

# ACTA/VIAVI 5G & B5G/6G Network KPIs Measurement ecosystem – Applications and Challenges



[www.acta.com.gr](http://www.acta.com.gr)



[viavisolutions.com](http://viavisolutions.com)

TMV Webinar, 6G KPIs and how to measure them – Sept 28<sup>th</sup>, 2022



The Viavi MTS-5800 probe



The Virtual CPE/  
Software Probe  
hardware

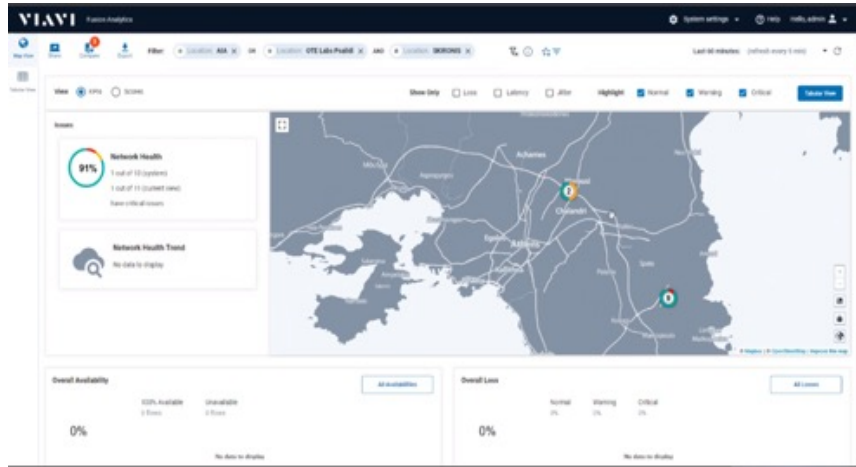


The Viavi SFP  
network probe

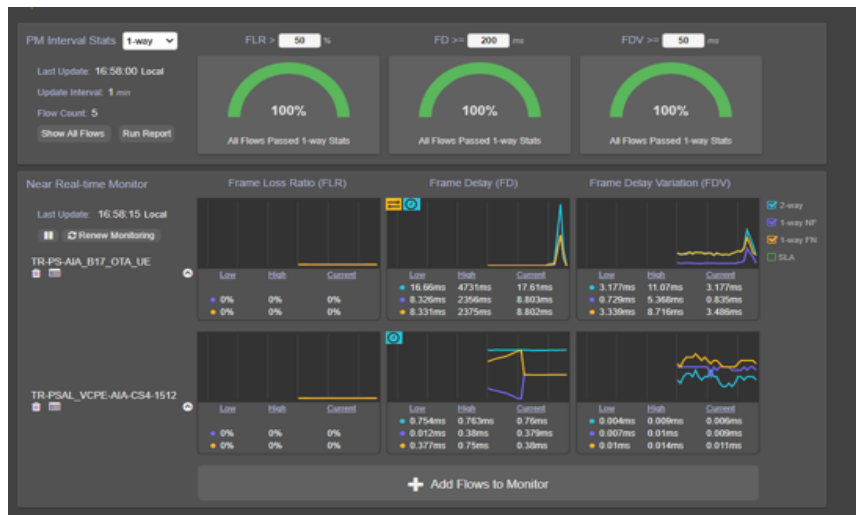
ACTA is member of two R&D EU projects (H2020 Horizon). The projects implement 5G network solutions for a variety of Verticals as customers.

- 5G HEART - <https://5gheart.org/>
- 5G TOURS - <https://5gtours.eu/>

Type	Probe type	Direction	KPI L2/L3	KPI L4
SAT - RFC2544 - Y.1564	MTS 5800	Bidirectional		Service Activation Testing
			Throughput	peak throughput
			Latency	Latency
			packet loss	packet loss
PM - TWAMP - RFC5357	SFP & Virtual	Bidirectional		Availability
			Latency	
			packet loss	
			Delay variation (jitter)	
WireSpeed - RFC6349 (TrueSpeed)	MTS 5800 & Virtual	Bidirectional		peak throughput (TCP)



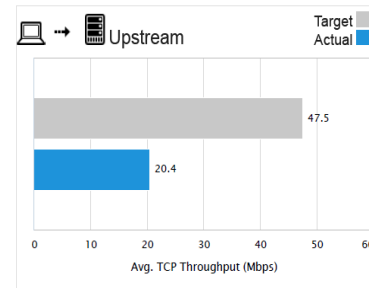
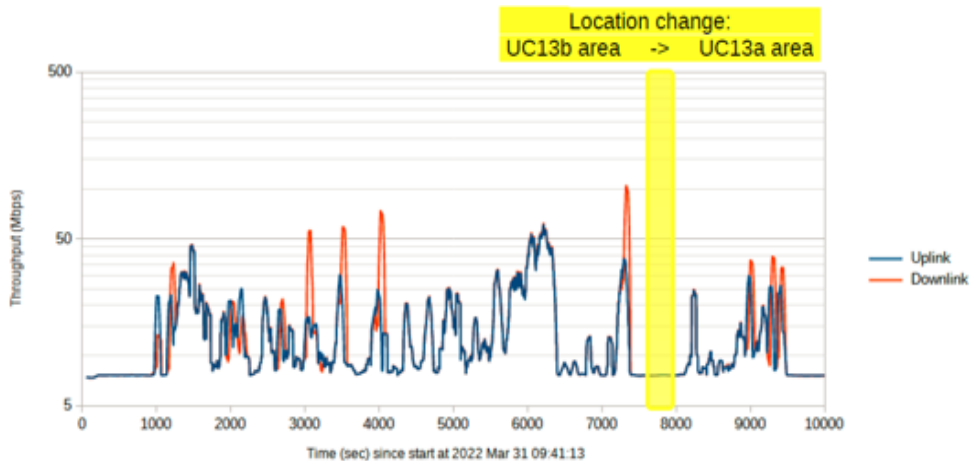
- **5G TOURS Touristic City** Greek pilot applications that are tested in Athens International Airport include:
  - Smart Parking Service Offering
  - Ground based “Follow-me Cars” Remote Monitoring and Guidance
  - AR/VR multimedia Services while on the move
  - Emergency Analytics and Decision Making e.g. Airport evacuation
- The collection of data in the KMVaP - KPI Measurement and Validation Platform, is an automated process running 24x7, with 1min monitoring granularity and 10 -100 ms sampling granularity.
- Typical KMVaP views are shown in the images, that allow the operator to monitor in real time the progression of the selected KPIs along the selected flows (network segments).



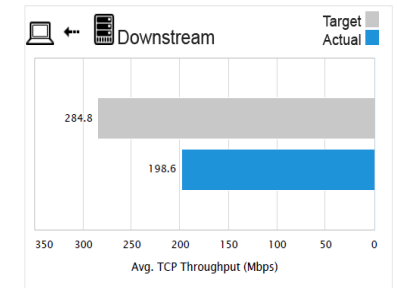
## Field Tests – Latency, Jitter, Packet Loss, Throughput



- Average latency, jitter and loss figures stay around 20 ms, 3 ms and 0,1%, while we can differentiate the transport and RAN contributions and their effect on KPIs.
- L4 peak throughput, measured through VIAVI speed tests, (Wireshield - RFC6349), average values of 200 Mbps downstream and 20 Mbps upstream reflect the particularities of the network (50 MHz bandwidth), while RTT was measured around 20 ms.
- Real time traffic measurements are also collected and displayed.

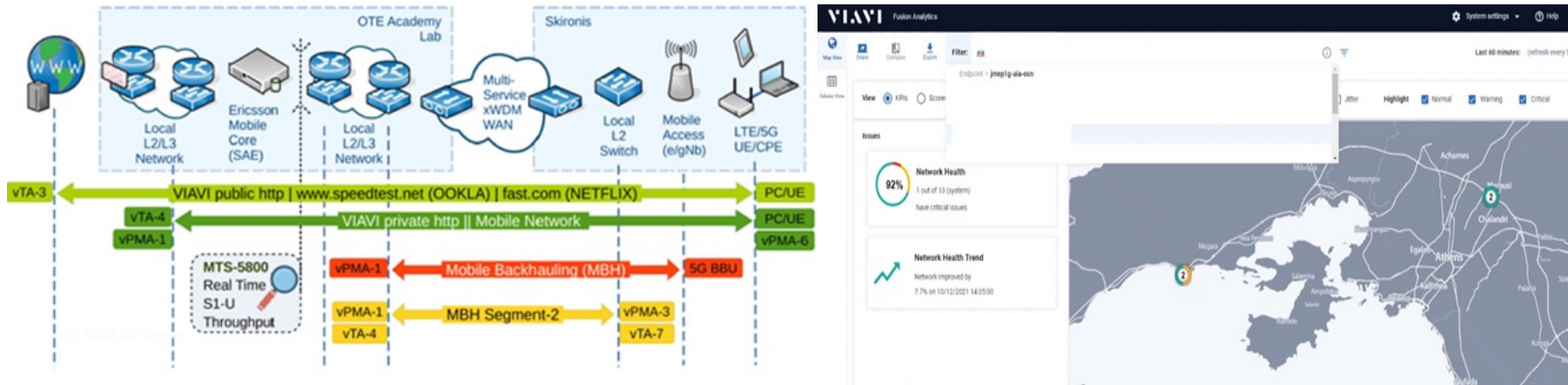


CIR: 50 Mbps  
 Target TCP Throughput: 47.5 Mbps  
 Average TCP Throughput: 20.4 Mbps

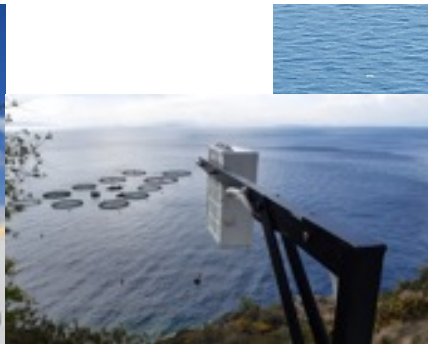


CIR: 300 Mbps  
 Target TCP Throughput: 284.8 Mbps  
 Average TCP Throughput: 198.6 Mbps

🕒 Round Trip Time: 17.00 ms (HTTPS: 35.90 ms)

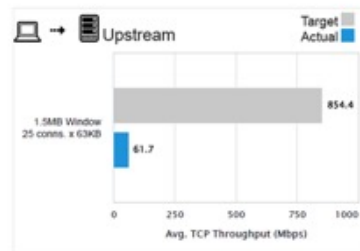


- The **5G-HEART Aquaculture** Greek pilot use case is in the Skironis fish-farming unit, on floating facilities of fifty thousand (50.000) m3 in the area of Megara Bay, near Athens.
- ACTA has installed network monitoring probes. Positioning of the probes in various parts of the network, allows for measuring the 5G network performance KPIs end-to-end as well as in segments of the network (Radio vs. Core, Physical vs. Service Layer, E2E vs. Segments of interest to the Operator).



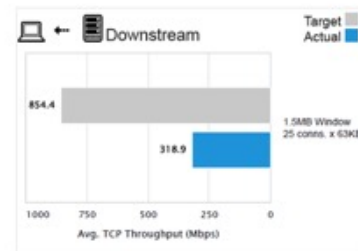
- The delay, jitter and loss parameters of the *e2e network* (TWAMP (RFC 5357) – L3 KPIs) have been measured as shown in the side figure:
  - ✓ 20 ms delay
  - ✓ 2,5 ms jitter
  - ✓ 0% Frame loss
- In terms of L4 TCP throughput capability of the *e2e network*, test traffic Service Activation Testing SAT (RFC 6349) has resulted to (figure below):
  - ✓ 320 Mbps downlink throughput
  - ✓ 61 Mbps uplink throughput

### Test Complete



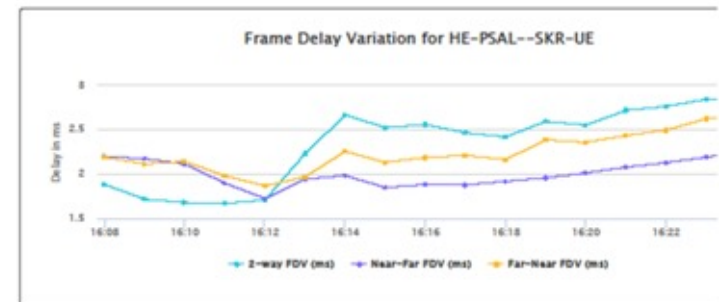
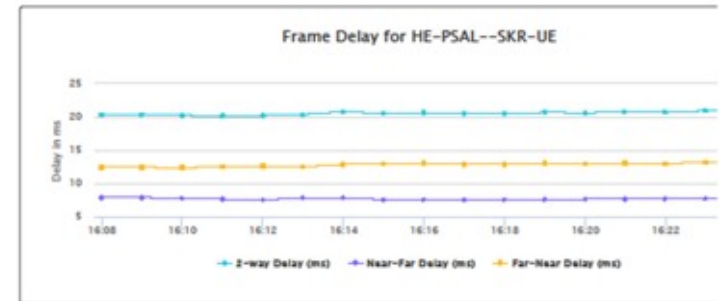
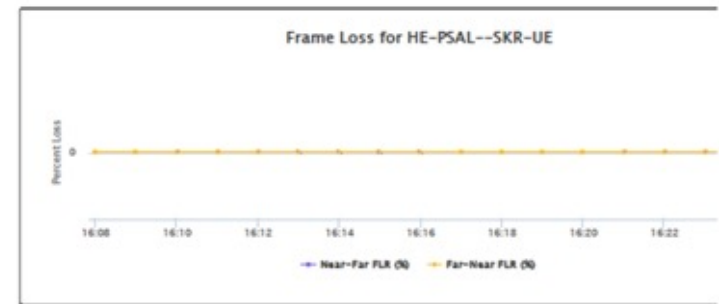
CIR: 900 Mbps  
 Target TCP Throughput: 854.4 Mbps  
 Average TCP Throughput: 61.7 Mbps  
 Peak TCP Throughput: 63.2 Mbps

TCP MSS: 1460 bytes  
 Round Trip Time: 14.86 ms



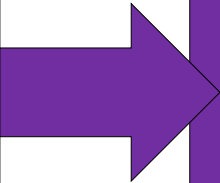
CIR: 900 Mbps  
 Target TCP Throughput: 854.4 Mbps  
 Average TCP Throughput: 318.9 Mbps  
 Peak TCP Throughput: 370.2 Mbps

### HE-PSAL--SKR-UE





The individual subscriber matters.  
Poor experience leads to bad publicity.



Need highly granular visibility of performance KPIs.

OWC THz

New spectrum – beyond mmWave

AI-native networks - distributed and data-driven. KPIs will be a key driver.

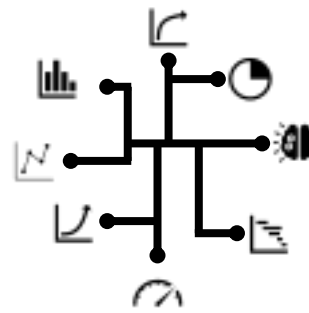
Novel use cases with tough QoS requirements

\$ €

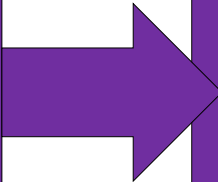
Strict SLAs and punitive penalty clauses

10<sup>6</sup>

Ever greater device density



Performance will depend on the ability of the analytics to respond to, and anticipate, the dynamics.



KPIs will need to be available with low latency where the analytics is performed.

OWC THz

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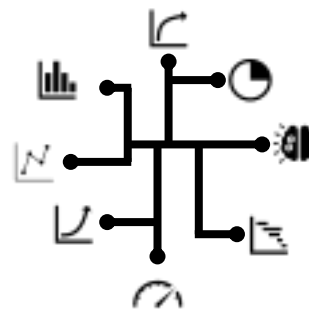
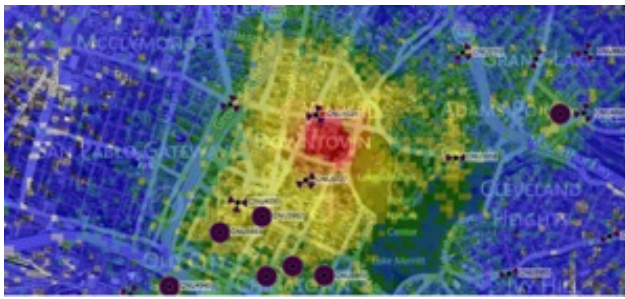
\$ €

Strict SLAs and punitive penalty clauses

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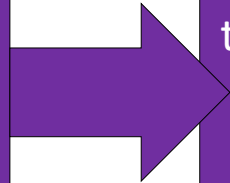
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Digital Twin

Need to know that the system can deliver before it's deployed. Components must be pre-trained before deployment in the field.



Realistic representations of the network need to exist in the lab with authentic KPIs to test and train the native AI.

OWC THz

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Ever greater device density

# Thank you

## Q & A

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