**3GPP TSG-SA5 Meeting #158 *S5-247063d1***

Orlando, USA, 18 - 22 Nov 2024

**Source: NEC, Intel, Nokia**

**Title: pCR TR 28.858 add clarifications and corrections to the Scope**

**Document for: Approval**

**Agenda Item: 6.19.1**

# 1 Decision/action requested

***The group is asked to discuss and approve the attached proposal.***

# 2 References

[1] 3GPP TR 28.858 v0.3.0; Study on Artificial Intelligence / Machine Learning (AI/ML) management Phase 2

# 3 Rationale

# The scope needs to be slightly adjusted with current contents in the TR 28.858 [1].

# The proposal presents some correction to align the text in the scope with expected final contents of the TR.

# 4 Detailed proposal

*Add the following changes to TR 28.858 [1]:*

***1st change***

1 Scope

The present document studies the enhanced Artificial Intelligence / Machine Learning (AI/ML) management capabilities and services building on the work of Rel-18, as well as new management aspects related to AI/ML functionalities across various 3GPP working groups within 5GS. It focuses particularly on the management of AI/ML-enabled features utilized in management and orchestration, 5GC, and NG-RAN. Furthermore, the study also investigates the AI/ML management capabilities supporting the emerging AI/ML technologies (e.g., Federated Learning, Distributed training andReinforcement Learning) and the sustainability and trustworthiness of AI/ML in 5G system.

***Next change***

4 Concepts and overview

4.1 Overview

AI/ML techniques have gained significant interests and advancements across various industries, including telecommunications, where they are now being applied to enhance mobile networks. While AI/ML technologies have matured considerably, certain aspects continue to evolve, and new techniques frequently emerge to complement existing methods.

AI/ML techniques can be characterized from several perspectives:

* **Learning Methods**: AI/ML employs various learning methods such as supervised, semi-supervised, unsupervised, and reinforcement learning. Each method is suited to specific inference categories (e.g., prediction) and requires distinct types of training data.
* **Learning Complexity**: AI/ML techniques vary in complexity, ranging from basic Machine Learning to more advanced e.g., Deep Learning with neural networks.
* **Learning Architecture**: Depending on the topology and location of learning tasks, AI/ML can be categorized into Generative AI, centralized, distributed, and federated learning.
* **Learning Continuity**: AI/ML can be implemented as online learning, offline learning or continual learning, depending on whether the learning process is static or ongoing.

In the 5GS, AI/ML capabilities are used across various domains, including management and orchestration, 5GC and NG-RAN. The performance of AI/ML inference function within 5GS depends on how well-trained ML models for accurate and efficient inference.

To effectively deploy AI/ML capabilities in 5GS, it is crucial to manage the ML models and AI/ML inference functions according to the specific characteristics and requirements of the use cases they support.

The study investigates enhancements of AI/ML management capabilities by building on the work from Rel-18 and exploring new management aspects across various 3GPP working groups. Additional advanced use cases are investigated, covering AI/ML management and operational capabilities to support different types of AI/ML technologies required for AI/ML in the 5G system (e.g. Federated Learning, Reinforcement Learning, online/offline learning, Generative AI and Distributed Learning):

Some primary aspects of AI/ML sustainability are studied, including the evaluation of energy and resource consumption and efficiency impacts associated with AI/ML features across all operational phases (training, emulation, deployment, inference).

The present TR also investigates management aspects (LCM CM and PM) of additional AI/ML functionalities defined by 3GPP SA WGs and RAN WGs.

## 4.x AI/ML trustworthiness

This document focuses on the following aspects of AI/ML trustworthiness:

 - Explainability

Other aspects of AI/ML trustworthiness have not been studies in this technical report.

***End of changes***