
ITU Workshop on “Performance, Quality of Service and Quality of
Experience of Emerging Networks and Services”
(Athens, Greece, 7-8 September 2015)

Network Performance vs. Application
Testing; findings and considerations

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agenda

1. Introduction
▶ **About Omnitele**
2. Beyond bitrates
Drive Testing vs. App Testing
3. OTT delivery chain
Understanding the QoS results
4. Key take-aways
Summary

omnitele

experience

Maximised Experience, Minimised Cost

We provide consulting and expert services for telecom operators and regulators in network strategy, design and quality assurance. Our mission is to maximise mobile subscriber quality of experience and minimise operator network expenditures.

Delivering Omnitele Experience

The company was founded in 1988 to set up world's first GSM network. Since then we have completed over 1000 projects in over 80 countries around the globe. Always delivering Omnitele Experience – a fact proven by our long lasting client relationships.

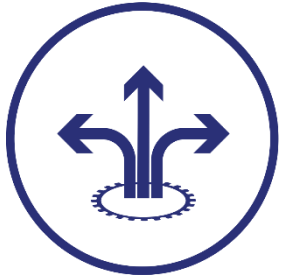
International And Independent

Our headquarters is located in Helsinki, Finland. We have local presence in the Netherlands. Our company is owned by Finnish telecom investors and we are independent of operator groups and network vendors.

The Omnitele Way

Our unique way of working sets us apart from the competition and gives us a strong identity in the world of telecommunications. We call this the Omnitele Way, which means being Straightforward, Trusted and Intelligent.

our services



Technology
Strategy



Design and
Optimisation



Audit and
Benchmark



Performance
Management

maximised customer experience
minimised network cost

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Monitoring End-User QoS in...

...pre-HSPA networks

General user experience
depends on two basic services

Voice Services



MOS, Success Rates, Drop
Rates, Setup Time

Data Services



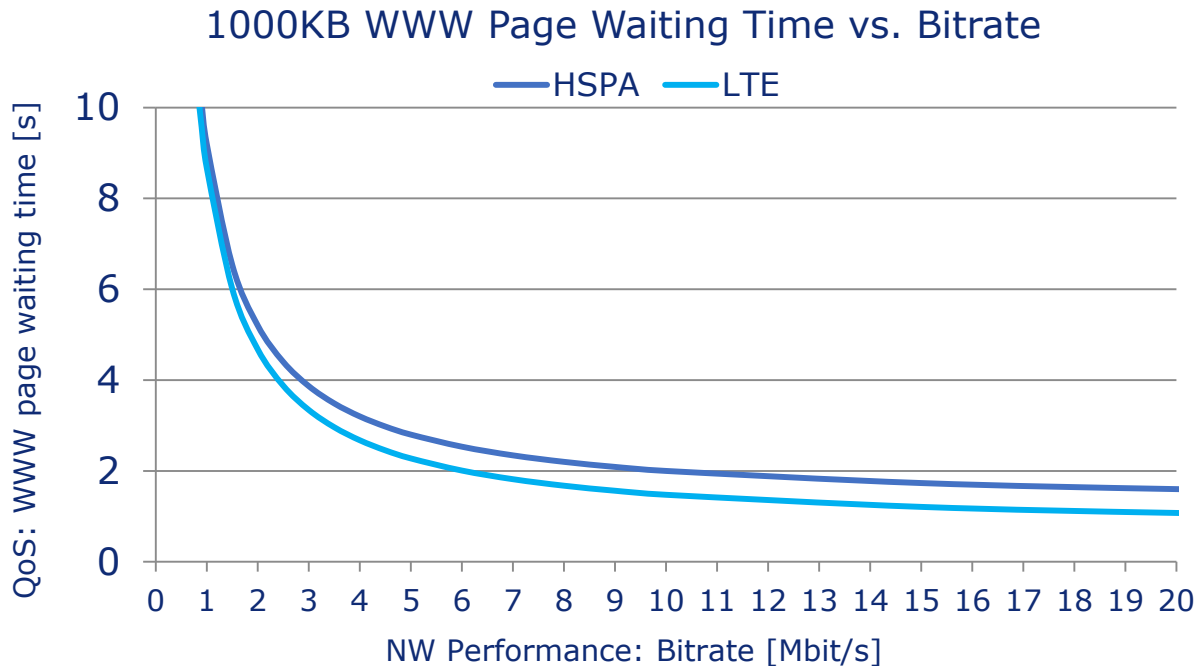
Throughput



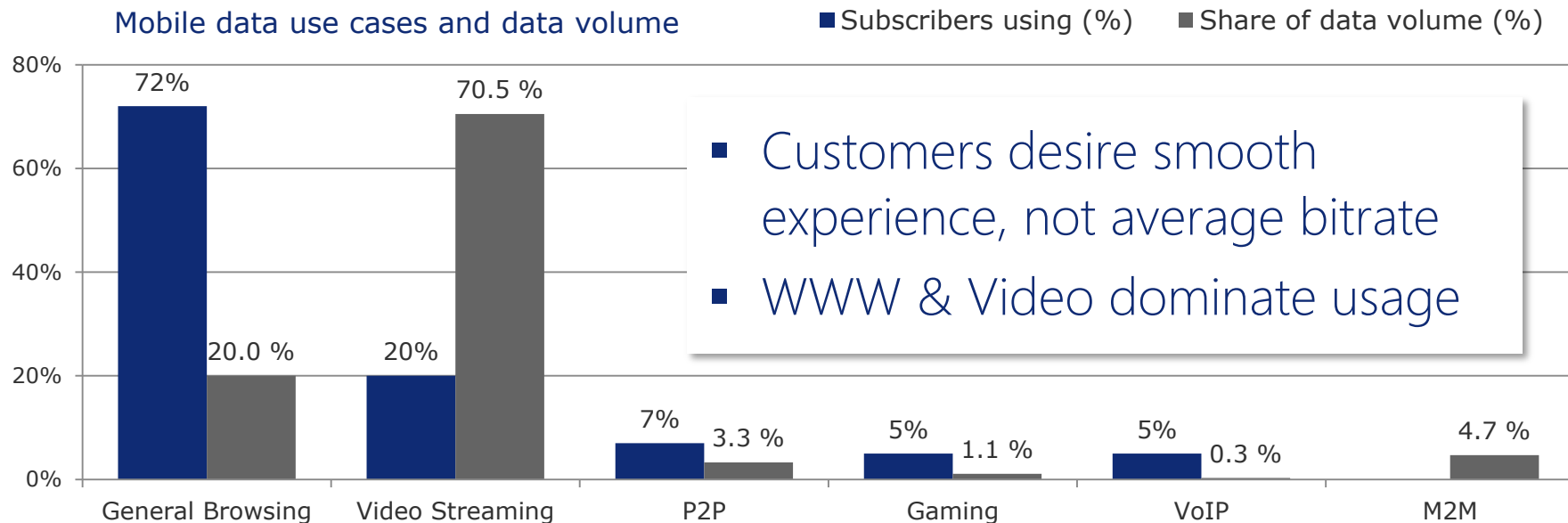
Generally available bitrates are not sufficient for data services. As throughput is the bottleneck, it becomes the measure to define the QoS

Customer Experience Challenge

Bitrate is no longer the ultimate mobile network quality indicator



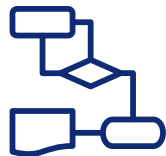
Customers mind service quality, not network performance



Competitive end-user QoS benchmark



OBJECTIVE: gain total visibility to mobile service experience & quality positioning



METHODOLOGY: "*be the customer*" - approach to capture end-user experience



RESULT: a high quality benchmark report suitable for public distribution

Capturing the End-user Experience

WHERE

Independently selected dense population areas & landmarks



WHEN

Test focus on peak hours, no empty network testing



HOW

Terminals & test cases as per real subscriber behaviour

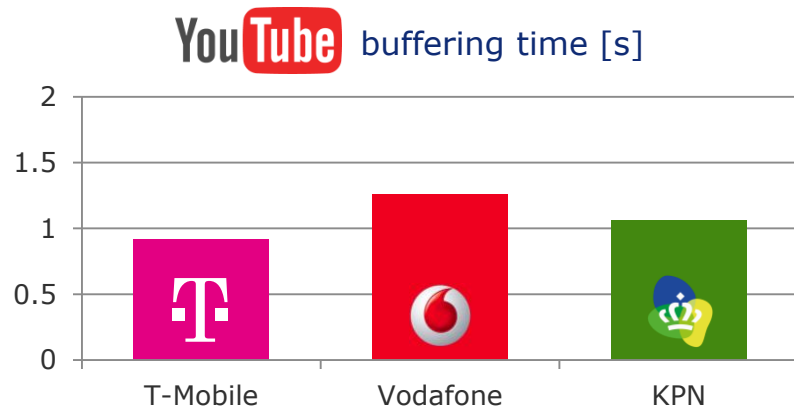
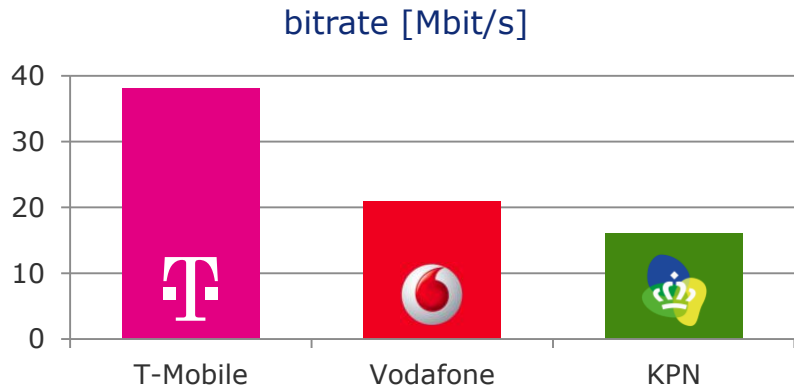


Customer Experience Challenge

Case study: Omnitele benchmark in Netherlands

big difference in NW performance...

...thin margins in Quality of Service



Vodafone higher bitrate,
but KPN faster YouTube

Drive Testing vs. App Testing

Case study – Omnitele benchmark in Estonia



Traditional Drive Testing



App Testing



FTP Downlink

Average (Mbps)

Operator 1

43.8

Operator 2

24.3

Operator 3

20.3

Dropbox DL

Average (Mbps)

Operator 2

13.5

Operator 3

12.8

Operator 1

11.1

Drive Testing vs. App Testing

Case study – Omnitele benchmark in Estonia



Traditional Drive Testing



App Testing



LTE RB Utilisation

Average (%)

Operator 1
Operator 2
Operator 3

91.2
80.0
72.8

LTE RB Utilisation

Average (%)

Operator 2
Operator 3
Operator 1

21.9
26.6
19.9

Results from Drive Testing and App Testing do not match at all. Network usage patterns are completely different

Customer Experience Challenge



all-IP PS network

OFDMA access scheme

spectral efficiency 15 bit/s/Hz

SC-FDMA uplink

adaptive modulation

low latency

20 MHz bandwidth

Carrier Aggregation

improved cell-edge performance

8x8 MIMO

300 Mbps



Customer Experience Challenge



all-IP PS network
OFDMA acc



300 Mbps

news refreshing time?



app download
time?

it takes too long to
upload a pic in
Instagram...

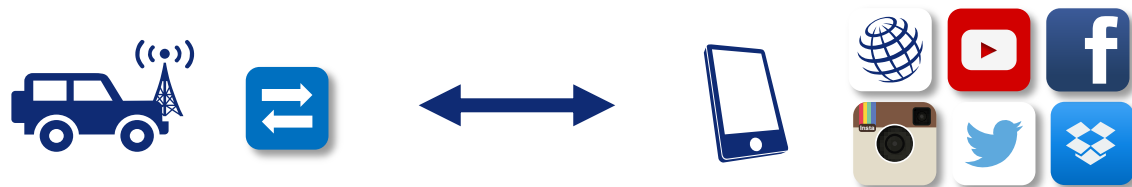


facebook
refreshing
time?



Customer Experience Challenge

Where to focus your monitoring efforts?



Depends on the objectives that
you want to achieve

Network
Performance

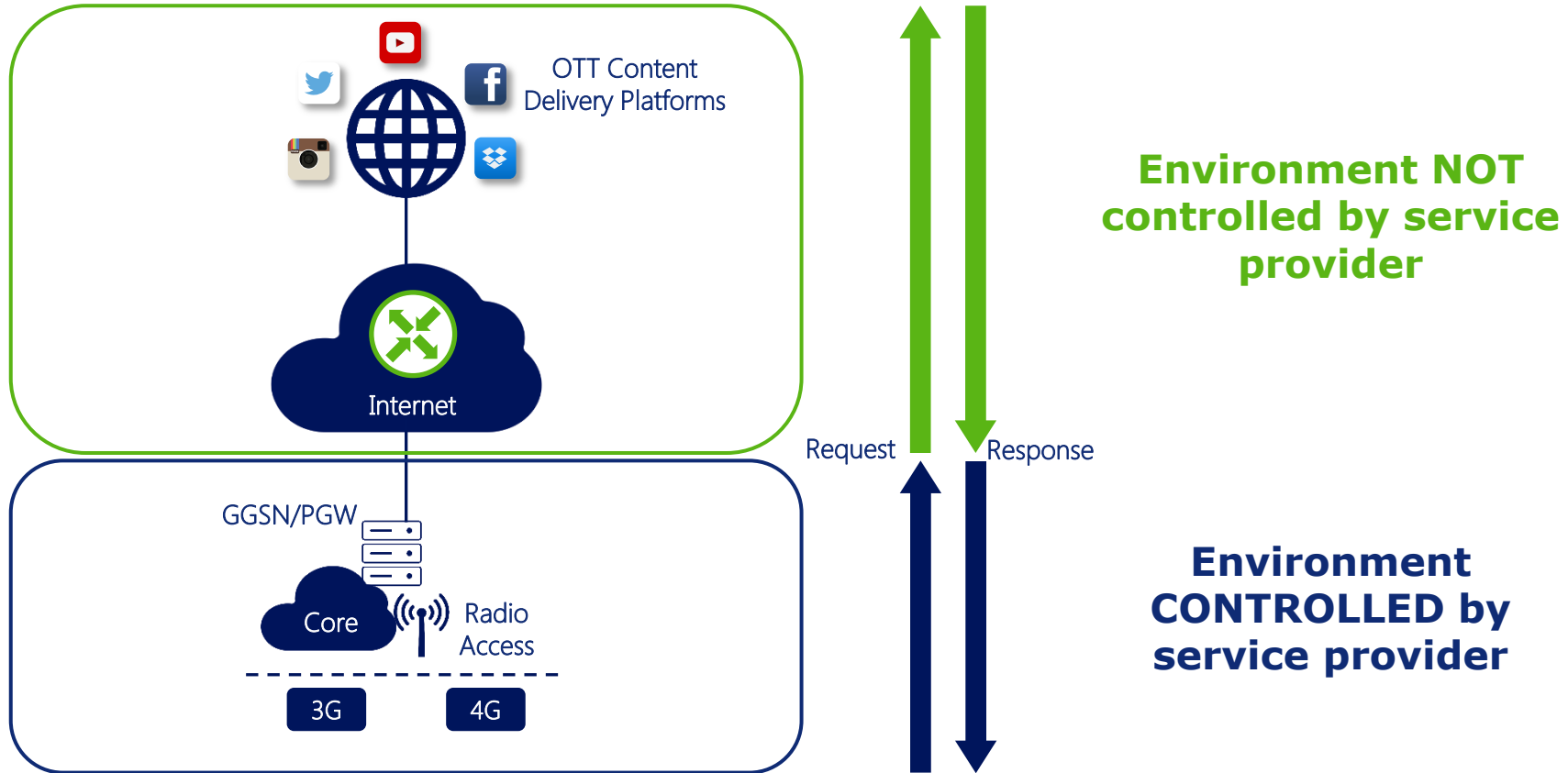


End-User
QoS

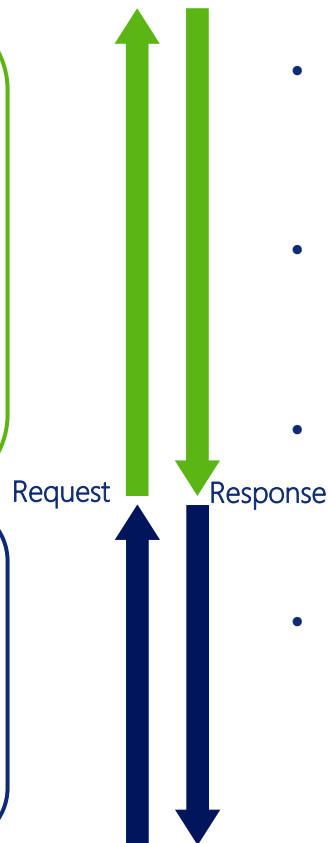
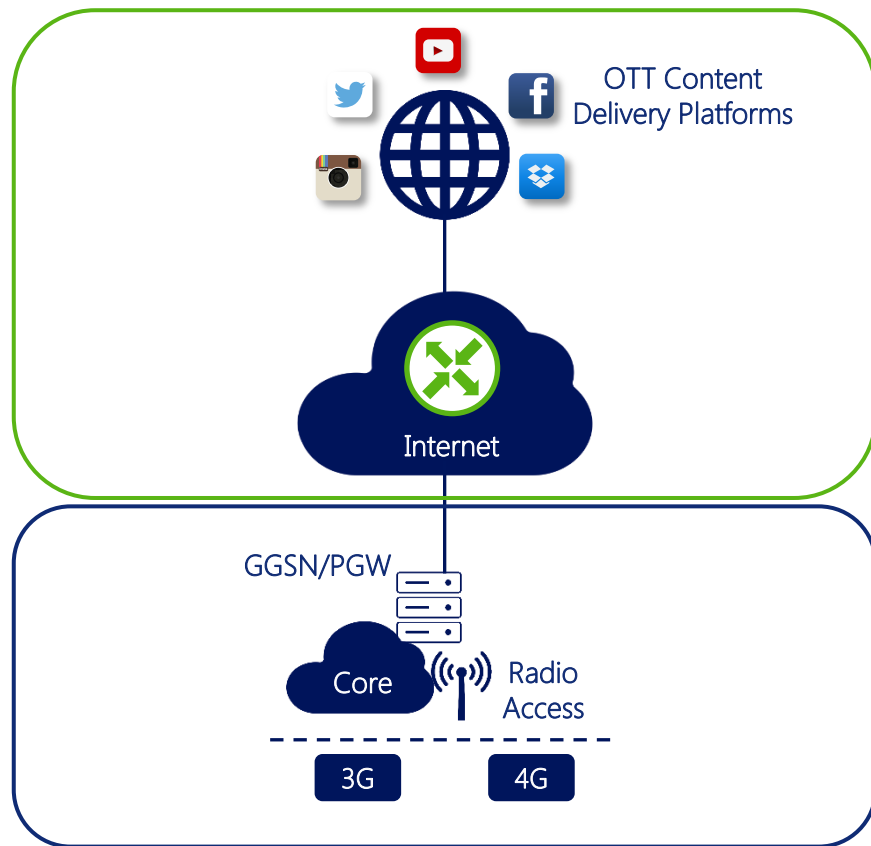
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OTT Delivery Chain in Mobile Network environment



OTT Delivery Chain in Mobile Network environment



- Environment is not fully controlled by network operator
- OTT measurement results will not depend only on operator performance
- Special attention should be paid when analysing OTT performance results (Facebook waiting times, YouTube buffering time, etc.)
- Multiple points of measurement within controlled environment would facilitate problem isolation

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Summary

1. Data throughput is no longer the unique KPI to take into consideration when monitoring Mobile Data QoS
2. Network Performance vs. App Testing – depending on your own objectives you may setup your measurements one way or another
 - Use of network resources differs and thus, results obtained
3. OTT delivery chain is not fully controlled by service provider, thus results may be influenced by external factors
 - Setting up different measurement points within controlled environment will assist in troubleshooting potential issues

thank you for your attention!

Questions?

We answer



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An abstract network diagram with blue nodes and lines on a dark blue background, representing a complex communication or data network. The nodes are small circles, and the lines are thin, connecting various points across the frame.

maximised customer experience
minimised network cost