Smarter technology for all

3GPP TSG RAN Meeting #102
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RP-233646

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Consideration of beam failure prediction in AI based mobility

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Background

- The potential objectives for AI/ML for Air Interface (Mobility) as outcome of previous RAN plenary.

  - Type of mobility
    - L3-based mobility and L1/L2-triggered mobility (LTM) are both considered
  - HO optimization in Network side, including
    - Candidate/target cell prediction in L3-based mobility, or, candidate/target beam(s) and cell(s) prediction in LTM
  - RRM measurement and event prediction, including
    - Beam-level measurement prediction
    - Cell-level measurement prediction, e.g., using intra-frequency measurement results to forecast the RRM measurement of inter-frequency/inter-RAT cells
    - HO failure/RLF prediction
    - Measurement events prediction
  - LCM framework and others
    - The conclusions in Rel-18 AI/ML study should be used as baseline
    - Other impacts are further studied

- Beam failure prediction and handling is not yet included. Beam failure detection/recovery is considered as MAC layer procedure, which does not fall into the scope of RRM measurement or event prediction.

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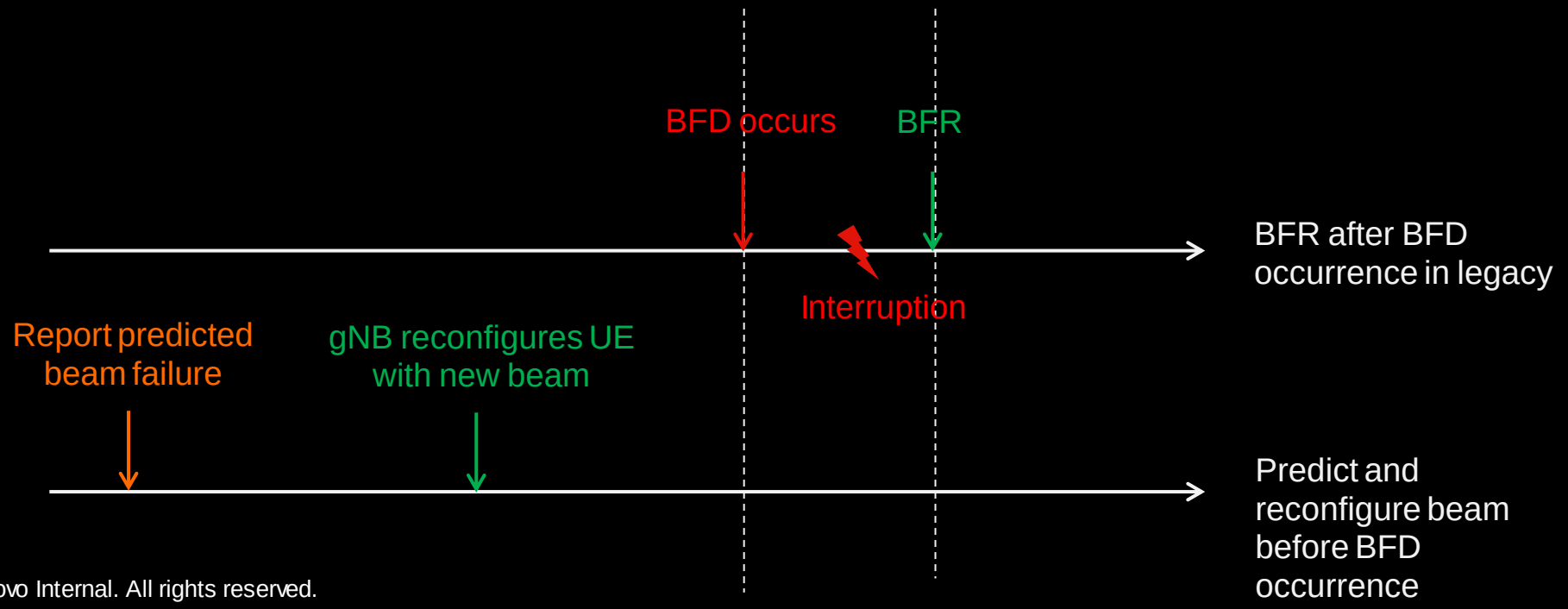
Motivation

- When a UE is moving, ideally NW should serve the UE with the best beam. On the other hand, it may still occur that a UE confronts a beam failure, which leads to service interruption.

- Utilizing the AI/ML technique can help UE to predict possible beam failure and trigger NW to pro-actively adjust the beam configuration to avoid beam failure event and any service interruption.

- In the meanwhile, RAN1 led AI/ML for air interface SI has discussed/shown the possibility of beam prediction using UE sided model at PHY layer, which can a basis for RAN2 study.



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Proposal

- In Rel19 SI AI/ML for Air Interface (Mobility), RAN2 also studies the support of beam failure prediction based on UE side model. Update the SID scope as below.

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    - HO failure/RLF prediction
    - Measurement events prediction
  - Beam failure prediction in UE side
  - LCM framework and others
    - The conclusions in Rel-18 AI/ML study should be used as baseline
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thanks.

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