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Integrating direct communications in mobile networks

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Why direct communications (D2D) in mobile networks?

Proximity gains
(link level benefits)



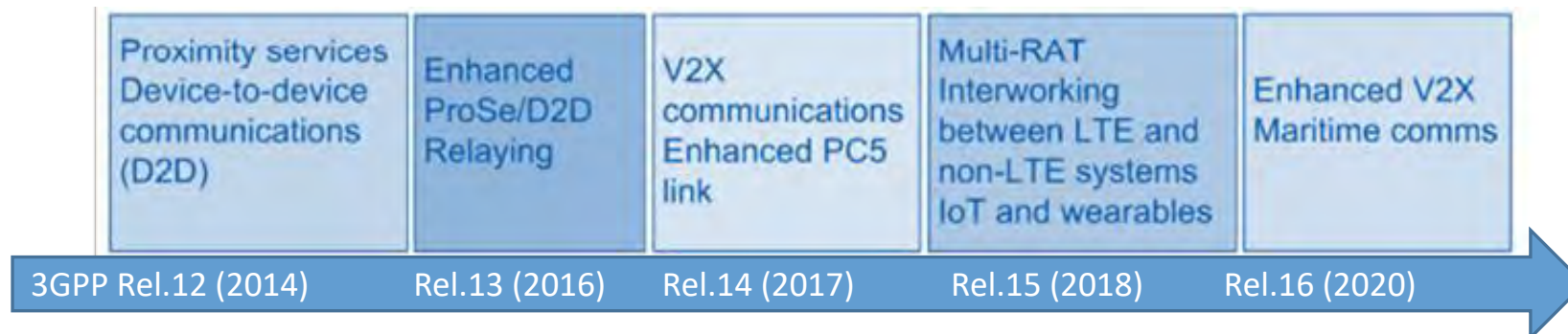
Support of critical
communications



Enable MTC and
IoT services



What has been standardized so far?



Dominant research challenges

Link level-originated

Device discovery

How can the devices identify that other devices are in their proximity and thus, be able to establish a direct communication?
What is the impact of this additional, yet necessary procedure to the devices and the network?

Mode selection

As the wireless environment / devices' locations / and service needs change, which mechanism guarantees that the devices can switch efficiently from a conventional cellular communication to a direct one, and vice versa?

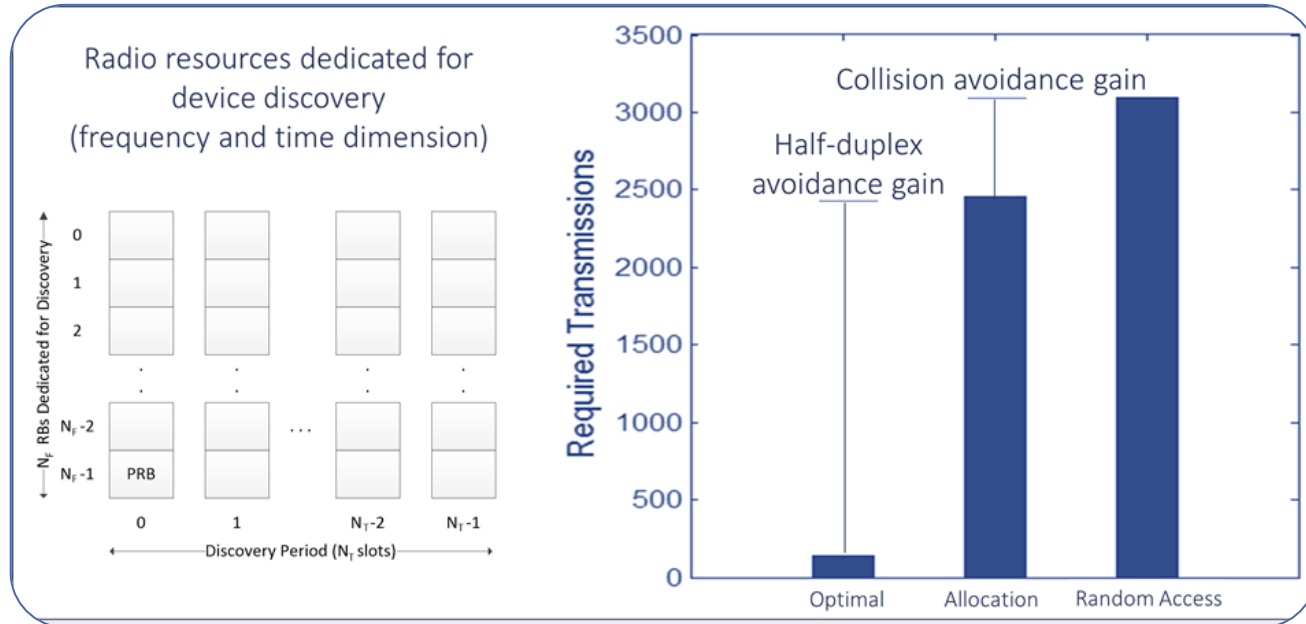
Service level-originated

Performance guarantees

How does the direct communication change the way end users perceive a service?
How could the users' perception behind the device be considered in the service provisioning or management process?

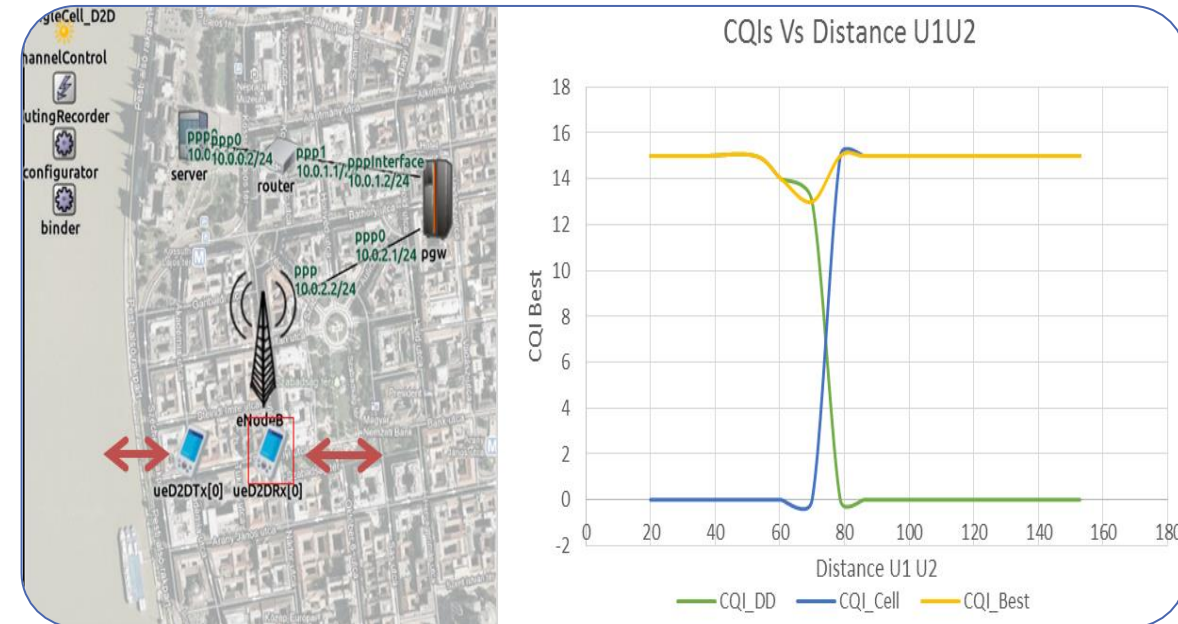
Selected results from our research

Comparison of resource utilization approaches for device discovery



- ✓ Results from research on random access in ad hoc networks provide useful insights towards handling the device discovery problem

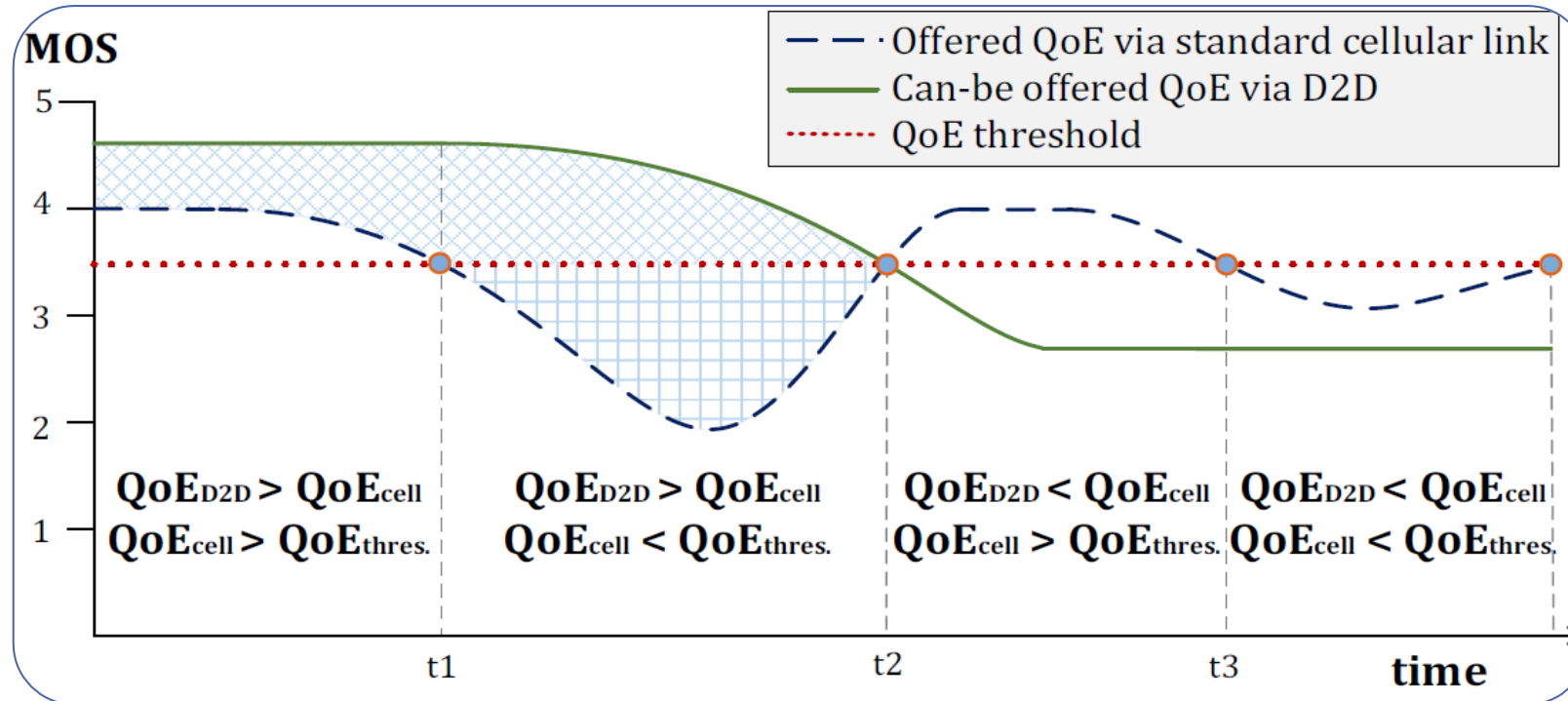
Framework in omnet++ for mode selection



- ✓ Improvements have been applied at the omnet++ D2D module so that various mode selection algorithms can be evaluated and compared

Selected results from our research

QoE metrics (Mean Opinion Score, MOS) as charging criterion in D2D communications



- ✓ The potential of involving user-centric criteria such as Quality of Experience (QoE) measurements for D2D service management has proven to be beneficial