**Source: Samsung Electronics Co., Ltd. (Rapporteur)**

**Title: [FS\_AI4Media] Proposed Updated Time and Work Plan**

**Version: 1.4**

**Agenda Item: 9.7**

**Document for: Discussion and Agreement**

1. Introduction

During SA4#117-e the New Study Item on “Artificial Intelligence (AI) and Machine Learning (ML) for Media” in S4-220226 was agreed and afterwards approved in by SA#95e in SP-220328.

The objective of this study item are primarily to identify the media service architectures and relevant service flows, model operation configurations, data components including available data formats, and the data traffic characteristics in AI/ML for media related services. Key performance indicators and performance metrics are also identified.

The concrete objectives are as follows:

* List and describe the use cases for media-based AI/ML scenarios, based on those defined in TR 22.874.
* Describe the media service architecture and relevant service flows for the scenarios, identifying for each use case the impacts on the architecture, including any potential gaps with existing 5G media service architectures. Also describe the model operation configurations for each use case, including split AI/ML operations, identifying where certain AI/ML operations occur.
* Identify and document the available data formats and suitable protocols for the exchange of different data components of various AI/ML models, such as model data, metadata, media data, and intermediate data necessary for such model operation configurations. Also investigate the data traffic characteristics of these data components for delivery over 5G system, including whether there are any needs and potentials for data rate reduction.
* Identify and study key performance indicators for such scenarios, based on the initial considerations in TS 22.261, with additional emphasis on the use cases, model operation configurations and data components as identified in earlier objectives, focusing on objective performance metrics considering the KPIs identified.
* Identify potential areas for normative work as the next phase and communicate/align with SA2 as well as other potential 3GPP WGs on relevant aspects related to the study.
1. Proposed Time and Work Plan

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| **Meeting** | **Feasibility Study on Artificial Intelligence (AI) and Machine Learning (ML) for Media - #950011**  |
| **SA4#117-e (14 – 23 Feb 2022, e-meeting)** | * Agree New Study Item “Feasibility Study on Artificial Intelligence (AI) and Machine Learning (ML) for Media” in S4-220226
 |
| **SA#95-e (15 – 24 Mar, 2022, e-meeting)** | * Approve New Study Item “Feasibility Study on Artificial Intelligence (AI) and Machine Learning (ML) for Media” in SP-220328
 |
| **SA4#118-e (06 – 14 Apr 2022, e-meeting)** | * Agree Specification skeleton and Scope for TR 26.927
* Agree initial Work Plan
 |
| **SA4#119-e (11 – 20 May 2022, e-meeting)** | * Initiate work on:
	+ Description of media-based AI/ML use cases and scenarios from TR 22.847
* Initiate work on:
	+ Basic architectures for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
 |
| **Post 119-e Telco 1 (31 May 2022, 15:30-17:30 CEST, host: Qualcomm)** | * Progress work on:
	+ Description of media-based AI/ML use cases and scenarios from TR 22.847
* Progress work on:
	+ Basic architectures for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
 |
| **Post 119-e Telco 2 (14 June 2022, 15:30-17:30 CEST, host: Qualcomm)** | * Progress work on:
	+ Description of media-based AI/ML use cases and scenarios from TR 22.847
* Progress work on:
	+ Basic architectures for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
 |
| **Post 119-e Telco 3 (28 June 2022, 15:30-17:30 CEST, host: Qualcomm)** | * Progress work on:
	+ Description of media-based AI/ML use cases and scenarios from TR 22.847
* Progress work on:
	+ Basic architectures for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
 |
| **Post 119-e Telco 4 (12 July 2022, 15:30-17:30 CEST, host: Qualcomm)** | * Progress work on:
	+ Description of media-based AI/ML use cases and scenarios from TR 22.847
* Progress work on:
	+ Basic architectures for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
 |
| **SA4#120-e (17 – 26 Aug 2022, e-meeting)** | * Complete work on:
	+ Description of media-based AI/ML use cases and scenarios from TR 22.847
* Progress work on:
	+ Architectures and service flows for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
* Initiate work on:
	+ Identifying gaps between such architectures and existing SA4 media service architectures
* Communicate with other 3GPP working groups and external organizations, if necessary
 |
| **Post 120-e Telco 1 (20 Sep 2022, 15:30-17:30 CET, host: Qualcomm)** | * Progress work on:
	+ Architectures and service flows for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
* Progress work on:
	+ Identifying gaps between such architectures and existing SA4 media service architectures
 |
| **Post 120-e Telco 2 (11 Oct 2022, 15:30-17:30 CET, host: Qualcomm)** | * Progress work on:
	+ Architectures and service flows for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
* Progress work on:
	+ Identifying gaps between such architectures and existing SA4 media service architectures
 |
| **Post 120-e Telco 3 (2 Nov 2022, 15:30-17:30 CET, host: Qualcomm)** | * Progress work on:
	+ Architectures and service flows for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
* Progress work on:
	+ Identifying gaps between such architectures and existing SA4 media service architectures
 |
| **SA4#121 (14 – 18 Nov 2022, Toulouse, France)** | * Progress work on:
	+ Architectures and service flows for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
* Progress work on:
	+ Identifying gaps between such architectures and existing SA4 media service architectures
* Initiate work on:
	+ Identifying the data types and possible formats for the different data components for AI/ML-based media services
* Communicate with other 3GPP working groups and external organizations, if necessary
 |
| **Post 121-e Telco 1 (06 Dec 2022, 15:00-17:00 CEST, host: Qualcomm)** | * Progress work on:
	+ Architectures and service flows for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
* Progress work on:
	+ Identifying gaps between such architectures and existing SA4 5G media service architectures
* Initiate work on:
	+ Identifying the data types and possible formats for the different data components for AI/ML-based media services
 |
| **Post 121-e Telco 2 (07 Feb 2023, 15:00-17:00 CEST, host: Qualcomm)** | * Progress work on:
	+ Architectures and service flows for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
* Progress work on:
	+ Identifying gaps between such architectures and existing SA4 5G media service architectures
* Initiate work on:
	+ Identifying the data types and possible formats for the different data components for AI/ML-based media services
 |
| **SA4#122 (20 – 24 Feb 2023, Athens, Greece)** | * Complete work on:
	+ Architectures and service flows for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
* Complete work on:
	+ Identifying gaps between such architectures and existing SA4 media service architectures
* Progress work on:
	+ Identifying the data types and possible formats for the different data components for AI/ML-based media services
 |
| **Post 122-e Telco 1 (14th Mar 2023, 15:00-17:00 CET, host: Qualcomm)** | * Complete work on:
	+ Architectures and service flows for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
* Complete work on:
	+ Identifying gaps between such architectures and existing SA4 media service architectures
* Progress work on:
	+ Identifying the data types and possible formats for the different data components for AI/ML-based media services
* Initiate work on:
	+ Defining an evaluation framework for AI/ML, including a set of anchor models and corresponding data sets, based on the use cases and scenarios previously identified. The evaluation to include:
		- Evaluation of different split points for the model and documentation of the intermediate data.
		- Comparison of different checkpoints of the model to evaluate model updates.
		- Comparison of compressed and non-compressed trained model and their accuracies.
 |
| **Post 122-e Telco 2 (28th Mar 2023, 15:00-17:00 CEST, host: Qualcomm)** | * Complete work on:
	+ Architectures and service flows for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning
* Complete work on:
	+ Identifying gaps between such architectures and existing SA4 media service architectures
* Progress work on:
	+ Identifying the data types and possible formats for the different data components for AI/ML-based media services
* Progress work on:
	+ Defining an evaluation framework for AI/ML, including a set of anchor models and corresponding data sets, based on the use cases and scenarios previously identified. The evaluation to include:
		- Evaluation of different split points for the model and documentation of the intermediate data.
		- Comparison of different checkpoints of the model to evaluate model updates.
		- Comparison of compressed and non-compressed trained model and their accuracies.
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| **SA4#123-e (17 – 21 Apr 2023, e-meeting)** | * Progress work on:
	+ Defining an evaluation framework for AI/ML, including a set of anchor models and corresponding data sets, based on the use cases and scenarios previously identified. The evaluation to include:
		- Evaluation of different split points for the model and documentation of the intermediate data.
		- Comparison of different checkpoints of the model to evaluate model updates.
		- Comparison of compressed and non-compressed trained model and their accuracies.
* Initiate work on:
	+ Traffic characteristics of the data components for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning

based on the identified architectures and data components* Initiate work on:
	+ KPIs for the same data components identified
 |
| **SA4#124 (22 – 26 May 2023, Berlin, Germany)** | * Progress work on:
	+ AI/ML evaluation using the defined evaluation framework, including:
		- Evaluation of different split points for the models and documentation of the intermediate data.
		- Comparison of different checkpoints of the models to evaluate model updates.
		- Comparison of compressed and non-compressed trained models and their accuracies.
* Progress work on:
	+ Traffic characteristics of the data components for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning

based on the identified architectures and data components* Progress work on:
	+ KPIs for the same data components identified
 |
| **SA4#125 (21 – 25 Aug 2023, EU, TBD)** | * Complete work on:
	+ AI/ML evaluation using the defined evaluation framework, including:
		- Evaluation of different split points for the models and documentation of the intermediate data.
		- Comparison of different checkpoints of the models to evaluate model updates.
		- Comparison of compressed and non-compressed trained models and their accuracies.
* Complete work on:
	+ Traffic characteristics of the data components for:
		- Complete/Basic AI/ML model distribution
		- Split AI/ML operation
		- Distributed/federated learning

based on the identified architectures and data components* Complete work on:
	+ KPIs for the same data components identified
* Initiate work on:
	+ Potential related normative work and conclusions
	+ Agree on TR 26.927 v1.0.0 to be sent to SA plenary for information
 |
| **SA#101 (13 – 15 Sep 2023, TBD)** | * Present TR 26.927 v1.0.0 for information
 |
| **SA4#126 (13 – 17 Nov 2023, Chicago, USA)** | * Complete work on:
	+ Potential related normative work and conclusions
* Complete all remaining open issues raised for completion of TR 26.9xx
* Document the agreements into the draft TR
* Communicate with other 3GPP working groups and external organizations, if necessary
* Agree on TR 26.927 v2.0.0 to be sent to SA plenary for approval
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| **SA#102 (12 – 13 Dec 2023, TBD)** | * Present TR 26.927 v2.0.0 for approval
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1. Proposal

It is proposed to agree on the work plan as described in clause 2.