**3GPP SA WG2 Meeting #152E** **S2-220xxx**

**e-meeting, August 17-25, 2022**

**Source: Nokia, Nokia Shanghai Bell**

**Title:** **KI#4 Evaluation and Conclusion**

**Document for:** **Approval**

**Agenda Item:** **9.23**

**Work Item / Release: FS\_eNA\_PH3/ Rel-18**

*Abstract of the contribution: This paper proposes analysis and conclusion for KI #4 in* 23*.700-81.*

# Discussion

This contribution proposes Overall Evaluation and Conclusions for aspects of KI #4. Seven KI#4 Solutions are proposed, which may be grouped as follows:

1. DCCF Relocation (solutions 12 and 44) – to support e.g. when UE moves outside the serving area of a DCCF.
2. Managing Impact of storing data in NFp during muting (Solutions 41 and 45) – to support NFp when it can no longer store / buffer notifications during event muting.
3. Storage and Retrieval of Trained ML models to/from ADRF (Solutions 42 and 43) – to support model storage in ADRF, which currently stores Data and Analytics.
4. ADRF / NWDAF Data Storage Management (Solution 46) – Manages storage of data in ADRF/NWDAF according to NFc preference or provisioned Policy.
5. Sharing models between NWDAFs – Allows NWDAFs to directly share models.

Group 3 - Storage and Retrieval of Trained ML models is pending possible resolution of ENs in Solution 42, and similarly Group 5 (Solution 47) is pending resolution of ENs. For the other groups, solution comparisons (where applicable), observations and KI conclusions are proposed.

# Proposal

It is proposed to add the following to TR 23.700-81.

\*\*\* Start of changes (all new text) \*\*\*

# 7.x Evaluation for KI #4

### 7.x.1 Key Solution Aspects

Seven Solutions are proposed for KI#4. They may be grouped as follows:

1. DCCF Relocation (solutions 12 and 44) – to support e.g. when UE moves outside the serving area of a DCCF.
2. Managing Impact of storing data in NFp during muting (Solutions 41 and 45) – to support NFp when it can no longer store / buffer notifications during event muting.
3. Storage and Retrieval of Trained ML models to/from ADRF (Solutions 42 and 43) – to support model storage in ADRF, which currently stores Data and Analytics.
4. ADRF / NWDAF Data Storage Management (Solution 46) – Manages storage of data in ADRF/NWDAF according to NFc preference or provisioned Policy.
5. Sharing models between NWDAFs (Solution 47) – allows NWDAFs to directly share models.

### 7.x.2 Solution Comparisons

7.x.2.1 DCCF Relocation (solutions 12 and 44)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Capability | Solution 12: DCCF and MFAF Relocation | Solution 44: DCCF Reselection when multiple instances of DCCF exist in a network |
| 1 | Supports DCCF Reselection / relocation (e.g. when a UE moves outside the serving area of a DCCF) | Yes | Yes |
| 2 | Supports MFAF Reselection / relocation (e.g. when a UE moves outside the serving area of an MFAF, with or without new DCCF) | Yes | No |
| 3 | Old DCCF chooses the new DCCF (and/or MFAF) and subscription context for UE is transferred, without requiring NFc to initiate a new subscription | Yes | No |

Observations:

1. In Solution 12, the transfer of context between old DCCF and new DCCF or between old MFAF and new MFAF is consistent with similar NWDAF context transfer procedures in TS23.288 clause 6.1B (where context is transferred between NWDAFs) and UE context transfer between AMFs and between SMFs defined in TS23.502. Solution 44 however requires the consumer to terminate its subscription with the DCCF.

7.x.2.2 Managing Impact of storing data in NFp during muting (Solutions 41 and 45).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Capability | Solution 41: Sending data that is about to be purged | Solution 45: Managing Impact of Muting on NF Producer |
| 1 | While collecting data during muting, producer NF may send data to Consumer NF when producer has performance issue | Yes | Yes |
| 2 | Producer NF may purge data when producer has performance issue | Yes | Yes |
| 3 | Consumer may request Producer action (send-all, discard all, or drop old) to be applied when the Producer has performance issue | No | Yes |
| 4 | Consumer may request Producer action on subscription (close, continue with muting, or continue without muting) when the Producer has a performance issue. | No | Yes |
| 5 | Producer NF may accept/reject a requested action on buffered notifications and/or subscription | No | Yes |

Observations:

1. Solution #41 is a subset of Solution #45, assuming “send all” in solution #45 means “send all” data that is to be purged.
2. Solution #45 gives the operator the option (via configuration of consumers) to specify different actions for different consumer NFs for how the buffered data and subscription are to be handled when the Producer NF has a performance issue. This allows different actions (per-consumer) for handling of buffered data and subscriptions according to the importance of the data/analytics as determined by the operator. For example:

* The producer NF having performance issues may discard the data and terminate the subscription for consumer requests that are of secondary importance (e.g. the data are of secondary importance for determining analytics or are where the analytics is not of critical importance).

Note this relieves the Producer NF of the burden to transmit the buffered data and continue the subscription during times when the Producer NF is having performance issues.

* The producer NF having performance issues may transmit the data to the consumer and continue the subscription for consumer requests that are of primary importance (e.g. the data are very importance for determining an analytic or are where the analytic is of critical importance).

7.x.2.3 ADRF / NWDAF Data Storage Management

Solution 46 is the only solution that addresses the management of data stored in the ADRF /NWDAF. We note that Storage policy that may be provisioned on the DCCF, NWDAF and ADRF, and Storage Handling Requests that may be sent by data or analytics consumers may both represent operator policy since NF consumers (with the exception of an untrusted AF) are part of the operator’s network. In this case Storage Policy on the DCCF, NWDAF and ADRF represent NF granularity rules for storing data, while Storage Handling Requests represent per-consumer granularity rules. Per-consumer granularity allows a given set of data to be stored, for example, for a longer or shorter duration according to how the data is used by the consumer while “storage policy” provides instructions in the absence of a request from the consumer.

\*\*\* Next change (all new text) \*\*\*

# 8.x Conclusion for KI#4

1. For DCCF Relocation, Solution 12 supports both DCCF and MFAF relocation in a manner consistent with NWDAF, SMF and AMF relocation. Solution 12 is adopted for normative work.
2. For Managing Impact of storing data in NFp during muting, Solutions #41 and #45 are adopted for normative work.
3. For ADRF / NWDAF Data Storage Management, Solution #46 is adopted for normative work.

\*\*\* End of changes \*\*\*