

3GPP TSG RAN Rel-19 workshop

Taipei, June 15 - 16, 2023

Agenda item: 5. Specific RAN1/2/3-led Rel-19 topics

RWS-230133

AI/ML for NR air interface

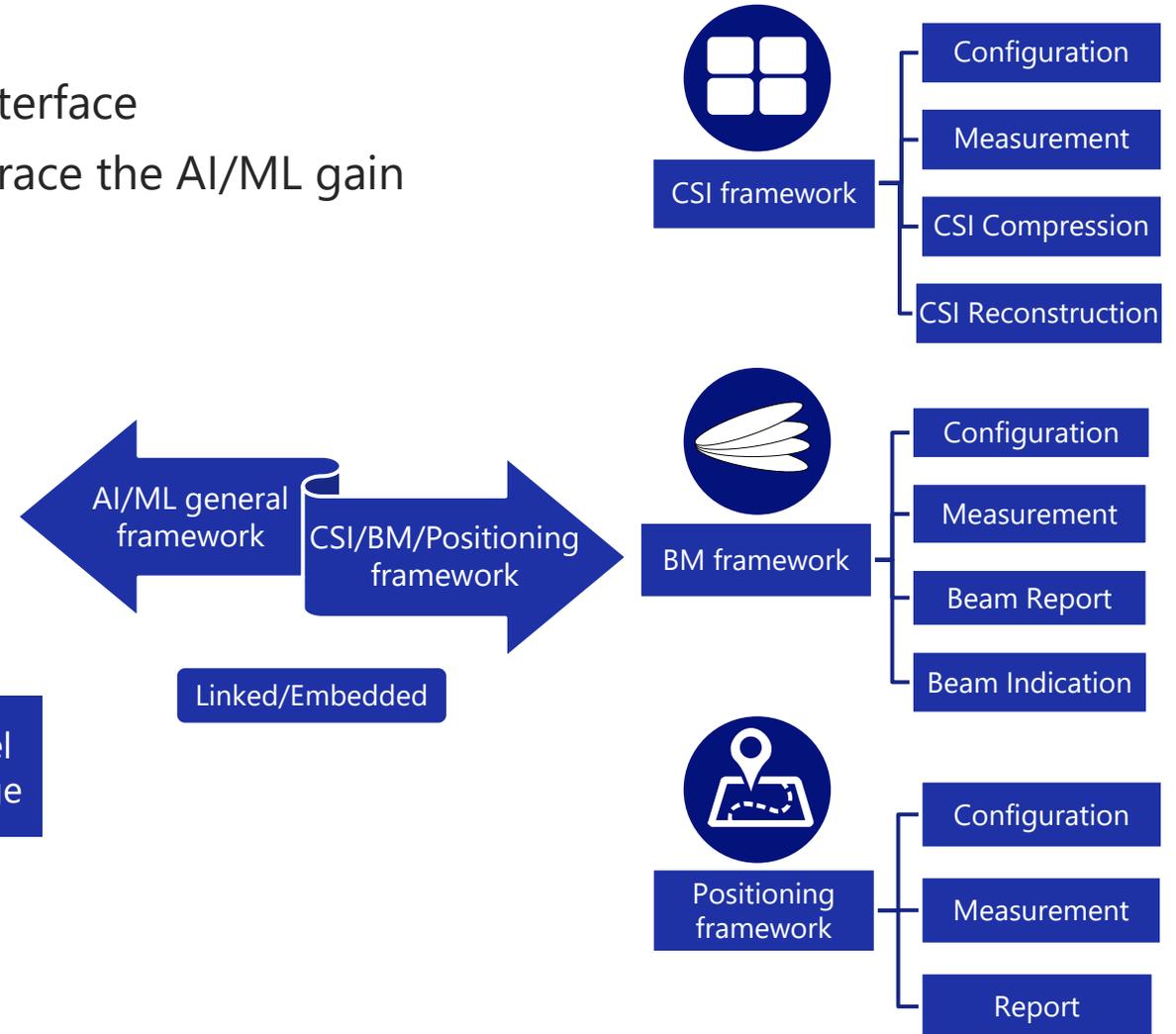
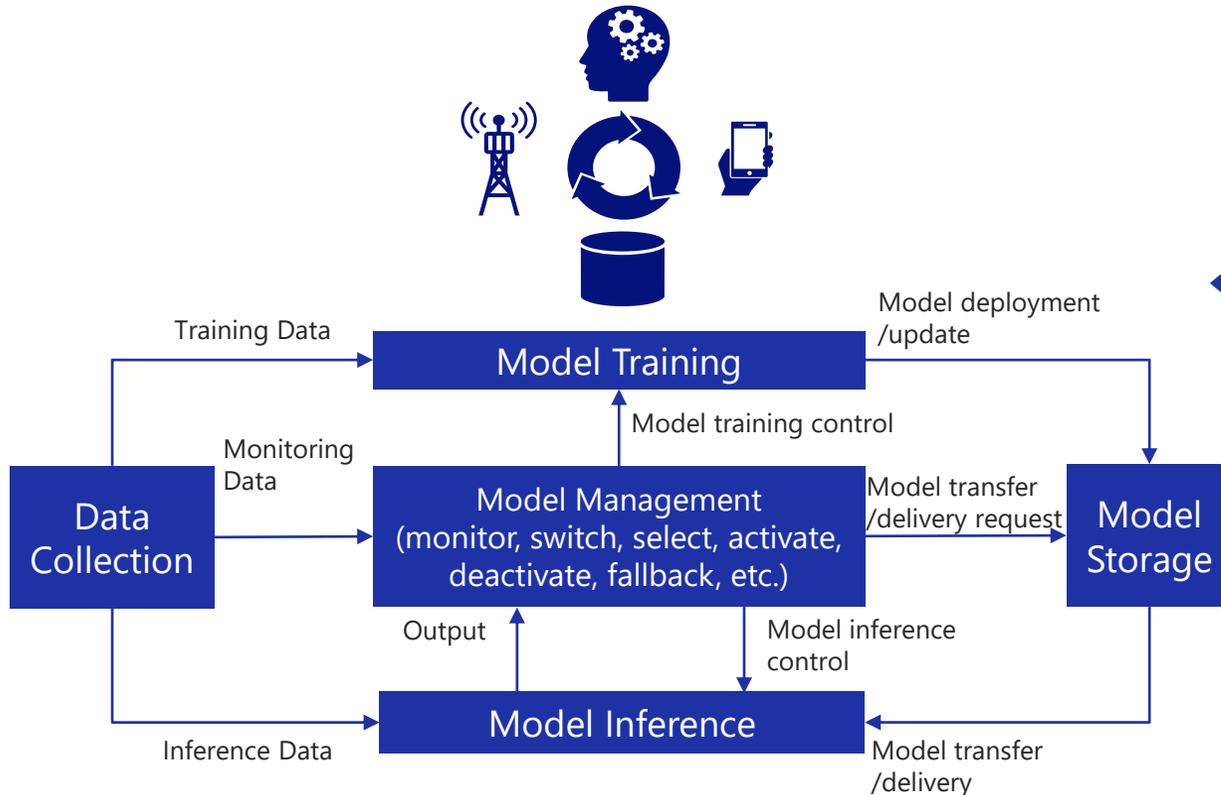
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Motivation for AI/ML for NR Air Interface

- ◆ In the SI phase,
 - General framework of lifecycle management (LCM) is studied to facilitate AI/ML for NR air interface.
 - In addition, evaluation shows measureable gains of using AI/ML models for all selected representative sub use cases including CSI feedback, beam management and positioning.
- ◆ At the SI approval, some other use cases were dropped to focus on some essential or more representative use cases in Rel-18.
- ◆ There could be opinions that one or more use case may be added directly to the WI. However, new use cases should be also studied firstly and selected carefully. We suggest focusing on the three use cases studied in Rel-18 for Rel-19 work.
 - Note that new use cases can be studied in parallel with the WI in Rel-19.

Overview of new WI

- ◆ Rel-19 AI/ML WI is expected to
 - Introduce a general AI/ML framework for NR air interface
 - Enable AI/ML operations for each use case to embrace the AI/ML gain



Objectives for AI/ML for NR Air Interface

- ◆ Specify a general AI/ML model lifecycle management (LCM) procedure for NR air interface
 - Specify, if necessary, the following aspects of LCM;
 - Data collection, model training, model identification, model registration, model deployment, model configuration, model inference, model selection, model activation/deactivation, model switching, and fallback operation, model monitoring, model update, model transfer, UE capability
- ◆ Specify the following techniques to enable AI/ML for NR air interface
 - Specify necessary enhancements on CSI related procedures including measurement and report, and signaling to enable spatial-frequency domain CSI compression using two-sided AI/ML model and time domain CSI prediction using UE sided model
 - Specify necessary enhancements on beam management related procedures including measurement and report, and signaling to enable spatial-domain DL beam prediction for Set A of beams based on measurement results of Set B of beams and temporal DL beam prediction for Set A of beams based on the historic measurement results of Set B of beams
 - Specify necessary enhancements on positioning related procedures including measurement and report, and signaling to enable direct AI/ML positioning and AI/ML assisted positioning
 - Note: The enhancements are based on Rel-18 MIMO and Rel-18 positioning, respectively.

Summary

- ◆ As the continuation from the Rel-18 SI, the work on AI/ML for air interface should be done on top of the outcome of the SI, where the target use cases are CSI feedback, beam management and positioning.

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