

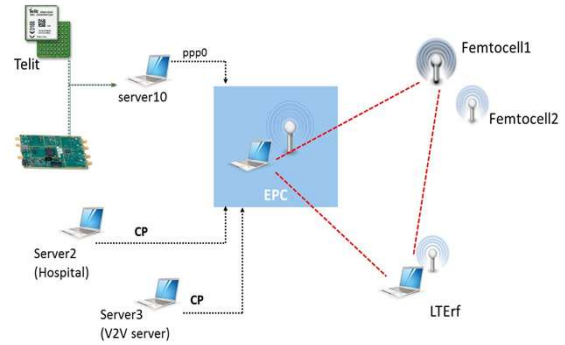
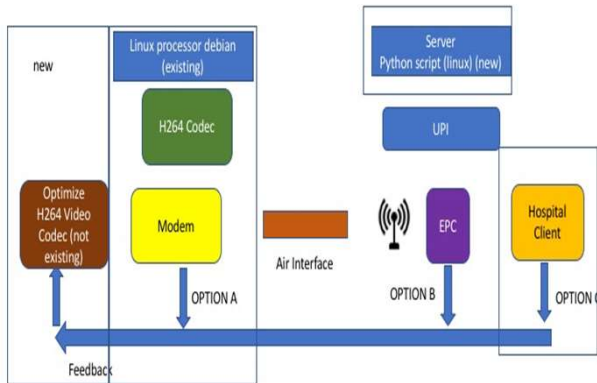
GOALS

The objective of the ADEPT experiment is integrating and validation of a video codec adaption system based on radio parameters describing the condition of the uplink air interface and other relevant parameters. The Bandwidth will be the reference to automatically be fine-tuned the code value as well as frame rate and frame size according to the variable radio network needs.

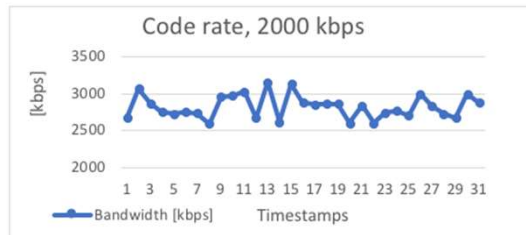
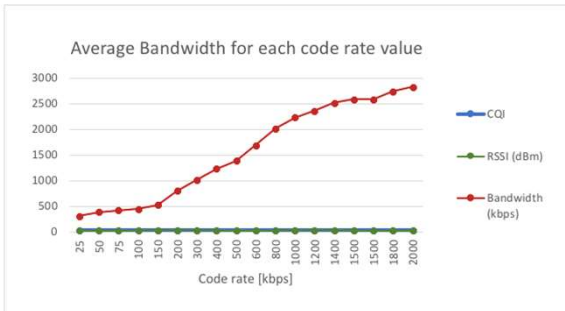
CHALLENGES

We designed the experiment around radio parameters but during the implementation of the experiment we were not satisfied with the results due to (i) lack of low level radio parameters available in production UE devices; (ii) the parameters that were available did not produce expected results. As a result we changed the tack of the experiment and introduced wireshark probes

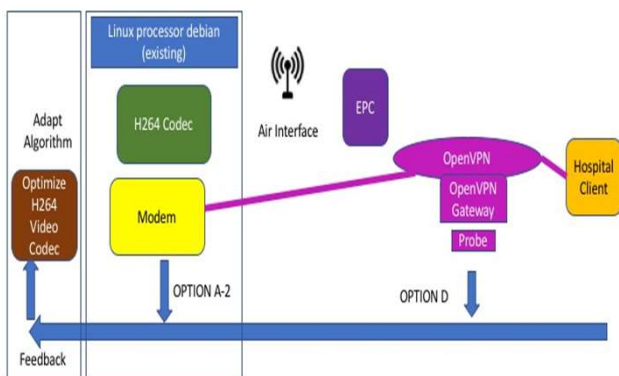
Architecture of Experiment



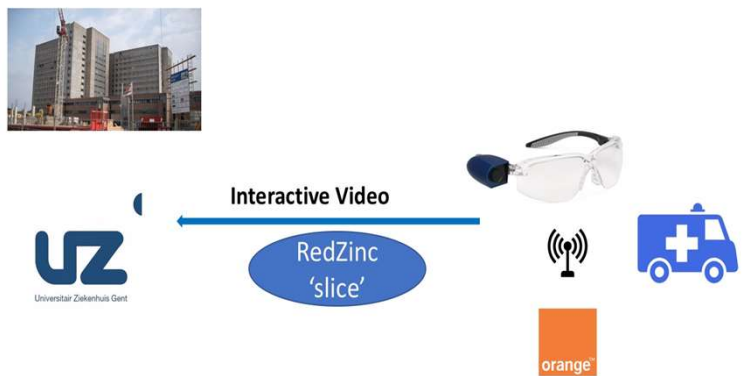
Inconclusive Results – Low Level Data Points Not Available



Alternative Architecture



Hospital Show Case



CONCLUSIONS

It is not possible to rely on 4G modem parameters to provide indication of instantaneous available uplink bandwidth. Bandwidth cannot be calculated by measurement of radio level parameters as these are not easily exposed. Even if the modem could offer estimate of uplink bandwidth, it has no knowledge of scheduling at the eNb. The situation may be changed for 5G with software radio devices – but these cannot be relied for production devices in 4G. The optimum solution is based on measurement of uplink bandwidth - in the 'slice' - as close to the packet gateway as possible and before any transcoding of other video processing functions. A standard Wireshark sniffer will suffice to measure the uplink bandwidth. Even if the codec is set higher than the uplink capacity then the sniffer will measure the throughput as received, accounting for packet loss in the radio segment. This will allow automatic feedback loop from edge of slice (at vpn gateway function) to modem