

PERformance EVALuation of Critical Communications

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Fed4FIRE+ Engineering Conference (FEC4) Brugge, 8-10th October 2018

Start-up from University of the Basque Country (UPV/EHU) Located in Bilbao, Basque Country, Spain

- Located in Bilbao, Basque Country, SpainFounded in January 2017
- 16 people involved (October 2018)
- Main areas

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- Next generation Mission Critical communications (3GPP MCPTT, MCVideo, MCData).
- Next generation emergency communications (NG112)
- Use of IoT for Public Safety
- Collaborations
 - Integration of systems
 - Pilots / PoC's / Demos
 - Research









What we do FED4FIRE Identity Management Server MCPTT AS MB? Group Management SID COTE INIS Server 27 Capable LTR **Emergency Control Centre (CCE)** Configuration Management Server Nemergent Key Д Management @Nemergent/ 00 MCPTT Server 0000 Enabler Other SIP based Group D sip:mcptt-client-E8organization.org Group C MCPTT System MCPTT IP Dispatcher PMR LMR Analogue WWW.FED4FIRE.EU

The need for Fed4FIRE+





testbed



Adaptation to PerformLTE (Fed4FIRE+) – Stage 1





Adaptation to PerformLTE (Fed4FIRE+) – Stage 2







From theory to reality – Stage 1&2



- Deployment of MCPTT AS VM → straightforward
- Deployment of Client App
 - Rights must be granted while installing.
 - By default, no rights granted. Suggestion of "adb install" command modification.
- Testing tool
 - 1st Stage: JFed
 - 2nd Stage: Triangle GUI
 - Quamotion to define user flow
 - Triangle tool to define TAP model (urban pedestrian, busy hours, ...)
 - 3rd Stage: Remote Desktop to Keysight-connected computer
 - Keysight Test Automation Platform (TAP)
 - Tailored user flow provided by UMA with 130 seconds gap
 - Vysor to connect to the smartphone (install App, run App, MCPTT call, play with token, ...)



Launching with RDP approach – Basic steps

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Free time-slot



Launching with RDP approach – Complete set







Successful MCPTT calls



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Gathered results/outcomes

- Channel characterization (RSSI, RSRP, CQI, ...)
- More fine-grained stats of CQI
- RTT stats
- Power consumption output
- RAM consumption output
- Pcap
- Logcat
 - Timestamped clicking pattern
 - Sip messages by sectors (UE, network and server)
 - INVITE
 - 200 OK
 - Floor control (request and granted/idle/taken)



Different network and channel conditions





- Pedestrian with good quality channel (-90dBm)
 - EPA5 fading
- Urban scenario in crowded area (-100dBm)
 - ETU300 fading
- Vehicular scenario away from the cell (-110dBm)
 - EVA70 fading

Different MCPTT server deployment – MEC vs. non-MEC





Impact on KPIs – Power consumption





Impact on KPIs – KPI1b (token request)







Impact on KPIs – KPI2 (end-to-end access time)





KPI2 - End-to-end access time

Impact on KPIs – KPI2 responsability





Business impact



- Position as technology provider to MC integrators demand:
 - The proper fulfillment of MC-grade KPI
 - The optimized power consumption to guarantee the operation of the UEs batteries for first responders
- Added value in delay and energy consumption →Gain position over competitors
- First phase of a polished integration of QoS/QoE monitoring and management in MCPTT AS product
- Knowledge of self-product and technology limitation
- New project opportunities main one being 5GENESIS







- PERCCEVAL → identify a series of technical constraints in the chosen platform.
- From a technical perspective, the experience of the project provides insights of the baseline performance of MCPTT solutions over commercial LTE deployments in terms of:
 - KPIs
 - Energy consumption
- Adaptation of the platform to allocate deployments with mixture of MEC-based and non-MEC services.



Post-mortem



- "Mission Critical as a Service (MCaaS)": Dynamic and flexible MCPTT VNF in different places of mobile network
- Development of an automated post-processing tool → semi-automated analyses of the MCPTT KPIs
- Recognize Fed4FIRE+ as a pan-European deployment ready to test and verify next generation emergency networks
- Evaluate the impact of "to-the-edge" migration mechanisms into MCPTT in terms of resiliency improvement and KPIs
- Analysis of the impact of optimization mechanisms into e2e KPI(s)
 - 5G-like MEC-based MCPTT service.
 - Evolution of UE+App-side to reduce e2e delay.
- Concepts to reality 5GENESIS Málaga platform UMA
 - MCPTT to MCS Nemergent and Airbus.
 - MEC by Telefónica, Orchestration by Atos, 5G-ready network by Athonet and RunEL, 5G-UE by Eurecom.
 - Málaga police end-user, first-responders.





THANK YOU



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Back-up slides





The company profile



- Start-up from University of the Basque Country (UPV/EHU)
 - Located in Bilbao, Basque Country, Spain.
 - Founded in January 2017.
- 16 people involved (October 2018)
- Main areas
 - Next generation Mission Critical communications (3GPP MCPTT, MCVideo, MCData).
 - Next generation emergency communications (NG112).
 - Use of IoT for Public Safety.
- Collaborations
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