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EACO, Communications Authority of Kenya and ITU  
Stakeholder Forum on Quality of Service and Consumer Experience  
*(Nairobi Kenya, 24 November 2015)*

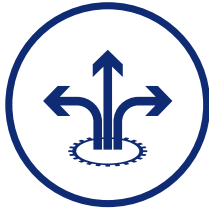
Session 4  
Measuring QoS of OTT Services

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# agenda

1. Introduction
  - ▶ **About Omnitele**
2. Beyond bitrates
  - Customer experience challenge**
3. Different measurements give different results
  - Example result**
4. Key take-aways
  - Summary**

# omnitele



Technology  
Strategy



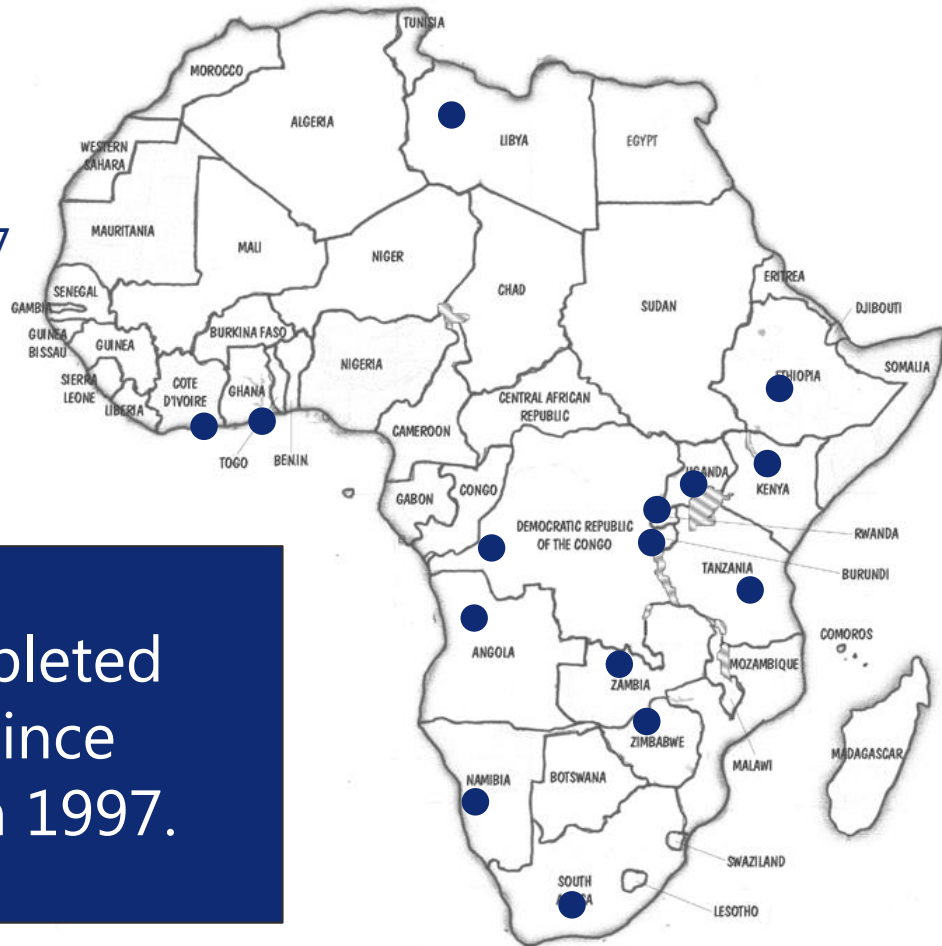
Network Design &  
Optimisation



Audit and  
Benchmark

Consulting and engineering services for mobile operators in network strategy, deployment and quality assurance. Maximised customer experience, minimised network cost.

● Projects Completed since 2007



In total Omnitele has completed over 50 projects in Africa since 2007. First Africa project in 1997.

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# QoE, QoS and network performance

## QUALITY OF EXPERIENCE

how well service quality meets expectations?

## QUALITY OF SERVICE

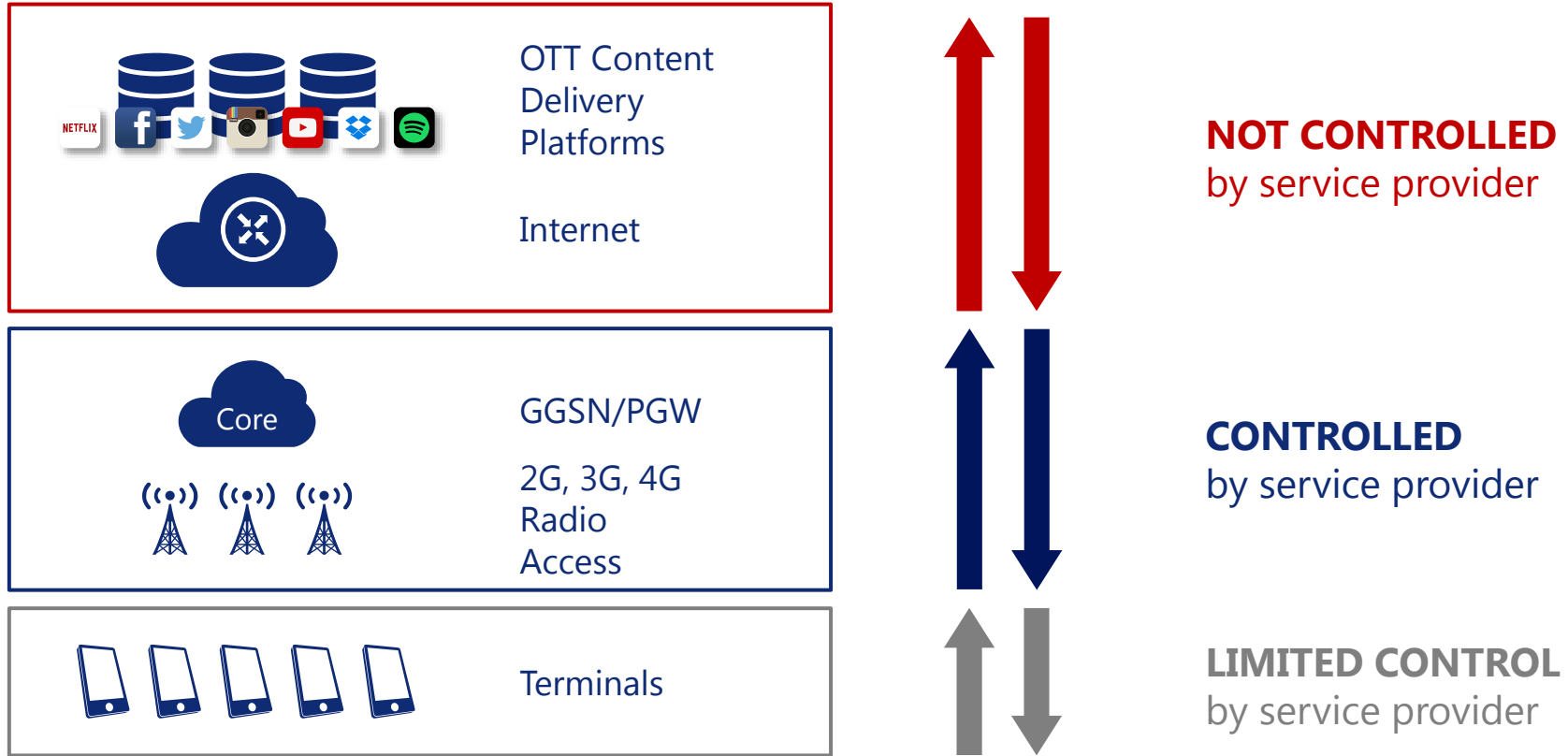
measured application/service KPIs

## NETWORK PERFORMANCE

capacity, coverage, functionality, efficiency...



# OTT Delivery Chain in Mobile Network environment



## CUSTOMER QoS at the start of data era (until HSPA+):

# Data Service Experience Defined by Bitrate

Voice Service



MOS, success rate, drop rate, call setup time

Data Service

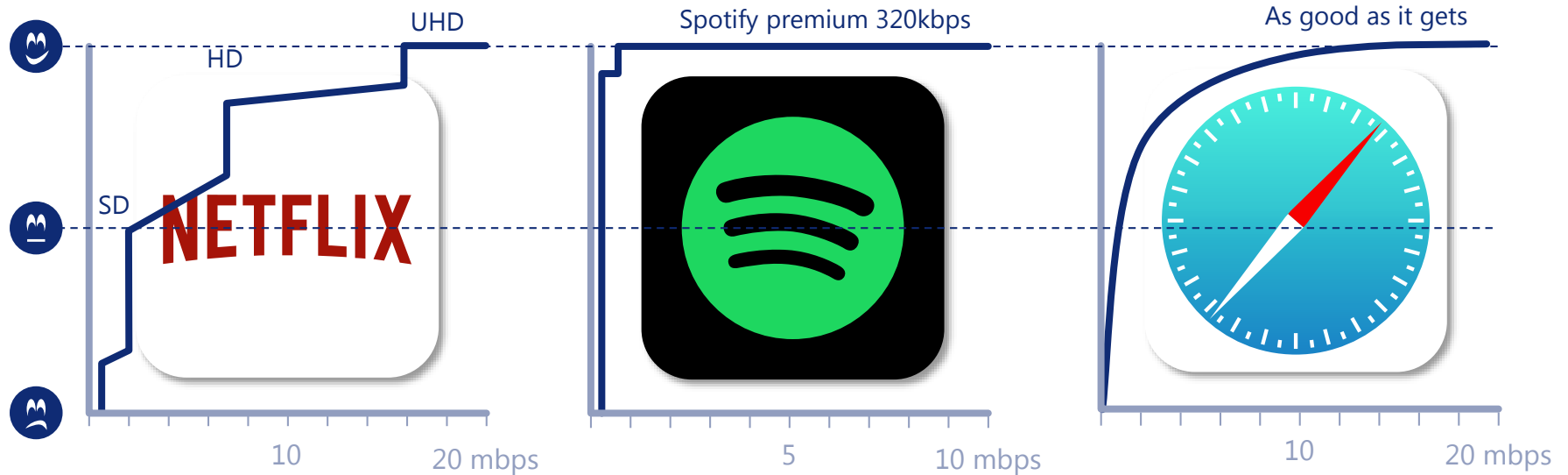


QoS determined by the available bitrate



## CUSTOMER QoS TODAY (HSPA+, LTE):

The higher the bitrate, the less relevant for OTT



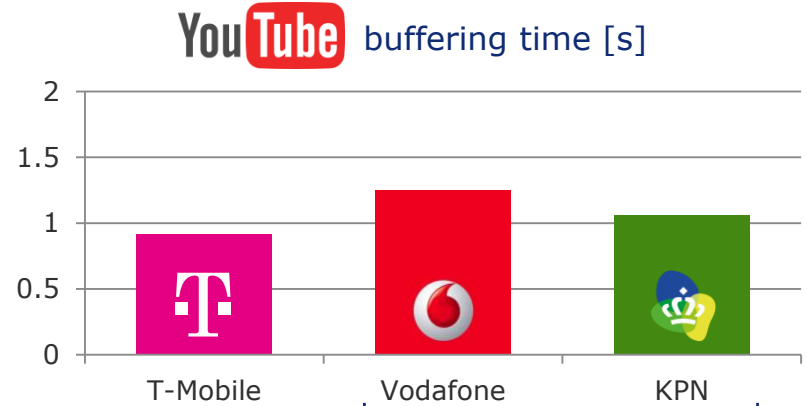
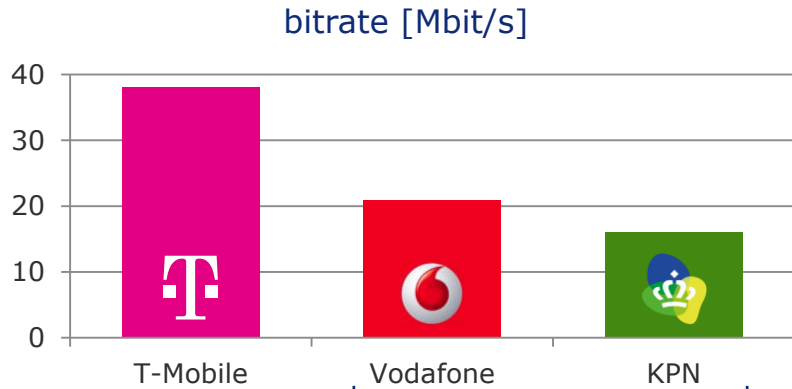
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# Customer Experience Challenge

Big difference in NW performance...

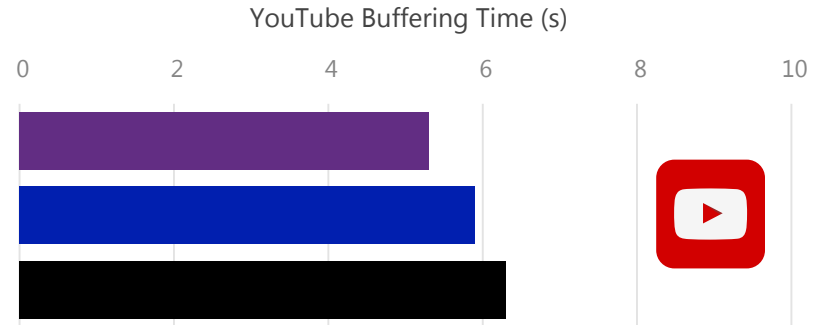
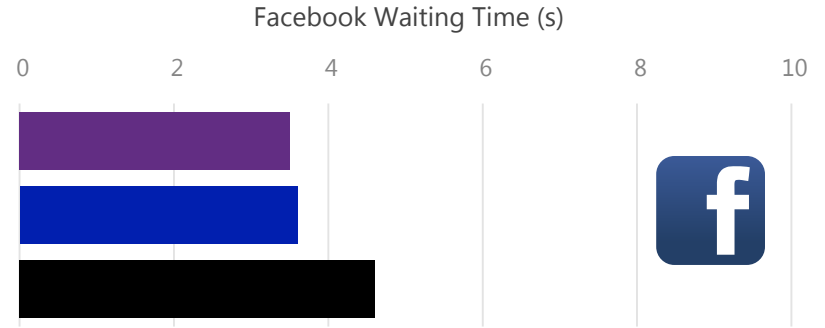
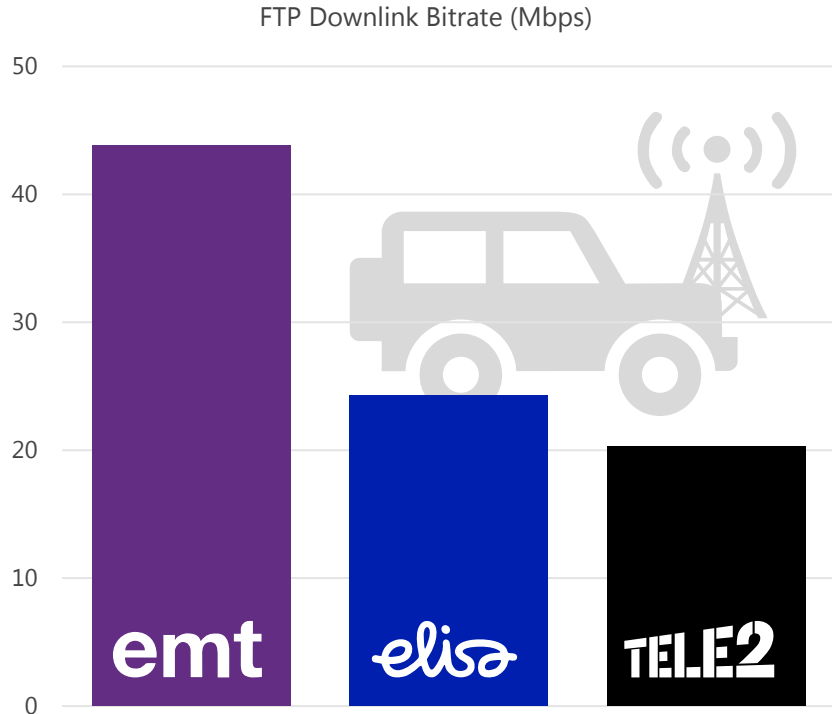
...Thin margins in Quality of Service



Vodafone higher bitrate,  
but KPN faster YouTube

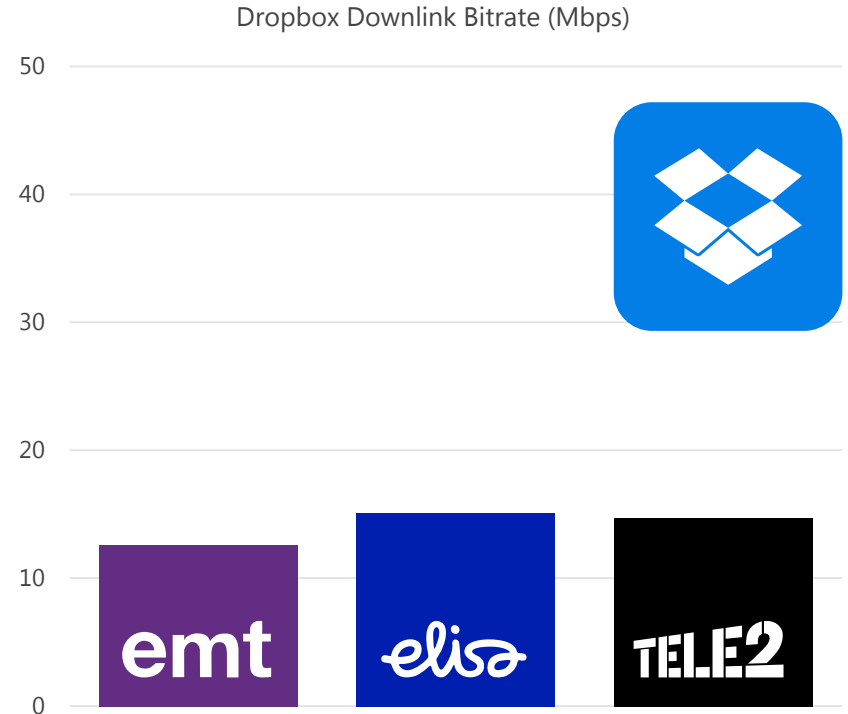
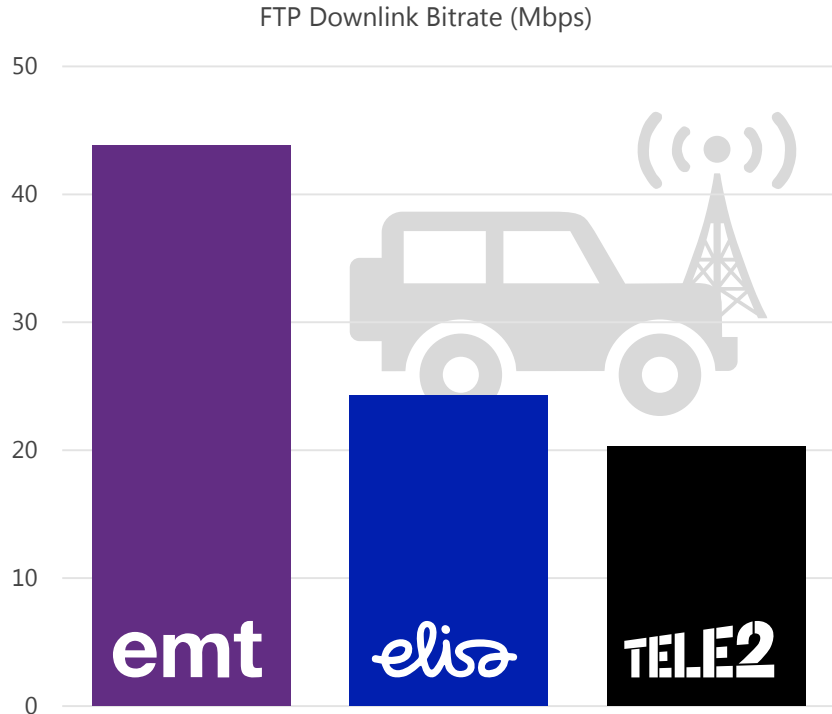
## OMNITELE BENCHMARK, CASE NORT EUROPE:

Drastic gap in FTP drive tests, limited difference in smartphone app experience



## OMNITELE BENCHMARK, CASE NORTH EUROPE:

Drastic gap in FTP drive tests, limited difference in smartphone app experience



# Example KPI set




## TRADITIONAL DRIVE TESTING

## APP TESTING

Measurement setup

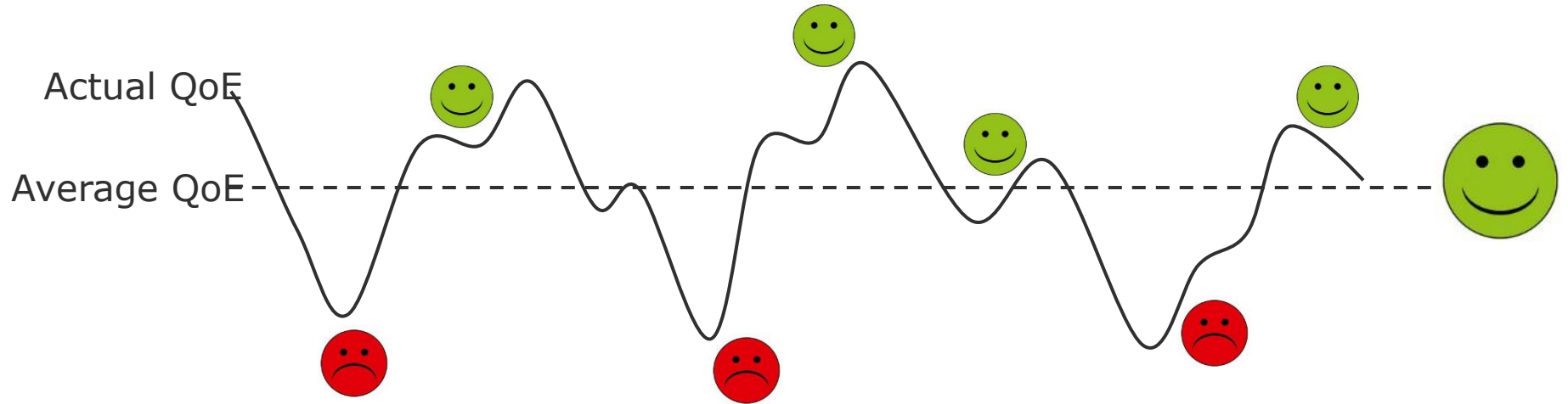


Example results

	 Latvia			 Denmark				 Estonia			Average All Operators
Application	Bite	LMT	Tele2	TDC	Telenor	Telia	Tre	EMT	Eisa	Tele2	
FTP Downlink Bitrate (Mbps)	22.0	26.4	10.5	45.3	28.4	27.0	22.2	43.8	24.3	20.3	27.0 Mbps
FTP Uplink Bitrate (Mbps)	10.4	13.5	2.7	33.2	14.3	12.8	11.3	20.5	13.4	8.7	14.1 Mbps
Dropbox Downlink Bitrate (Mbps)	13.9	15.2	8.1	23.6	15.1	13.8	12.3	12.6	15.1	14.7	14.4 Mbps
WWW Browsing Waiting Time (s)	5.3	4.0	5.8	4.6	5.3	5.1	5.8	6.5	7.8	8.4	5.9 s
Facebook Waiting Time (s)	6.7	3.7	8.8	1.4	2.7	2.8	3.0	3.5	3.6	4.6	4.1 s
Twitter Waiting Time (s)	3.3	2.8	3.2	2.7	2.9	2.9	4.9	3.2	3.5	3.5	3.3 s
Instagram Waiting Time (s)	9.9	8.0	10.2	7.5	8.2	8.0	13.5	8.5	9.0	7.7	9.1 s
YouTube Buffering Time (s)	5.3	4.7	5.5	5.7	6.3	6.2	6.6	5.3	5.9	6.3	5.8 s
Average App Response Time (s)	<b>6.1</b>	<b>4.6</b>	<b>6.7</b>	<b>4.4</b>	<b>5.1</b>	<b>5.0</b>	<b>6.8</b>	<b>5.4</b>	<b>6.0</b>	<b>6.1</b>	5.6 s

# Poor QoE defines Customer Satisfaction

...but average easily hides it

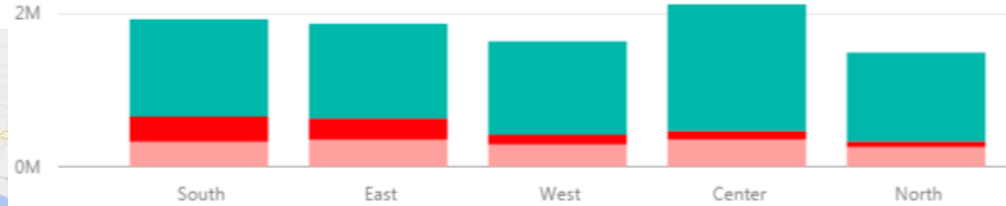
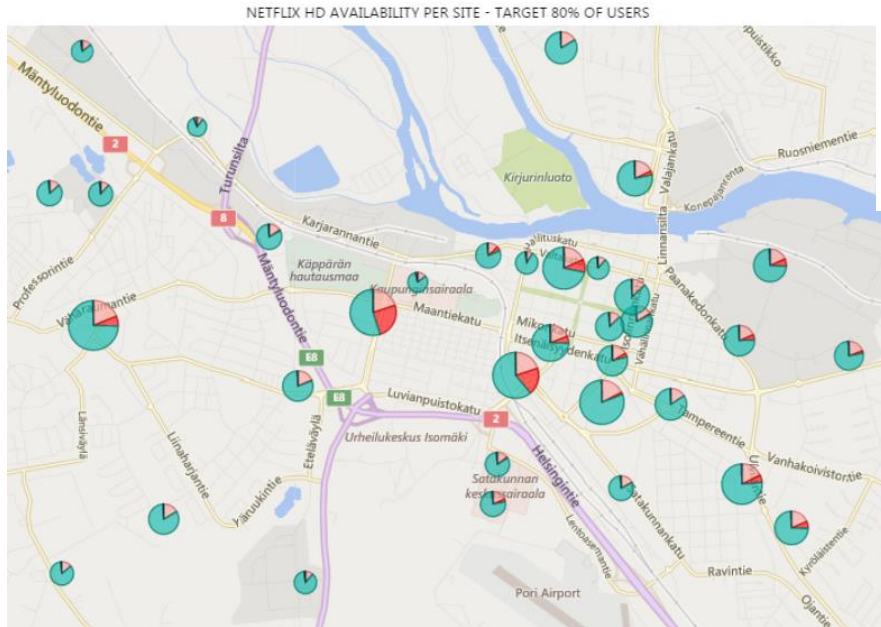


# Network view: Case Netflix

1. Set a target for QoS satisfaction ▶
2. Check where target is not met ▼



NETFLIX HD WORST CLUSTERS - TARGET 80% OF USERS PER CELL  
● 1: No NF HD ● 2: No NF HD exceeding cell target ● 3: NF HD available



3. Analyse root cause and improve

ROOT CAUSE ANALYSIS

● Average of Capacity impact o... ● Average of Radio plan impact...





# summary

1. Bitrate no longer the sole KPI for monitoring Mobile Data QoS. Both network performance and OTT QoS monitoring are needed
2. Omnitele *be-the-customer* approach measures OTT services in real life environment where the services are truly used
3. OTT delivery chain is not controlled by operator, results influenced by “out of network” factors
4. Operators should develop OTT view into their network performance statistics, in addition to traditional KPIs

thank you for your attention!

# Questions?

# We answer



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maximised customer experience  
minimised network cost