

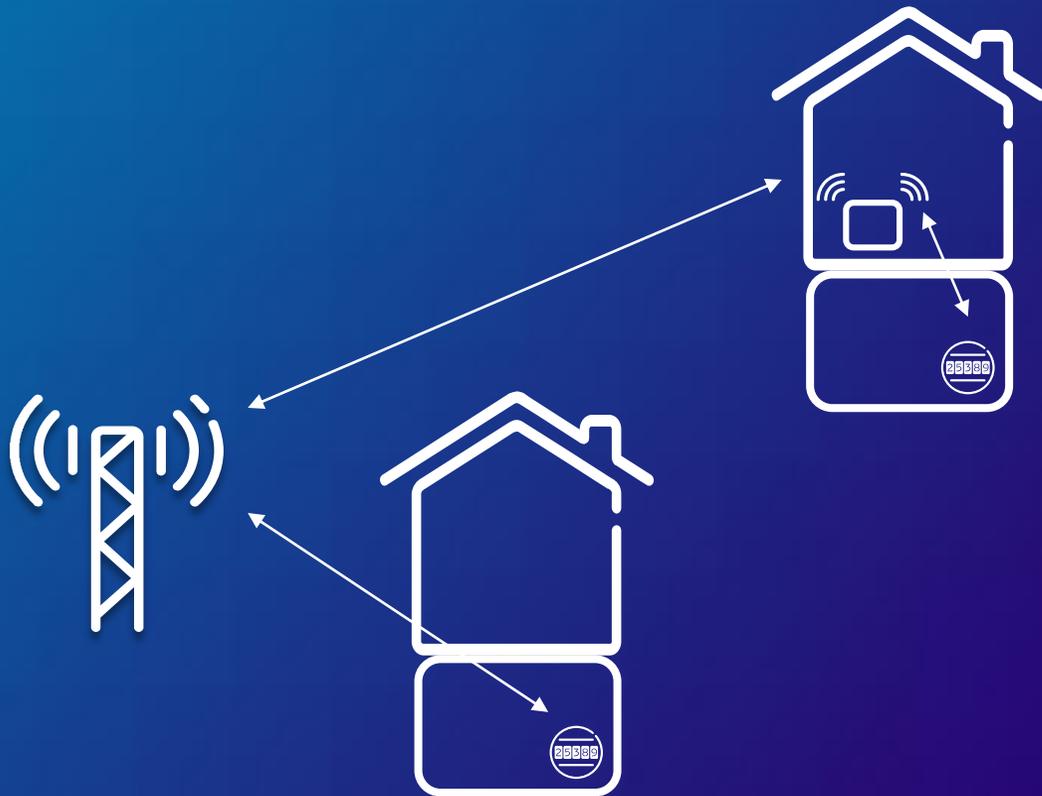
3GPP TSG RAN Meeting #78
Lisbon, Portugal, December 18 - 21, 2017
Agenda item: 10.1.2
Source: Ericsson

RP-172796



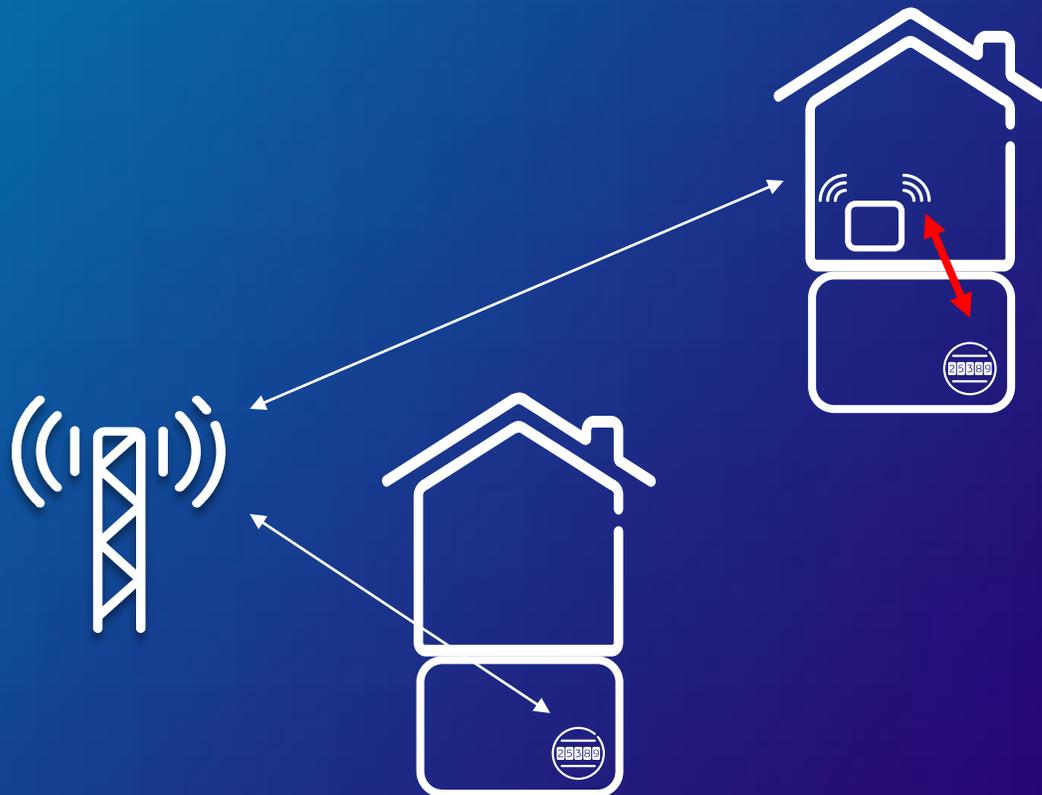
THOUGHTS ON IOT RELAYING

BACKGROUND



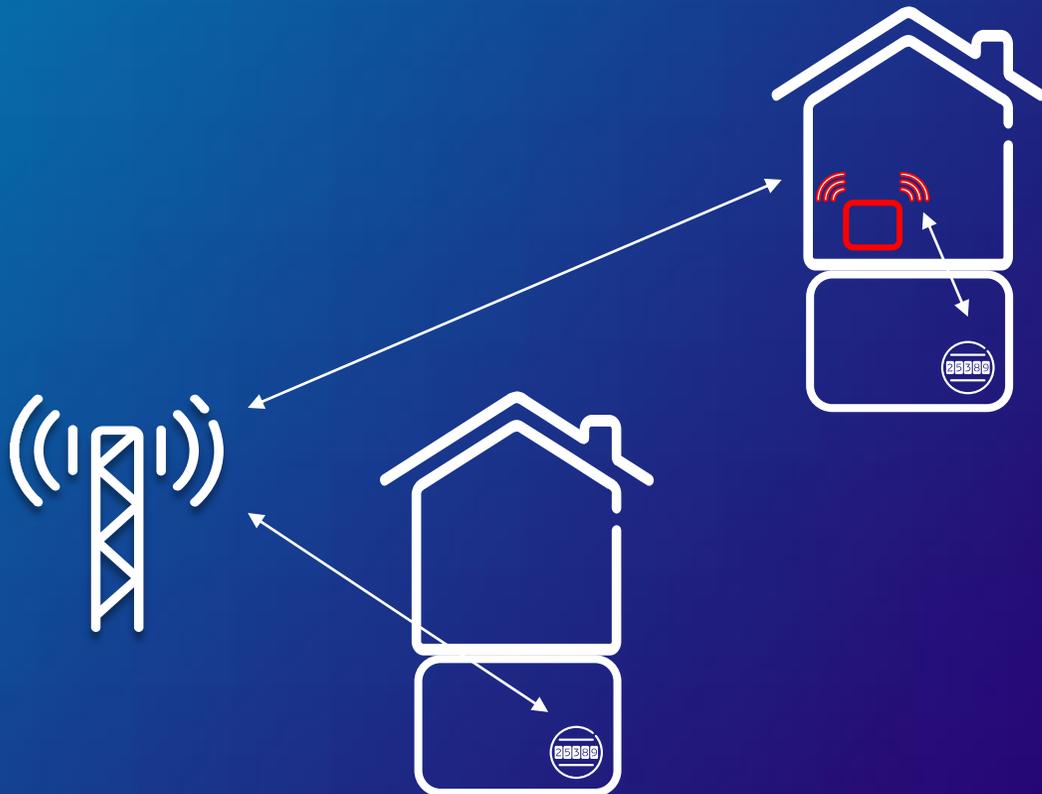
- › The original proposal on “wearables relaying” has, after the completion of the SI, transformed into a WI proposal on “IOT relaying”
 - An example use case of “wearables relaying” is a smart watch connecting to the network via a smart phone
 - An example use case of “IOT relaying” is a smart meter connecting to the network via a gateway/other smart meter
 - › Targeting NB-IOT/eMTC
- › This document discusses whether the solution for “wearables relaying” is also the most preferential for “IOT relaying”
 - The alternative could be a network-based relay node.

WHICH SPECTRUM TO USE FOR ACCESS LINK?



- › Licensed spectrum needs operator approval, independent of DL or UL
 - PC5 operating on UL only
 - NW-based relaying operating on DL & UL
- › Unlicensed spectrum does not need operator approval
 - NR-U, MFA, Bluetooth, WiFi, etc.
- › Inband relaying requires coordination and partitioning of resources
 - › TDM between donor and access link
 - › Separated PC5 resource pools (unused by Uu)
 - › MBMS subframes in case of NW-based relaying
- › Outband relaying does not requires coordination
 - › Donor (Uu) and access link (PC5, Uu) independent

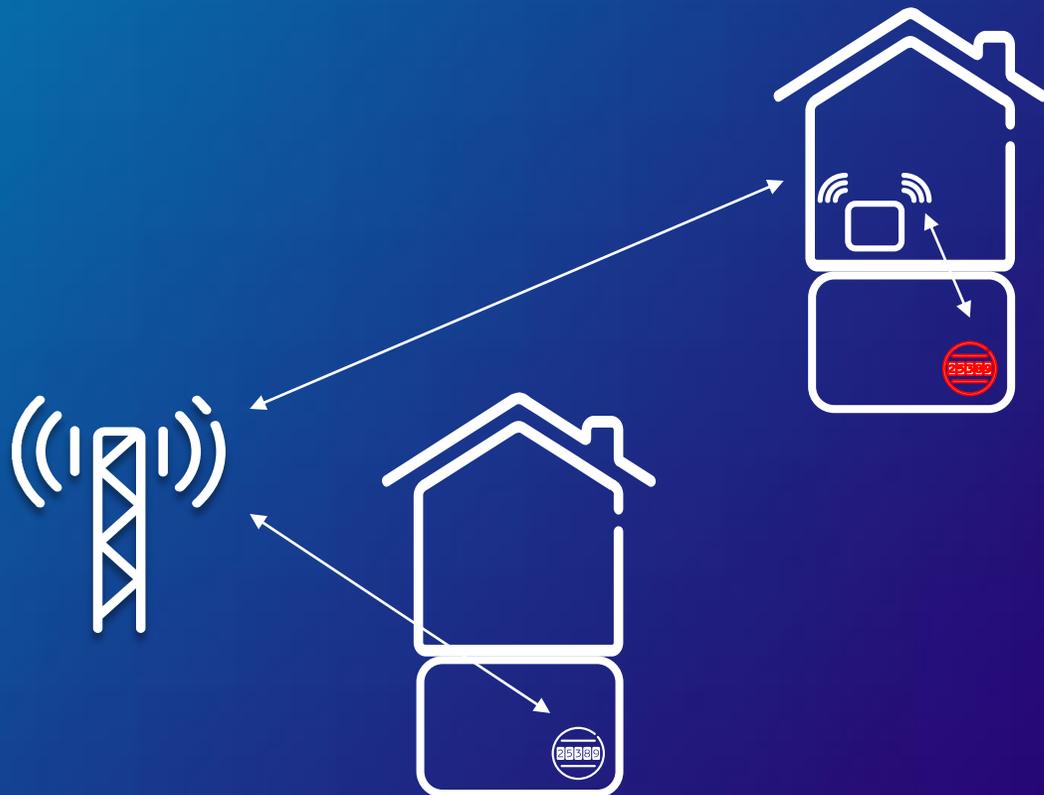
WHAT TYPE OF RELAY NODE?



- › Dedicated relay nodes
 - Requires extra deployment effort but ensures to be in “planned/good” spots
 - Keeps cost impact away from UEs
- › Non-dedicated relay
 - No extra deployment cost but unplanned/random location
 - UE complexity impact, see next slide
 - Need power supply
 - 3. party control, see below
- › Operator controlled relays
 - Benefit all operator customers
- › 3.party control
 - Primarily benefit 3. party devices



UE IMPACT



- › Sidelink based relaying negatively impacts UE complexity
 - All smart meters required to implement sidelink (in addition to Uu)
 - › LTE-PC5 based on LTE/eMTC UL but NOT on NB-IOT UL
 - New sidelink design needed!
 - Legacy UEs do not benefit
- › For non-dedicated relays, in addition
 - Relaying functionality and processing capacity for other subordinates required in all smart meters
- › Unidirectional relaying
 - Can limit UE complexity impact
 - But limited coverage extension to UL only

3GPP SIDELINK TRACK RECORD



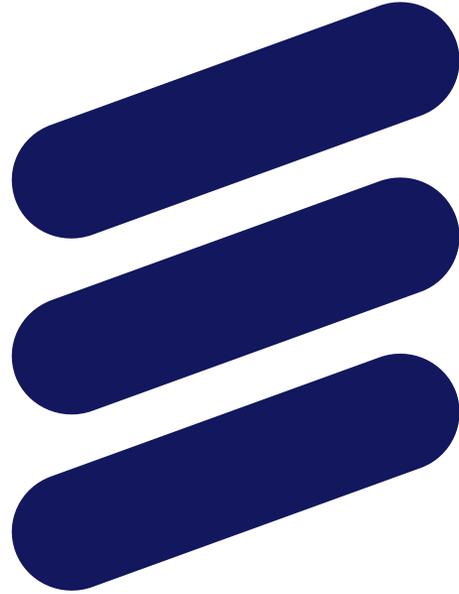
- › Rel-12/13
 - PS sidelink → struggling
 - Commercial D2D → failed
- › Rel-14
 - LTE-based V2V → struggling/under discussion
- › Rel-15
 - Wearables D2D → lost interest
- › Rel-16
 - NB-based sidelink for V2V
 - eMTC/ NB-IOT sidelink?

NETWORK BASED RELAYING



› Needed enhancements

- Enhance relay architecture with CIOT enhancements (RAN2/RAN3)
 - › UP based: Suspend/resume (optional)
 - › CP based: DoNAS
- For inband relaying only
 - › R-PDCCH like control for eMTC (RAN1)
- Very low Tx power BS class for eMTC/NB-IOT (RAN4)?



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