**3GPP TSG-SA5 Meeting #140-e *S5-216371***

e-meeting, 15 - 24 November 2021 (revision of xx-yyxxxx)

**Source: Intel, Verizon, AT&T, CMCC**

**Title: New SID Study on measurement data collection to support RAN intelligence**

**Document for: Approval**

**Agenda Item: 6.2**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: **Study on** **measurement data collection to support RAN intelligence**

Acronym: FS\_MDC\_RANINT

Unique identifier:

{A number to be provided by MCC at the plenary}

Potential target Release: *{Rel-18}*

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  |  | X |  |  |
| No |  | X |  | X |  |
| Don't know | X |  |  |  | X |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

|  |  |
| --- | --- |
|  | Feature |
|  | Building Block |
|  | *Work Task* |
| X | Study Item |

## 2.2 Parent Work Item

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| N/A |  |  |  |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 880076 | Study on enhancement for data collection for NR and ENDC | functional framework for RAN intelligence |

**Dependency on non-3GPP (draft) specification:**

# 3 Justification

5G networks are becoming increasingly complex, as new technologies, such as network densification, network slicing, and other advanced techniques, such as beamforming, mmWave, MR-DC, …, are introduced to extend the capacity while reduce the latency in mobile communication to meet the requirements of demanding applications. However, the existing network automation features, such as Self Organization Network (SON), still need some levels of human intervention. Therefore, the industry is looking into solutions of AI/ML technology to embed intelligence in the RAN.

RAN3 has a Rel. 17 SI (FS\_NR\_ENDC\_data\_collect) to study on the functional framework for RAN intelligence. TR 37.817 “Study on enhancement for Data Collection for NR and EN-DC” specifies the RAN intelligence framework that includes the Model Inference function in the RAN node to perform the inference function on the model with input data of UE measurement reports from the serving node and relevant data from the neighboring nodes, and generate the output actions to optimize the SON functions, such as network energy saving, load balancing, and mobility optimization. The RAN intelligence framework also includes the Model Training function in OAM that needs the input data of UE measurement reports from the serving node and relevant data from the neighboring nodes to train the model. This model then needs to be tested and validated prior to the deployment to the RAN node.

This SI is intended to support the objective a) in RAN’3 Rel. 17 study RP-201620 “Study on enhancement for data collection for NR and ENDC” with the collection of measurement data identified by the use cases in TR 37.817, as input data to AI functions. The measurement data collected at OAM will be used as inputs to AI functions, including, but not limited to, model training, model testing, and model evaluation.

The UE measurement reports can be collected via MDT and RRM measurements. Since MDT has restriction due to user consent and not all UEs are MDT capable, only a small percentage of UEs in a cell can be configured to create MDT sessions. So, MDT alone cannot provide sufficient training samples for AI model training. RRM measurements are referring to the RRC message – *MeasurementReport* message (see clause 6.2.2 in 38.331), where UEs can be configured to send *MeasurementReport* that are used to support UE mobility. Therefore, this SI is to study a way, with consideration of the existing MDT mechanism, to collect the UE *MeasurementReport* data that already exist in gNB.

# 4 Objective

The objectives of this study item include:

* Study the concept, use cases, potential requirements, and possible solutions for collecting measurement data (e.g., the UE measurement reports from the serving node, relevant input data from neighboring nodes, and predicted results from RAN.) to support RAN intelligence.
* Investigate a way, with consideration of the existing MDT mechanism, to collect the UE *MeasurementReport* data that already exist in gNB.

This study may need to cooperate with RAN2 and RAN3.

# 5 Expected Output and Time scale

|  |
| --- |
| New specifications {One line per specification. Create/delete lines as needed} |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| TR | 28.xyz | Study on measurement data collection to support RAN intelligence | Jun 2022 (SA#96) | Sep 2022 (SA#97) | Joey Chou, Intel, joey<dot>chou<at>intel<dot>com: primary rapporteurQi Sun, CMCC (sunqiyjy<at>chinamobile<dot>com): rapporteur for coordination with RAN2, RAN3 WGs (e.g., use cases, measurement requirements) |

{Note 1: Only TSs may contain normative provisions. Study Items shall create or impact only TRs.
"Internal TR" is intended for 3GPP internal use only whereas "External TR" may be transposed by OPs.}

{Note 2: The first listed Rapporteur is the specification primary Rapporteur. Secondary Rapporteur(s) are possible for particular aspect(s) of the TS/TR. In this case, their responsibility has to be provided as "Remarks".}

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
|  |  |  |  |

# 6 Work item Rapporteur(s)

Chou, Joey, Intel (joey<dot>chou<at>intel<dot>com): primary rapporteur and rapporteur for the new TR.

Qi Sun, CMCC (sunqiyjy<at>chinamobile<dot>com): rapporteur for coordination with RAN2, RAN3 WGs (e.g., use cases, measurement requirements)

# 7 Work item leadership

SA WG5.

# 8 Aspects that involve other WGs

May need cooperation with RAN2 and RAN3 WGs

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Intel |
| Verizon |
| AT&T |
| CMCC |
| Orange |
|  |