

- Privately held company
- Headquarters in Milan, Italy
- Global company with subsidiaries in France, China, Sweden, Finland, US and local Partners worldwide
- R&D and Manufacturing in Milan
- 130+ collaborators – 90% graduate (≈+10% annual growth rate since 2004)
- 35 M€ group global turnover in 2015



HQ
Milan
Italy



France
Paris



China
Shanghai



Sweden
Stockholm



USA
Cary (NC)



Finland
Helsinki



PRISMA Telecom Testing is a global company, offering outstanding solutions and expertise in the *Mobile & Radio Technologies Testing*, supporting all the major Service Providers and Network Vendors worldwide

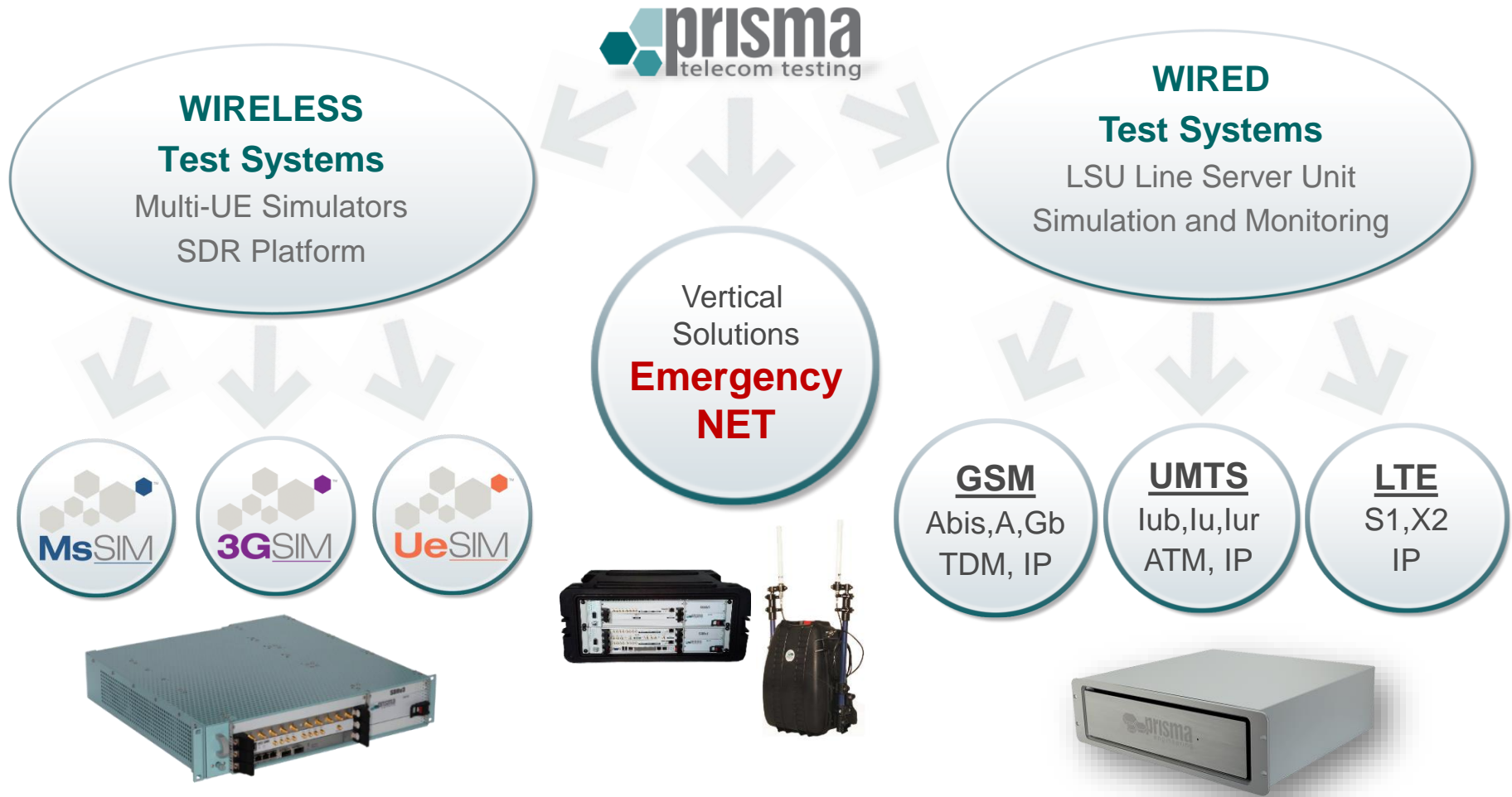
Solutions

- ◆ **Testing solutions** adopted globally in many test labs of the largest **Mobile Infrastructure Vendors** and **Service Providers** – more than 30% of 4G LTE networks are developed and tested using PRISMA technologies
- ◆ Simulation, test automation and monitoring solutions available for wireless radio and wired interfaces
- ◆ Dense-network testing, load tests, QoS analysis, latency verification, MOS score evaluation on large number of simultaneous calls
- ◆ Simple but Effective User Interface enable users to reduce testing time and complexity
- ◆ Alliances with major technological players to develop new systems based on upcoming standards (**5G, MTC, IoT, NB-IoT**)

Expertise

- ◆ Complex HW design, including RF, DSP, FPGA
- ◆ 4th iteration of a, multi technology SDR platform designed for high performances
- ◆ FW e BSP software
- ◆ Operating system for highly responsive/real time applications
- ◆ Layer 1/baseband development skill for GSM/WCDMA and LTE to implement a complex multi terminal UE for testing purposes
- ◆ Development of MAC, RLC, PDCP protocols with highest performance targets
- ◆ RRC & NAS protocols development for multi terminal simulation
- ◆ Customization of Wireshark for new telecom protocols

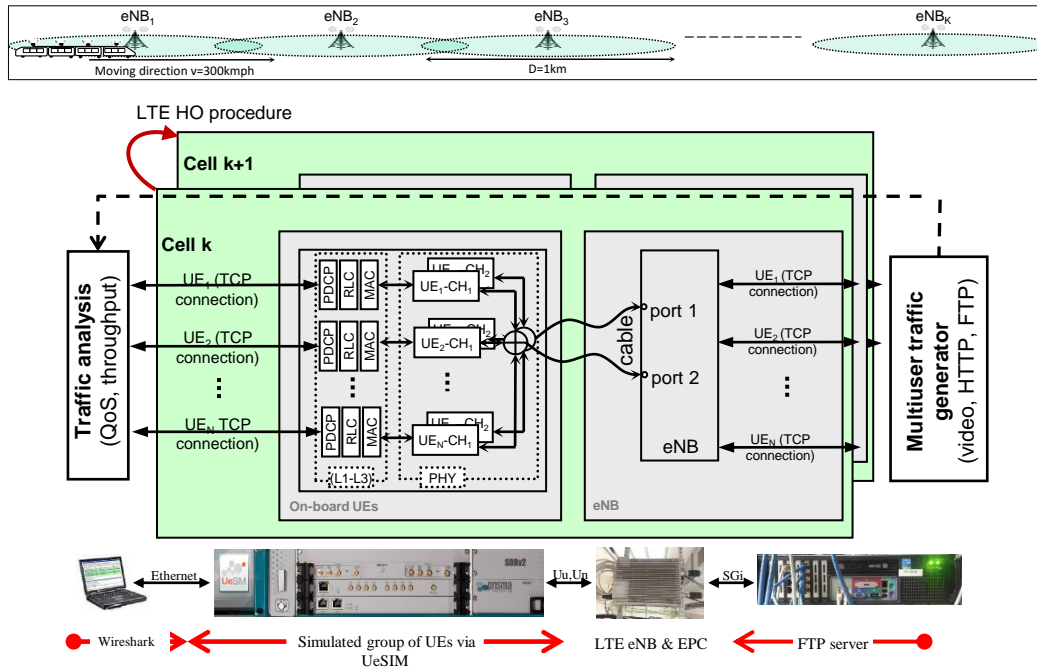
Prisma's Portfolio Overview



Load-Stress Test of Massive Handovers for LTE System in High Speed Trains

Ali Parichehreh, Umberto Spagnolini, Paolo Marini, Alberto Fontana, Paolo Timelli
A joint work between Prisma Telecom Testing and Politecnico di Milano, Milano, Italy.

Method

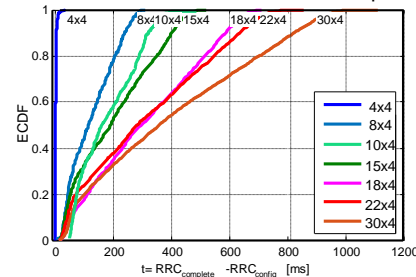


Objectives

- In-lab experiment to investigate the performance of eNBs with linear topology coincident with train-track network plan and massive on-board UEs.
- Characterizing the impairment effects of massive load on the end users QoS on a **commercial LTE Base Station** using real IP applications and voice
 - Handover induced latency
 - Throughput reduction
 - Optimization on the Base Station implementation

Results

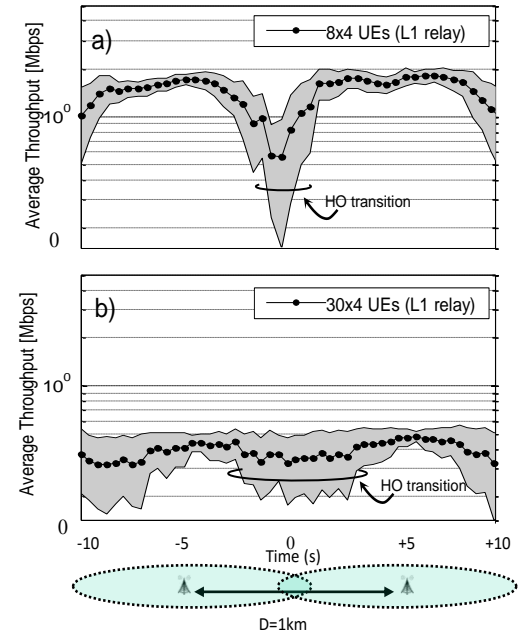
- Effect of massive users on the HO interruption time



Confidential – Version 1.6

Results

- Effect of massive users on the on-board throughput



Conclusions

- Results highlight that Exponential functions can be fitted to the HO-induced latency with scaling parameter depending on the number of on-board UEs.
- We observed that HO-induced latency increases up to 1s for 120 UEs at 300km/h, causing TCP disconnection and drastic throughput degradation with a cell-periodic behavior.
- Experimental results (without considering Doppler effect) provide a reference QoS measurement approach based on the UEs density and the specific Base Station manufacturer.