**3GPP TSG-SA5 Meeting #138e *S5-214185rev1***

**23 Aug to 31 Aug 2021, E-meeting**

**Source: China Telecom**

**Title: The measurement of the useful output for the 5GC NF**

**Document for: Approval**

**Agenda Item: 6.5.1**

# 1 Decision/action requested

***The group is asked to discuss and agree on the proposal.***

# 2 References

[1] 3GPP TR 28.813: "Study on new aspects of Energy Efficiency (EE) for 5G "

[2] S5-213551: “Discussion paper on Useful Output Measurement Solution”

[x] 3GPP TS 28.552: "Management and orchestration; 5G performance measurements"

# 3 Rationale

In TS 28.813[1], an Editor’s note was left:

*The measurement of the useful output for the 5GC NF is FFS.*

In S5-213551[2], the measurements of the useful output for the user plane and control plane of the 5GC were discussed, and the following proposal has been endorsed:

* Useful Output of the UPF may reuse the measurement of Data Volume of UPF.
* The measurement of mean number of the registered subscribers defined in TS 28.552 can be taken as the measurement of the Useful Output of the AMF.
* The measurement of mean number of the registered subscribers measured on AMF may be taken as the measurement of the Useful Output of the control plane of the 5GC.
* The measurement of mean of the number of PDU Sessions defined in TS 28.552 can be taken as the measurement of the Useful Output of the SMF.
* The measurement of mean of the number of PDU Sessions measured in SMF may be taken as the measurement of the Useful Output of the control plane of the 5GC.

This pCR is to define the measurement of the useful output for the 5GC NF based on the S5-213551[2].

# 4 Detailed proposal

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| **Start of modifications (all new text)** |

#### 4.2a.2.2 Potential solution #1 for measuring UsefulOutput5GC

##### 4.2a.2.2.1 Introduction

This potential solution focuses on the definition of UsefulOuput5GC appeared in:



For this proposed solution, it can be applied to both User Plane Function (UPF) and Control Plane network functions that constitute the 5GC. And it is assumed that the definition of the useful output for UPF and control plane network function are different.

##### 4.2a.2.2.2 Description

The useful output of a 5GC NF is defined as the capacity of the 5GC NF, and depending on the different type of 5GC NFs, it may be:

* throughput (e.g. bps) for 5GC User Plane Functions
* capacity (e.g. subscribers, sessions) for control plan 5GC NF.

The UsefulOuput5GC is composed of the useful output of all the 5GC NF. Therefore, the UsefulOuput5GC can be divided into:

* UsefulOuput5GC, UP
* UsefulOuput5GC, CP, which can be further divided into:

- UsefulOuput5GC, CP, subscribers

- UsefulOuput5GC, CP, sessions

NOTE: Each type of the useful output is one dimension used to describe the UsefulOuput5GCThe useful output of the same kind can be added together, while the useful output of different kinds cannot be added together.

In this proposed solution, the following network functions may be considered (see clause 4.2.2 of TS 23.501 [2]):

- Access and Mobility Management Function (AMF)

- Session Management Function (SMF)

- User Plane Function (UPF)

The Useful Output of the UPF can be measured by the Data Volume of UPF at N3 or N6 interface defined in TS 28.552[x] clause 5.4.1.3, 5.4.1.4, 5.4.2.1 and 5.4.2.2. The UsefulOuput5GC, UP can be taken as the measurement of the Useful Output of the UPF(s). Therefore, the UsefulOuput5GC, UP is equivalent to the Data Volume of UPF(s) at N3 or N6 interface(s).

For N3 interface(s), the UsefulOuput5GC, UP can be expressed as follows:



and

- GTP.InDataOctN3UPF already defined in TS 28.552 [x] clause 5.4.1.3 (Number of octets of incoming GTP data packets on the N3 interface, from (R)AN to UPF), and

- GTP.OutDataOctN3UPF already defined in TS 28.552 [x] clause 5.4.1.4 (Number of octets of outgoing GTP data packets on the N3 interface, from UPF to (R)AN).

For N6 interface(s), the UsefulOuput5GC, UP can be expressed as follows:



and

- IP.N6IncLinkUsage.N6RP already defined in TS 28.552 [x] clause 5.4.2.1 (N6 incoming link usage, in bit/sec),

- IP.N6OutLinkUsage.N6RP already defined in TS 28.552 [x] clause 5.4.2.2 (N6 outgoing link usage, in bit/sec),

- MeasurementDuration is the duration, in seconds, of the measurement period.

The Useful Output of the AMF can be measured by the mean number of the registered subscribers defined in TS 28.552[x] clause 5.2.1.1. The UsefulOutput5GC, CP, subscribers can be taken as the measurement of the Useful Output of the AMF(s). Therefore, the UsefulOutput5GC, CP, subscribers is equivalent to the mean number of the registered subscribers of the AMF(s).

The UsefulOuput5GC, CP, subscribers can be expressed as follows:



and

- RM.RegisteredSubNbrMean.SNSSAI already defined in TS 28.552 [x] clause 5.2.1.1 (mean number of registered state subscribers per S-NSSAI per AMF).

The Useful Output of the SMF can be measured by the mean of the number of PDU Sessions defined in TS 28.552 [x] clause 5.3.1.1. The UsefulOutput5GC, CP, sessions can be taken as the measurement of the Useful Output of the SMF(s). Therefore, the UsefulOutput5GC, CP, sessions is equivalent to the mean of the number of PDU Sessions of SMF(s).

The UsefulOuput5GC, CP, sessions can be expressed as follows:



and

- SM.SessionNbrMean.SNSSAI already defined in TS 28.552 [x] clause 5.3.1.1 (mean number of PDU sessions per S-NSSAI per SMF).

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| **End of modifications** |