[BEREC] WNE 5G Workshop

R&S EXPERIENCE OF MOBILE NETWORK TESTING
using ETSI method

Body of European Regulators for Electronic Communications
BEREC

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ROHDE&SCHWARZ
Make ideas real

AGENDA

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

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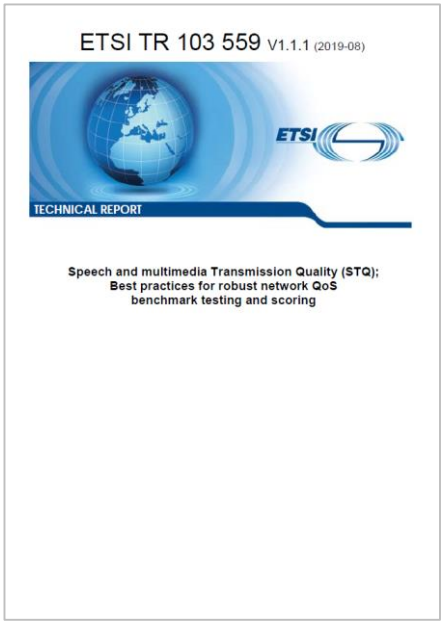
ETSI TR 103 559

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)



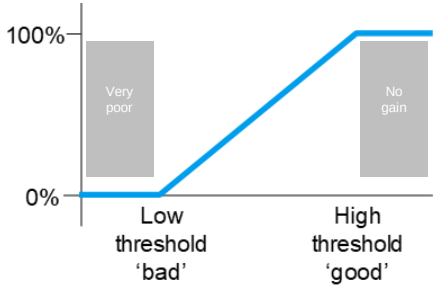
Free and publicly available for use
https://www.etsi.org/deliver/etsi_tr/103500_103599/103559/01.01.01_60/tr_103559v010101p.pdf

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

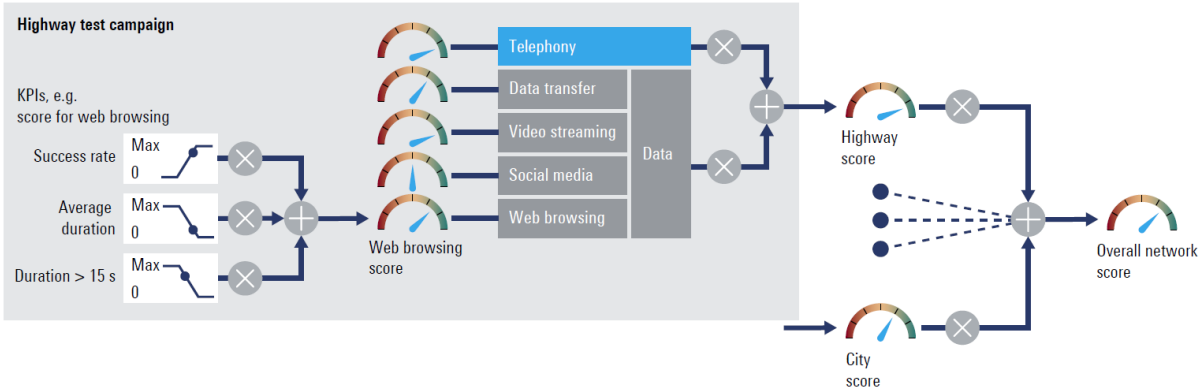
- According to the ETSI document, there are important principles to be followed to ensure that the measured results are truly representative of the real end-user experience
  - Test method transparency
  - Statistical confidence and robustness
  - Appropriate test device and test server selection
  - 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 evolvements for 5G SA networks
- Taking into account requirements regarding URLLC (Automotive, Industry 4.0)

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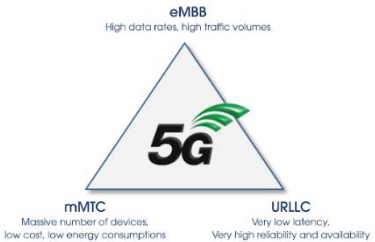
Rohde & Schwarz

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

- More and more 5G networks are live
- Influence of the underlaying 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