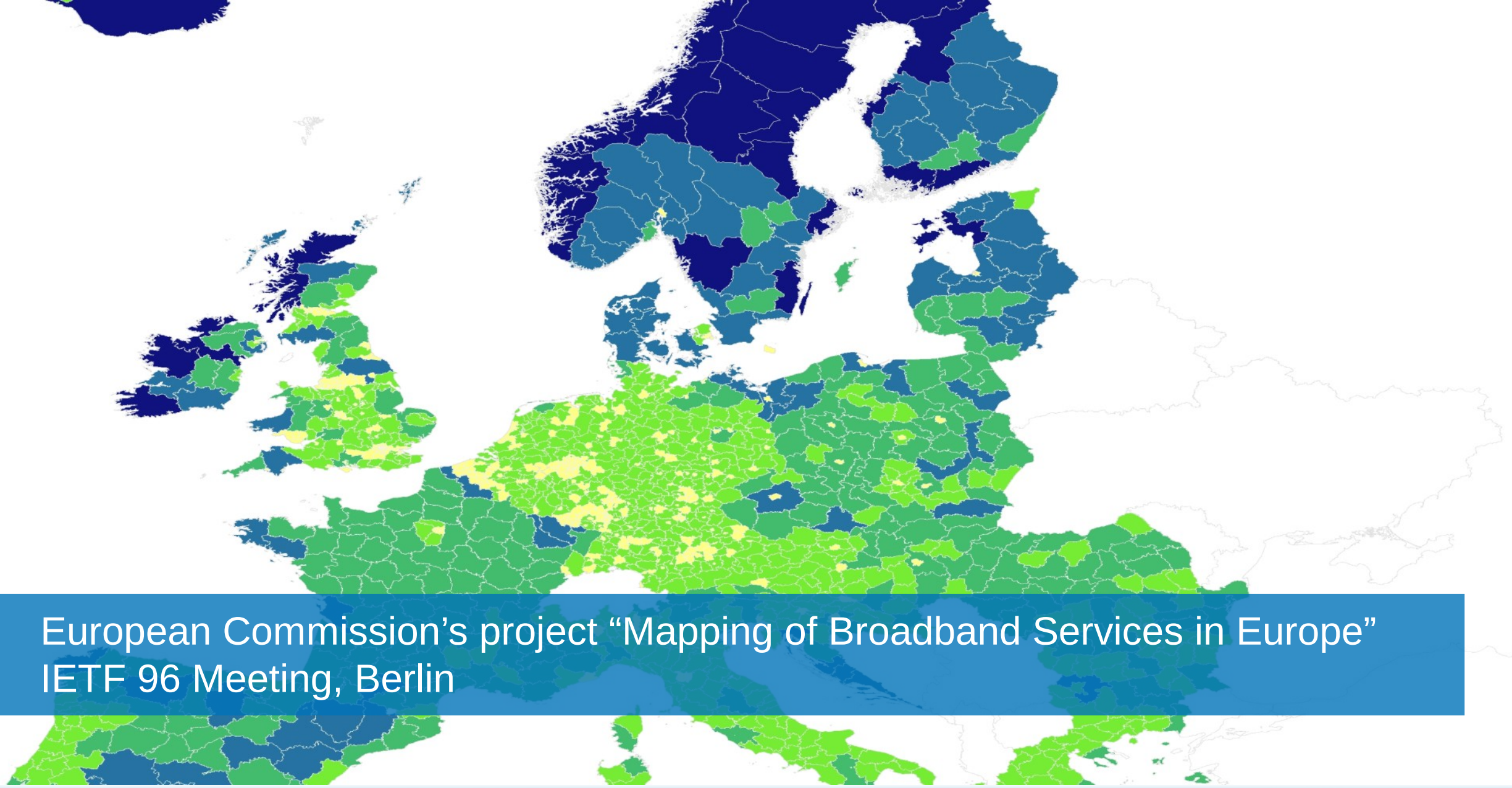


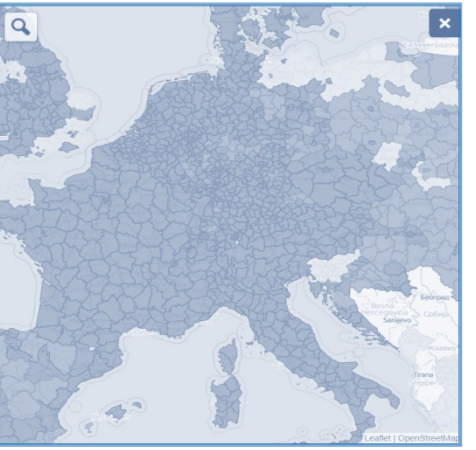
European Commission’s project “Mapping of Broadband Services in Europe”
IETF 96 Meeting, Berlin

TÜVRheinland®
Precisely Right.

What is TÜV Rheinland - Who am I?

Olga van Zijverden

- Project coordinator – “Mapping of Broadband Services in Europe”
- Project management - Stakeholder engagement - Coordination
- No technical background regarding internet measurements



TÜV Rheinland

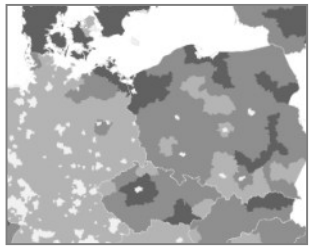
- Independent provider of technical services for testing, inspection, certification, consultation and training
- Expertise on broadband strategies
  - EU, national, regional QoS mapping systems
  - NGA network planning, cost analysis, public funding instruments
  - Roll out of NGA network deployment

What is the European Commission‘s project about?

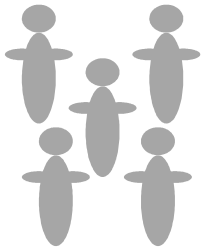
Development of **first European-wide** interactive mapping platform and database (EU and EEA)

Quality of Service (QoS) and Quality of Experience (QoE) data accessible in **one mapping application**

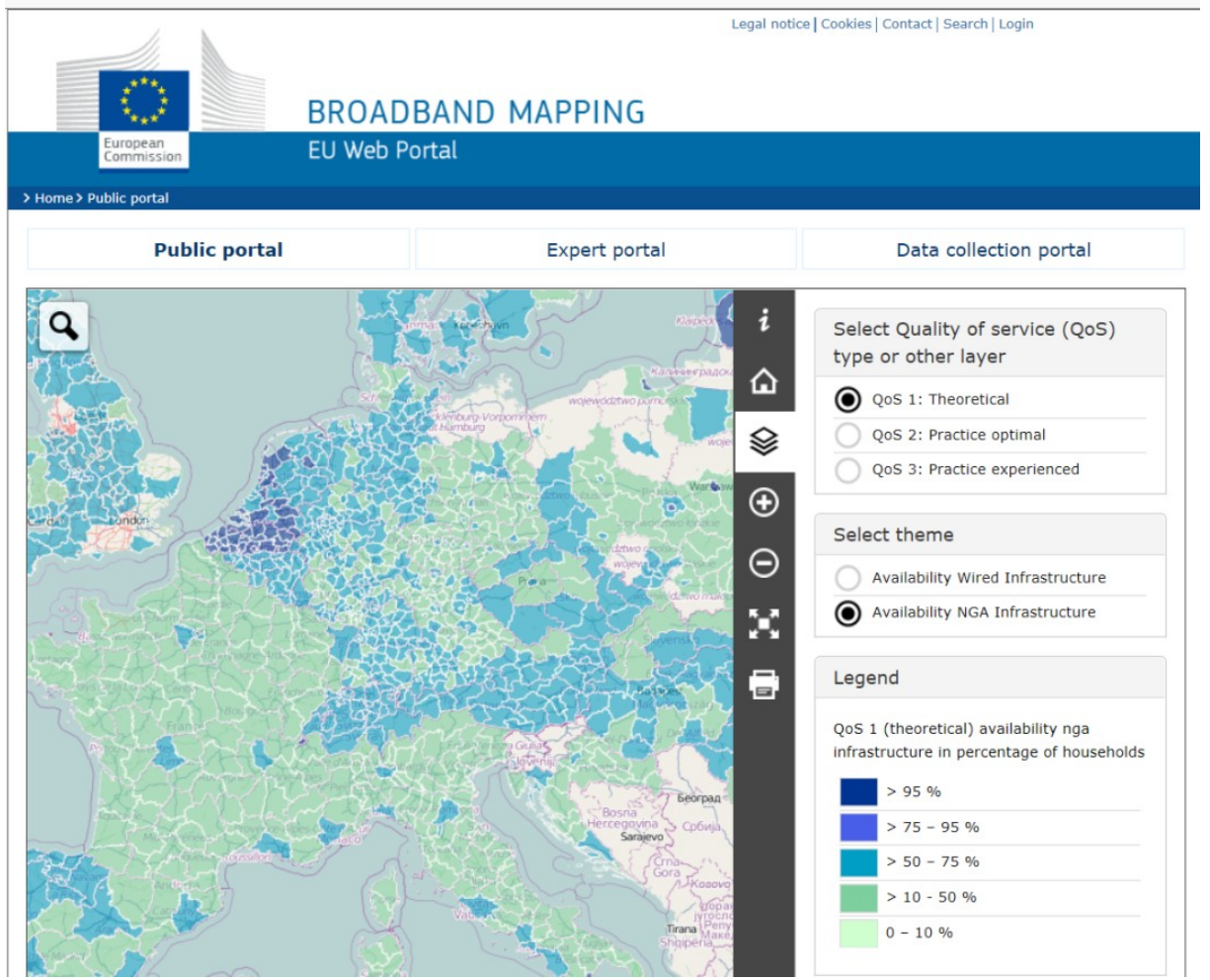
Data feeds from **existing public and private** mapping initiatives (~83)



130 data providers and experts involved so far



What can be the final product? (first proposal)



Public portal

- ✓ Visualized data at NUTS3-level (small regions)
- ✓ Data selection query is structured according to user's interest
- ✓ Link to socio-demographic data from Eurostat (EU statistical office)

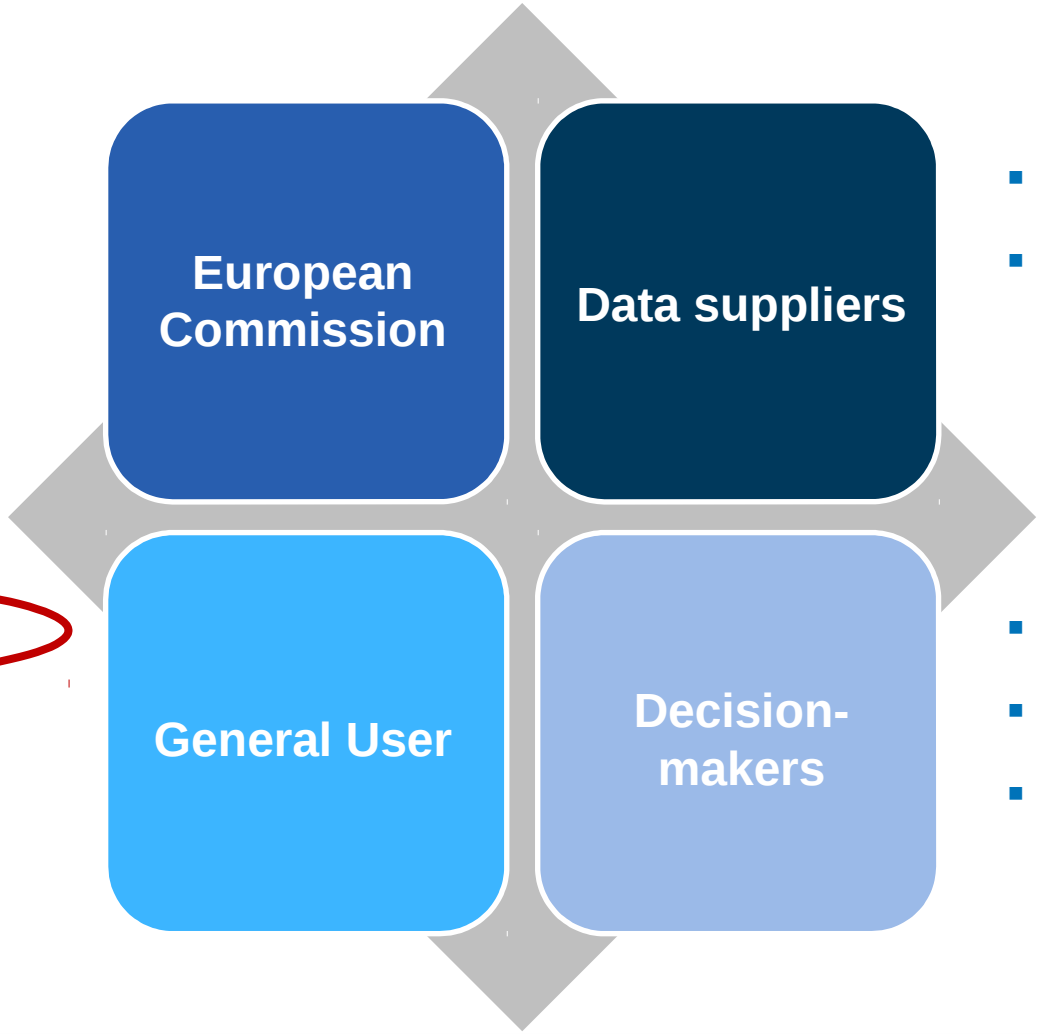
Expert portal (restricted group)

- ✓ Display different layers to benchmark data categories
- ✓ Higher granularity than NUTS3-level, complete data sets available
- ✓ More complex and detailed query structure
- ✓ Output of maps & reports, dynamic diagrams & tables with link to national GIS systems

User groups of the mapping platform

- DG CNECT
- DG COMP
- EUROSTAT
- Joint Research Center

- Academia and researchers
- ICT operators and investors
- Customers



- National mapping initiatives
- Private mapping initiatives

- National administrations
- EU institutions
- Politicians at all decision-taking levels

Cooperation between IETF and European Broadband Mapping project

IETF

Large scale measurement essential for accurate characterisation of internet performance

Goal:

- Have measurements using same metrics and mechanisms
- For a large number of points on the Internet
- Results collected and stored in the same form

How can "EU Project" help:

Database with European-wide data sets as „evidence base"

European Broadband Mapping project

Visualise and compare Quality of Service and Quality of Experience in one platform

Goal:

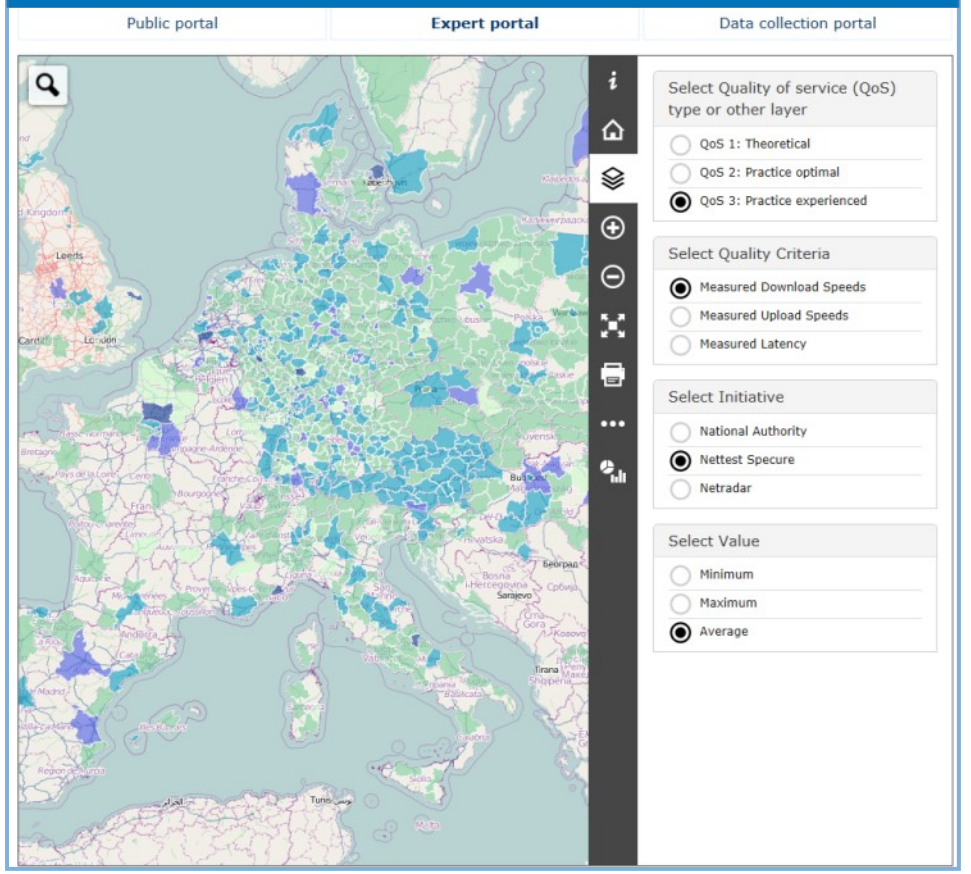
Overcome heterogeneity of measurements with standards

How can IETF help:

- Control Protocol (which metrics, when to measure)
- Report Protocol (When/how to report, Data model

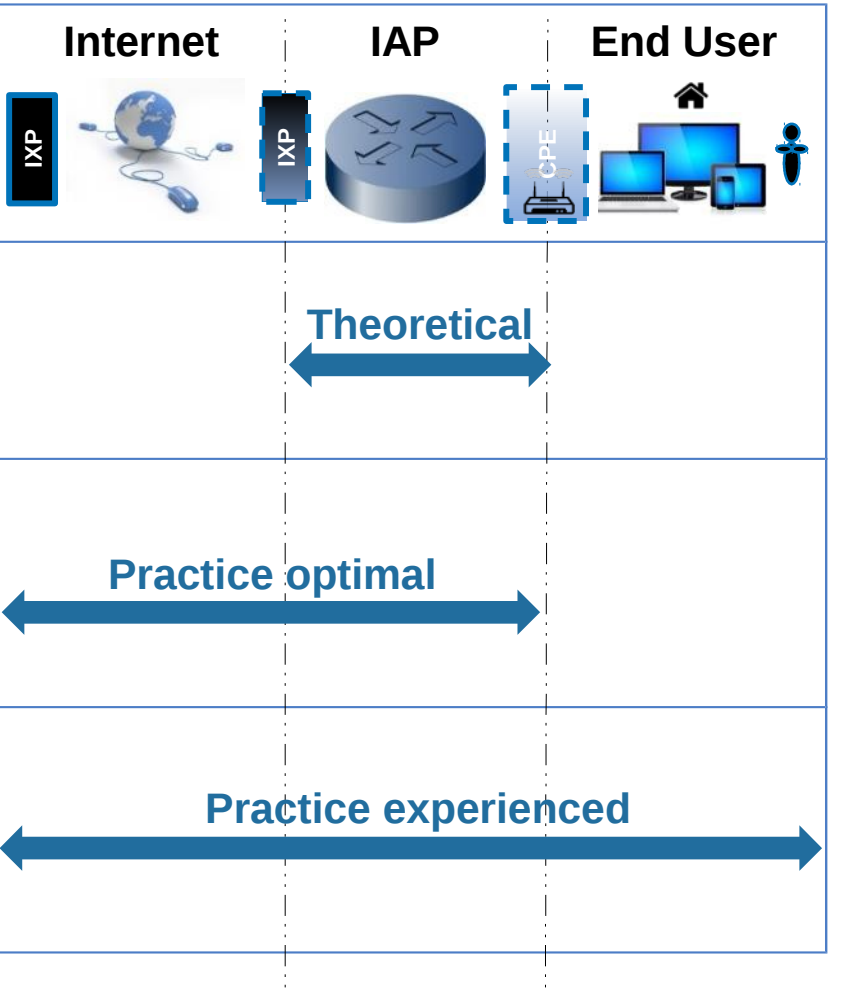
The data collection approach

Visualization on the platform



Data collected from whom?	Data suppliers – owner of quality of service mapping initiatives ▪ NRAs and Ministries ▪ Private application operators (crowdsourcing, academia, public transport services etc.)
How is data collected	▪ Various data formats (geo-data or tables / text) ▪ Flexible collection process with coaching from project owner
What data is collected?	▪ Three data categories on QoS/QoE ▪ Spatial resolution / geometry (from small regions NUTS-3 to grid cells and address points without IP addresses) ▪ Attributes and meta data

Our data categories for this project

	Project definitions are based on network infrastructure Three data categories	
QoS-1: Theoretical	**What:** Predicted network performance of existing infrastructure **How**: Assessment / calculation / marketed speeds by providers	
QoS-2: Practice optimal	**What:** Line qualification **How:** Measurement through panel probes or speed tests with filter to exclude end user‘s environment	
QoS-3: Practice experienced	**What:** Actual user’s experience when using Internet Access Service (IAS) **How:** Measurement via online speed tests including end user’s environment	

Data model – Thousands of value combinations can be collected

Initiative	NUTS / GRID ID	QoS Type	Technology Internet Access Provider	Additional indicator	Quality criteria	Time	Technology Customer End User	Operator	Result of combinations			
Name	ID	1	Group: All/Unknown	Availability Households	Infrastructure	All time / Unknown	All/ Unknown	All/Unknown	Min	Max	Median	X
		2	Group: Wired	Availability Inhabitants	Speed Down	Working Days	LAN	Operator (physical)				
		3	Group: Wireless	Availability Area	Speed Up	Weekends	WLAN	…				
			Group: Mobile	Availability Addresses	Latency	Day Peak	Mobile	Operator (physical)				
			Group: NGA	Availability Roads	Jitter	Day Non peak		Operator (virtual)				
			Single: DSL/ADSL	Take-up	Packet loss			…				
			Single: CATV	Measurement Only	Data Usage			Operator (virtual)				
			Single: FTTC/VDSL	Measurement Comparison								
			Single: FTTH/B									
			Single: UMTS/3G									
			Single: LTE/4G									
			Single: 2G									
			Single: WiMAX/WLAN									
			Single: Satellite									

→ No expectation to receive data for all attributes

→ Data model is adaptable over time

→ Data model is compromise between completeness and user-friendliness

Project‘s challenges

General / Technical challenges

- Measurement results are affected by various aspects
  - User: device quality, location, movement, chosen (or sold) data plan
  - Operator: network problems, network load, network configuration
- Significance of already one single metric can vary (e.g. short-term versus sustained throughput)

Project specific challenges:

- Countries are cautious about data representation
- Avoid comparing apples with oranges
- Define minimum standards
- Define comparison groups

What is the time line?

3 years to set up the platform:

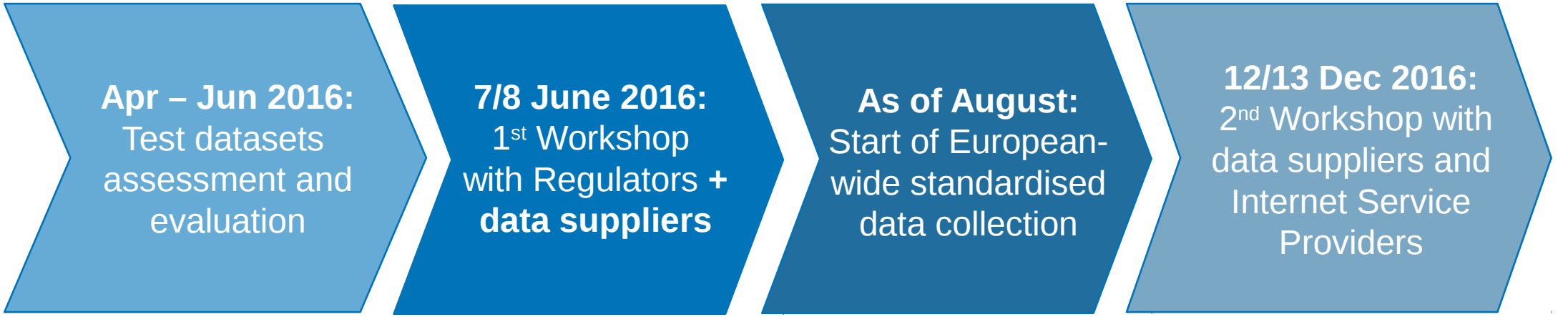
In 2016 development of data base and design of platform, consultation with data providers

By end of 2017: final and complete version of the platform is online

As of 2018: automated data collection process and data publication

Process of BEREC's net neutrality working group is reflected in the project

Work in 2016



Thank you
for your attention

Don’t hesitate to contact us for more information

Ms Olga van Zijverden – Project coordinator at TÜV Rheinland

Project website: https://www.broadbandmapping.eu/

Email: broadband-mapping@de.tuv.com