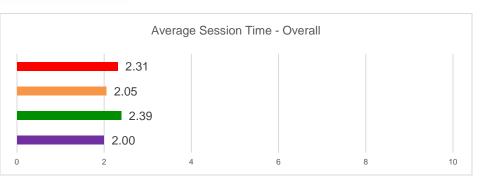


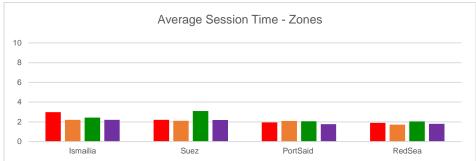


#### Session Failure Ratio

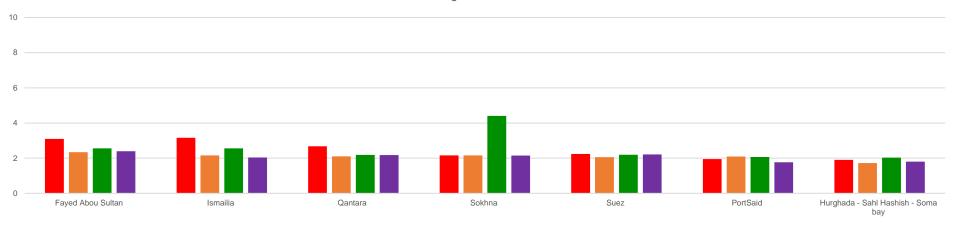


# Google Session Time

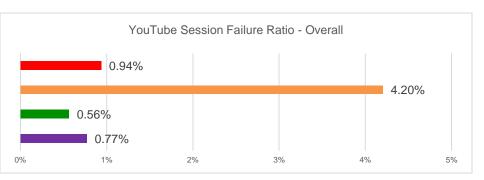


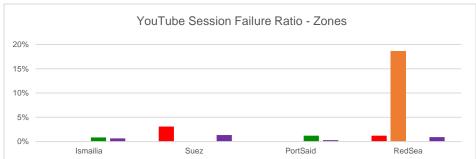


#### Average Session Time

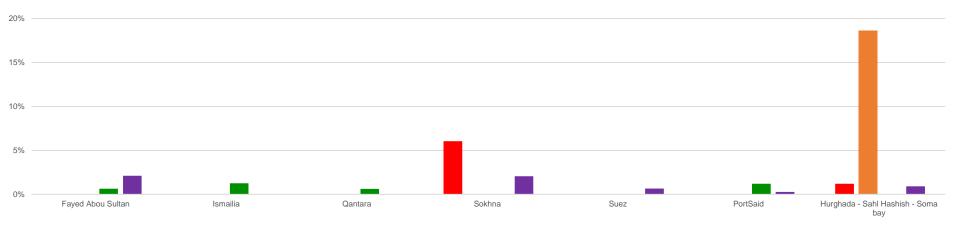


### ■ YouTube Session Failure Ratio

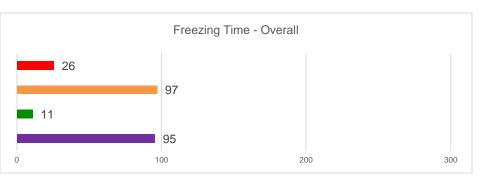


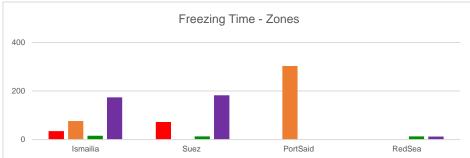


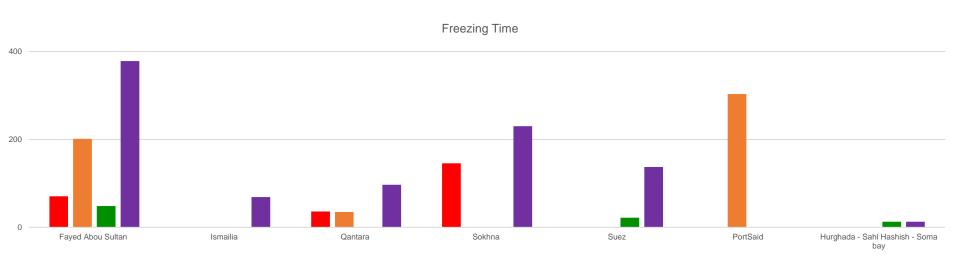
#### YouTube Session Failure Ratio



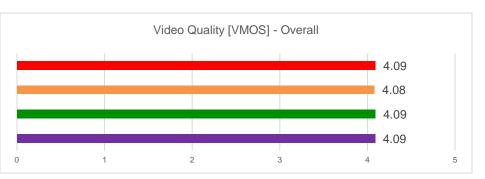
### ► YouTube Freezing Time [msec]

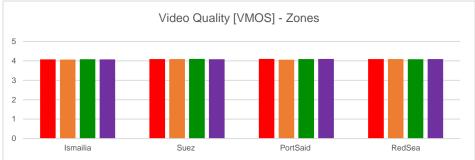




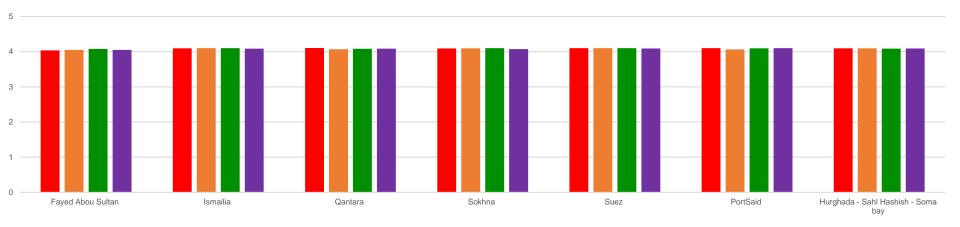


### ► YouTube Video Quality

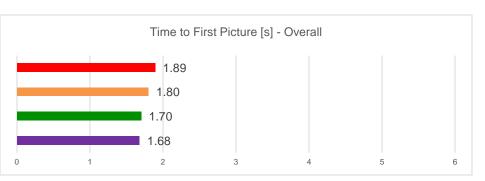


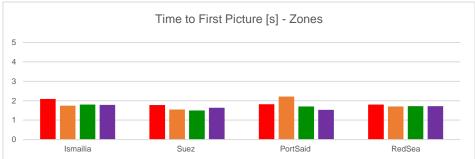




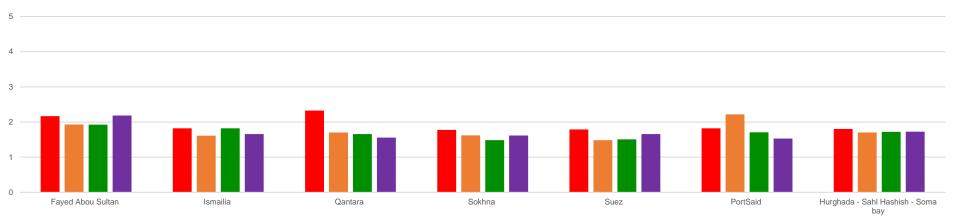


### **► YouTube** Time to 1st Picture





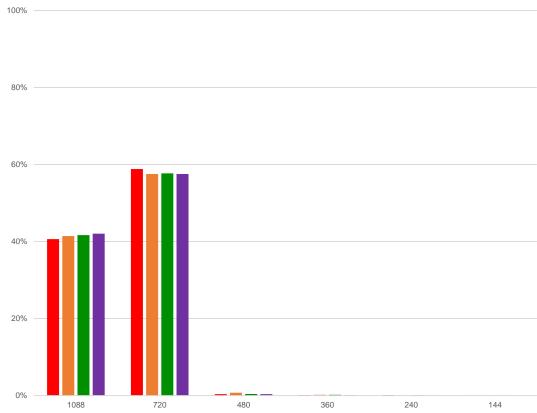












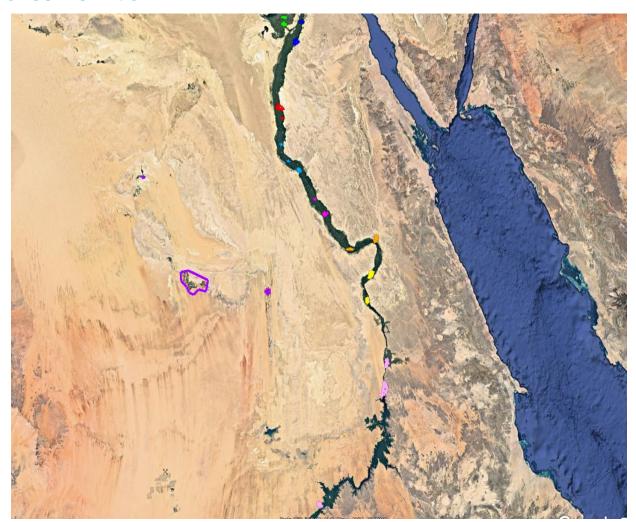
# **AGENDA**

- 1. Quantitative Information
- 2. Voice Service Quality & Performance Cairo
- 3. Data Service Quality & Performance Cairo
- 4. Voice Service Quality & Performance Giza
- 5. Data Service Quality & Performance Giza
- 6. Voice Service Quality & Performance Alexandria
- 7. Data Service Quality & Performance Alexandria
- 8. Voice Service Quality & Performance Delta
- 9. Data Service Quality & Performance Delta
- 10. Voice Service Quality & Performance Canal
- 11. Data Service Quality & Performance Canal

### 12. Voice Service Quality & Performance – Upper Egypt

- 13. Data Service Quality & Performance Upper Egypt
- 14. Annexes

### **Zones Definition**



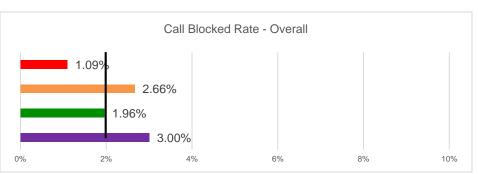
### Upper Egypt

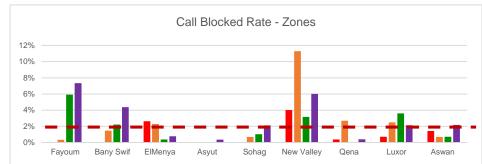
Fayoum SinurisTirsa  BanySwif Wasta  AbuQurqas Menya  Asyut DayroutManfalout  Sohag TahtaAkhmim  Kharga Dakhla Farafra  Qena Nagaa  Esna Luxor  Aswan	er Z4 Upper Z3 upper Z2 Upper Z	SinurisTirsa  BanySwif  Wasta  AbuQurqas  Menya  Asyut
BanySwif Wasta  Wasta  AbuQurqas  Menya  Asyut  DayroutManfalout  Sohag  TahtaAkhmim  Kharga  Dakhla  Farafra  Qena  Nagaa  Esna  Luxor  Aswan	er Z4 Upper Z3 upper Z2 Upp	BanySwif Wasta AbuQurqas Menya Asyut
Sohag TahtaAkhmim  Sharga Dakhla Farafra  Qena Nagaa  Esna Luxor Aswan	er Z4 Upper Z3 upper Z2	Wasta AbuQurqas Menya Asyut
Sohag TahtaAkhmim  Sharga Dakhla Farafra  Qena Nagaa  Esna Luxor Aswan	er Z4 Upper Z3 uppe	AbuQurqas Menya Asyut
Sohag TahtaAkhmim  Sharga Dakhla Farafra  Qena Nagaa  Esna Luxor Aswan	er Z4 Upper Z3	Menya
Sohag TahtaAkhmim  Sharga Dakhla Farafra  Qena Nagaa  Esna Luxor Aswan	er Z4 Uppe	Asyut
Sohag TahtaAkhmim  Sharga Dakhla Farafra  Qena Nagaa  Esna Luxor Aswan	er Z4	
Sohag TahtaAkhmim  Sharga Dakhla Farafra  Qena Nagaa  Esna Luxor Aswan		DayroutManfalout
TahtaAkhmim  Kharga Dakhla Farafra  Qena Nagaa  Esna Luxor  Aswan	Npp	
Kharga Dakhla Farafra  Qena Nagaa  Esna Luxor  Aswan	ır Z5	Sohag
Parafra  Qena  Nagaa  Esna  Luxor  Aswan	Oppe	TahtaAkhmim
Parafra  Qena  Nagaa  Esna  Luxor  Aswan	r Z6	
Nagaa  Esna  Luxor  Aswan	Uppe	
Esna Luxor Aswan	r 27	Qena
Luxor Aswan	∍dd∩	Nagaa
Aswan	er Z8	Esna
Aswan	Upp	Luxor
	62	Aswan
Abu Semble	pper 2	Abu Semble
Komombo	n	Komombo



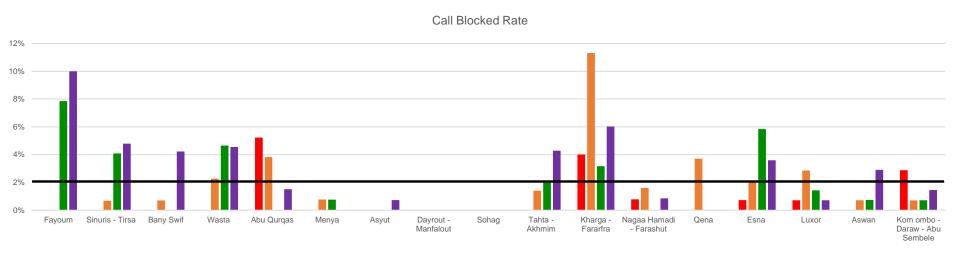
### Accessibility: Call Blocked Rate



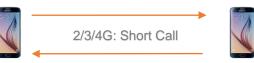


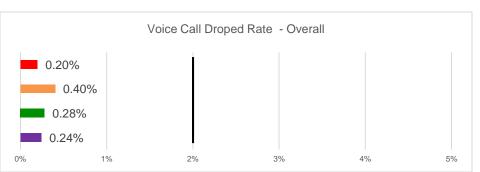


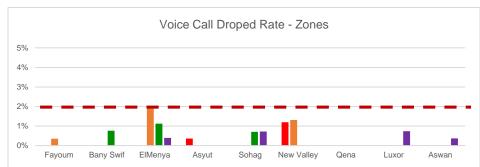
Call Blocked Calls represents the ratio between unsuccessful call attempts and all calls made (both successful & unsuccessful).



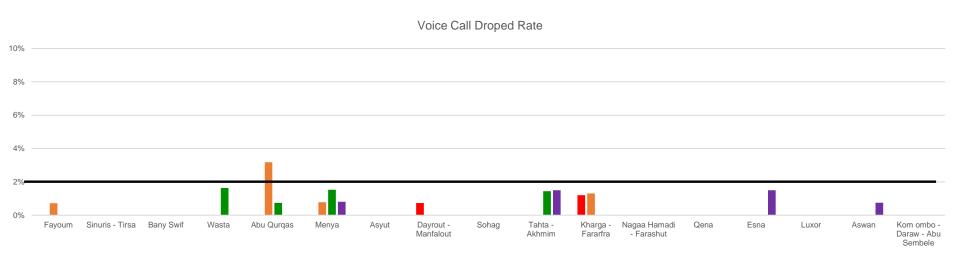
### Retainability: Call Dropped Rate







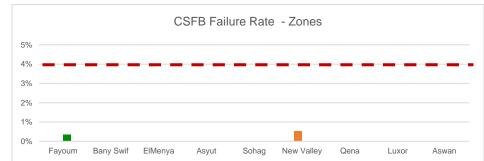
**Voice Call Retainability** *is represented by call drop rates.* 



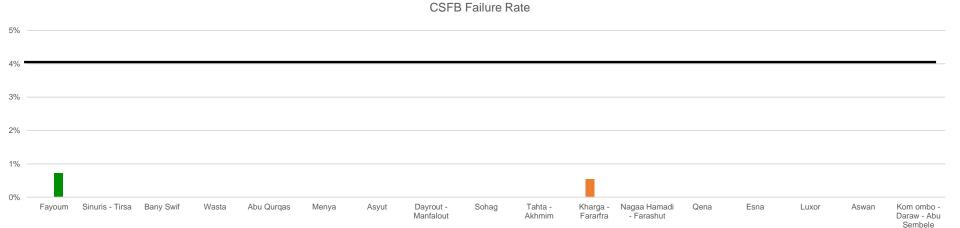
## Accessibility: CSFB Failure Rate [%]





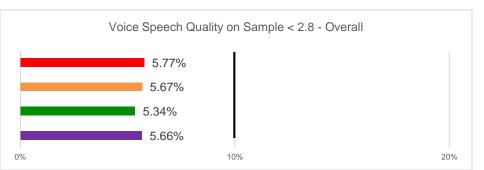


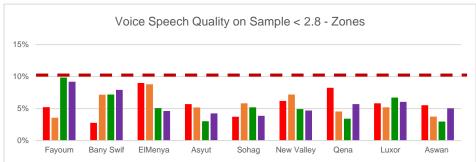
**CSFB Failure Rate** represents the ratio between unsuccessful fall back attempt to lower technology than 4G (LTE) and all calls made (both successful & unsuccessful). When there is 4G (LTE) present before starting the session.



### Speech Quality: MOS Voice Speech Quality < 2.8

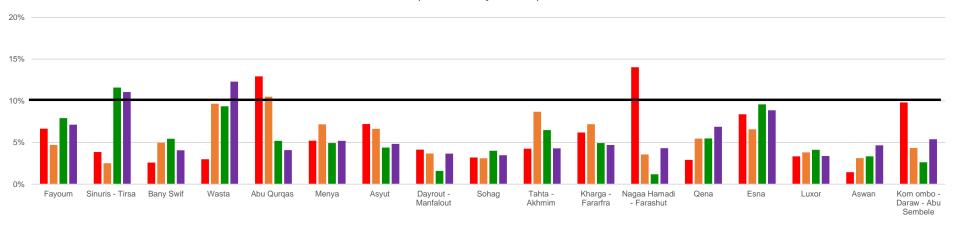






MOS Voice Speech Quality < 2.8 represents the ratio between total number of MOS samples less than 2.8 all collected MOS samples

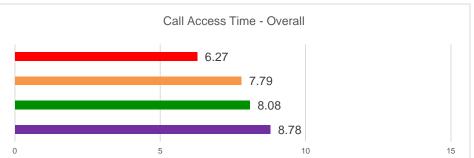


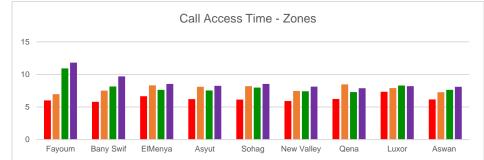


### Accessibility: Call Access Time [sec.]

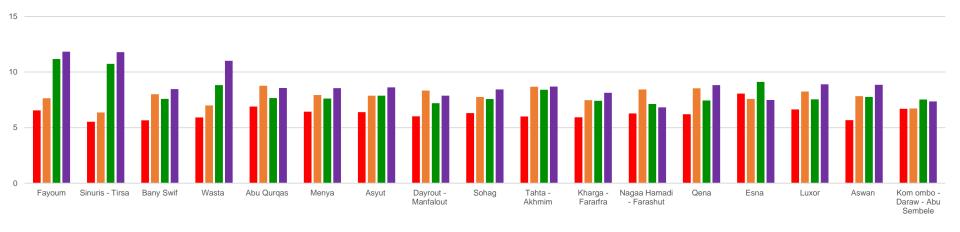






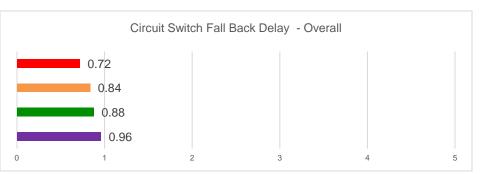


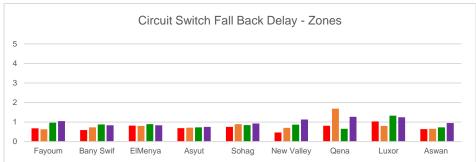
#### Call Access Time



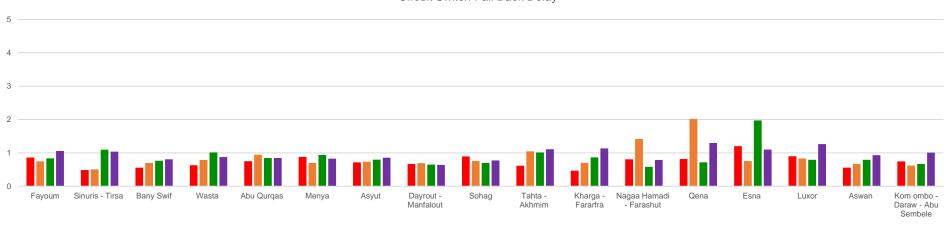
### Accessibility: CSFB Delay [sec.]



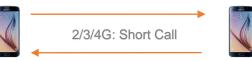




#### Circuit Switch Fall Back Delay

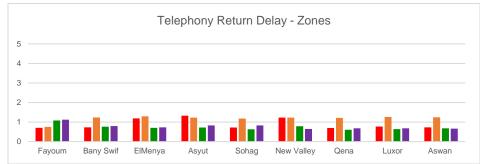


### Accessibility: Telephony Return Delay [sec.]

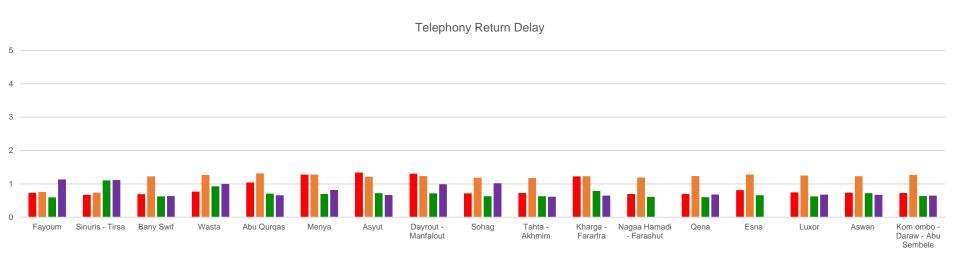






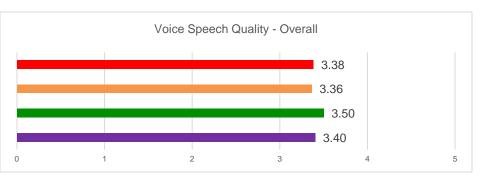


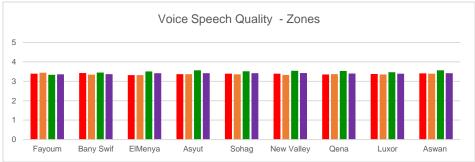
Telephony Return Delay measures the time that a UE uses to re-join the LTE (4G) network after call end





### Speech Quality: MOS Scores

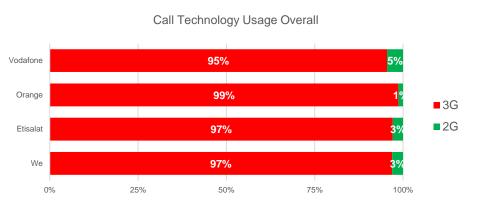




#### Voice Speech Quality

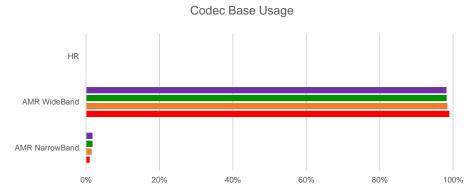


### Speech Quality: Call technology Usage & Codec Base Usage



**Call technology Usage** represents the call technology used over call period. The more calls on 3G (UMTS) the better MOS served.

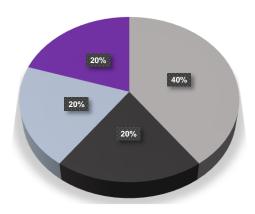
Codec Base Usage represents the codec used over the call where AMR wideband (AMR WB) leads to better voice quality experience by the end user than the AMR Narrowband (AMR NB)





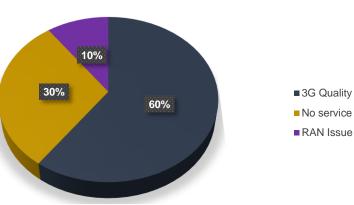
## **Analysis: Dropped Calls Causes**



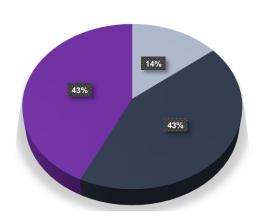














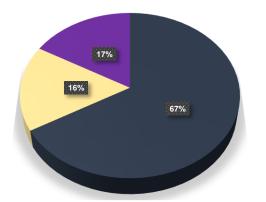


■RAN Issue

■2G Quality

■ RAN Issue

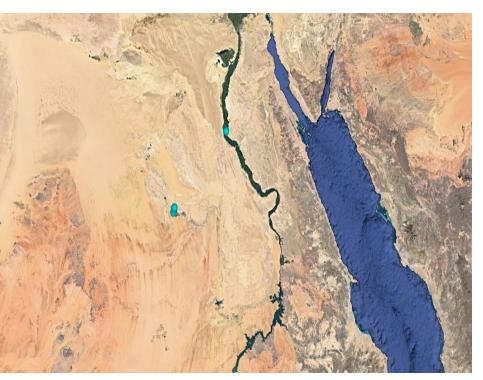
■3G Coverage





## All Operators: Dropped Calls Locations 1/2









## All Operators: Dropped Calls Locations 2/2



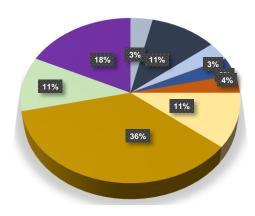






## **Analysis: Failed Calls Causes**

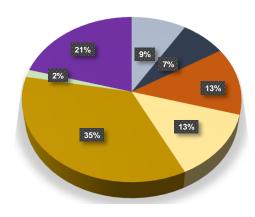






- ■3G Quality
- ■4G Coverage
- ■4G Quality
- ■CSFB Issue
- Mobility Issue
- No service
- Other
- RAN Issue

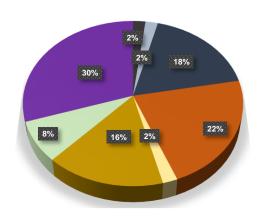






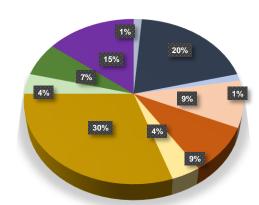
- ■3G Quality
- ■CSFB Issue
- Mobility Issue
- No service
- Other
- ■RAN Issue







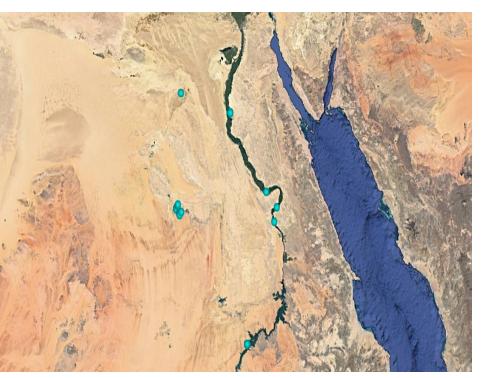
- ■2G Quality
- ■3G Coverage
- ■3G Quality
- ■CSFB Issue
- CSFB issue
- Mobility Issue
- No service
- Other
- RAN Issue



- ■3G Coverage
- ■3G Quality
- ■4G Coverage
- Core Network
- 00ED I----
- CSFB Issue
- Mobility IssueNo service
- Other
- Paging Issue
- RAN Issue

## All Operators: Blocked Calls Locations 1/2









## All Operators: Blocked Calls Locations 2/2







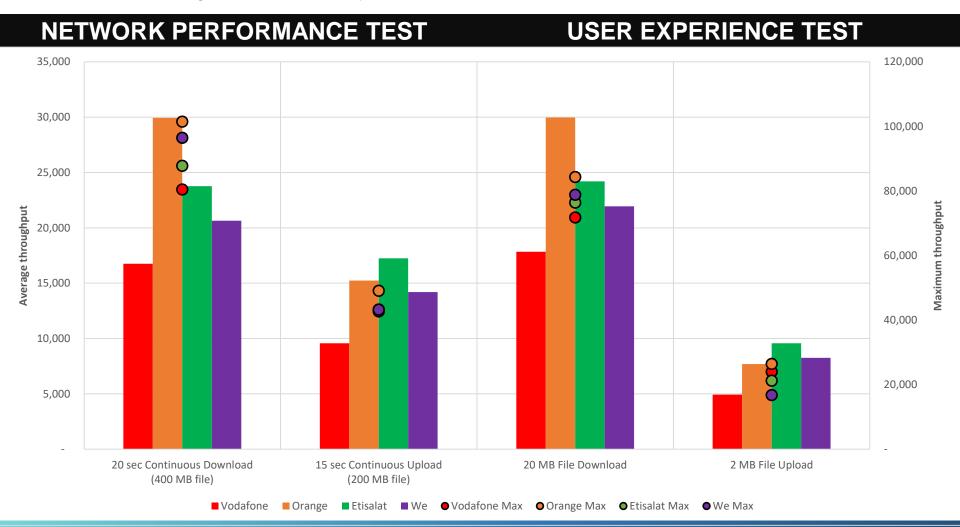


## **AGENDA**

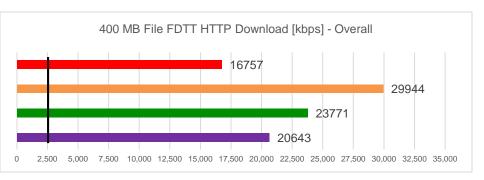
- 1. Quantitative Information
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- 3. Data Service Quality & Performance Cairo
- 4. Voice Service Quality & Performance Giza
- 5. Data Service Quality & Performance Giza
- 6. Voice Service Quality & Performance Alexandria
- 7. Data Service Quality & Performance Alexandria
- 8. Voice Service Quality & Performance Delta
- 9. Data Service Quality & Performance Delta
- 10. Voice Service Quality & Performance Canal
- 11. Data Service Quality & Performance Canal
- 12. Voice Service Quality & Performance Upper Egypt
- 13. Data Service Quality & Performance Upper Egypt
- 14. Annexes

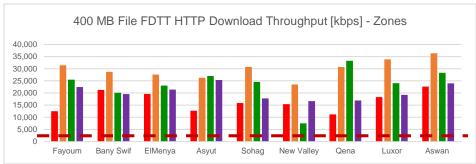


## Free Mode Throughput Per Test Type

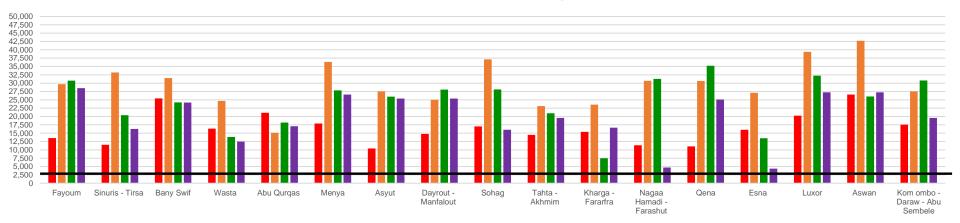


## FDTT HTTP Download Transfer Throughput – Network Performance

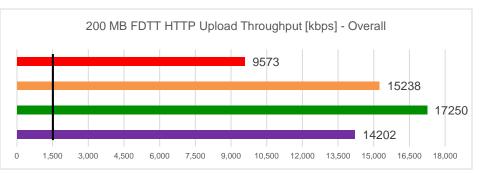


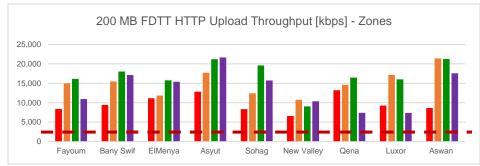


#### 400 MB File FDTT HTTP Download Throughput [kbps]

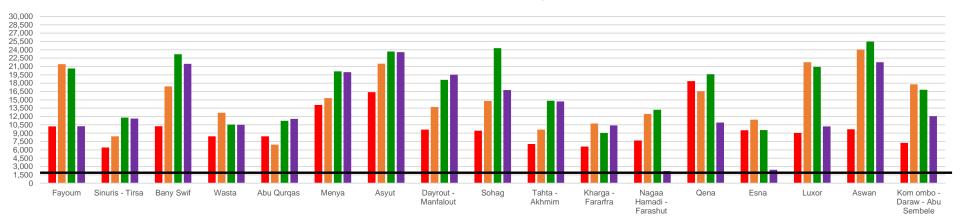


## FDTT HTTP Upload Transfer Throughput – Network Performance

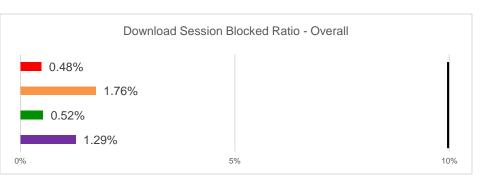


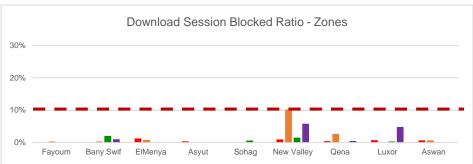


#### 200 MB FDTT HTTP Upload Throughput [kbps]

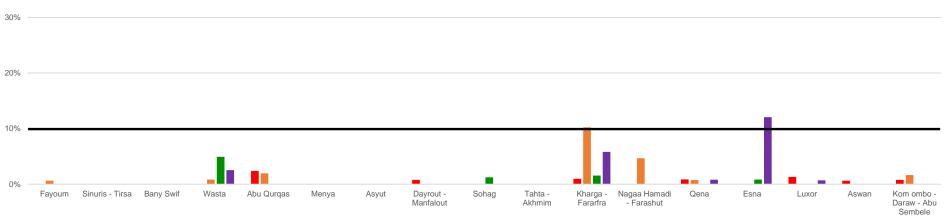


## HTTP Download Session Blocked Rates

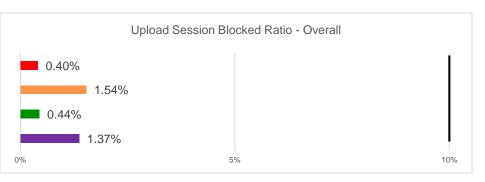


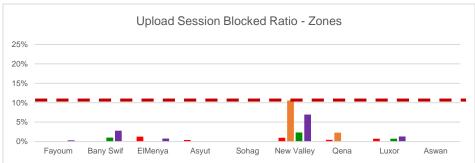




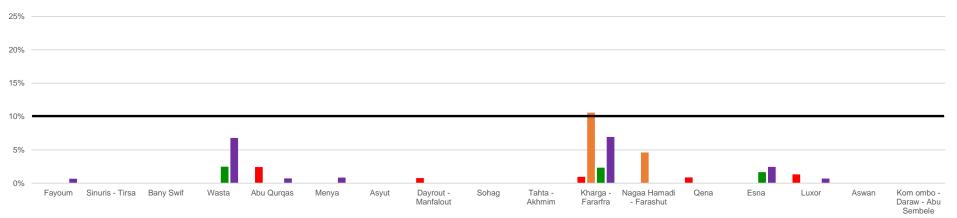


## HTTP Upload Session Blocked Rates

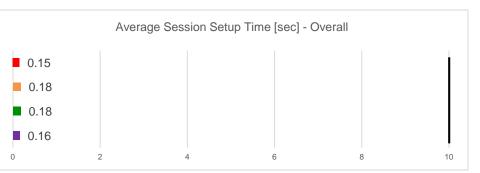




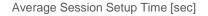
#### Upload Session Blocked Ratio

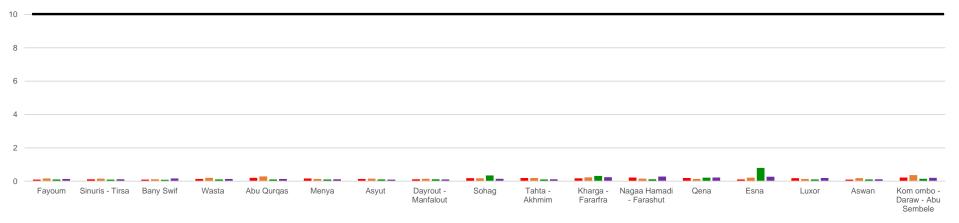


## HTTP Download Average Session Setup Time

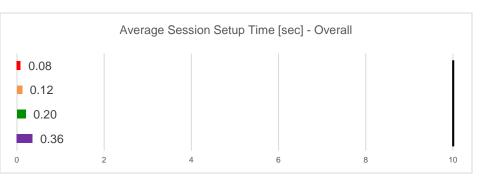


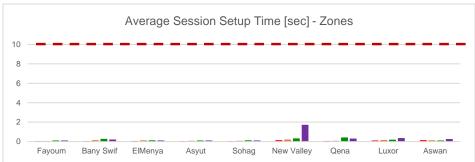




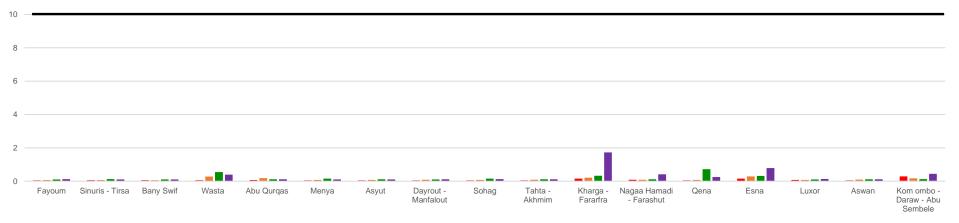


## HTTP Upload Average Session Setup Time



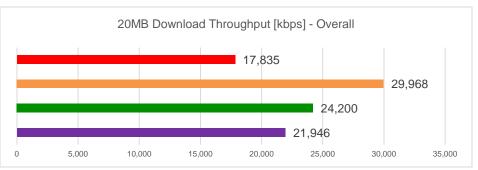


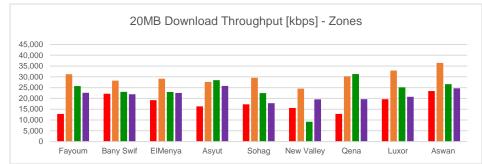




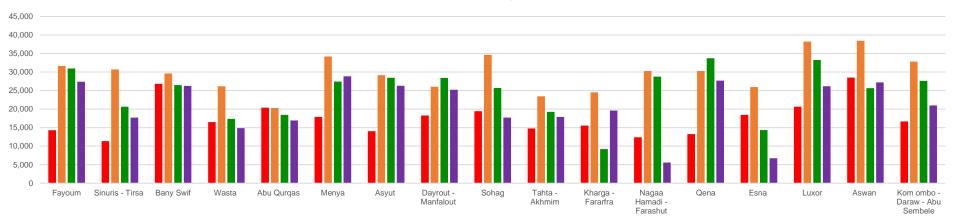


## HTTP Download Throughput – Customer Experience

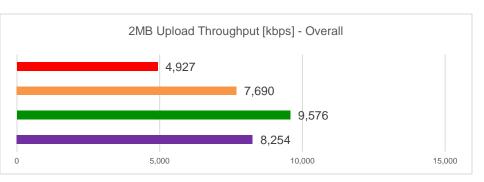


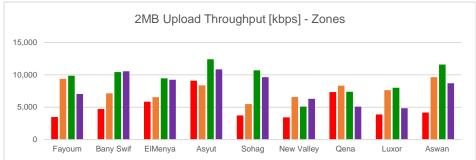


#### 20MB Download Throughput [kbps]

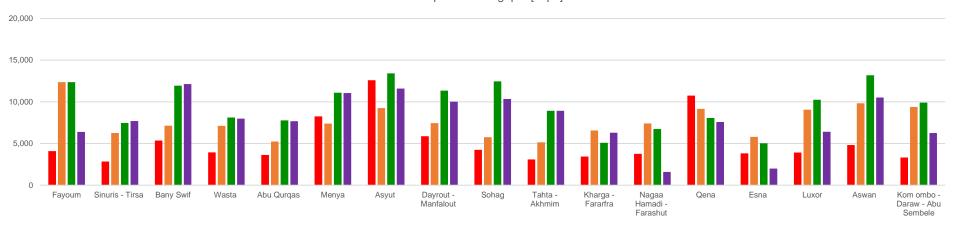


## HTTP Upload Throughput – Customer Experience



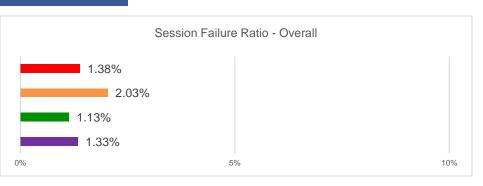


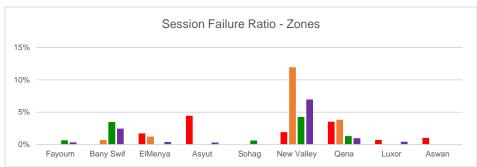
#### 2MB Upload Throughput [kbps]



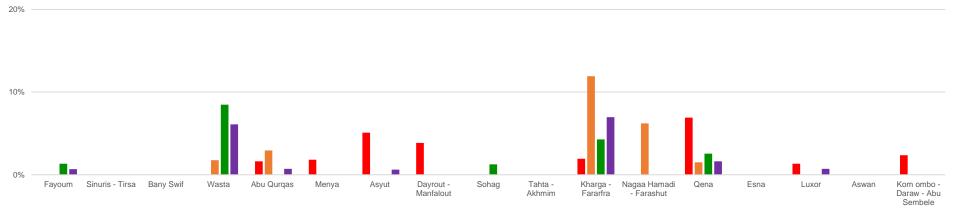


## facebook. Session Failure Ratio



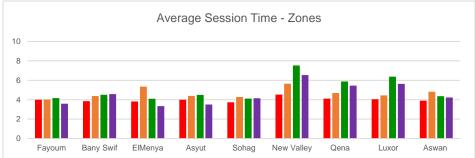


#### Session Failure Ratio

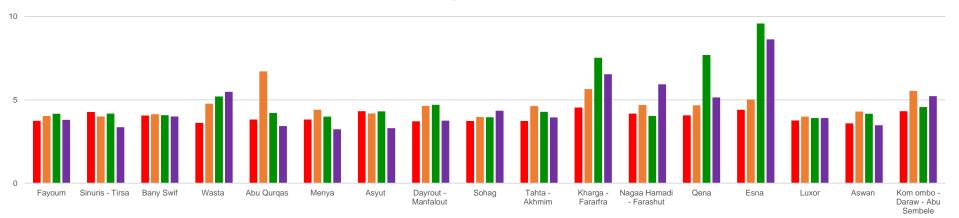


## facebook. Session Time

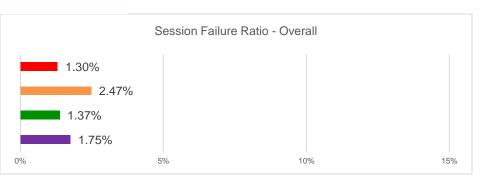


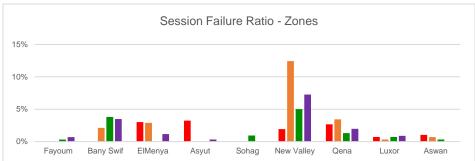


#### Average Session Time

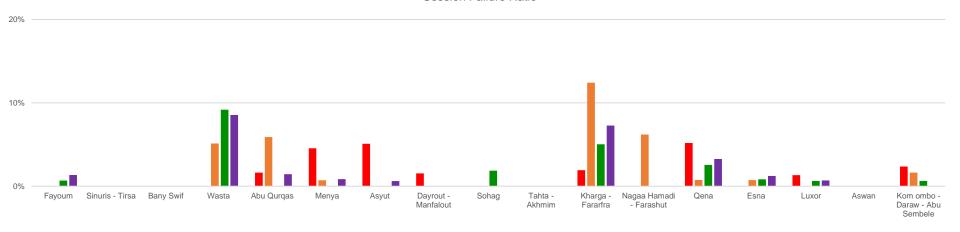


## Google Session Failure Ratio

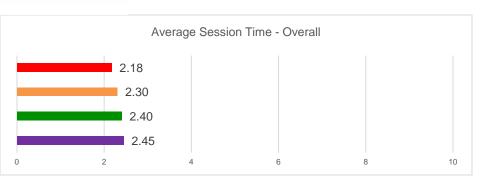


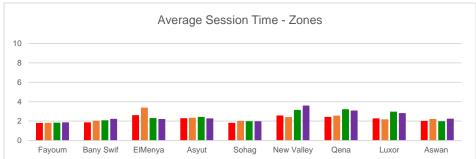


#### Session Failure Ratio

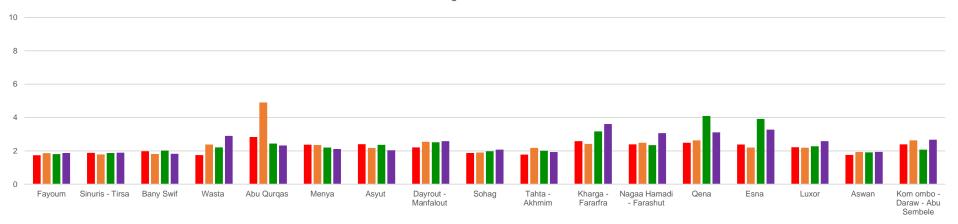


## Google Session Time

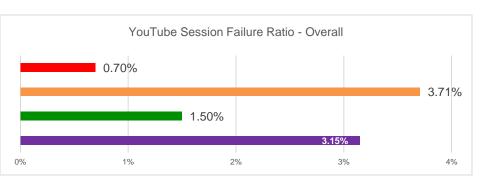


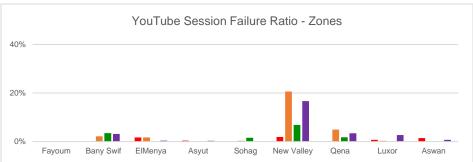


#### Average Session Time

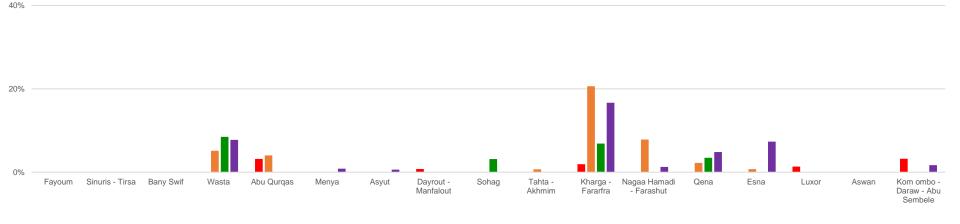


## ▶ YouTube Session Failure Ratio

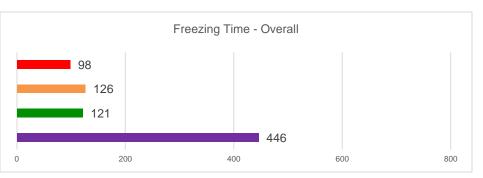


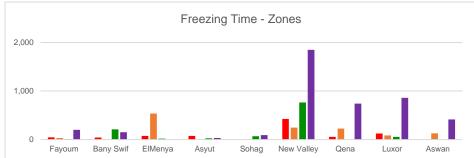


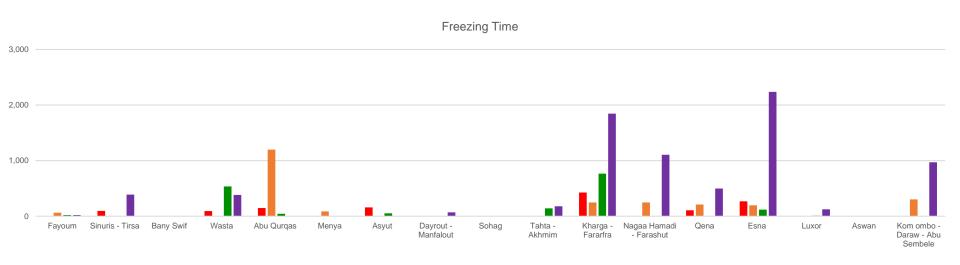
#### YouTube Session Failure Ratio



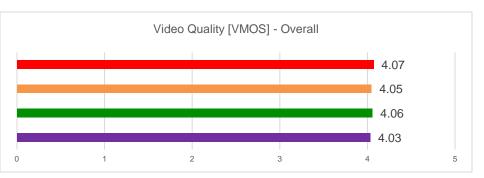
## ► YouTube Freezing Time [msec]

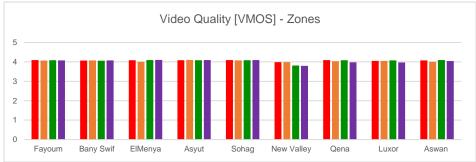


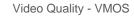


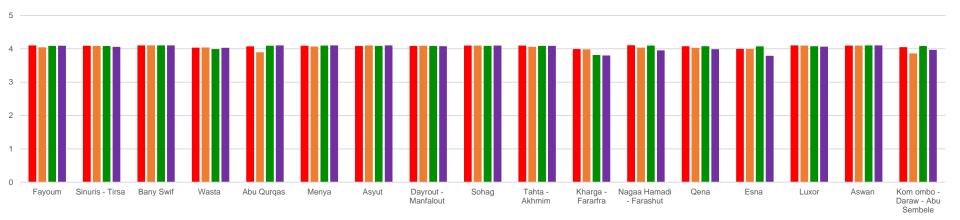


## ► YouTube Video Quality

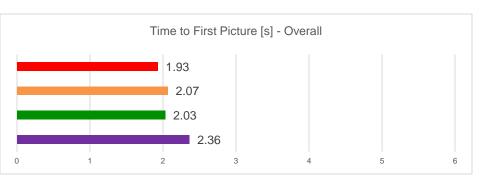


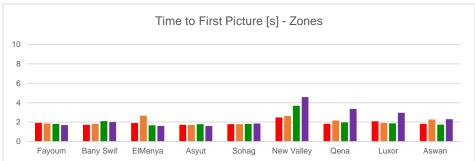




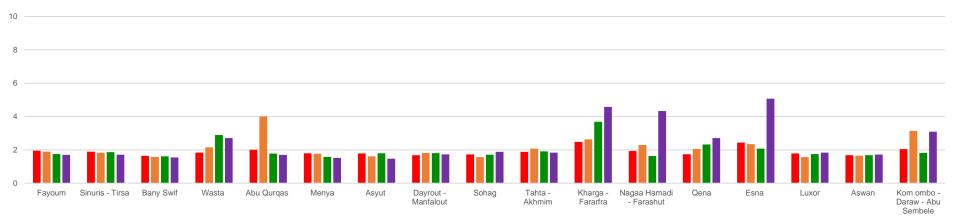


## **► YouTube** Time to 1st Picture





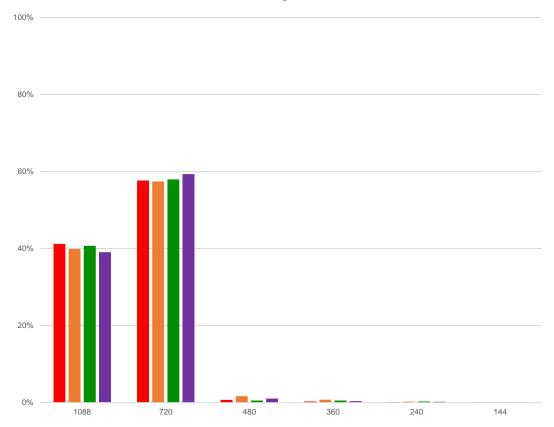
#### Time to First Picture [s]







#### Youtube - Image Resolution



## **AGENDA**

- 1. Quantitative Information
- 2. Voice Service Quality & Performance Cairo
- 3. Data Service Quality & Performance Cairo
- 4. Voice Service Quality & Performance Giza
- 5. Data Service Quality & Performance Giza
- 6. Voice Service Quality & Performance Alexandria
- 7. Data Service Quality & Performance Alexandria
- 8. Voice Service Quality & Performance Delta
- 9. Data Service Quality & Performance Delta
- 10. Voice Service Quality & Performance Canal
- 11. Data Service Quality & Performance Canal
- 12. Voice Service Quality & Performance Upper Egypt
- 13. Data Service Quality & Performance Upper Egypt

## 14. Annexes

## **KPI** definitions - Voice KPIs

### **Call Blocked Rate: (licensed KPI)**

The percentage of unsuccessful call setup attempts to the total number of call attempts in a specified period.

Threshold value = 2 %

### **Call Dropped Rate: (licensed KPI)**

The percentage of dropped or interrupted calls without the subscriber's permission after successful call establishment to the total number of successfully established attempts.

Threshold value = 2 %

### **Bad Speech Voice Quality Rate: (licensed KPI)**

The percentage of bad speech voice calls (less than 2.8) scored on MOS score which is a measure for end-to-end (mouth to ear) speech quality of a voice service call to the total number of completed calls. Threshold value = 10 %

### **CSFB Call Setup Failure Rate (licensed KPI)**

The ratio between unsuccessful CSFB Call setup attempts to all successful CSFB Call setup attempts for the calling UE. Threshold value = 4 %

#### **Call Access: (non-Licensed KPI)**

Represents the period of time elapsed from the sending of a complete destination address (target number) to the setting up of a call to the receiving terminal.

#### **CSFB Delay: (non-Licensed KPI)**

Represents the period of time to overlay 3G/2G environment instead of handling calls in 4G (LTE). Depending on the CSFB strategy.

#### **Telephony Return Delay: (non-Licensed KPI)**

Measures the time that a UE uses to re-join the LTE (4G) network after call end

## **KPI** definitions - Data KPIs

#### **Session Blocked Rate: (Licensed KPI's)**

The Percentage ratio of number of data sessions setup that failed to attach on the network data domain to the total number of sessions.

### **Average Session Setup Time: (Licensed KPI's)**

The time taken in seconds to access network data domain averaged over all sessions.

### Average http download throughput: (Licensed KPI's)

The average rate of successful data downloaded over a communication channel. The throughput is measured in bits per second (bit/s or bps).

## **Average http Upload throughput: (Licensed KPI's)**

The average rate of successful uploaded data over a communication channel. The throughput is measured in bits per second (bit/s or bps).

#### YouTube Session Failure: (Non-Licensed KPI's)

Stream session failure rate in percentage equal Total number of Streams / Total number of failed Streams.

### Freezing Time: (Non-Licensed KPI's)

Average freezing during stream in miliseconds. The relative amount of freezing in the stream, that is, the ratio between the total time of freezings and the video sequence duration.

### **Video Quality: (Non-Licensed KPI's)**

Average of visual quality from an average of visual quality per video stream. The predicted MOS value lies in the range of 1 to 5, where 1 stands for bad, and 5 for excellent stream quality.

#### Time to 1st Picture: (Non-Licensed KPI's)

Average Time to first picture appear in seconds for the sessions.

### Image Resolution: (Non-Licensed KPI's)

The total percentage of Image resolutions using in the clips.

### **Browsing Session Failure: (Non-Licensed KPI's)**

The percentage of failed browsing sessions.

#### **Browsing Session Time: (Non-Licensed KPI's)**

Presents the average time needed for browsing (download) a webpage.

## Causes Definition will be added

Classification	Definition	
2G Coverage	Weak GSM (2G) Coverage	
2G Quality	Weak GSM (2G) Quality	
3G Coverage	Weak UMTS (3G) Coverage	
3G Quality	Weak UMTS (3G) Quality	
4G Coverage	Weak LTE (4G) Coverage	
4G Quality	Weak LTE (4G) Quality	
Core Network	Problem related to core recourses not radio recourses	
CSFB Issue	Problem related to transfer the call to lower than LTE (4G) technology	
Mobility Issue	Problems related to transfer call from one base station to another	
No service	No service	
Paging Issue	Problem related to delayed or missing paging	
RAN Issue	Problems related to grant the radio access	
Other	Timeouts	

## **Quantitative Information**

Calls	License Target value
Call Blocked Rate	2%
Dropped Call Rate	2%
Speech Voice Quality	10%
CSFB Call Setup Failure Rate	4%

Calls	License Target value
Session Blocked Rate	10%
Average Session Setup Time	10 Sec
Average http download throughput	2.5 Mbps
Average http upload throughput	1.5 Mbps

# THANK YOU