3GPP TSG-RAN WG3 Meeting #120 R3-233397

**May 22 – 26 2023**

**Agenda item: 10.2.2**

**Source: Samsung**

**Title: (TP for SON BLCR for 38.300) MRO for inter-system handover for voice fallback**

**Document for: Discussion and Decision**

# **1 Introduction**

This contribution provided the TP for SON BLCR for TS38.300 on MRO enhancement for inter-system handover for voice fallback.

# **Annex B: TP for TS38.300**

##### 15.5.2.2.3 Connection failure due to inter-system mobility

One of the functions of Mobility Robustness Optimization is to detect connection failures that occurred due to Too Early or Too Late inter-system handovers or inter-system Mobility Failure for Voice Fallback. These problems are defined as follows:

- Inter-system/ Too Late Handover: an RLF occurs after the UE has stayed in a cell belonging to an NG-RAN node for a long period of time; the UE attempts to re-connect to a cell belonging to an E-UTRAN node.

- Inter-system/ Too Early Handover: an RLF occurs shortly after a successful handover from a cell belonging to an E-UTRAN node to a target cell belonging to an NG-RAN node; the UE attempts to re-connect to the source cell or to another cell belonging to an E-UTRAN node.

- Inter-system Mobility Failure for Voice Fallback: an RLF occurs shortly after a successful handover triggered due to Voice Fallback, or a failure occurs during an handover triggered due to Voice Fallback, from a cell belonging to an NG-RAN node to a cell belonging to an E-UTRAN node; the UE attempts to re-connect to a cell belonging to an E-UTRAN node, or an NG-RAN node.

**Detection mechanism**

A failure indication may be sent to the node last serving the UE when the NG-RAN node fetches the RLF REPORT from UE by triggering:

- The Failure Indication procedure over Xn;

- The Uplink RAN configuration transfer procedure and Downlink RAN configuration transfer procedure over NG.

In case the last serving node is an E-UTRAN node, the detection mechanism proceed as defined in TS 36.300 [2].

In case the last serving node is an NG-RAN node, the detection mechanisms for Too Late Inter-system Handover, Too Early Inter-system Handover, and Inter-system Mobility Failure for Voice Fallback are carried out through the following:

- Too Late Inter-system Handover: the connection failure occurs while being connected to a NG-RAN node, and there is no recent handover for the UE prior to the connection failure i.e., the UE reported timer is absent or larger than the configured threshold, e.g., *Tstore\_UE\_cntxt*, and the first node where the UE attempts to re-connect is a E-UTRAN node.

- Too Early Inter-system Handover: the connection failure occurs while being connected to a NG-RAN node, and there is a recent inter-system handover for the UE prior to the connection failure i.e., the UE reported timer is smaller than the configured threshold, e.g., *Tstore\_UE\_cntxt*, and the first cell where the UE attempts to re-connect and the node that served the UE at the last handover initialisation are both E-UTRAN node.

- Inter-system Mobility Failure for Voice Fallback: in case the connection failure occurs during an inter-system handover for voice fall back from NR, the RLF Report from the UE includes a voice fallback indication.

*Editor’s note 1: the name of the indication needs be refined when details are agreed in RAN2.*

The "UE reported timer" above indicates the time elapsed since the last handover initialisation until connection failure. The UE may make the RLF Report available to an NG-RAN node. The NG-RAN node may forward the information using the FAILURE INDICATION message over Xn or by means of the Uplink RAN configuration transfer procedure and Downlink RAN configuration transfer over NG to the node that served the UE before the reported connection failure.

In case the failure is a Too Early Inter-system Handover, the NG-RAN node receiving the failure indication may inform the E-UTRAN node by means of the Uplink RAN Configuration Transfer procedure over NG. This may include the RLF report.