**SA WG2 Meeting #141-e S2-200xxxx**

**Online, 12 October – 23 October 2020 (revision of )**

**Source: Sandvine**

**Title: KI #7, Sol 69: Update to improves the Observed Service Experience Analytics ID**

**Document for: Discussion, Approval.**

**Agenda Item: 8.1**

**Work Item / Release: FS\_eNA\_ph2 / Rel-17**

*Abstract: This contribution is related to Key Issues #7 Sol 61: Update, it improves the observed Service experience Analytics ID stated in TS-23.288; by including Application IDs that are present in the traffic mix and are not necessarily linked to the AFs*

# Discussion

Key Issue #7 proposes to study and determine which Analytics-ID, from those described in TS 23.288 improves analytic analysis. The addition of data can comprise of either Application ID, related KPIs or both; this data is available at the UPF as described in 23.503 clause 6.2.2.2 and is based on the packet inspection functionality available in the UPF as described in 23.501 clause 6.2.3.

This contribution improves the observed Service experience Analytics ID stated in TS-23.288; it focuses on improving statistics reporting and extending the analysis capability to cover those Application IDs that are present in the traffic mix and are not necessarily linked to the AFs.

Measurement of QoE

Related to measurement of QoE from Application-IDs in TS23.288 is stated in table in Table 6.4.2-1 the Service Experience is provided by AF, in several figures and paragraph it is stated that the Service experience is provided by the AF, there is also a NOTE: *When the Service Experience is expressed as a customized MOS, the customized MOS may be defined by the content provider or by the MNO and may be based on the nature of the targeted service type (e.g. web browsing, gaming, augmented reality, V2X, SMS).*

 However in the Figure 6.4.4-1 there is just one NOTE 2 says *QoE measurements from the applications are based on outcome of the ongoing SA5 Rel-16 WID "Management of QoE measurement collection" which addresses how to collect the QoE measurements from the applications in the UE.* It is necessary to conciliate such contradiction.

Rel-16 rely on TS 28.406 for measurements of QoE in the UE. TS 28.406 is limited to QoE metrics for 3GP-DASH and MTSI, which corresponds respectively to Dynamic Adaptive Streaming over HTTP and speech, video and text media MTSI. It is a very limited scope.

To base the measurement of the QoE exclusively on the UE, it produces to rely on the implementation of this capability on the UEs, likely the most economic or simple devices will never implement such capability, the legacy devices unlikely will implement the new version of application ID. In the other hand the limited scope defined so far in TS 28.406 not only exclude those mentioned in the NOTE such as gaming, augmented reality, V2X but also any new kind of Application ID that appear in the market tomorrow. For instance an important service excluded is QoE for VPN service no matter what payload is transporting. Anyway the customized MOS never will be supported by the UEs

In this contribution we propose to have the possibility to measure the QoE in UPF for those Application ID present in the Internet traffic that their QoE measurement for any reason is not supported in the UE. How the QoE measurement is performed in the UPF is out of the scope of SA2.

# 2. Observed Service Experience Analytics

In Rel-16, the NWDAF may provide Observed Service Experience for one or both of the following:

* Service Experience for a Network Slice: Service Experience for UEs (for a UE or a group of or any UE) for a given Application, set of Applications or any Application (i.e. all Applications) in a Network Slice;
* Service Experience for an Application: Service Experience (i.e. for a UE or a group of UEs or any UE) in an Application.

Here the term “Application” or “all Applications” refers to the Applications served by one or several AFs. To populate table 6.4.2-1 in TS 23.288, the AFs interact directly with the NWDAF and the NWDAF subscribes to the service data from AF using the Naf\_EventExposure\_Subscribe service or through the NEF using the Nnef\_EventExposure\_Subscribe service; this table is a relevant part of the Input Data.

Hence, in Rel16, this analytics ID focuses only on Application IDs served by AFs that could interact with the NEF and NWDAF. As a reference in a typical 4G network in 2020, Application IDs served by AF are less than 5% of the total Application-IDs present in the traffic.

This contribution aims that the observed Service experience includes Application IDs that are present in the traffic mix and are not necessarily linked to the AFs, also improving statistics reporting.

The NWDAF may provide Observed Service Experience no matter if the local AF serves the applications or the applications are part of the internet traffic or are a mix of them; for one or both of the following:

* Service Experience for a Network Slice: Service Experience for UEs (for a UE or a group of or any UE) for a given Application or a set of Applications or any Application that is present in the traffic mix (i.e. all Applications) in a Network Slice.
* Service Experience for an Application: Service Experience (i.e. for a UE or a group of UEs or any UE) in an Application that is present in the traffic.

# Text Proposal

The following changes are proposed to be applied to TR 23.700-91.

This contribution is related to Key Issues #7 Sol 61: Update, it improves the observed Service experience Analytics ID stated in TS-23.288; by including Application IDs that are present in the traffic mix and are not necessarily linked to the AFs

\*\*\* Start of the change \*\*\*

## 6.0 Mapping Solutions to Key Issues

Table 6.0-1: Mapping of Solutions to Key Issues

|  |  |
| --- | --- |
| Solutions | Key Issues |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| 61 | 7 |  |  |  |

\*\*\* Next (All new text) \*\*\*

6. X.9 Improvement of Observed Service Experience Analytics

In Rel16, this analytics ID focuses only on Application IDs served by AFs that could interact with the NEF and NWDAF. As a reference in a typical 4G network in 2020, Application IDs served by AF are less than 5% of the total Application-IDs present in the traffic.

This contribution aims that the observed Service experience includes Application IDs that are present in the traffic mix and are not necessarily linked to the AFs, also improving statistics reporting.

The NWDAF may provide Observed Service Experience no matter if the local AF serves the applications or the applications are part of the internet traffic or are a mix of them; for one or both of the following:

* Service Experience for a Network Slice: Service Experience for UEs (for a UE or a group of or any UE) for a given Application or a set of Applications or any Application that is present in the traffic mix (i.e. all Applications) in a Network Slice.
* Service Experience for an Application: Service Experience (i.e. for a UE or a group of UEs or any UE) in an Application that is present in the traffic.

Once the Application-IDs present in internet traffic are included as a possible targeted Application-IDs the statistics reporting is implicitly improved, now the reporting is not limited to Application-ID served by those AFs that can provide the service data information to the NWDAF.

6. X.9.1 Analytics Filter Information improvement

The improvement performs one change in the Analytics Filter Information part of the Observed Service Experience related network data Analytics ID. It adds a new parameter TOPN (1... max). This change allows the service consumer to target the top N applications that are experiencing the poorest service experience; that are present in the internet traffic and are not served by AFs that can interact with the NWDAF. In this case of the TOPN parameter is specified, the service consumer does not need to include in the filter or in the input data the Application-IDs that wants to target as part of the application-IDs that are present in internet traffic.

The following new information is now part of the TS 23.288 Table 6.4.1-1: Analytics Filter Information related to the observed service experience

|  |  |
| --- | --- |
| Information | Description |
| TOPN (1... max) | Top N applications that are experiencing the poorest service experience; that are present in the internet traffic and are not served by AFs that can interact with the NWDAF. |
| NOTE 4: If no TOPN is provided, the Analytics Filter information applies only to the provided Application ID in the Network Slice. |

6. X.9.2 Input data improvement

The improvement performs one change in the input data part of the Observed Service Experience related network data Analytics ID. This change allows the NWDAF to receive Data information related to service experience available at the UPF

### The following new information is added to TS 23.288 Table 6.4.2-1: Service Data from AF related to the observed service experience

Table 6.4.2-1: Service Data from AF related to the observed service experience

|  |  |  |
| --- | --- | --- |
| Information | Source | Description |
| Application ID | AF, UPF | To identify the service and support analytics per type of service (the desired level of service) |
| IP filter information | AF, UPF | Identify a service flow of the UE for the application |
| Locations of Application | AF/NEF | Locations of application represented by a list of DNAI(s). The NEF may map the AF-Service-Identifier information to a list of DNAI(s) when the DNAI(s) being used by the application are statically defined. |
| Service Experience | AF, UPF | Refers to the QoE per service flow as established in the SLA and during on boarding. It can be either e.g. MOS or video MOS as specified in ITU-T P.1203.3 [11] or a customized MOS for any kind of service including those not related to video or voice. |
| Timestamp | AF, UPF | A time stamp associated to the Service Experience provided by the AF, mandatory if the Service Experience is provided by the ASP. |

NOTE: How the information in table above is collected will not be defined in Rel-17.

6. X.9.3 Procedures improvement

They are performed changes in the clause 6.4.4 Procedures Figure 6.4.4-1 and steps descriptions. The purpose of this change is to include the part where the NWDAF receives Data available at the UPF. It is also added the follow note

NOTE: How NWDAF receives data available at UPFs is not defined in this specs.

### The following new step is added to TS 23.288 Figure 6.4.4-1 and respective description.



Figure 6.9.4-1: Procedure for NWDAF providing Service Experience for an Application

The follow steps descriptions suffer changes

**2b.** NWDAF receives Data available at the UPF. Application ID & info related service experience and KPIs see table 6.4.1-1, 6.4.2-2

2c. NWDAF subscribes the network data from 5GC NF(s) in the Table 6.4.2-2 by invoking Nnf\_EventExposure\_Subscribe service operation.

2d. With these data, the NWDAF estimates the Service experience for the application.

NOTE 2: QoE measurements from the applications are based on outcome of the ongoing SA5 Rel-16 WID "Management of QoE measurement collection" which addresses how to collect the QoE measurements from the applications in the UE.

NOTE 3: QoE measurements from Application-IDs no supported in the UE are performed and available at UPF. How the QoE measurement is performed in the UPF is out of the scope of SA2.

NOTE: How NWDAF receives data available at UPFs is not defined in this specs.

### The following new step is added to TS 23.288 Figure 6.4.5-1 and respective description.



Figure 6.4.5-1: Procedure for NWDAF providing Service Experience for a UE or a group of UEs in a Network Slice

6. X.9.5 Impacts on services, Existing Nodes and Functionality

UPF:

* At least one UPF in the path of each PDU session shall have available the following KPIs

|  |  |  |
| --- | --- | --- |
| Information | Source | Description |
| Application IDs | UPF | To identify the service and support analytics per type of service (the desired level of service) |
| Service Experience, it could be individual or the Top N applications that are experiencing the poorest service experience; | UPF | Refers to the QoE per service flow as established in the SLA and during on boarding. It can be either e.g. MOS or video MOS as specified in ITU-T P.1203.3 [11] or a customized MOS for any kind of service including those not related to video or voice. |
| Timestamp | UPF | A time stamp associated to the Service Experience provided by the AF, mandatory if the Service Experience is provided by the ASP. |

NOTE: How the information in table above is collected will not be defined in Rel-17.

NWDAF:

* To support additional data in the input data as follow

|  |  |
| --- | --- |
| Information | Description |
| TOPN (1... max) | Top N applications that are experiencing the poorest service experience; that are present in the internet traffic and are not served by AFs that can interact with the NWDAF. |

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