2023 Mobile Networks Benchmarking Framework

Abstract
Document Version V1.0 April, 2023
Benchmarking, our Territory. The Industry Standard.

Our top priority is to fairly and transparently assess the global development of networks, push their quality and performance with our benchmarks and ultimately achieve improvements for every customer.

Today, more than 200 mobile networks in more than 120 countries are being evaluated by our unique scoring methodology.

As the de-facto industry standard, our benchmarking methodology focuses on customer-perceived network quality and covers a wide range of mobile services. It allows a technical analysis that is unprecedented in its level of detail.

Every year, our methodology is moving toward more challenging test cases and evaluation criteria to evolve with customer expectations.
Preface

The umlaut Benchmarking Framework Basis.

The umlaut Benchmarking Framework is based on a unified measurement method for true international comparability combined with the umlaut-Score approach.

Key features:

- International comparability
- End customer relevance
- Full drill-down capability
- Transparency
- Rooted in ETSI TR 103 559 recommendations
Rationale
How to stay focused?

Measuring performance means collecting a vast multitude of different performance indicators, so the important aspects can be easily missed. The question is how to stay focused and communicate results smoothly?

The umlaut Score, as a management tool, is umlaut’s solution which:

- aggregates the complete set of KPIs into a single score figure, preserving the drilldown capability
- features implicit weighting of environment, services and KPIs and comparability on national and international level...
umlaut Scöre®
As a Management Tool.

Unique performance profile
That characterizes your network

Benchmark
Your network against competitors in or across markets

Priorities
Help steering your investments where they make an impact to the user

Manageable targets
Derive achievable targets to steer your teams

History
Benchmark against your former self

Learning from best in class
Understand what can be achieved with similar setup/spectrum/vendor
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.
For Drive and Walk Testing, each service session is typically characterized by a **Qualifier** KPI and one or several **Differentiator** KPIs.

- **Qualifier** KPIs model minimum requirements that have to be met to make the experience of the service satisfactory.

- **Differentiator** KPIs describe additional aspects of those service sessions that fulfil the qualifier criteria.
Concept Overview

Characterized by

- defined weighting between environments and services
- fixed maximum score
- modular extensions
- qualifiers and differentiators

Properties

The Baseline umlaut-Score covers a default combination of different environments and services, that may be added to or dropped from Score on a yearly basis.

Scope:

- Drive Test for Voice and Data services
- In Cities, Towns, Roads
- Complemented by crowdsourcing-based score

and optionally extended by:

- Indoor city Walk Test, public transport, railways (commuter and long-distance)
umlaut Score Family:
Modularity and Hierarchy.

umlaut delivers user experience and performance ratings for the communications and other industries. The family of umlaut score products is depicted below and constantly being expanded.

This document focuses on the Mobile Broadband related Scores.

Scope:
- 1) Network Testing Voice and Data Experience and Performance, Focus on “best available product”
- 2) Crowdsourcing Mobile Broadband (4G+5G focus), Coverage, DL+UL Speed, Latency, Voice, Stability

Scope:
- Crowdsourcing Mobile Broadband (4G+5G focus), Coverage, DL+UL Speed, Latency, Voice, Stability

Draft Scope:
- Crowdsourcing of in-Home Users on WiFi focus on DL+UL Speed, Latency, Stability
Test and Crowd Assessment Methodology

Test Cases and Modules to be included in the Campaign Scope.

Core Requirements

- The green and indigo sets of test cases represent the Network Test component (drive and walk test)
- The purple modules represent the User Experience Test (UET) component based on Crowdsourced data

M2M Voice
Web Browsing (static and live)
HTTPS File Up-/Download Fixed Size
Conversational App
YouTube Video
HTTP File Up-/Download Data stream
Interactivity for eGaming
Coverage
Latency
Data Speed
Stability
Voice

Network Test: Customer Experience 5G
Network Test: Capability 5G
Crowd: User Experience Assessment
Public Benchmarks, Network Certification, Audit Reports

Description of Approach

The umlaut benchmarking activities with public visibility are based on a combination of dedicated testing and crowdsourcing–based assessment. The umlaut score is the common element of all activities. These publicly visible activities are:

- **Public benchmarks** executed in cooperation with a publishing partner
- **Independent network certification** activities, commissioned by one or more 3rd parties (e.g., mobile network operator, network vendor, etc.)
- **Audit reports**, which are independently executed but can contain bespoke elements as far as technical or geographical scope, timeline, or other aspects are concerned

The setup, scope and timeline

- for any certification and claim support activity is independently chosen and decided by umlaut
- for any public benchmarking activity is independently chosen and decided by the publisher and umlaut

Per default, network certification activities are a combination of dedicated testing activity + crowd–based assessment
Disclaimer

This document and all information contained herein is the sole property of umlaut. No intellectual property rights are granted by the delivery of this document or the disclosure of its content. This document shall not be reproduced or disclosed to a third party without the express written consent of umlaut. This document and its content shall not be used for any purpose other than that for which it is supplied.
www.umlaut.com