The Bench-marking Framework 2020

umlaut

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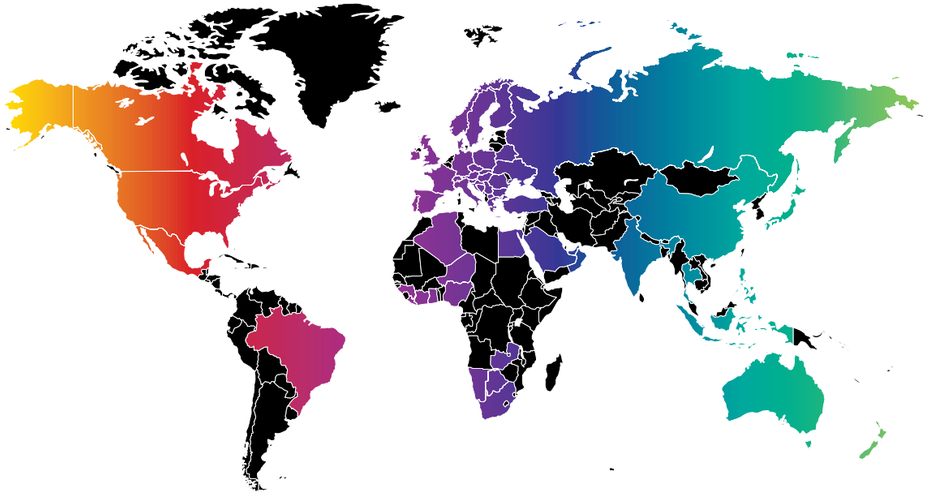
Introduction

Recently, the new umlaut 2020 benchmarking framework has been released.
Like in the past, the framework has been elaborated in dialogue with network operators and we remained true to our philosophy to focus on customer–perceived network quality and to cover a wide range of mobile services unprecedented in its level of detail.
Our top priority stays valid to fairly and transparently assess the global development of networks, to push their quality and performance with our benchmarks and ultimately achieve improvements for every customer.
We are proud that the importance and recognition of our mobile network assessments have steadily increased across the world over the years.



Today, more than 200 mobile networks in more than 120 countries are being evaluated by our unique scoring methodology, being widely recognized as the de–facto industry standard.

Our unified framework is based on a rule set that is used in all countries to provide a fair, transparent and independent evaluation of all networks and allows for true international comparability.

General concept

Testing to the edge

The umlaut score delivers a robust scale to assess network quality and performance. It is coupled with a unified measurement methodology for true international comparability.
The modular approach includes service modules of both, Network Testing (NT) based on drive and walk testing and User Experience Testing (UET) based on crowdsourced data.

Modular Score Approach

Overall Score	umlaut Score: 1000 Pts			
Service Modules	NT Data	NT Voice	UET	
Area Level	City	Town	Road	All
KPI Level	Qualifier KPIs	Differentiator KPIs	Crowd KPIs	

2020 umlaut Scoring Framework

Qualifier KPIs

Model minimum requirements that have to be met to make the experience of the mobile network satisfactory.

Examples: Voice: Percentage of successful and sustainable calls
Data: Percentage of sessions faster than 500kbps

Qualifiers are worth: 55% of all the points

For every Service usage, a simple **Success / Failure** Distinction is made

Differentiator KPIs

Differentiator KPIs describe additional aspects of those services that fulfil the qualifier criteria

Examples: Voice: (Avg. & P90) Call Setup Time, (Avg. & P10) Speech Quality, Data availability
Browsing: Avg. Session Duration
5MB File: Avg. Session Duration, 10 and 90 Percentile of Throughput distribution

Differentiators are worth: 45% of all the points

For drive and walk testing, each service session is characterized by a Qualifier KPI and one or several Differentiator KPIs.

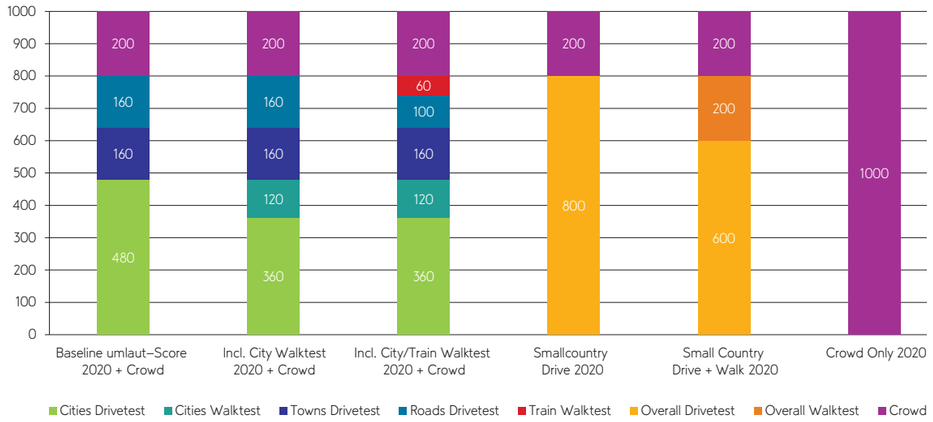
Overall assessment methodology

M2M Voice	Web Browsing (static and live)	HTTP/S File /Download Fixed Size	YouTube APP	HTTP File Up–/Download Data stream	Broadband Coverage	Latency / Interactivity	Data Speed
Network Test: Customer Experience 4G / 5G				Network Test: Capability 4G/5G	Crowd: User Experience Assessment		
4G preferred to 4G preferred UE Controlled Background Traffic	Reference web page download, HTTP and HTTPS Popular live web pages download, HTTP, HTTPS	Fixed Size HTTP, HTTPS File download Fixed Size HTTP, HTTPS File upload	YouTube Video download & playout Video on Demand (VOD) Live Stream	Fixed Duration multi socket download Fixed Duration multi socket upload	Geographic: Broadband Coverage Excellence (based on quality of coverage metric) User Centric: Time on Broadband	RTT based capability for: Gaming OTT Voice	Download speed metrics based on passive observation of real user traffic Capability for: Basic Internet HD Video UHD Video

- The red and blue sets of test cases represent the Network Test (NT)
- The green modules represent the User Experience Test (UET) component based on crowdsourced data.

Score relation and coexistence of different measurement scopes.

In the activities performed by umlaut, different score models will coexist, but maximum scores per scenario are harmonized.



Network testing

M2M Voice	Web Browsing (static and live)	HTTP File Up–/Download Fixed Size	YouTube App	HTTP File Up–/Download Datastream
Customer Experience				Network Capability
4G preferred to 4G preferred calls VoLTE enabled 115s Call Window 70s Call Duration MRAB traffic injection in every call	UE in 4G/5G preferred Mode Kepler static web page download, HTTP and HTTPS 10 popular live web pages download, HTTPS or HTTP	UE in 4G/5G preferred Mode 5 MB HTTP File download 2.5 MB HTTP File upload 2.5 MB HTTPS File upload	UE in 4G/5G preferred Mode Based on Android YouTube App+ YouTube Android Player API 40.50s Video download & playout Rotation of 2 different VOD and 1 live Stream	UE in 4G/5G preferred Mode 7s Fixed Duration multi socket download 7s Fixed Duration multi socket upload # of sockets used: 5

The 2020 methodology reflects network evo–lution in the setup by the adoption of a 5G capable device while keeping a view on legacy performance. Further various adjustments and harmonization have been realized in the scoring and geographical model.
To obtain the umlaut–Score and the related "best in test" award, a set of mandatory test cases needs to be included in the campaigns scope.

User Experience testing

Based on crowdsourced data

Speed

- User–centric
- Rewarding how often users achieve speeds supporting popular services:
  (i) basic internet, requiring 2 Mbps and above
  (ii) HD Video, requiring 5 Mbps and above
  (iii) UHD Video, requiring 20 Mbps and above

Latency

- User–centric
- Rewarding how often users experience latency supporting popular services:
  (i) OTT Voice, requiring 100ms or less
  (ii) Gaming, requiring 50ms or less

Coverage

- 4G(+5G) Broadband Focus, Geography– and user–centric
- Geography–centric:
  comparative (not absolute) KPI rewarding wide and deep Broadband offering
- User–centric: rewarding individual good Broadband offering through users' "Time on 4G + 5G

Various adaptations have been realized in the 2020 User Experience testing methodology to further improve end–user focus, differentiation, robustness and fairness.

The international score comparison of independent mobile benchmarks

Benchmarks with public visibility

Historical overview Top Ten 2019

Our public benchmarks as well as the certifica–tion benchmarks help network operators around the globe to demonstrate how well they deliver wireless connections to consumers, business users and enterprises while revealing the areas of improvement.

Using our experience in the field of network–testing of mobile networks we verify and certify the performance of mobile services.

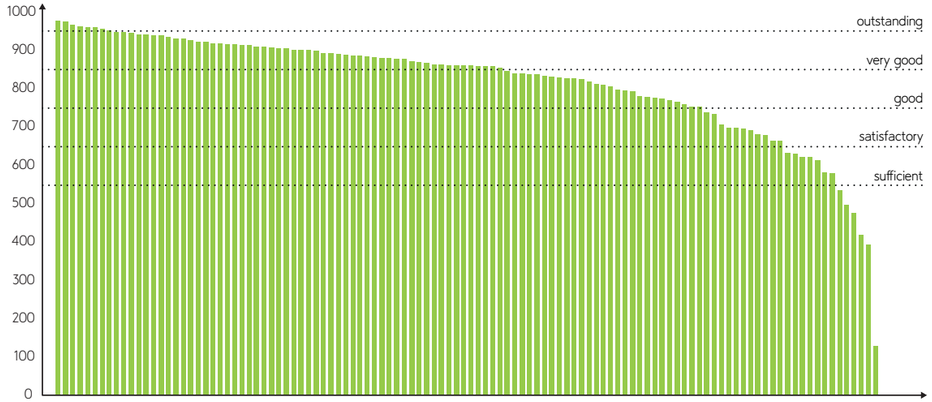
The umlaut score and service certification is the ideal tool for the independent assessment and attestation of mobile networks and the services they offer.

Benchmark results

Top 10

977: T–Mobile (NL, 04/2019)
974: Swisscom (CH, 12/2019)
967: Sunrise (CH, 12/2019)
963: Slovak Telekom (SK, 10/2019)
961: KPN (NL, 04/2019)
959: Vodafone (NL, 04/2019)
955: Magenta (AT, 12/2019)
951: A1 (AT, 12/2019)
946: A1 Hrvatska (HR, 05/2019)
946: Verizon (USA, 12/2019)

umlaut Scores — worldwide applied



Score comparison of mobile networks published by umlaut worldwide by May 12th 2020.

The graph shows the overview of all umlaut Score results collected internationally since 2019 and highlights the top 10 performing networks. Update activities under the new 2020 framework will show in the course of this year, if and how the advent of 5G and the innovations introduced in the user experience testing will change the group of front runners.

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