Study on the quality of broadband Internet access services

ETSI TC STQ WORKSHOP
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Background

- Transposition of Universal Service Directive
  - Article 20 Contracts
    - Information on conditions limiting access to and/or use of services and applications
    - Minimum service quality levels offered
    - Information on any procedures to measure and shape traffic and information on how those procedures could impact on service quality
  
- Article 22 Quality of Service
  - In order to prevent the degradation of service and the hindering or slowing down of traffic over networks, Member States shall ensure that national regulatory authorities are able to set minimum quality of service requirements

Results of quality study are needed to take decisions on further actions on an informed basis
Aim of study

Study serves to provide detailed information on:

- Status quo of received Internet access speed compared to advertised/contracted broadband speeds
- Possible degradation of Internet access quality due to in parallel offered services via the same broadband access service (e.g. Triple Play with IPTV, VoIP)
- Different achievable throughput ratios with respect to destinations, content and applications used (net neutrality)
- Fundamental considerations for the development of a quality measurement methodology usable by end-users
Scope of study
Factors influencing service quality

Quality of Internet access service is influenced by:

- Throughput ratio of access line („bandwidth/speed“ of individual access)
- Design of access architecture and dimensioning of aggregation network (overbooking of capacities)
- Service profile – Design and policy of service creation
- Implementation of other services relying on the same broadband infrastructure
Basically network performance measurement between two reference points
- Client-Server architecture
- Measurement of based on test calls at dedicated end points (interfaces) (based on EG 202 057-4 and relevant other ETSI standards)
- Measurement without knowledge of provider (user accessible end points)
- Client at end-user interface and server connected to the Internet

Technical aspects to be addressed:
- Throughput/capacity of access service
- General restrictions with respect to transport function (e.g. blocking, throtteling)
- Allow conclusions on typical end-user use cases
- Interdependency of services offered in bundle
In order to allow for representative results the following aspects need to be taken into account:

- Different technologies (xDSL, CATV, FttX, LTE stationary, mobile access)
- Different product classes
- Different providers
- Different regions (rural, sub-urban, urban)

Number and spatial and geographical distribution of test calls need to reflect the above mentioned requirements

Mobile Internet access only with respect to basic performance aspects (no drive tests)
Pre-conditions

- Individual end-user accesses only differ with respect to throughput/capacity (bandwidth of access „line‟)
- Pre-defined (non-varying) service creation (service profile) for product classes
- Fixed conditions for services provided in parallel via broadband access infrastructure
- Net neutrality linked to service profile and regions (not to individual accesses)
- No significant daily traffic variation per access line (see e.g. SamKows Study „Measuring Broadband America 2012‟)
Conclusions

- At individual access lines throughput measurements are adequate
- Throughput measurement technically rather simple (no specific hardware/software required)
- Complex measurements of net neutrality and interdependency of bundled services only needed at (few) well-chosen end points
- One single measurement per individual access lines adequate (no 7d/24h measurement regime)
Twofold approach

- Measurement of individual accesses based on browser-based software tool
  - Call for voluntary users (pre-defined panel not needed)
  - Tool to be provided by study
  - Statistical validation of collected test samples needed (post-processing)
- Measurement based on nation-wide test platform with dedicated measurement equipment to assess
  - Interdependency and net neutrality
  - Throughput measurement
  - Mobile access measurements (collection of dedicated places [train stations, town centres, …])
Solution – Measurement methodology II

- Measurement platform used to monitor and validate measurements of software based tool
  - Reachability and connectivity of test server
  - Identification and validation of fault reports by end-users

- Software based tool provides basis for checking feasibility and further development of end-user based measurement tools
  - Evaluation of fault reports
  - Modification and adoption of software during study
Measurement parameters (software tool)

- Download and Upload ratio (http sessions)
- Flash application
- Accessed via browser (http://www.initiative-netzqualitaet.de)

- Postal code
- Access technology
- Provider
- Advertised speed
- Optimal measurement set-up (LAN only, no parallel processes)
- Customer satisfaction
Der Breitband-Test

Download: 6,077 MBit/s
Upload: 0,471 MBit/s

Status: Test erfolgreich. Danke für Ihre Teilnahme!

Wenn Sie Fragen zum Test haben oder die Messwerte Ihren Erwartungen nicht entsprechen, dann finden Sie hier weitere Informationen.
Fixed and mobile accesses (7d/24h)

- Download and upload ratio (http/ftp)
- Delay (Ping) and delay variation
- Packet loss ratio and loss variation
- Website access
- Download and upload while
  - Parallel usage of IPTV
  - Parallel usage of VoIP
- Net neutrality
  - Glasnost tool
  - Different locations and measurement times
Results & further study

- Presentation of results
  - Study report (to be published early 2013)
  - Stakeholders workshop (early 2013)
  - Ongoing evaluation of study results during 2013

- Issues to discuss/Questions for further study
  - How to define meaningful criteria for transparency obligations in contracts?
  - Internet access performance not directly perceivable by end-user. End-user can only perceive application performance (QoE)
  - Identification of criteria for end-user based measurement tool
  - Service (Quality) concept of IP based networks
    - No connections (circuits)
    - Network planning based on capacity not on transmission plans for end-to-end connections
    - Applications adapt to varying network performance
    - Service/applications in end points – no „end-user QoS“ in networks
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