# *Fixed–mobile Convergence: Structural convergence*

# *Optimal baseband unit placement*


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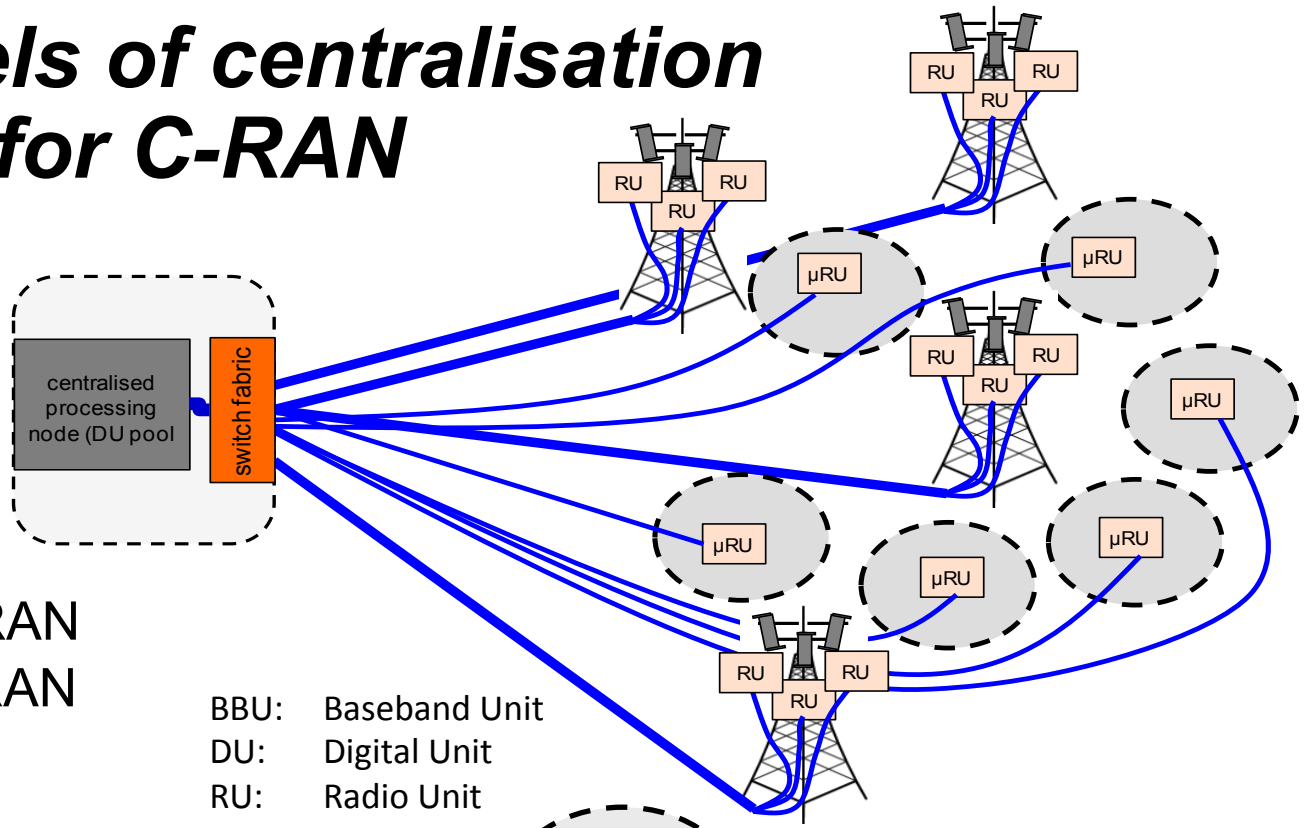
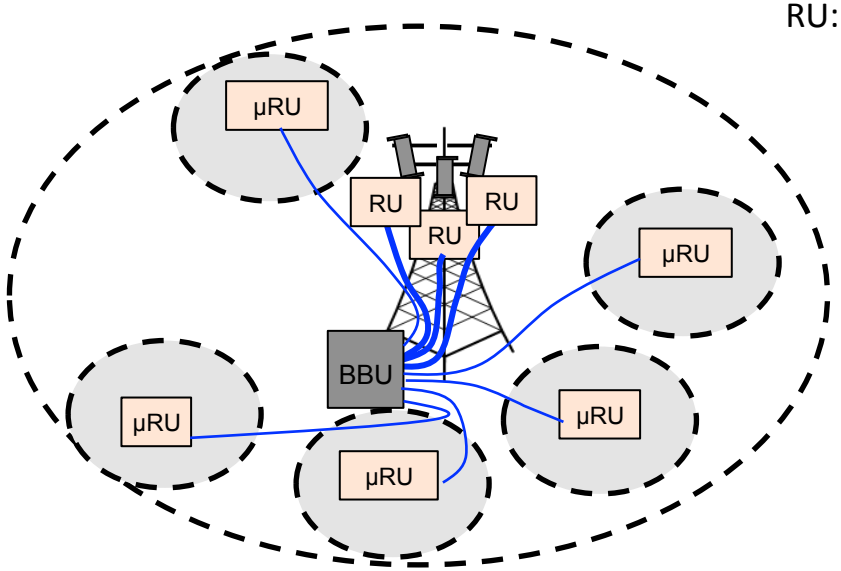
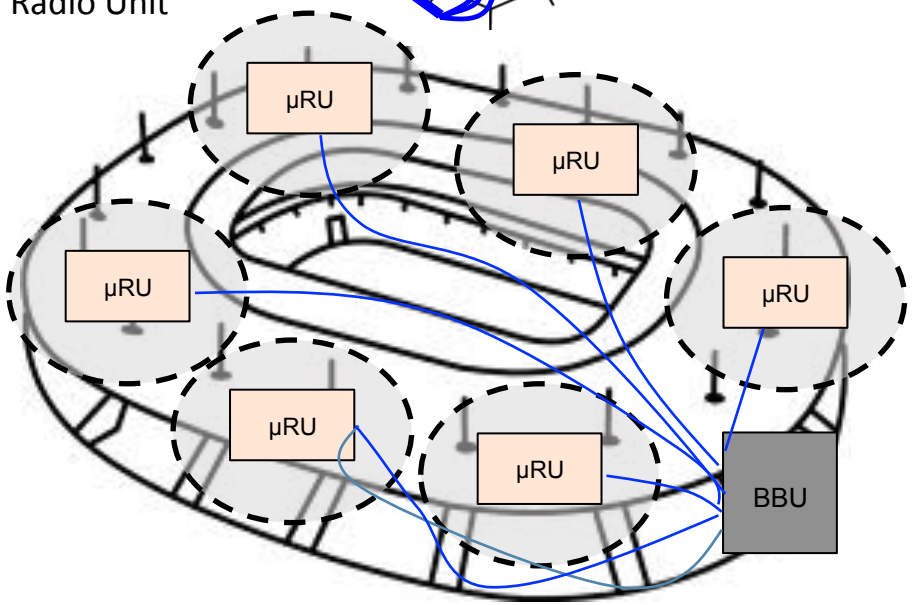
# *Different levels of centralisation are possible for C-RAN*

- Wide C-RAN
  - Macrocells + HetNets
- Micro-small cell
  - Outdoor: Local C-RAN
  - Indoor: Private C-RAN




BBU: Baseband Unit
DU: Digital Unit
RU: Radio Unit

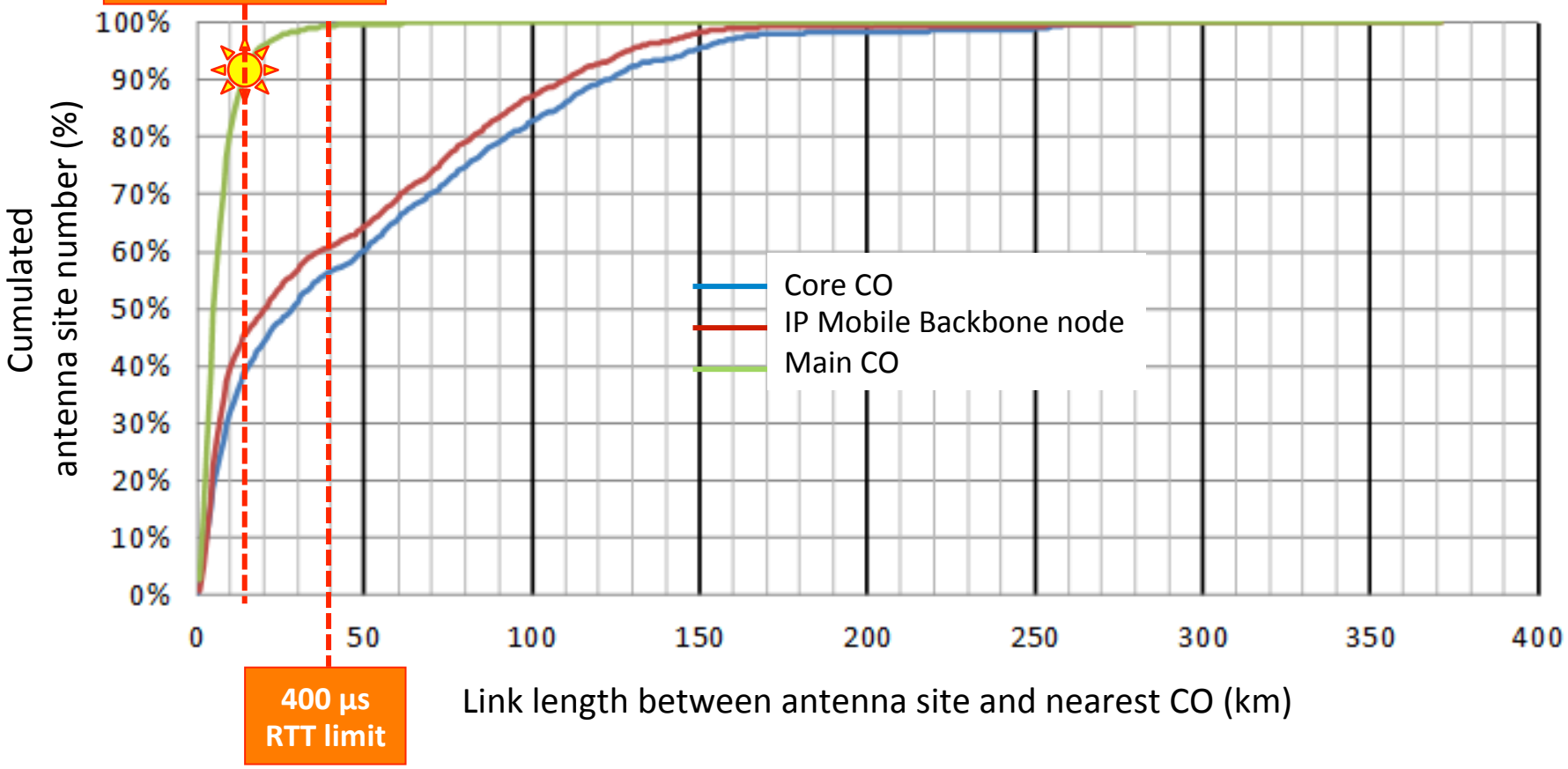


# *Where is the optimal BBU hotel location?*

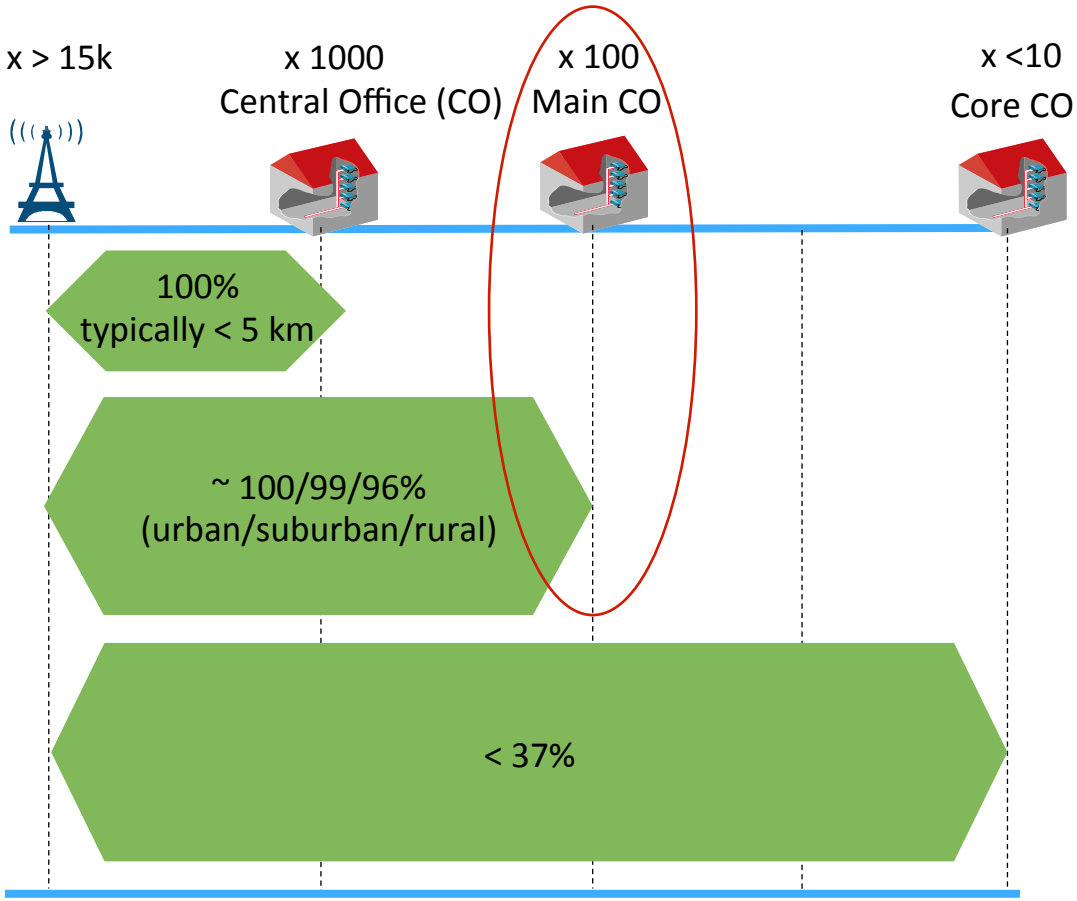
**150 µs RTT limit as rule of thumb from RAN vendors**

Statistics based on about 9000 antenna sites in high density areas in a typical European country



# *Where is the optimal BBU hotel location?*

**Fronthaul requires very low delay between RRH and BBU of << 1 ms!**




Assumptions

- Fibre propagation delay only (ideal data processing of negligible time assumed)
- Tolerable round-trip latency between RRH to BBU: Values of < 400 µs are expected (eq. 40 km). RAN vendors may restrict this to a lower value.
- Typical distance to a Main CO is less than 20 km for more than 90% of all households.

LTE HARQ delay requirement puts severe limit on BBU placement in a converged network

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