**3GPP TSG-SA5 Meeting #157 *S5-245556***

Hyderabad, India, 14 - 18 October 2024

**Source: Huawei**

**Title: Correct the use of specification**

**Document for: Approval**

**Agenda Item: 6.19.1**

# 1 Decision/action requested

***In this box give a very clear / short /concise statement of what is wanted.***

# 2 References

[1] 3GPP TR 28.858

[2] 3GPP TS 28.105

# 3 Rationale

The specification (see TS 28.105) for AI/ML management has been updated due to incorporate a group of agreed CRs in last meeting. Those changes affect some clause, clause title changes related to 28.858. This contribution is to correct some reference, description related and corrections.

# 4 Detailed proposal

*========================Start of change======================*

#### 5.1.2.3 Potential requirements

**REQ-ML\_ TRAIN -****MLPT-1:** The ML training MnS producer shall have a capability to enable an authorized consumer to request a pre-training of an ML model.

Editor note: It is for further discussion if the same requirements in clause 6.2b.3 "Requirements for ML model training" in TS 28.105 [2] related to training function also applies for pre-training.

#### 5.1.3.3 Potential requirements

**REQ-ML\_ TRAIN-MLFT-1:** The ML training MnS producer shall have a capability to enable an authorized consumer to request the fine-tuning of a pre-trained ML model.

Editor’s note: It is for further discussion if the same requirements in clause 6.2b.3 "Requirements for ML model training" in TS 28.105 [2] related to training function also applies for fine-tuning.

*========================Next change======================*

#### 5.1.5.4 Possible solutions

1) Introduce a new attribute of type, e.g., datasetStatisticalProperties, in the MLTrainingRequest IOC(see TS 28.105[2]) requested by an authorized MnS Consumer to the ML Training MnS Producer. This information influences the training data selection mechanisms to be used for training an ML model, assuring that the trained ML model reflects the statistical characteristics of the data that are relevant for the aIMLinferenceName. The proposed datasetStatisticalProperties datatype may include the following two attributes:

* UniformlyDistributedTrainingData - It indicates the need for using training data that are uniformly distributed according to the different aspects of the aIMLinferenceName. The attribute is of type Boolean. For e.g., in case of coverage problem analytics, data samples for gNBs belonging to each geographical location area needs to be uniformly distributed for the ML model to correctly determine in which geographical location areas the coverage problem occurred during inference.
* TrainingDataWithOrWithoutOutliers – It indicates that the training data samples should consider or disregard data samples that are at the extreme boundaries of the value range. The attribute is of type Boolean. For e.g., in case of coverage problem analytics, if there are only say few training data samples belonging to a particular geographical location, they may be considered as outliers w.r.t. the other training data samples..

#### 5.1.5.5 Evaluation

The solution described in clause 5.1.5.4 proposes the addition of two new attributes to the MLTrainingRequest IOC (see TS 28.105[2]) to enable the MnS consumer to indicate the training data statistical properties allowed to be used by the MnS producer for training an ML model. Therefore, the solution described in clause 5.1.5.4 is a feasible solution to be developed further in the normative specifications.

*========================Next change======================*

#### 5.1.6.4 Possible solutions

Introduce a new attribute, e.g., modelConfidenceIndication, in the MLTrainingRequest IOC(see TS 28.105[2]) requested by an authorized MnS consumer to the ML Training MnS Producer. This attribute indicates to the ML Training MnS Producer the minimum average confidence value (in unit of percentage) that the ML model should meet on the data with the same distribution as training data. If the minimum average confidence value cannot be satisfied, then the ML Training MnS Producer should retrain the ML model. The attribute is of type real with allowed values {0…100}.

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#### 5.1.8.4 Possible solutions

The IOC MLTrainingReport (See TS 28.105[2]) needs to be enhanced with a new attribute related to energy consumption for training each ML model, e.g., modelEnergyConsumptionTraining. This attribute is of type real and indicates the energy consumption value pertaining to the ML model training, e.g., “KWh”.

Editor’s Note: The method to determine energy consumption for ML model training is FFS. If energy consumption for ML model training cannot be determined, the proposed solution in 5.1.8.4 becomes redundant.

*========================Next change======================*

#### 5.5.2.4 Possible solutions

The inferenceOutputs attribute (of type inferenceOutput) defined in the AIMLInferenceReport IOC (See TS 28.105[2]) needs to be enhanced with a new attribute related to energy consumption for AI/ML inference, e.g., inferenceEnergyConsumption. This attribute is of type real and indicates the energy consumption value pertaining to generating AI/ML inference, e.g., “KWh”.

Editor’s Note: The method to determine energy consumption for AI/ML inference is FFS. If energy consumption for AI/ML inference cannot be determined, the proposed solution in 5.5.2.4 becomes redundant.

*========================End of change======================*