

[BEREC] WNE 5G Workshop

# R&S EXPERIENCE OF MOBILE NETWORK TESTING using ETSI method

Maja Mitić  
Managed Services Director  
[maja.mitic@rohde-schwarz.com](mailto:maja.mitic@rohde-schwarz.com)

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# AGENDA

- ETSI method
- From 4G to 5G networks
- Rohde & Schwarz experience

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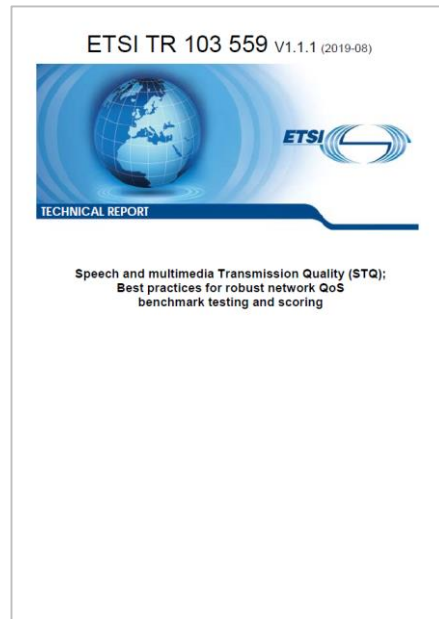
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# ETSI TR 103 559

## Best practices for robust network QoS benchmark testing and scoring

- ▶ ETSI TR 103 559 describes method and KPIs for measuring and scoring mobile network end-to-end performance, with respect to the area and population to be covered, by drive (and walk) testing
- ▶ **The described method is focusing on end-to-end performance and end-user point of view**
  - Technology agnostic and its principle can be applied to all existing networks as deployed today
  - Most popular use cases by end-users are considered (voice, web browsing, using social media, video streaming, data down/up-load)



Free and publicly available for use  
[https://www.etsi.org/deliver/etsi\\_tr/103500/103599/103559/01.01.01\\_60/tr\\_103559v010101p.pdf](https://www.etsi.org/deliver/etsi_tr/103500/103599/103559/01.01.01_60/tr_103559v010101p.pdf)

**Tech Highlights**

### Quality of experience: a key requirement for end users

*Aware of the importance of speech transmission requirements from the perspective of a user's quality of service, ETSI sets standards for handsfree, handset and headset VoIP terminals, in narrowband and wideband.*

Successful global implementation

National mobile network benchmarking and scoring campaigns are of great importance to mobile network operators. ETSI has therefore developed TR 103 559 to meet these requirements, with regard to the area and population to be covered, the collection and aggregation of test results, and the weighting of the various aspects tested. The report takes into account the rapid development of mobile technology and the consumer habits of users, as users' quality of experience changes over time, by parameterizing individual factors that contribute to the score.

The tests assess telephony, video streaming, data throughput and more interactive applications such as browsing, social media and messaging. The results collected from the various areas are individually and collectively weighted and summarized by an overall score.

For greater authority, the scoring methodology is based on a set of standardized market KPIs and provides governance and implementation principles as well as concrete realizations. TR 103 559 describes its scoring method with full transparency for the benefit of implementers, network providers and regulatory authorities, and has been applied on a global scale.

Standards relating to terminals and networks for speech and media quality, end-to-end single media and multimedia transmission performance are essential for end users. The ETSI Technical Committee on Speech and multimedia Transmission Quality (TC STQ) successfully handles these standards. It also develops Quality of Service (QoS) parameters for networks and services and Quality of Experience (QoE) descriptors and methods. To ensure alignment with other standard-setting organizations and facilitate industry implementation, the group provides guidance and background information on effectively applying the standards and methods created.

As well as creating a large number of standards for speech transmission requirements, the committee has developed a specification offering guidance and detailing the methodology to objectively assess the listening effort required by a user during a voice call.

The committee has also standardized subjective and objective methodologies for the qualification and performance requirements of the new ETSI speech codec for encoding and decoding digital speech signals, in cooperation with the ICT Digital Enhanced Cordless Telecommunications group.

To meet the requirements of mobile networks, the subgroup STQ Mobile focuses on QoS and QoE aspects for popular services in mobile networks, as well as parameters and test scenarios for assessing network capabilities in 5G performance measurements. STQ Mobile liaises with 3GPP and other standards organizations to support the development of methods and equipment used for characterizing existing and future network telecommunications services, both landline and mobile. Several of its

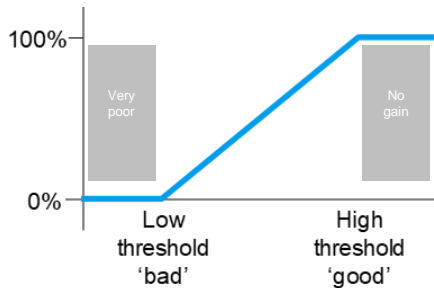
12 ENJOY THE ETSI MAG

ETSI Magazine, July 2021  
QoE testing with ETSI 103 559  
<https://www.etsi.org/e-brochure/Magazine/July-2021/mobile/index.html#p=12>

# Governing principles

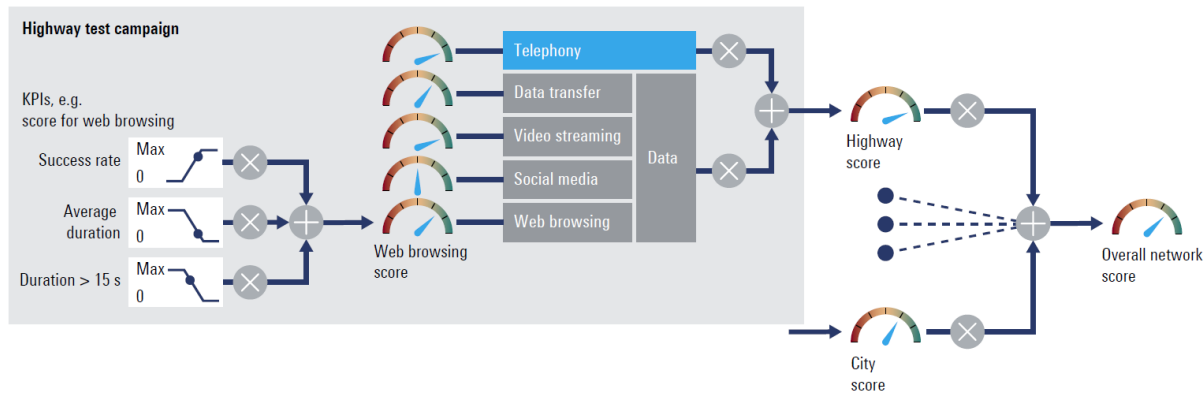
- ▶ According to the ETSI document, there are important principles to be followed to ensure that the measured results are truly representative of the real end-user experience
  - Test method transparency
  - Statistical confidence and robustness
  - Appropriate test device and test server selection
  - Best practice for webpage selection
  - The best or highest end-user tariff plans
- ▶ Test areas
  - Regions (geographical types): Cities, Towns, Roads, Railways, Hot spots
  - Possibility to assign special weighting on a certain area due to its high importance (hot spots, areas where mobile connection is the only connectivity available)
- ▶ List of KPIs to be measured for each of the service
  - Success Ratio, Time to setup/transfer, Quality
  - Most KPIs defined acc. to ETSI TS 102 250-2

# Network Performance Score (NPS)



Each KPI has its bad and good threshold

Negative end-user experience counts more than positive one



KPI → Service → Region → Overall

Aggregation layers

Each KPI is weighted according to its importance to the end-users, further combined and aggregated with other KPIs

Individual services results are aggregated per different regional areas

Regional weighting (City, Roads, etc.) is aggregated into the overall score

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# From 4G to 5G NR networks

## What will change?



- ETSI Method is technology agnostic, but end-users expectation increases
- Adjustments of thresholds and weights required, to allow better discrimination of network quality for highly advanced LTE and 5G NR networks (eg. higher data throughputs)

## Rohde & Schwarz



- Rohde & Schwarz wrote a contribution to ETSI (Draft TR 103 733)
- TR is expected later this year

## Outlook



- Further evolvments for 5G SA networks
- Taking into account requirements regarding URLLC (Automotive, Industry 4.0)



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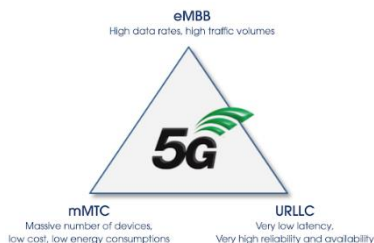
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# Rohde & Schwarz

## Real-field experience with using ETSI method for measuring 5G networks



- ▶ More and more 5G networks are live
- ▶ Influence of the underlying LTE network is important
- ▶ LTE anchor cell configuration is crucial in 5G NSA networks
  
- ▶ Today's key focus of MNOs is still high throughput in DL direction
- ▶ Maximum throughputs in DL 1.2 Gbps, UL 95 Mbps
- ▶ Low latency is desired, but currently not optimized
- ▶ 5G network is a prerequisite to achieve low latency values
- ▶ ETSI method is still valid, Interactivity test is introduced
- ▶ Interactivity combines latency, packet loss and delay variation into one score
  
- ▶ Mobile device capability can significantly impact performance\*
- ▶ Different device models causing different results in the same mobile networks

\*Flagship smartphones do not necessarily support all expected anchor bands or important 4G/5G band combination in the same frequency range

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**THANK YOU**