**3GPP TSG RAN Meeting #88e RP-201304**

**29th of June - 03rd of July, 2020**

**Source: CMCC**

**Title: New SID: Study on further enhancement for data collection**

**Document for: Approval**

**Agenda Item: 9.1**

3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](http://www.3gpp.org/About/WP.htm), article 39; and [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm).
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

# Title: **Study on further enhancement for data collection**

## Acronym:

## Unique identifier:

NOTE: For new WIs/SIs leave the Unique identifier empty but you may make a proposal for an Acronym.

 If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI.

 Please tick (X) the applicable box(es) in the table below:

 Either:

|  |  |
| --- | --- |
| **This WID includes a Core part** |  |
| **This WID includes a Performance part** |  |

 or:

|  |  |
| --- | --- |
| **This WID includes a Testing part** |  |
| **and it addresses the following 3GPP work area:** | **Radio Access** |  |
| **Core Network** |  |
| **Services** |  |

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | x | x |  |  |
| **No** | 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 |

NOTE: Normally, Core/Perf./Testing parts in RAN WIDs are Building Blocks. Only if they are under an SA or CT umbrella, we define them as work tasks. If you are in doubt, please contact MCC.

### 2.2 Parent and child Work Items

|  |
| --- |
| Parent and child Work Items  |
| Unique ID | Title | Nature of relationship |
|  |  |  |

NOTE: RAN agreed some time ago, that it describes the feature WI + Core/Perf. part WI or Testing part WI in one WID. Therefore the table above should just include the feature WI Unique ID and title and Nature of relationship is "parent WID".

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
| 801000 | Study on RAN-centric Data Collection and Utilization for LTE and NR | Preceding Study Item |

NOTE: Classical examples: List a preceding SI or a preceding WI (e.g. if you further enhance a topic). Also related or dependent WIs in other TSGs should be indicated.

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

## 3 Justification

5G networks are expected to meet the challenges of consistent optimization of increasing numbers of key performance indicators (KPIs) including latency, reliability, connection density, user experience, etc. Meanwhile, it has to address the complex system design and optimization issues introduced by NR features e.g. MR-DC, beamforming, and network slicing. Operators see traditional human-machine interaction as slow, error-prone, expensive, and cumbersome to handle these challenges. Artificial Intelligence (AI) including machine learning (ML) algorithms provides a powerful tool to help operators to improve the network management and the user experience, by analyzing the data collected and autonomously processed that can yield further insights. Application of AI in 5G network has gained tremendous attention in both academia and industry.

Although most of the AI algorithms can be up to implementation, the signalling support for AI deserves study of the training and the execution involved in AI schemes, the data required by the AI algorithms (potentially reported by the UE or collected from different parts of the network), and outputs generated by the algorithms to be delivered to other network nodes or Network Functions (NFs) in RAN, CN, or OAM/CHM. Before the introduction of standardization support for AI, it would be desirable to get some common understanding within 3GPP RAN community on the concept of AI and the AI frameworks commonly used in the current or future networks. Potential use cases and examples could be discussed to identify the AI enabling features; this could include various RAN areas without re-opening existing topics like Self Organization Network (SON), unless a beneficial AI approach is proven for e.g. energy saving, traffic steering, mobility optimization, load balancing, physical layer configuration optimization, etc. Therefore, a study should be conducted to investigate the functional framework of using AI/ML (i.e. data acquisition and exposure) and the high level requirements of operating RAN-AI. This study should identify common understanding, principle and requirements to enable RAN-AI based on indicative use cases.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

This study item aims to study the functional framework for RAN intelligence enabled by further enhancement of data collection through use cases, examples etc. and identify the potential standardization impacts on current RAN nodes and interfaces.

The detailed objectives of the SI are listed as follows:

Study high level principles for RAN intelligence enabled by AI, the functional framework (e.g. the AI functionality and the input/output of the component for AI enabled optimization) and identify the benefits of AI enabled NG-RAN through possible use cases e.g. energy saving, load balancing, mobility management, coverage optimization, etc.:

* 1. Study standardization impacts for the identified use cases including: the data that may be needed by an AI function as input and data that may be produced by an AI function as output, which is interpretable for multi-vendor support.
	2. Study standardization impacts on the node or function in current NG-RAN architecture to receive/provide the input/output data.
	3. Study standardization impacts on the network interface(s) to convey the input/output data among network nodes or AI functions.

One general objective for the work is that the studies should be focused on r the current NG-RAN architecture and interfaces to enable AI support for 5G deployments.

Coordination based on LSs with other groups, if needed, e.g. SA3, RAN1/RAN2, SA2 and SA5.

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

### 4.3 RAN time budget request (not applicable to RAN5 WIs/SIs)

NOTE: For all RAN related WIs/SIs which are not led by RAN WG5 the WI/SI rapporteur has to fill out the attached Excel table to request time budgets for corresponding RAN WG meetings.
The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI.
One time unit (TU) corresponds to ~ 2 hours in the meeting.
If no TU is needed leave the field empty otherwise enter a number in the field.

 For revisions of already approved WI/SI descriptions: Please remove the Excel table from the WID/SID's zip file. The time budgets are already recorded. If you want to modify them, then this has to be done via the status report and not via a revised WID/SID.

 If this WID is covering Core and Performance part, then please fill out one line for each of them in the attached Excel table.

**additional comments to the time budget request in the attached Excel table:**

## 5 Expected Output and Time scale

|  |
| --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* |
| Proposed Spec no. or series | Type (see note 1)  | Title | For info at TSG#  | For approval at TSG# | Remarks |
| ab.xyz | Internal TR | Study on further enhancement for data collection | *TSG RAN #93* | *TSG RAN #94* |  |

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: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Remarks for each spec.
By default a new specs can only be new for one of both parts.

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

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Remarks for each spec.
If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 6 Work item Rapporteur(s)

**Fang Xie, CMCC, xiefang@chinamobile.com**

## 7 Work item leadership

**Responsible RAN WG: RAN3**

## 8 Aspects that involve other WGs

NOTE: For RAN WIDs: Section 8 applies only toWGs outside of TSG RAN because RAN WG aspects have to be covered in section 4.

## 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| AT&T |
| CATT |
| CMCC |
| China Telecom |
| China Unicom |
| Deutsche Telekom |
| Ericsson |
| Huawei |
| NTT Docomo |
| Nokia |
| Nokia Shanghai Bell |
| OPPO |
| Orange |
| Softbank |
| SAMSUNG |
| Telecom Italia |
| Verizon |
| Vivo |
| Vodafone |
| ZTE |
| Lenovo |
| Motorola Mobility |
| NEC |
| Matrixx |
| KT Corp. |
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