MECPerf

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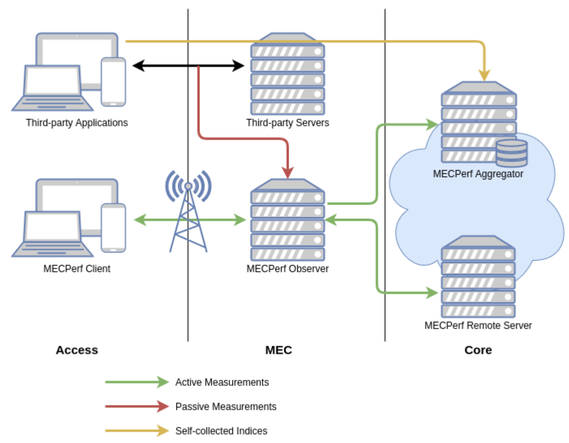
GOALS

Validate MECPerf in an operational environment (the NITOS testbed). MECPerf's aim is twofold:

1. Provide a tool to measure network- and application- level KPIs in a Mobile Edge Computing (MEC) environment.
2. Provide an open interface to make the measured KPIs available for everyone (e.g. for dynamic orchestration of resources, or for checking that the application's requirements are satisfied.

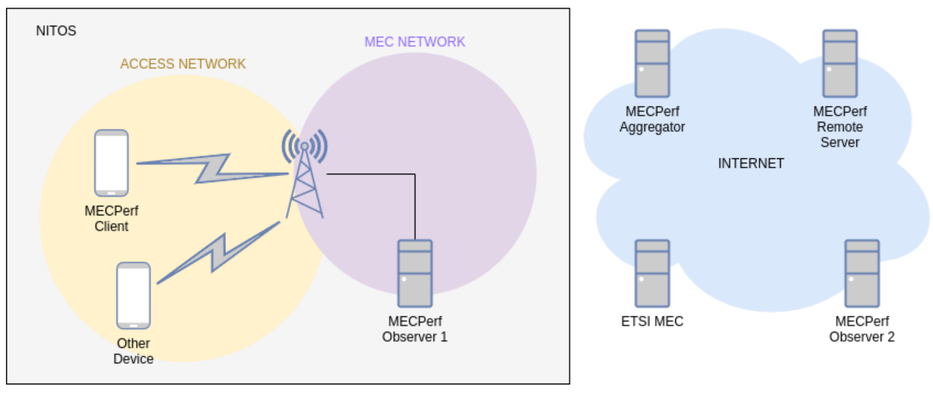
MECPERF ARCHITECTURE

Multiple components to measure the KPIs in the two segments of a MEC infrastructure (Access – MEC, and MEC – Core), in both uplink and downlink directions, with active and passive approach. Interface to collect self-measured KPIs.



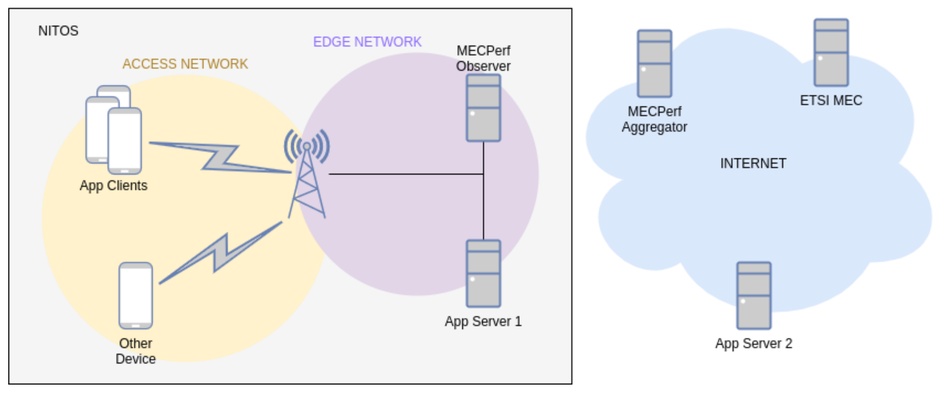
EXPERIMENT SETUP (ACTIVE)

Experiment aimed at measuring network-level KPIs such as bandwidth and latency (for both TCP and UDP) with increasing cross traffic. We measured the KPIs in the Access – MEC segment and compared them with the ones obtained in the MEC – Cloud, and Access – Cloud segments, to highlight possible allocation strategies basing on the measured KPIs.



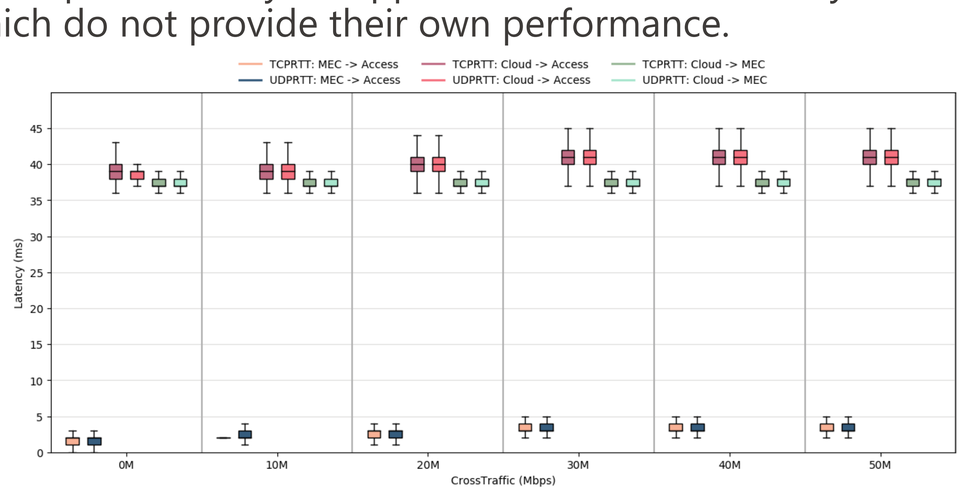
EXPERIMENT SETUP (PASSIVE/SELF)

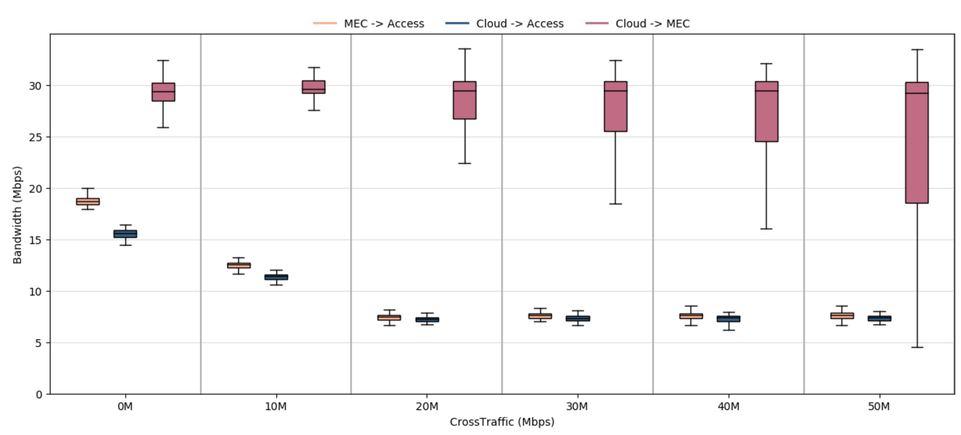
Experiment aimed at measuring application-level KPIs such as bandwidth and latency of a DASH-based video streaming application, with multiple clients and increasing cross traffic, and with app servers placed on MEC and on Cloud. The passive- and self- measured KPIs are then compared to highlight differences due to the measurement approach.



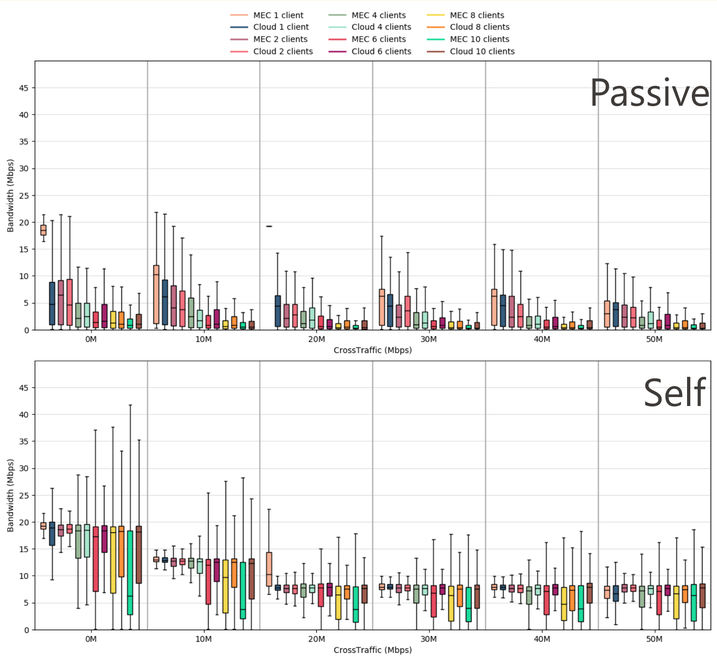
RESULTS

For applications running on MEC a decoupling of functions is desirable: i) latency-sensitive components are best allocated between the mobile device and the MEC server; ii) high-throughput components are best positioned on the MEC server in communication with a remote cloud infrastructure. Passive and Self measurements highlighted the importance of self-assessment of the performance, especially for applications with not continuous traffic patterns. In other scenarios, transparently computing KPIs from the analysis of the traffic produced by an application can be extremely useful, in order to obtain an assessment of the performance of those applications which do not provide their own performance.





RESULTS



CONCLUSIONS

The experimentation conducted on the NITOS facility of Fed4FIRE+ allowed us to reach our goal of validating and evaluating MECPerf in an operational environment. The overall validation has highlighted the soundness and robustness of MECPerf, which did not present any issues of scalability or performance. The active, passive, and self measurements experiments led us to validate our measurement tools and to ensure that these are working correctly in both a wired and wireless environment, with multiple wireless technologies. This data can be used to improve application's performance by better structuring their deployment or automatically configuring it according to the application's requirements and resources' utilization.