MedUX

QoS/QoE Analytics and Benchmarking

ITU Workshop on
"Telecommunication Service Quality"

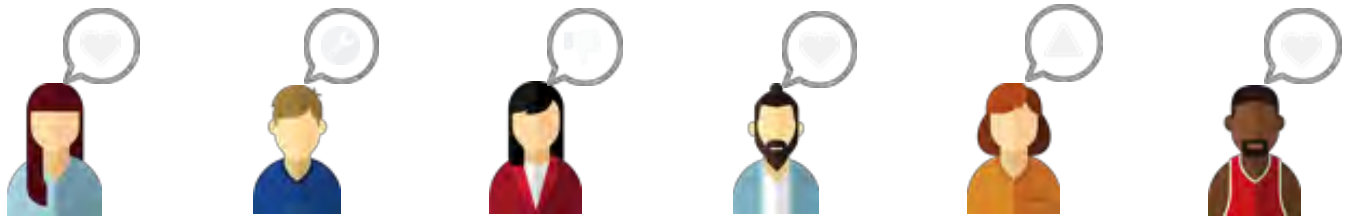
Amman, Jordan
17-18 October 2022

ITU ASSOCIATE

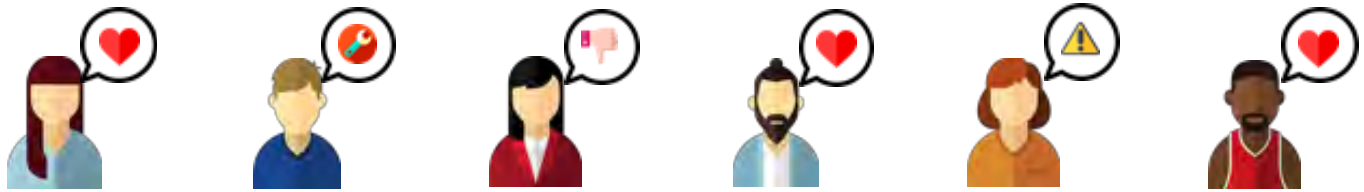
The challenge: Understanding the Customer Experience

Digital Life is becoming more complex in a hyperconnected world
and customers are becoming more demanding than ever

Are end-users really happy with Internet and service Quality?



Satisfaction surveys deliver subjective and non-actionable info

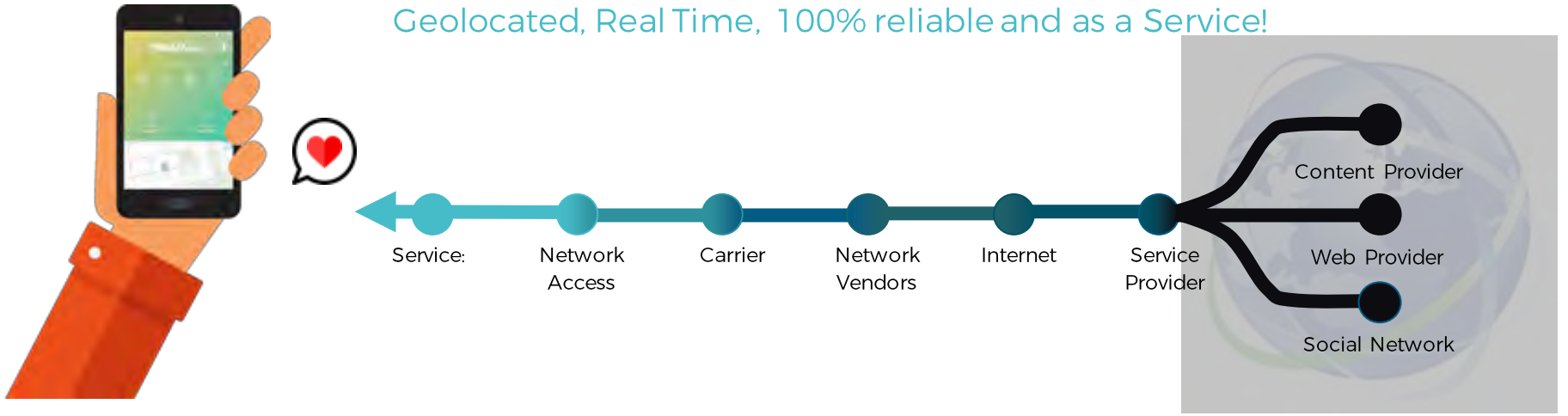


What if you could know the TRUE Quality of Experience from one platform?
360°: Objective, subjective and actionable

Standard surveys or crowdsourcing are not enough (lack of context)

The solution: Digital Experience Monitoring

Massively testing digital services and obtaining actionable insights
by making use of AI Powered Real-Time Applied Analytics.



TRUE customer experience from customer premises

Home

Street & Transport & Public Buildings

Enterprises

MedUX, a global trusted partner since 2014

Our QoS/QoE solutions are available for Regulators, Governments and Telecom Operators alike

Our telecom regulation use cases (benchmarking, monitoring and auditing) provide visibility into the QoS/QoE and network performance delivered by network operators, and help enforce obligations and shape future policies.

Regulators & Govs.

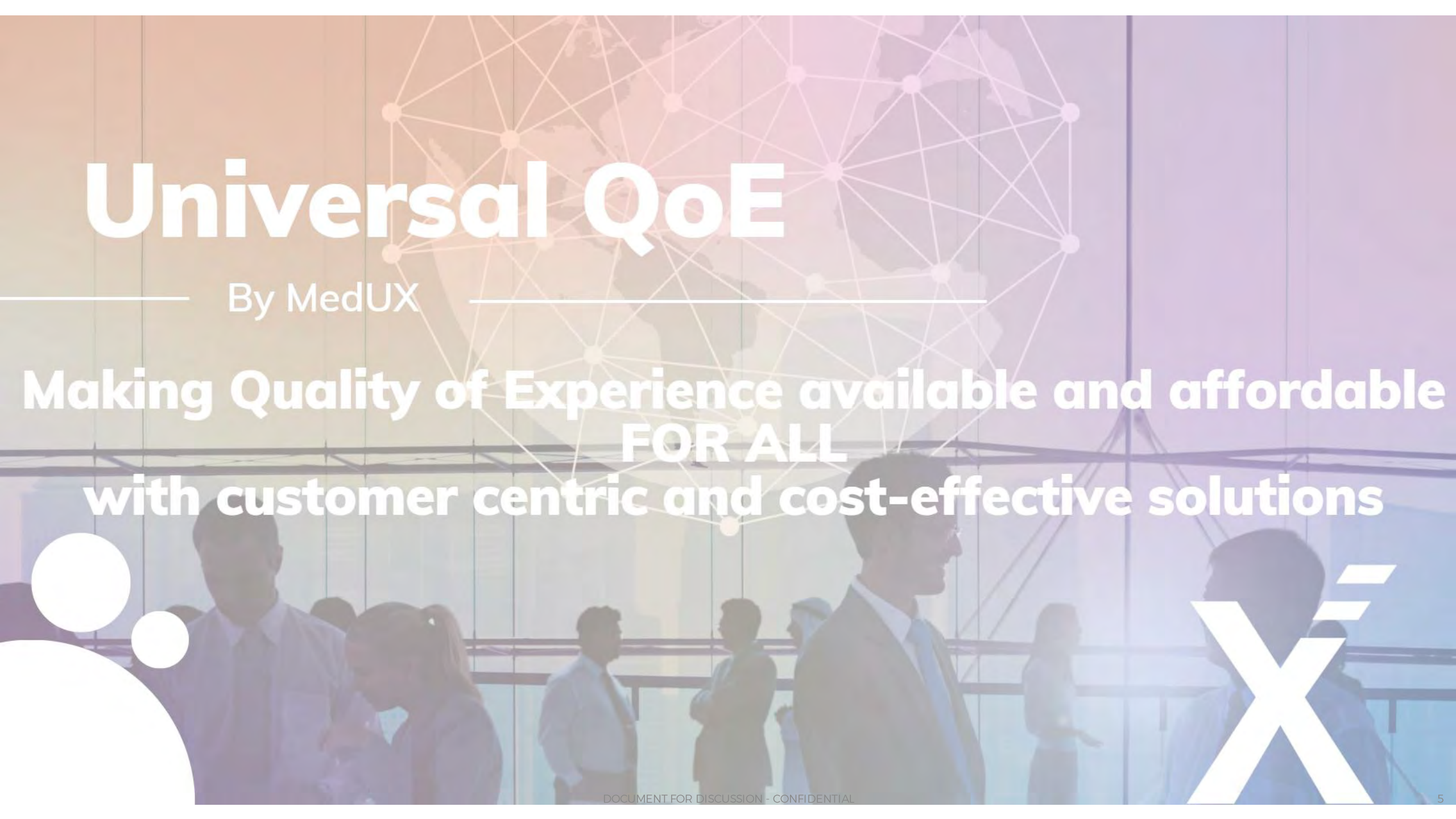
Telecom Operators

+ 25 Countries International presence

Universal QoE

By MedUX

Making Quality of Experience available and affordable FOR ALL with customer centric and cost-effective solutions



At the forefront of QoE with a customer-centric approach

Probe virtualization

- CPE Agent
- APP & SDK
- Multi platform agent (IoT)

1 Gbps +

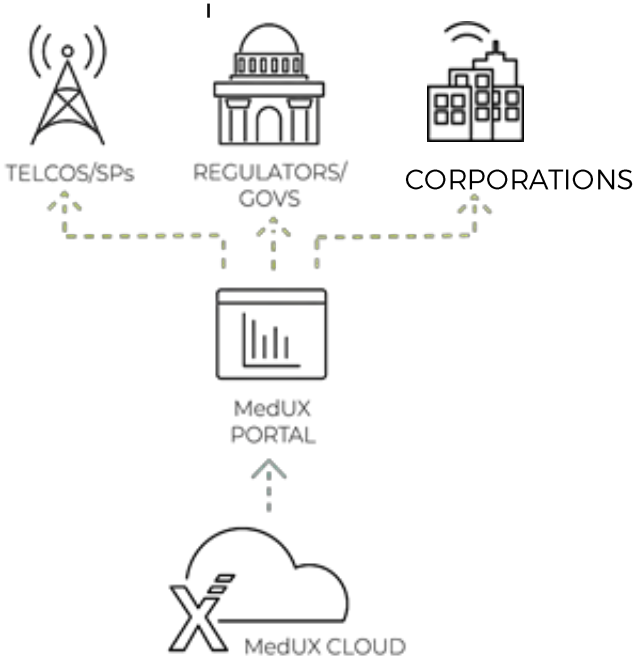
- XGPON
- DOCSIS 4.0
- Wi-Fi6

5G Ready

- Non Stand Alone Access
- Stand Alone Access
- Private 5G Networks

MedUX Platform

3 Patents in the USPO!



MEDUX ROBOTS

FEEDBACK

CROWDSOURCING AND SW AGENTS

03 Results Presentation

Data is presented in a 100% web tool - MedUX ANALYTICS PORTAL. and Data is avalilable through APIs

02 Data Processing

The information is sent in real-time to the cloud –MedUX CLOUD- where it is processed in real-time.

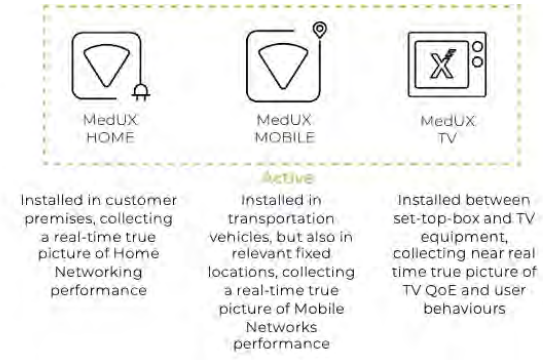
01 Data Collection

MedUX obtains through different technologies information on user experience while using fixed, mobile and TV services.

MedUX ANALYTICS PORTAL

MedUX ROBOTS

(No integration with ISPs)



MedUX HOME | IN-HOME TRUE CUSTOMER EXPERIENCE visibility and E2E performance analytics...

Providing reliable in-Home performance measurements from the end-user perspective

Organizations can transform service monitoring and benchmarking capabilities to redefine a customer-centric strategy as networks evolve.

Use Cases

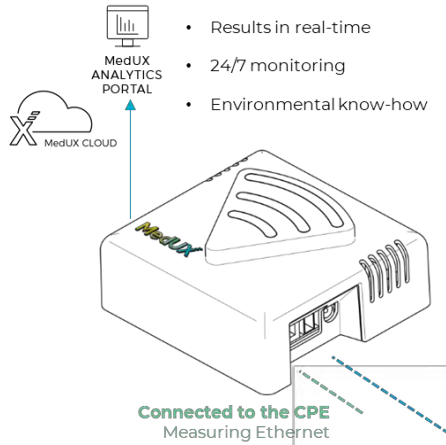
- Benchmarking
- Network monitoring
- Optimization
- CPE Performance
- Regulation
- VIP Clients
- In-Home performance
- Voice of the customer

QoS/QoE KPIs

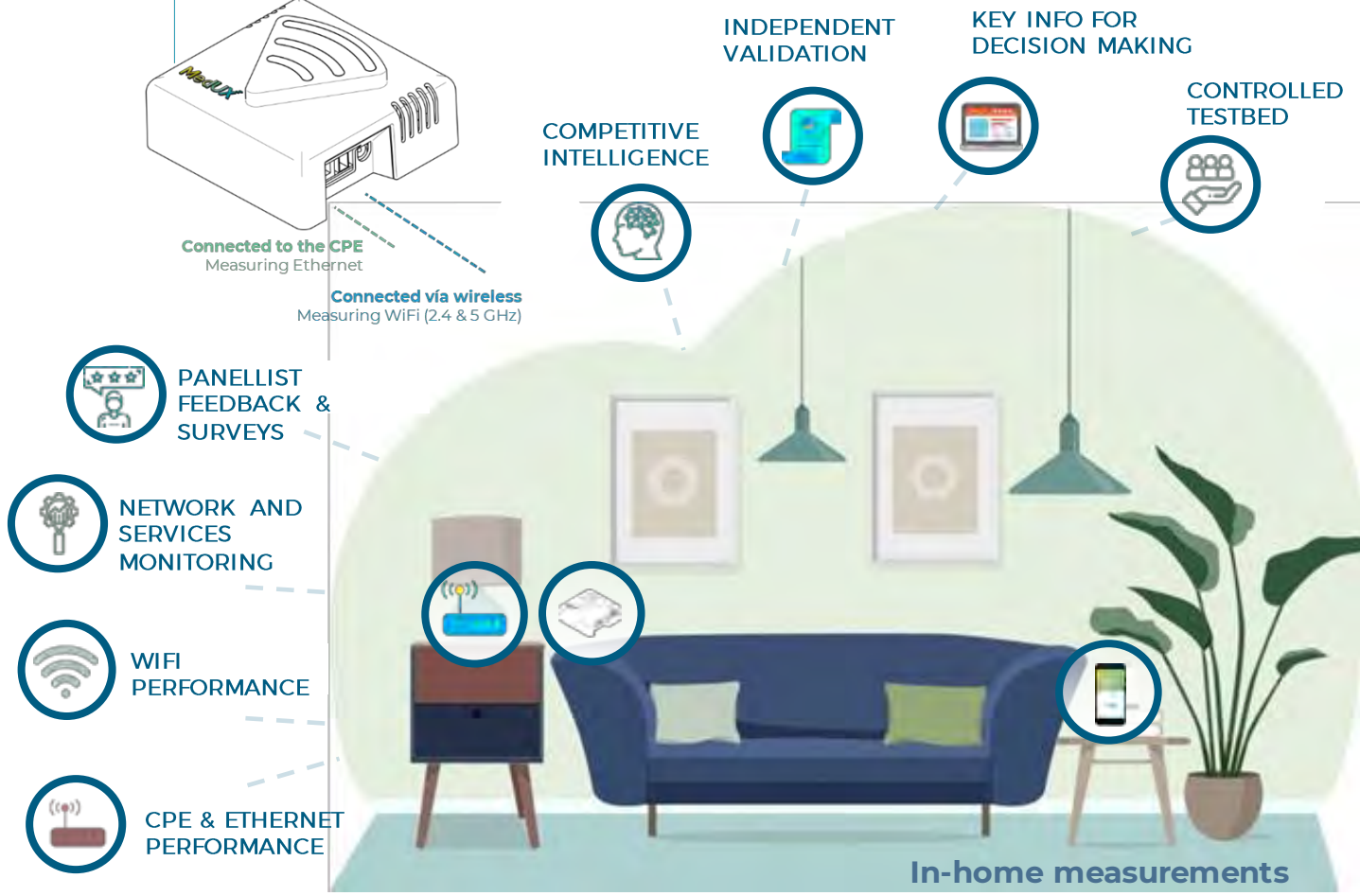
PING, DNS, SPEEDTEST, HTTP, FTP

Smart Services (OPTIONAL)

- Smart Performance
- Smart WiFi
- Smart Compliance
- Smart Wholesale
- Smart Service Mgmt
- Smart Web Browsing
- Smart CPE Testbed
- Smart NPS
- Smart Crowdtesting
- Smart Marketing



MedUX HOME BENEFITS
For Fixed Broadband Networks



Key selected use cases in FBB

360° customer experience benchmark

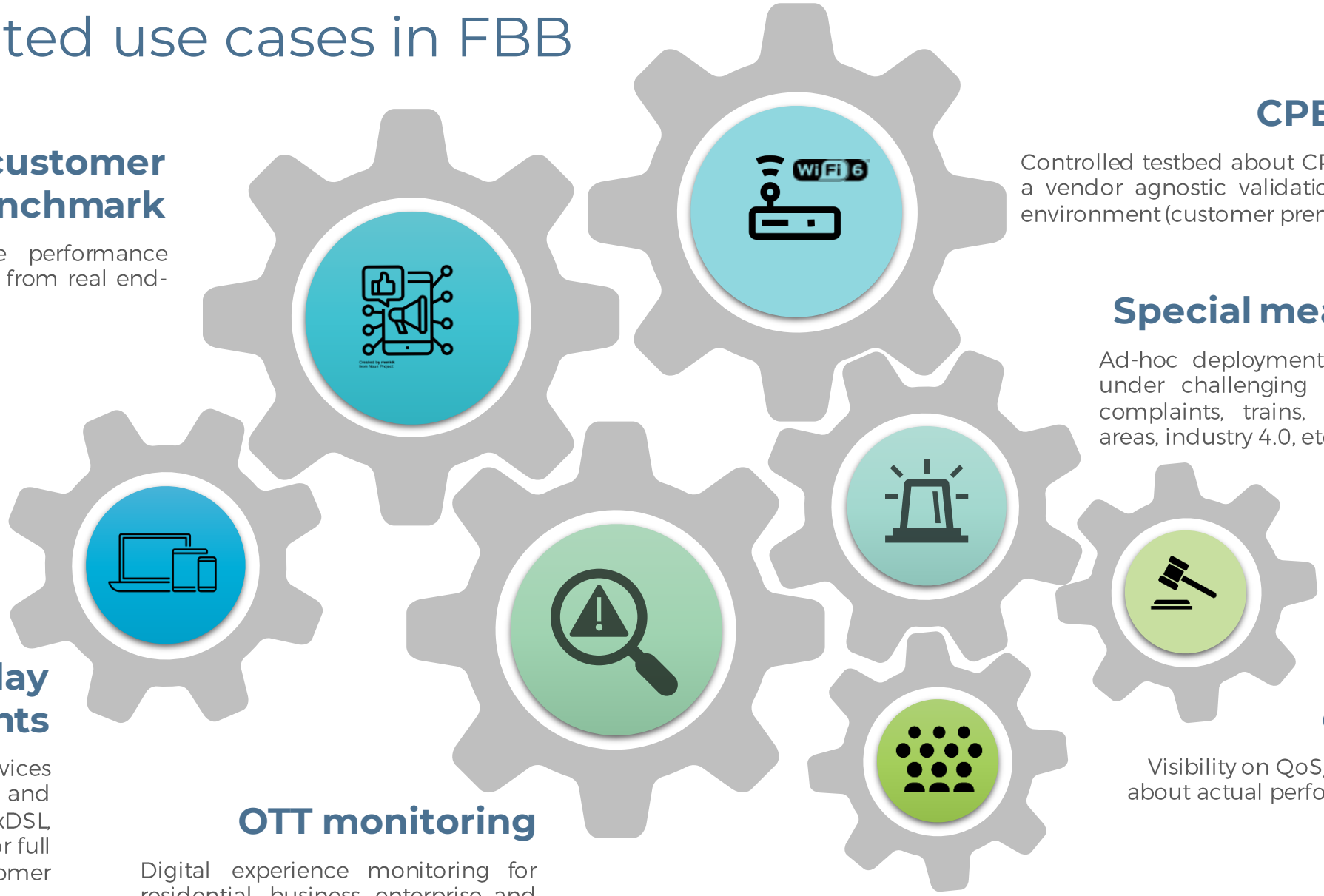
Combination of in-home performance monitoring with feedback from real end-users

CPE Testbed

Controlled testbed about CPE performance, a vendor agnostic validation in real-world environment (customer premises)

Special measurements

Ad-hoc deployments for 24/7 statistics under challenging circumstances (VIP, complaints, trains, mass events, rural areas, industry 4.0, etc)



Multi-play measurements

Measurement of all services (fixed, mobile and TV) and access technologies (xDSL, FTTx, HFC, FWA, celullar), for full visibility on customer experience

OTT monitoring

Digital experience monitoring for residential, business, enterprise and corporate segments with real-time AI-powered anomaly detection

SLA & Regulatory compliance

Visibility on QoS/QoE measurements about actual performance delivered to the end users

Grand scale deployment

Unattended and cost-effective solution without losing measurement accuracy and scope capabilities

European Information as a Service (IaaS)

A unique customer-centric and in-home performance project

Deploying MedUX HOME and retrieving Customer Experience information of European fixed broadband markets from over 5,000 households

NATIONAL LEVEL

· Benchmarking operators.
· Monitoring Real Time QoE.

INTERNATIONAL LEVEL

· Benchmarking across markets.
· Ranking pan-European best networks.

Millions of tests

More than 100 million monthly measurements available in real-time

+40 ISPs

Ranked with our MedUX QoE Scorecard®
(Ethernet)

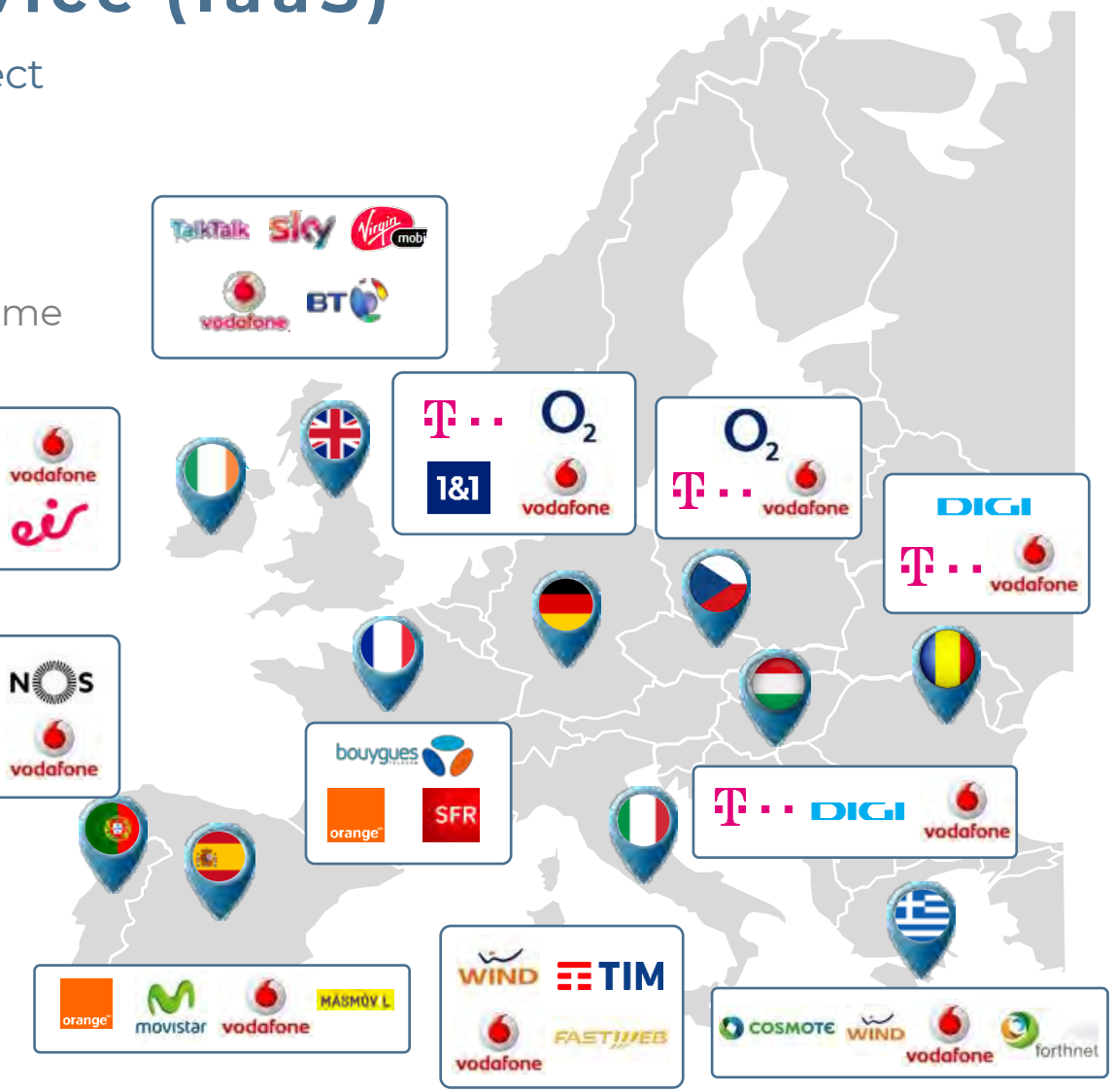
+10 countries

Hungary [NEW]
Czech Republic [NEW]
Romania [NEW]

Upcoming countries?

EU: Albania, Netherlands, Austria, Switzerland

Other countries in EMEA



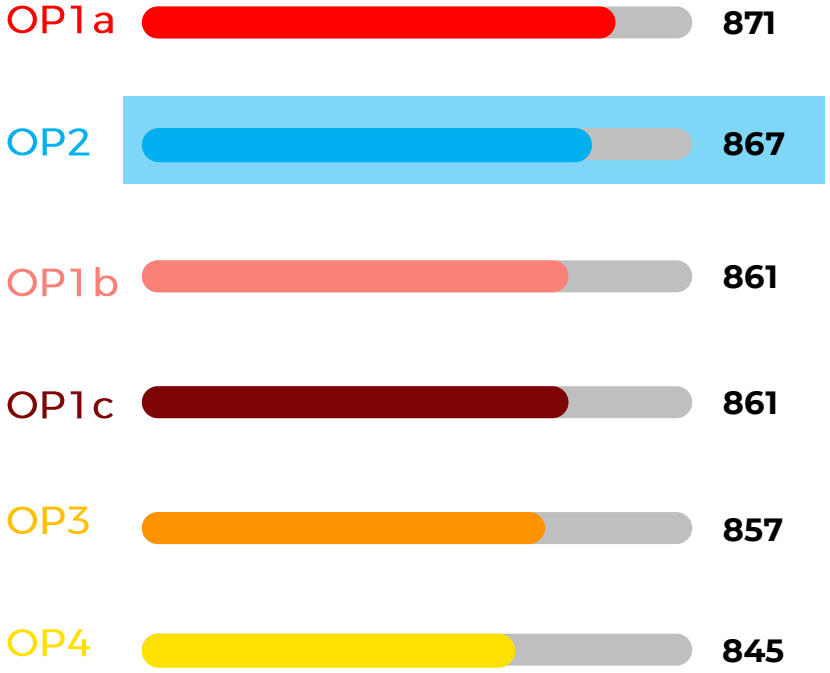
Investigating how NPS&CSAT relate to QoS/QoE?

MedUX surveys reveal relationship between Network Performance and Customer Satisfaction

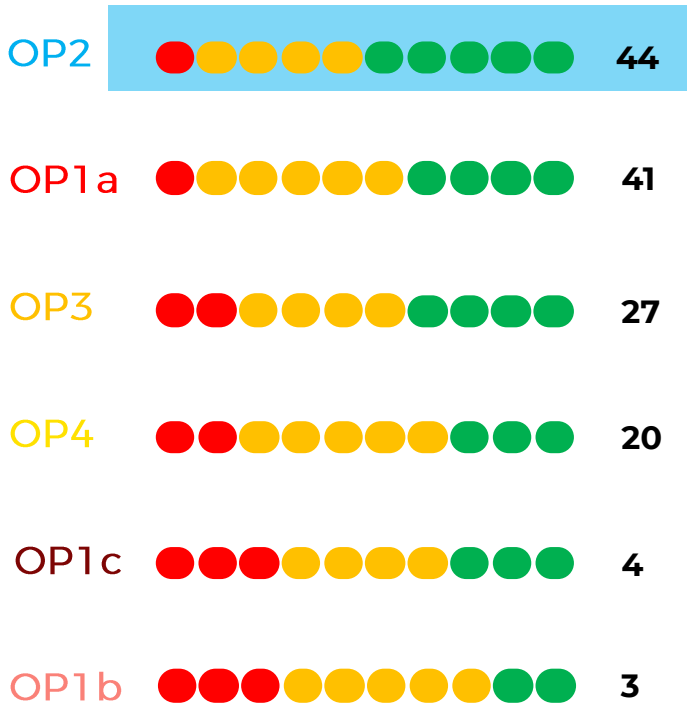
Customer Experience: Network performance and service experience

Customer Feedback: Recommendation and satisfaction levels

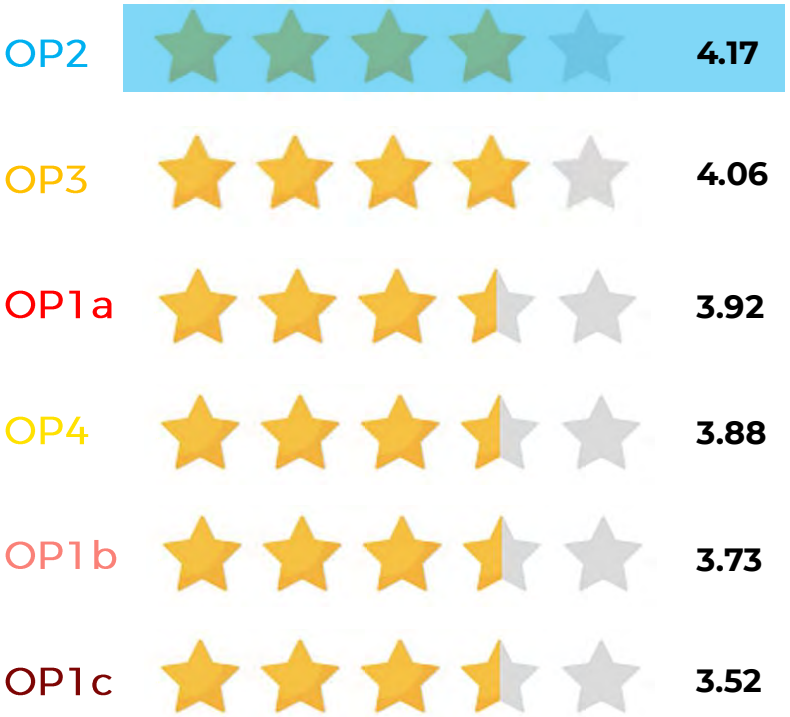
MedUX QoE Scorecard - Q42021



NPS - Q42021



MedUX CSAT Star Rating - Q42021



Services

XSmart - NPS

QoS/QoE KPIs are key drivers for customer satisfaction, but how can telecom providers understand how network strategy impacts customer satisfaction:

- MedUX asks panelists to rate their provider and respond a customizable set of questions to understand pain-points
- The in-home performance and service experience measurements are combined with customer feedback from real end-users hosting MedUX HOME devices to get a 360° picture of customer experience

Keen on understanding your in-home performance gaps?

MedUX benchmarks wired and wireless performance for network improvement

MedUX

	Ethernet	5 GHz	Best-in-Class
Service Availability	●	◕ ⚠	○
Speed compliance	◕	◔ ⚠	◔
Latency	●	◑ ⚠	◔
Web Browsing	◔	◔	◔
Gaming	●	◑ ⚠	◔
Cloud Storage	◕	◕	◔
HTTP	◑	◔ ⚠	◔
Streaming	◕	◑ ⚠	◔
Cloud Performance	◑	◑	◔

Services

XSmart - Wi-Fi

MedUX evaluates the performance statistics and information from both Ethernet and Wi-Fi interfaces from relevant players and CPE router models in the market.

MedUX Analytics may also exploit Wi-Fi radio parameters for a complete view of the home network performance to identify common problems:

- RSSI, quality, channel, frequency, link peed
- Neighboring NW details (RSSI, ch, freq)
- Connected devices and performance (latency, jitter and loss), incl. manufacturer and IP/MAC

MedUX identifies issues and provides a set of improvement actions, and recommendations to improve customer satisfaction and lower operational costs (See Closed Loop Management Framework below)

● Strong
○ Weak

Quantifying the QoE impact of service degradations?

MedUX offers visibility and alerts in real-time for service management

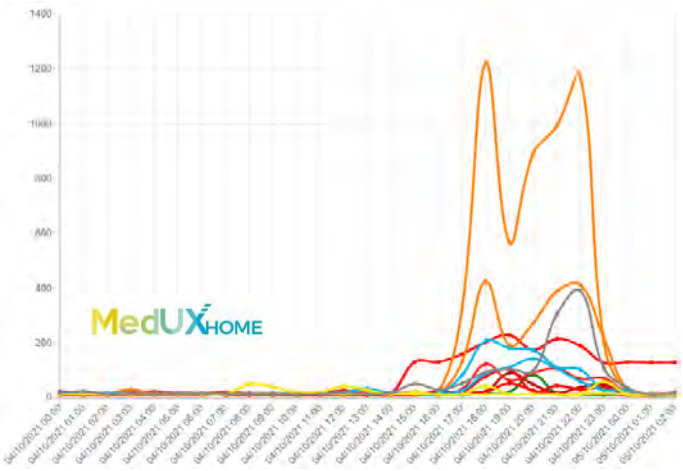
Facebook (now Meta) Tsunami: Services were down for over 5 hours.Backbone configuration issues in Facebook impacted internet experience worldwide It is one of the worst incidents we can recall. Many other services from Google,Youtube, Amazon, Microsoft Live and Yahoo were impacted as well. Facebook kicked off the tsunami, followed by an increase in DNS requests from humans and apps denying the obvious:Facebook was down.

Services

XSmart - Alerts

Impact on DNS performance

DNS resolution time (ms) – FTTH services in Spain



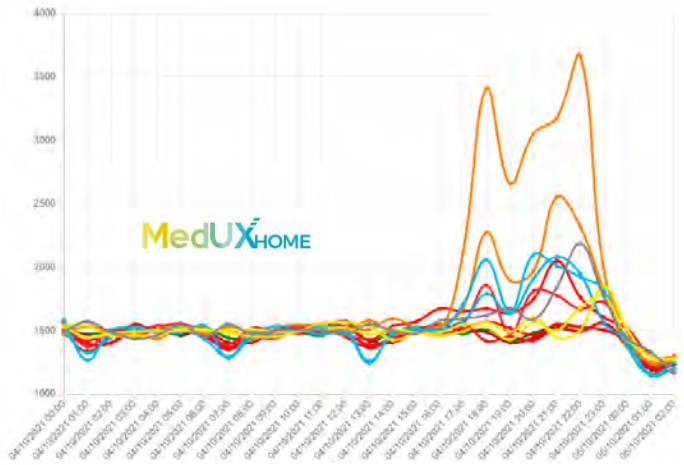
Facebook destinations were unreachable. Furthermore, reliability and accessibility were impacted across the board with skyrocketing DNS resolution times in Europe (DE, IT, FR, UK, ES, PT, GR, RU, HU, CZ. IE).

Typical DNS resolution times in Spain use to be in the range of 5-50 ms, whereas during the incident they increased above 200 ms in some operators and top Alexa sites.

Each line in the graph corresponds with different speed profiles per operator

Impact on Web Browsing Experience

Web loading time (ms) – FTTH services in Spain



MedUX observed degradations in network performance consistency (test success rates) and how long it takes to access the network (network responsiveness and latency).

Web loading times increased severely in some operators and degraded internet experience of millions of users worldwide. Typical web loading times in Spain increased by 0.5 s, from typical values of 1.5 s.

Each line in the graph corresponds with different speed profiles per operator

Are you one of those severely impacted ISPs?
Ask MedUX for help

MedUX Value

- Real-time issues detected in top Alexa websites. Some operators and DNS service providers more affected than others
- Actionable insights on Facebook outage, but also on overall services performance during the incident
- Real end to end Quality of Experience from clients perspective
- Issues on most-used services and OTT applications easily diagnosed

Willing to monitor your CPE lifecycle performance?

MedUX tests your CPE models and customer experience

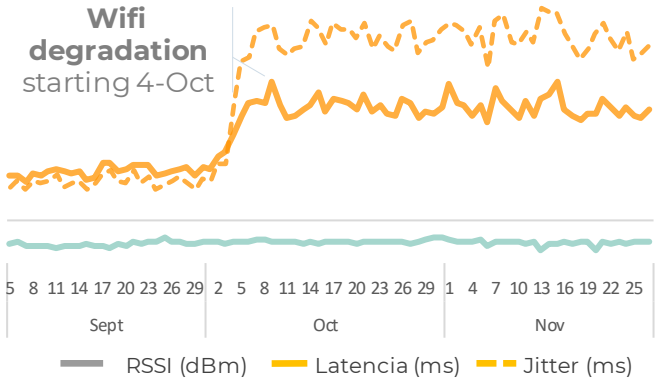
MedUX Smart Performance help detect and solve an issue affecting customer experience in a major customer base of our client affecting Wifi performance and quality of service (latency and jitter indicators)

Services

XSmart - CPE/Wi-Fi

Issue Detected

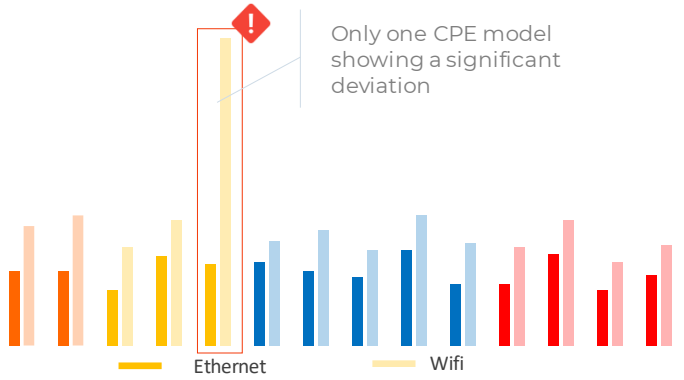
After an automatic CPE firmware upgrade MedUX detected issues related to latency and jitter for the Wifi Interface



ZTE H218N Wifi Latency & Jitter vs RSSI

MedUX Analysis

- CPE benckmark showed latency and jitter increased while RSSI and WiFi conditions remained stable.



Benchmark Latency CPE Model (ms)

Conclusion:

Wifi chipset management issue for ZTE Model

MedUX Value

- Issue reported to CPE manufacturer that released a firmware patch
- Independent tool and validation during negotiations with manufacturer
- Real end to end Quality of Experience from clients perspective
- Correlation of multi-interface measurements helps monitor Wi-Fi performance and upgrades.

Thank you!

MedUX

Improving Customer Experience in the 5G Era

Rafael Gonzalez– rafa@medux.com

CMO at MedUX

www.medux.com

©MedUX All rights reserved