5G Infrastructure-associated network application for vertical industries performance evaluation - 5GinVivo

GOALS

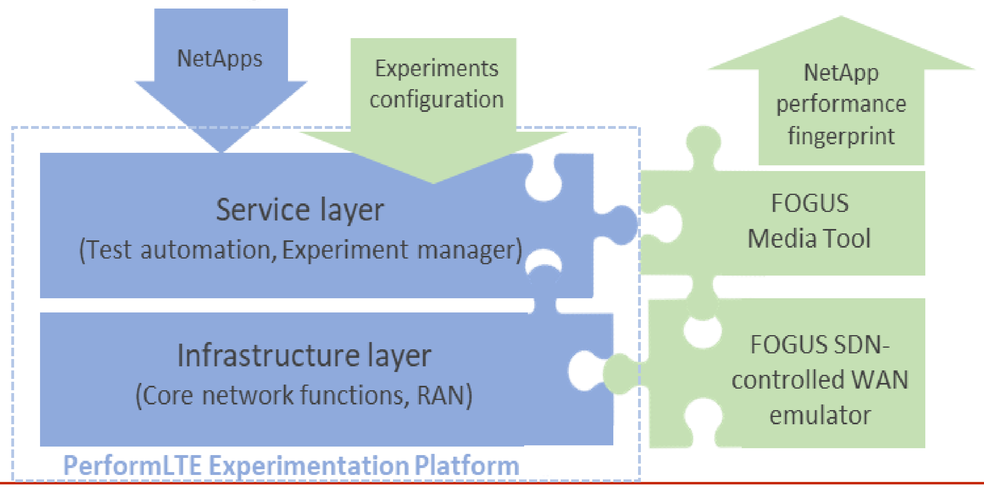
- Run end-to-end performance tests by exploiting features of the PerformLTE Platform related to automation, monitoring, and visualisation
- Devise a new performance metric and an add-on reporting interface for quantifying the performance fingerprint of a NetApp to its underlay 5G network
- Expand Platform's reporting and monitoring modules and add the FOGUS WAN Emulator

CHALLENGES

- Integration of FOGUS Media Tool with PerformLTE Platform Service Layer
- Precise configuration of PerformLTE to engage with FOGUS WAN Emulator
- Accurate performance of network tests and obtainment of the fingerprint from each NetApps

DEMO SETUP

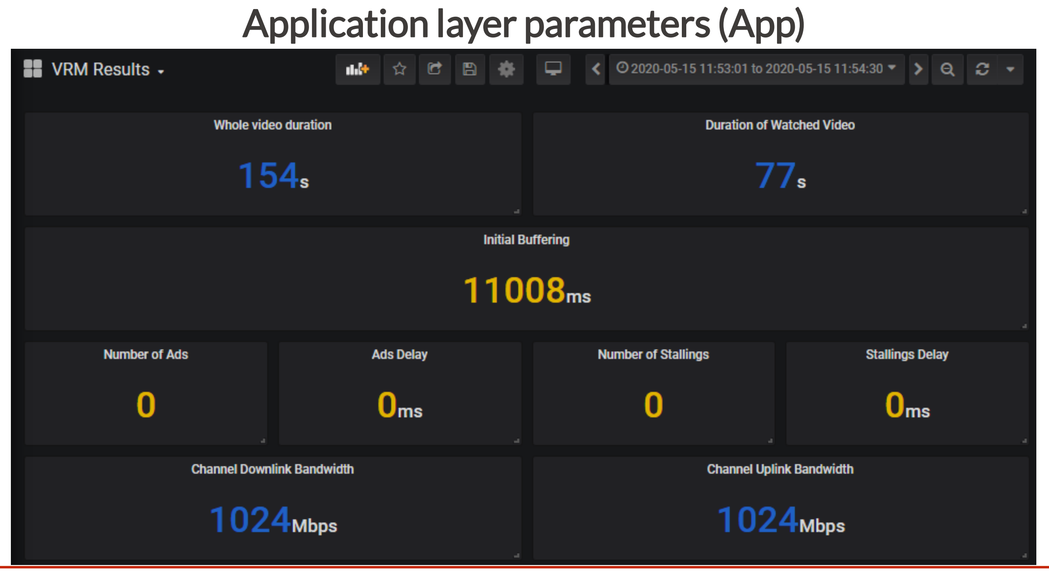
1. Familiarization and integration of NetApps with PerformLTE Platform
2. Integration of FOGUS Media Tool and FOGUS WAN Emulator in PerformLTE Platform
3. Configuration of the experimentation environment, Test Running and Results visualization with Grafana



RESULTS

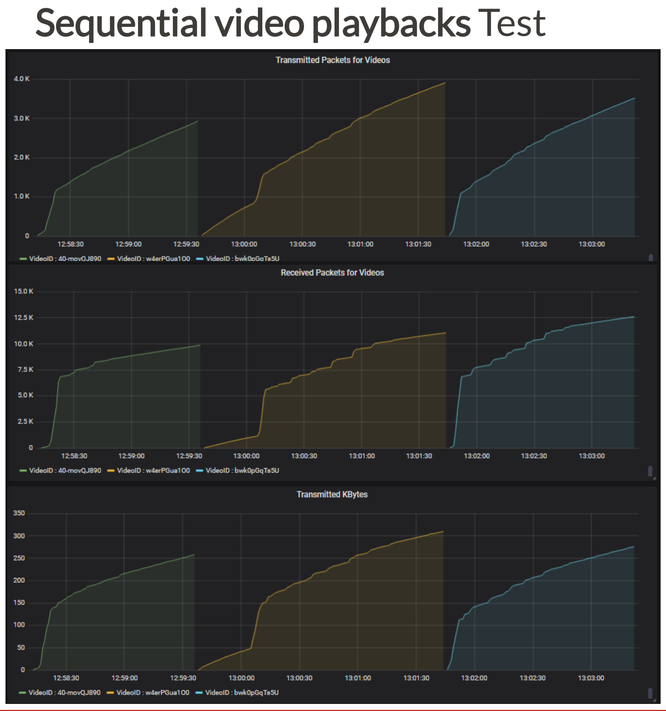
- Tests that executed were:
  - Single Device – Single RAT – Single Video
  - Single Device – Single RAT – Sequential Videos
  - Two Devices – Single RAT – Single Video
  - Two Devices – Two RATs – Single Video

Application layer parameters (App)

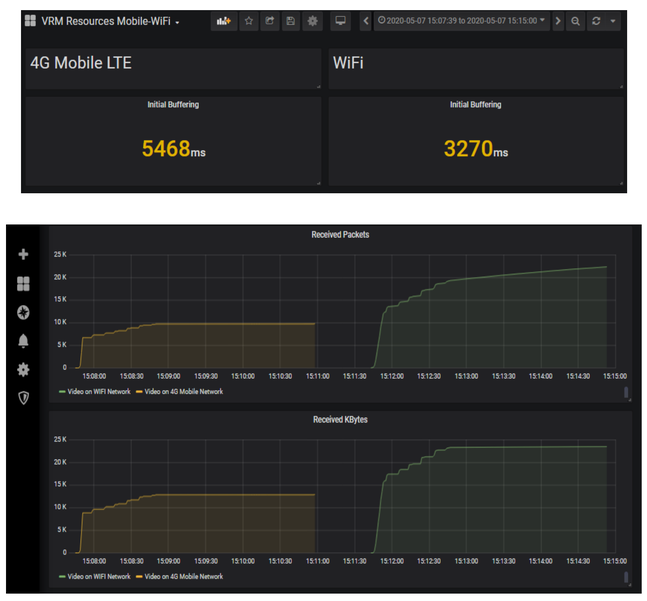


MORE RESULTS

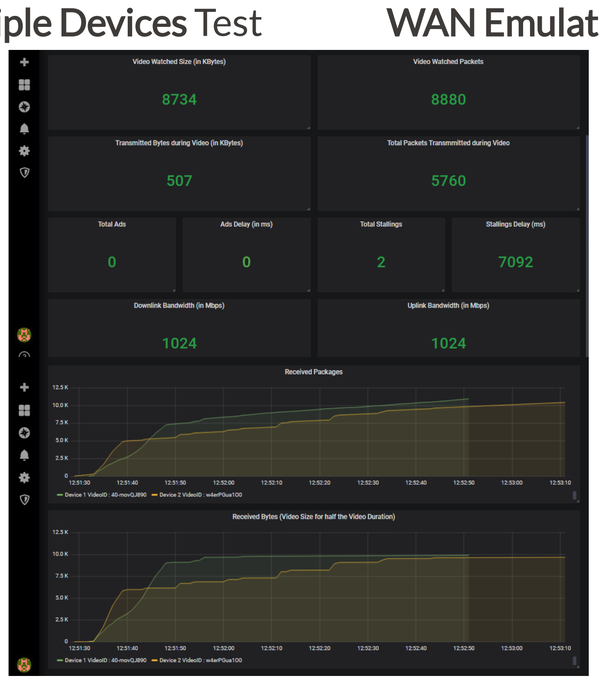
Sequential video playbacks Test



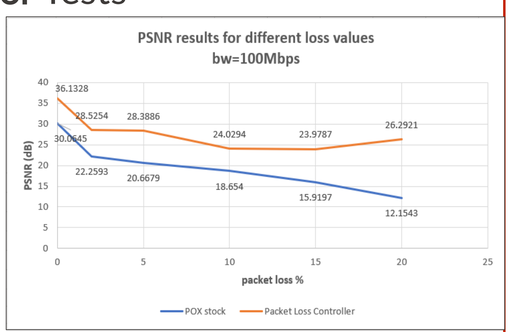
Different networks Test

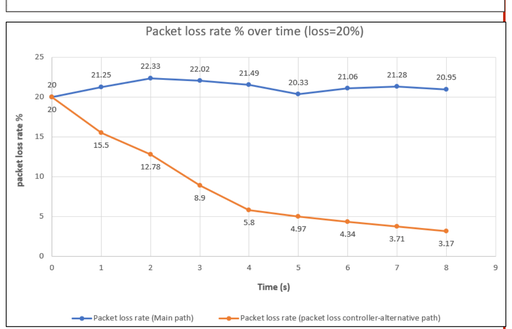


Multiple Devices Test



WAN Emulator Tests





CONCLUSIONS

- The experiment proved that end-to-end monitoring during video consumption enables two key aspects:
  - User-centric management (given that QoE can be estimated from the collected data)
  - Network bottlenecks/issues can be available to the service provider, allowing for related adjustments at the app layer
- The measurements collected define a valuable source for further research study on QoE provisioning
  - Initial study of the results imply that the initialization time when a video starts is less annoying for the user (QoE), compared to potential stallings during the video consumption
- The Tests conducted with FOGUS Tools with PerformLTE Platform gave us feedback to improve the development and the performance of our tools

POST MORTEM

- Assist in making the whole PerformLTE platform more robust to challenging application requirements and network scenarios
- Define methodologies and recommendations in order to automatically improve NetApp performance
- Conduct subjective tests with real end-users that will allow to quantitively map the NetApps' performance fingerprints to QoE
- Extract and quantify the business impact of our experiments