**SA WG2 Meeting #S2-153e(e-meeting) S2-220xxxx**

**10-14 October 2022, Electronic Meeting (revision of S2-220xxxx)**

**Source: Nokia, Nokia Shanghai Bell**

**Title:** **KI#1 and KI#2, Conclusions**

**Document for: Approval**

**Agenda Item: 9.19**

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

*Abstract of the contribution: This contribution proposes conclusions for Key Issues #1 and #2.*

# 1. Introduction

This contribution proposes conclusions for Key Issue #1 and Key Issue #2.

# 2. Proposal

This paper proposes the following updates to TR 23.700-60 clause 8 (all new text) with respect to conclusions for Key Issue #1 and Key Issue #2. Both key issues #1 and #2 are concluded together as they are closely related and several solutions aim at resolving both key issues.

\* Start of changes all new\*

# 8 Conclusions

Editor's note: This clause will list conclusions that have been agreed during the course of the study item activities.

### 8.X KI #1 and KI#2

**General**

The main scenario to support is where UEs involved in a multi-modality communication service have already established their PDU Sessions when they start using the service. The information about the UEs and traffic flows is provided to the 5GS by an Application Function, because only at that point the flows have been negotiated between the application endpoints and the AF can provide service flow identification and QoS requirement information to the 5GS.

The summary of the main new mechanisms is:

* Any number of service flows related to any number of UEs can be associated to a common group. Any flow in the group can be declared critical within the group. Each flow can have a number of alternative QoS profiles with a specific ordering. The group may have a policy on synchronized delivery.
  + - * + Criticality attribute is used for the purpose of assisting admission control and QoS fulfilment. Its semantic is that unless (any of) the (alternative) QoS requirement(s) is met for a critical flow within the group, the whole QoS for the whole group is considered failed.
        + Synchronized delivery policy is used for the purpose of selecting proper delay requirements for the flows. It is specifically used to select alternative QoS profiles for the flows in the group in a consistent manner.
* In case the service flows in the group are related to multiple UEs, multiple PCFs may become involved, requiring messaging between the PCFs. This is facilitated by the NEF.
* How the new grouping and policy information is used is normatively described for NEF and to some extent for PCF. For RAN it is only provided as assistance information to be used in an implementation specific manner.

**AF to NEF**

The AF provides service flow identification, QoS requirements, flow grouping information and group treatment policy to NEF using the Nnef\_AFSessionWithQoS service API. The NEF service API is extended in the following ways:

* A single AF Session can contain one or multiple service flows related to one or multiple UEs with separate QoS requirements and alternative service requirements for each service flow. A separate QoS monitoring indicator can be provided for each service flow.

NOTE: If including service flows for multiple UEs within a single AF session is not agreeable, the alternative is to keep each AF session limited to a single UE but allow it to include multiple service flows with separate QoS requirements and alterative QoS profiles.

* Each service flow is associated with a common a flow group ID and attributes describing the role of the service flow within the group, at minimum containing an indicator whether the flow is critical for the group. Critical means the application is unusable if the flow is not admitted to the network or if flow’s QoS requirements or none of its alternative QoS requirements are fulfilled.
* The flow group ID is be associated with group treatment policies, at minimum containing an indicator whether the group of flows are to be delivered in a synchronous manner. In case that indicator is present special rules apply to how the alternative service requirements are treated.

NOTE: The above aims to be compatible also with the SDP media grouping framework where a number of media flows can be grouped and it can be indicated that Lip Synchronization (synchronized handling) should be performed for the flows within the group. If the AF (being, e.g., an IMS CSCF or WebRTC signalling server) obtains the SDP descriptions exchanged between the endpoints it can map the SDP information to new AFSessionWithQoS flow group D parameter and the synchronized delivery group handling policy.

The AF can update the session by adding or removing service flows or updating their QoS requirements or group role attributes or group policies via Nnef\_AFSessionWithQoS service API.

**NEF**

Different UEs involved in the flow group may be served by different PCFs. NEF discovers and selects a PCF on per UE basis.

If multiple PCFs are involved in the same flow group, the NEF keeps track of this and forwards notifications and results information between the PCFs so that each PCF involved in the group gets information from each other.

**NEF to PCF or TSCTSF**

NEF uses the Npcf\_PolicyAuthorization service API for each PCF separately. The Npcf\_PolicyAuthorization service API is extended with the same new information as the Nnef\_AFSessionWithQoS API, namely the flow group ID, the flow criticality attribute and the synchronized delivery group treatment policy.

NEF can also use TSCTSF rather than directly contacting PCF. For this reason, the Ntsctsf\_QoSandTSCAssistance service API is also extended to include the new information.

**PCF**

PCF may use the flow group ID, flow criticality attribute and synchronized delivery group treatment policy for the following purposes:

* If it receives information from SMF or from another PCF via NEF that admission for one of the critical flows in the group failed, it may, based on this, update the policy information for all the other flows in the group.
* If it receives information from SMF or from another PCF via NEF that QoS fulfilment for one of the critical flows in the group failed, it may, based on this, update the policy information for all the other flows in the group.
* If it receives information from SMF or from another PCF via NEF that alternative QoS profile, if initially provided by AF, was taken into use for one of flows in a group with a synchronized delivery group treatment policy, it may, based on this, update the corresponding alternative QoS profiles to be used for all the other flows in the group.

**PCF to SMF and RAN**

PCF provides the new information to SMF via Npcf\_SMPolicyControl\_UpdateNotify service API per impacted PDU session.

SMF determines the QoS Flow binding and provides the new information to AMF via the Namf\_Communication\_N1N2MessageTransfer service API per PDU session. Note that at this point the policies originally attached to service flows is mapped to QoS flows. AMF forwards the information via N2 Message procedure to NG-RAN.

**RAN**

NG-RAN may use the flow group ID, flow criticality attribute and synchronized delivery group treatment policy for its admission control or alternative QoS profile application decisions by considering all the QoS flows in the same group in a joint manner.

\* End of changes \*