**3GPP WG SA WG2 Meeting #151E e-meeting S2-2204102r04**

**Elbonia, May 16th – 21st, 2022 (revision of S2-220xxxx)**

**Source: China Mobile**

**Title: KI #7, New Sol: FL member selection**

**Document for: Discussion / Approval**

**Agenda Item: 9.21**

**Work Item / Release: FS\_AIMLsys / Rel-18**

*Abstract of the contribution: This contribution proposes a Solution on Key Issue #7: 5GS Assistance to Federated Learning Operation in FS\_AIMLsys, Rel-18*.

# Discussion

This contribution proposes a solution for Key Issue #7: 5GS Assistance to Federated Learning Operation in the FS\_AIMLsys.

In order to provide assistance to the AF and the UE for FL operations, it is proposed to study the following aspects:

**On assistance to selection of UEs for FL operation:**

- Whether, how and what information provided by 5GC to the AF can help the AF to select and manage the group of UEs which will be part of FL operation.

- Whether, how and what information is required by the 5GC in order to assist the AF for selecting and managing the group of UEs which will be part of FL operation.

# 2. Proposal

It is propose the solution on Federated Learning member selection.

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

## 6.0 Mapping Solutions to Key Issues

Table 6.0-1: Mapping of Solutions to Key Issues

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Key Issues | | | | | | |
| Solutions | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | X |  |  |  |  | X |  |
| 2 |  | X |  |  |  |  |  |
| 3 |  | X |  |  |  |  |  |
| 4 |  | X |  |  |  |  |  |
| 5 |  | X |  |  |  |  |  |
| 6 |  |  | X |  |  |  | X |
| 7 |  |  | X |  |  | X |  |
| 8 |  | X | X |  |  |  |  |
| 9 |  |  |  | X |  |  |  |
| 10 |  |  |  |  | X |  |  |
| 11 | X |  |  |  | X |  |  |
| 12 |  |  |  |  | X |  |  |
| 13 |  |  |  |  | X |  |  |
| 14 |  |  |  |  |  | X | X |
| 15 |  |  |  | X |  | X |  |
| 16 | X |  |  |  | X | X | X |
| 17 |  |  |  |  |  |  | X |
| 18 |  |  |  |  |  |  | X |
| 19 |  |  |  |  |  |  | X |
| 20 |  |  |  |  |  |  | X |
| 21 |  |  |  |  |  |  | X |
| 22 |  |  |  |  |  |  | X |
| 23 |  |  |  |  |  |  | X |
| 24 |  |  |  |  |  |  | X |
| 25 |  |  |  |  |  |  | X |
| 26 |  |  |  |  |  | X | X |
| 27 |  |  |  |  |  |  | X |
| X |  |  |  |  |  |  | X |

**\* \* \* \* Second Change(All New text) \* \* \* \***

## 6.X Solution #X: FL member selection

### 6.X.1 Description

This solution is proposed to address Key Issue #7: 5GS Assistance to Federated Learning Operation.

This solution proposed that application server determine the UE groups for FL operation based on the UE's location, UE's subscription, end to end delay and packet drop for the UE.

### 6.X.2 Procedures



Figure 6.X.2-1: Procedure for FL member selection

1. [Optional]The AF requests the location reporting of the UEs from the AMF (via NEF if AF is untrusted) by invoking Namf\_EventExposure\_Subscribe (Location Reporting).

The AF should maintain the candidate UE list itself before FL member selection, and include the Target UE Identifier(s) for the UEs in the candidate list in the request as described in TS 23.501 [3] clause 5.6.7, which is same for step 2 and step 3.

2. The AF retrieves the FL member subscription data, indicating whether the network is allowed to exposure UE related 5GC information, for the UEs in the candidate list from the UDM (via NEF if AF is untrusted) by invoking Nudm\_SDM\_Get service operation.

3. The AF initiates direct notification of Qos Monitoring procedure for delay information for the UEs in the candidate list, as defined in clause 6.4.2.1 of TS 23.548 [10], steps 1a-5.

4. The AF requests user plane information, e.g., Throughput UL/DL, Packet transmission, Packet retransmission, for the UEs in the candidate list from UPF.

NOTE: How to collect data from UPF will depend on the outcome of FS-UPEAS SID.

5. The AF selects FL members based on UE location from AMF, subscription data from UDM, and delay and packet drop information reporting from UPF.

NOTE: AF may keep monitoring the information from AMF/UPF/UDM to update FL members.

### 6.X.3 Impacts on services, entities and interfaces

AF：

- Supporting FL member subscription data collection from UDM.

- Supporting FL member selection based on the information from AMF, UDM and UPF.

UDM:

- Supporting FL member subscription data.

UPF：

- Supporting to report user plane information to AF.

**\* \* \* \* End of change \* \* \* \***