

Mobility Enhancements in Rel-19

The Nokia logo is displayed in white, uppercase letters within a large white arrow graphic that points to the left. The arrow is composed of two parallel lines that converge to a point on the left side of the slide.

Taipei, June 15-16, 2023

Agenda Item: 5

Source: Nokia, Nokia Shanghai Bell

Improved Handover Interruption and Mobility Robustness

Motivation

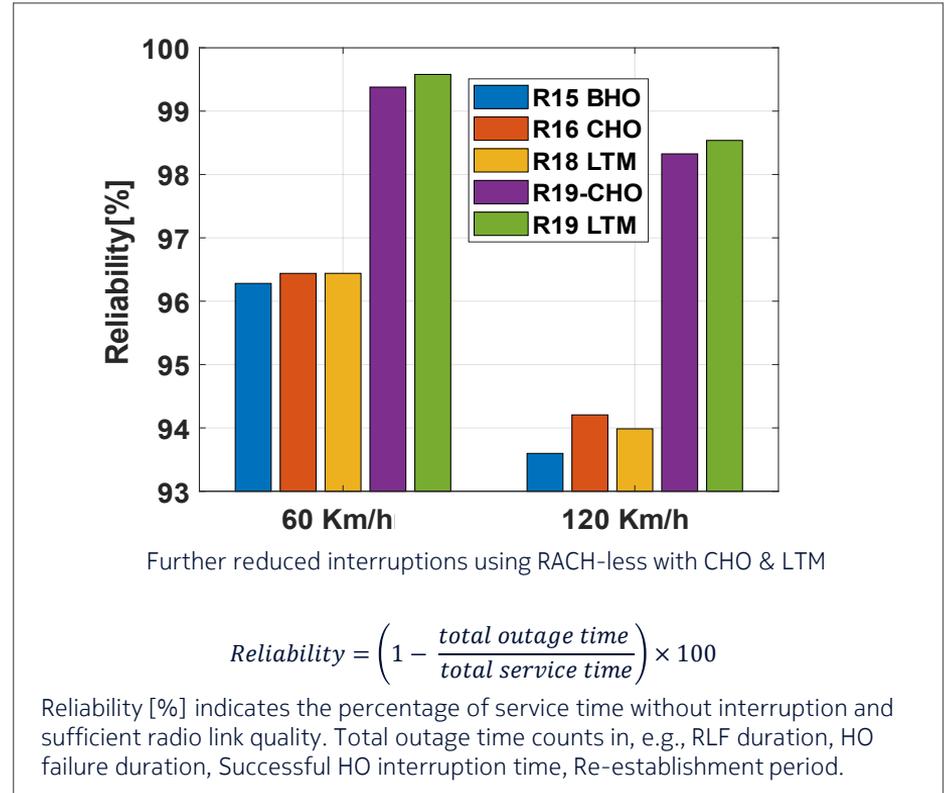
Conditional Handover (CHO) of R16 minimizes the radio link failures (RLFs) and handover failures (HOFs) but it does not improve the handover interruption time

DAPS (Dual Active Protocol Stack) of R16 reduces the handover interruption time but it does not address the RLFs and HOFs

LTM (L1/L2-triggered mobility) of R18 reduces the interruption time, RLFs and HOFs but only in intra-gNB scenario

In Rel-19 handover interruption time, RLF and HOF KPIs could be improved and LTM could be enabled in inter-gNB scenarios by following means:

- CHO using RACH-less
- Enhanced LTM for inter-gNB scenarios in RACH-less manner



Efficient Signalling for Beam/Beam Group based Handover

Motivation

Beam-specific mobility key performance metrics have been introduced in SA5 to enable beam-specific Mobility Robustness Optimization (MRO).

- The beam-based MRO can reduce the total amount of network failures by 82% compared to the baseline and 34% compared to MRO

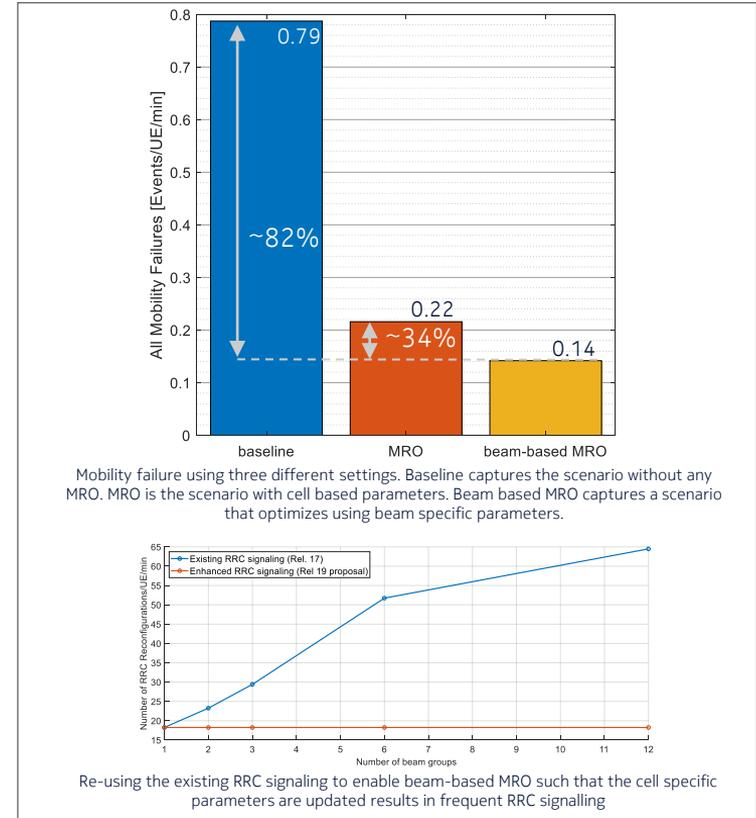
In disaggregated architecture the centralized unit is not aware of the serving beam of the UE.

- Enhancements are needed for enabling beam-based MRO in disaggregated architecture.

Different handover parameters can be configured for different areas/beams of the cells. Frequent update of handover parameters per beam/group of beams incurs high RRC signaling overhead.

Signaling overhead could be reduced in Rel-19 by

- Network configuring different handover parameters per beam or beam-group
- UE updating the mobility parameter upon receiving a lower layer command to change the TCI state (beam switch)



Mobility robustness enhancements for FR1 and FR2

Motivation

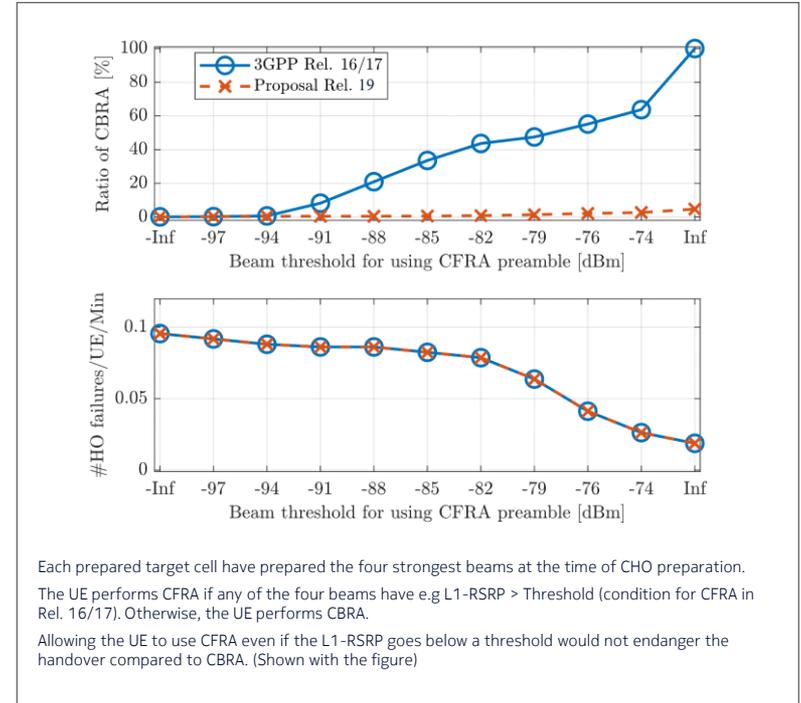
UE falls back to contention-based RACH (CBRA) if the prepared beam configured for CFRA in CHO changes. This may occur as there is a delay between CHO preparation and execution.

CBRA decreases handover robustness due to collisions. The following enhancements would improve mobility robustness:

- Contention free preamble update
- Changing beam selection in RACH procedure

Mobility robustness enhancements for FR2:

- Receive beam refinement towards the target cell before/upon handover execution.
- Enhancements for neighbour cell measurement reporting to include information on panel diversity for robust handover decisions.
- MPE awareness for neighbouring cells to enable higher UL throughput handover decisions.



R19 Mobility Enhancements

Proposal

Enhance handover interruption time, radio link failure and handover failure performance through

- Conditional Handover using RACH-less
- Inter-gNB using LTM (L1/L2-triggered mobility) framework

Enhancements for beam/beam group handover parameter configuration

- Different handover parameters can be configured for different areas/beams of the cells.
- Signalling overhead reduction
- Enhancements for disaggregated architecture

Improve mobility robustness in FR1 & FR2 with

- RACH enhancements for CHO
- Additional FR2 enhancements: Beam refinement before/during HO execution and MPE enhancements



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