**3GPP TSG-WG2 Meeting #166-Ad Hoc-e *S2-2500692r04***

**20th – 24th January, 2025, e-meeting (revision of )**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** | **1364** | **rev** |  | **Current version:** | **19.1.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | KI#1 - Further clarification on ML Model performance monitoring for AI/ML positioning | | | | | | | | | |
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| ***Source to WG:*** | Lenovo | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | AIML\_CN | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **C** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | Clarification of ML model performance monitoring for LMF-based AI/ML positioning.  It is not clear how the NWDAF collects input data from the LMF to evaluate the performance of an ML model used for AI/ML positioning.  In addition, procedure for the LMF to trigger monitoring of an ML model is missing. | | | | | | | | |
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| ***Summary of change:*** | | LMF indicates to the NWDAF the ML model to monitor by including the ML model identifier.  NWDAF collects the following input data from LMF:  - Ground truth information from PRU(s)/UE(s) by using the procedure of input data collection by NWDAF as specified in clause 6.22.4 of TS 22.273 [39].  - The inference output (location estimation using Direct AI/ML positioning) of the PRU and/or UE providing the ground truth data.  It is also clarified that the consumer provides ground truth information and inference output corresponding to a PRU or UE at the same time.  . | | | | | | | | |
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| ***Consequences if not approved:*** | | Incomplete ML model performance monitoring procedure | | | | | | | | |
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| ***Clauses affected:*** | | 6.2E.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* First Change \* \* \*

### 6.2E.4 Procedure for MTLF-based AI/ML model performance monitoring for LMF-based AI/ML Positioning

NWDAF containing MTLF supports to perform the performance monitoring for AI/ML model used by LMF for AI/ML positioning.

The LMF requests the NWDAF to monitor the ML model performance by including in the request the ML model identifier of the ML model whose performance needs to be monitored and an ML Model Accuracy threshold which is used as an indication to execute the accuracy monitoring operations.

When the NWDAF containing MTLF monitors the AI/ML Model performance, the NWDAF requests the LMF to provide the following as input data using the procedure of input data collection as specified in clause 6.22.4 of TS 22.273 [39]:

- Ground truth information from PRU(s)/UE(s) and

- The corresponding inference output (location estimation using Direct AI/ML positioning) of the PRU(s)/UE(s).

NOTE X: The LMF provides the ground truth information of PRU(s)/UE(s) and the corresponding inference output at the same time.

Editor’s Note: Another option of collected data (i.e., measurement data and ground truth UE location) used for ML model performance monitoring for LMF-based AI/ML positioning is FFS..

Before collecting the input data from UE(s), LMF needs to check the user consent in UDM during the data collection procedure.

Editor’s Note: The action of the LMF if the LMF is informed of user consent revocation is FFS.

The NWDAF containing MTLF evaluates the ML Model performance by comparing the ground truth data against the corresponding location location estimation of the PRU(s)/UE(s) provided by the LMF using Direct AI/ML positioning..

If the performance threshold requested by the LMF is not satisfied, the NWDAF containing MTLF retrains the AI/ML model, or sends to LMF a trigger to change the positioning method, e.g. from LMF-based AI/ML Positioning to legacy positioning.Figure 6.2E.4-x illustrates the procedure by which an LMF request an NWDAF containing MTLF to monitor the ML model performance.



Figure 6.2E.4-1: Monitoring performance of ML Model used for AI/ML positioning

1. The LMF may subscribe or unsubscribe for training an ML Model by invoking the Nnwdaf\_MLModelProvision\_Subscribe/ Nnwdaf\_MLModelProvision\_Unsubscribe service operation. The LMF may include an ML Model Identifier and an ML Model Accuracy threshold

2. The NWDAF containing MTLF trains ML Model and, based on the ML Model Accuracy thresholds, monitors the accuracy of the ML model

3. The NWDAF containing MTLF requests input data from the LMF as per clause 6.22.4 of 3GPP TS 22.273 [39].

4. The NWDAF containing MTLF determines, by comparing the input data, whether the ML model is degraded or not

5. The NWDAF containing MTLF may retrain the ML model using new data or may indicate to the LMF that the ML model accuracy is degraded

6. The NWDAF containing MTLF provides a new ML model or notifies that the ML model is degraded.

\* \* \* End of Changes \* \* \*