3GPP TSG-RAN WG2 Meeting #113bis-e draftR2-2104366

Elbonia, Online, 12 – 20th of April 2021

**Agenda item: 8.10.3.3**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Report from [113bis-e][107][NTN] CHO aspects (Nokia)**

**WID/SID: NR\_NTN\_solutions-Core - Release 17**

**Document for: Discussion and Decision**

# 1 Brief scope of the paper

This document aims at collecting companies’ views regarding the Rel-17 NTN Conditional Handover (CHO):

* [AT113bis-e][107][NTN] CHO aspects (Nokia)

Initial scope: Discuss the proposals in [R2-2103335](file:///C:\Data\3GPP\Extracts\R2-2103335%20On%20Connected%20mode%20mobility%20for%20NTN.docx)

Initial intended outcome: Summary of the offline discussion with e.g.:

* + - List of proposals for agreement (if any)
    - List of proposals that require online discussions
    - List of proposals that should not be pursued (if any)

Initial deadline (for companies' feedback): Thursday 2021-04-15 18:00 UTC

Initial deadline (for rapporteur's summary in R2-2104366): Thursday 2021-04-15 22:00 UTC

Proposals marked "for agreement" in R2-2104366 not challenged until Friday 2021-04-16 10:00 UTC will be declared as agreed via email by the session chair.

For the rest the discussion will continue in a second round of the offline discussion until Monday 2021-04-19. Further details on the scope/intended outcome/exact deadlines to be announced by the session chair after Friday 2021-04-16 10:00 UTC.

The following sections elaborate on the topics listed in the scope above.

# 2 Discussion

In this section we discuss the aspects described in [1], as instructed in the scope of this e-mail discussion.

## 2.1 Time related aspects

In various TDocs submitted to RAN2#113bis-e, including [1], one can find the issue of how to actually use the timing information for CHO/measurement report triggering. First aspect to discuss is what the time information should indicate. Among the options considered we have:

1. Time since when the UE can access the candidate CHO target cell
2. Time until when the UE can access the candidate CHO target cell
3. Time until when the source cell provides coverage
4. Other

Companies are asked to express their views how the time information shall be defined.

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| **Question 1: What does the timing information actually describe in CHO triggering condition for NTN?** | | |
| **Company** | **Option** | **Motivation** |
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Another related aspects is how such timing information is implemented. In [1] and other papers it is mentioned to use the timer (typical NR/LTE functionality), absolute time or timer range (e.g. implemented via two timers). Obviously, each of these options has its pros and cons. Thus, companies are asked to express their view how the timing-information is used for CHO/measurement reporting in NTN. Please motivate your answer.

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| **Question 2: How is the timing information implemented (i.e. timer/timers, absolute time, etc.)** | | |
| **Company** | **Answer** | **Motivation** |
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## 2.2 Location related aspects

Another metric to be used in for CHO triggering is location. It is however unknown what the term “location” actually implies. It can be at least one of the following:

1. Distance between the UE and the satellite
2. Distance between the UE and the cell center (of either the serving cell or the target cell)
3. Difference in the distance between the UE and its serving cell center and the UE and its target cell’s center
4. Other

Companies are encouraged to choose the definition of the distance which suits them most and justify the selection.

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| **Question 3: What does the location information actually describe in CHO triggering condition for NTN?** | | |
| **Company** | **Answer** | **Motivation** |
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In other papers, e.g. in [1], it is highlighted the use of instantaneous distance between the UE and cell center may lead to unnecessary HOs or RLFs. Instead, it is proposed to assess the distance change metric. One of the considered options is to use such distance change metric as an offset in radio measurement events (Ax). By doing so, the radio-based event has a notion of distance change and will be triggered sooner if the distance towards the target cell decreases.

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| **Question 4: Do you think the distance change should be considered in CHO/MR triggering, e.g. for modifying the offset used in Ax events?** | | |
| **Company** | **Answer** | **Motivation** |
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## 2.3 Combination of events

During the discussion in [2] there were lots of controversies on how the different events (location-based, time-based, radio-based) can be linked and whether radio-based measurement event needs to be always configured – for either MR or CHO triggering. As the motivation and use case for applying the location-based or time-based event alone remains vague, companies supporting such option are given the chance to explain how it shall work and what is the use case they have in mind for such standalone event.

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| **Question 5: Should the time- or location-based event for CHO/MR triggering in NTN always need to be configured with radio-based measurement event (Ax)?** | | |
| **Company** | **Answer** | **Motivation/use case for standalone use** |
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In [1][2] there were also considerations on using time-based event with location-based event. Please share your opinion whether such combination shall be allowed.

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| **Question 6a: Can the location-based event be combined/configured with time-based event for NTN Rel-17?** | | |
| **Company** | **Answer** | **Motivation** |
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If the answer to Question 6a is positive, companies are asked to express how such combination is used, i.e. with or without radio-based measurement:

1. Radio-based measurement event (Ax) always used in parallel to time and location events
2. Radio-based measurement event (Ax) used when other (time and/or location) event triggers
3. Radio-based measurement event (Ax) not used

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| **Question 6b: How the combination of location-based event and time-based event is configured? Please select one of the options listed above.** | | |
| **Company** | **Answer** | **Motivation** |
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## 2.4 Chain of Conditional Handovers

In [1], but also in some other papers submitted to RAN2#113 and RAN2#113bis, it is mentioned that the UE may retain the CHO configurations even after executing a CHO. The configurations to be kept are not the ones for other candidate cells evaluated in this CHO evaluation phase, but rather the configurations for future serving cells. As claimed in [1], in NTN the sequence of next serving cells can be predicted with high probability, which apparently may justify to equip the UE with the CHO configurations for future cells, i.e. not for the next handover execution only, but beyond that. Thus, companies are asked whether they see a benefit in enabling such option and would like to continue the related work.

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| **Question 7: Do you think providing the UE with CHO configurations for cells beyond the next cell change can be beneficial in NTN?** | | |
| **Company** | **Answer** | **Motivation** |
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# 3 Conclusions

Based on the views expressed in the previous sections, we propose the following:

For e-mail agreement:

For online discussion:

# 4 List of referenced documents

[1] R2-2103335 *On connected mode mobility for NTN* 3GPP TSG-RAN WG2 Meeting #113bis Electronic Elbonia, 12 – 20 of April 2021

[2] R2-2102016 *Report of [AT113-e][106][NTN] CHO aspects (Ericsson)* 3GPP TSG-RAN WG2 Meeting #113 electronic Online, January 25th - February 5th, 2021

# Contact information

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