Technical Disclosure Commons

Defensive Publications Series

October 2020

CONTROLLING CHARGING TRIGGERS AND/OR LIMITS AT A RATING GROUP/SERVICE LEVEL FOR 5G CHARGING

Mukesh Yadav

Ravi Shankar Mantha

Follow this and additional works at: https://www.tdcommons.org/dpubs_series

CONTROLLING CHARGING TRIGGERS AND/OR LIMITS AT A RATING GROUP/SERVICE LEVEL FOR 5G CHARGING

AUTHORS:

Mukesh Yadav

Ravi Shankar Mantha

ABSTRACT

Presented herein is technique that may provide a mobile network operator with the ability to control all charging triggers and/or limits at a Rating Group (RG) level or at a RG and Service Identity (ID) (RG+ServId) level. Hence, a mobile network operator can leverage the technique presented herein in order to better control bandwidth allocation to services within an RG, when desired.

DETAILED DESCRIPTION

In Third Generation Partnership Project (3GPP) Fifth Generation (5G) network charging, a Charging Function (CHF) can arm a Session Management Function (SMF) for charging Limits and/or Triggers at a Rating Group (RG) level. Each Charging service is associated with some Rating group. Within a same RG, there can be multiple Charging Services, each of which that can be differentiated by a Service Identity (ID).

Thus, currently in a 5G architecture, the CHF can arm the SMF at an RG level for:

1. Triggers: Event(s) when the SMF has to report usage to the CHF; and

2. Limits: Volume/Time threshold(s) when the SMF has to report usage.

While the CHF can arm values at the RG level, reporting can be at the RG or the RG and Service ID (RG+ServId) level. Since reporting is possible at Service ID level, there are use cases in which allocation of triggers/limits should be at the Service ID level. However, there are limitations in this approach.

Consider an example RG, RG 10, involving two Services with Service ID S1 and S2. If Volume Limits are set to 100 Megabits (Mb), there is currently no control at the SMF to distribute the Limits to S1 and S2; rather, the SMF reporting will occur at 100Mb. However, consumption of the services S1/S2 could be 30/70, 50/50, or 10/90 (among others). Further, if there is a set of triggers that are not desired to be applicable for all

1

6548

Services within an RG, such granularity cannot currently be supported in current 5G deployments.

However, charging control at a Service level within an RG is desirable. For example, a network operator may want to control Limits at an RG level but at thresholds proportionate at the Service Level. Consider, for example, RG 10 as a Streaming RG in which an operator desires 100 Mb to be allocated for Streaming. Within this RG, the operator may desire to set a bandwidth differentiation with respect to different services, say a first streaming video provider versus a second streaming video provider. Yet, such service differentiation is not possible under current 5G standards.

3GPP Technical Specification (TS) 32.291, Section 6.1.6.2.18 currently defines that the CHF arms the SMF with Triggers/Quotas/Limits at the RG level using data types defined as follows:

```
ChargingDataResponse
{
   ...
   invocationSequenceNumber
   multipleUnitInformation array(MultipleUnitInformation) //this is array
   per rating Group
   …
}
MultipleUnitInformation
{
   …
   RatingGroup
   triggers array(trigger) //This is array of various trigger including
   volume/Time Limits
   …
}
```

Thus, as illustrated above, all information from the CHF is per RG level. However, the technique of this proposal involves enhancing the current information from the CHF to further include control at the RG level or the RG + Service ID Level. For this proposal, consider that the data types may be enhanced as follows:

6548

3

```
MultipleUnitInformation
{
    …
    RatingGroup 10
    triggers array(trigger) //This is array of various trigger including
    volume/Time Limit
} // All info at RG level
{
    …
    RatingGroup 11
    [
        ServiceId 1
        trigger array(trigger) //This is array of various trigger including
        volume/Time Limit

    ]
    [
        ServiceId 2
        trigger array(trigger) //This is array of various trigger including
        volume/Time Limits

    ]
} // All info at RG level is controlled at Service ID Level. Limits/Triggers
can be distribute at will of operator.
    // Same or different triggers can be enabled at Service IDs within RG.
```

Although the enhancements above are illustrated only with regard to Triggers/Limits, it is to be understood that the technique of this proposal could also be used to control Quotas from the CHF at the ServId level in a similar manner as provided for Triggers/Limits.

Consider an example call flow, as shown below in Figure 1, which illustrates current behavior in a 5G network without utilizing the technique of this proposal, in contrast to Figure 2, which illustrates behavior in a 5G network that may be realized utilizing the technique of this proposal.
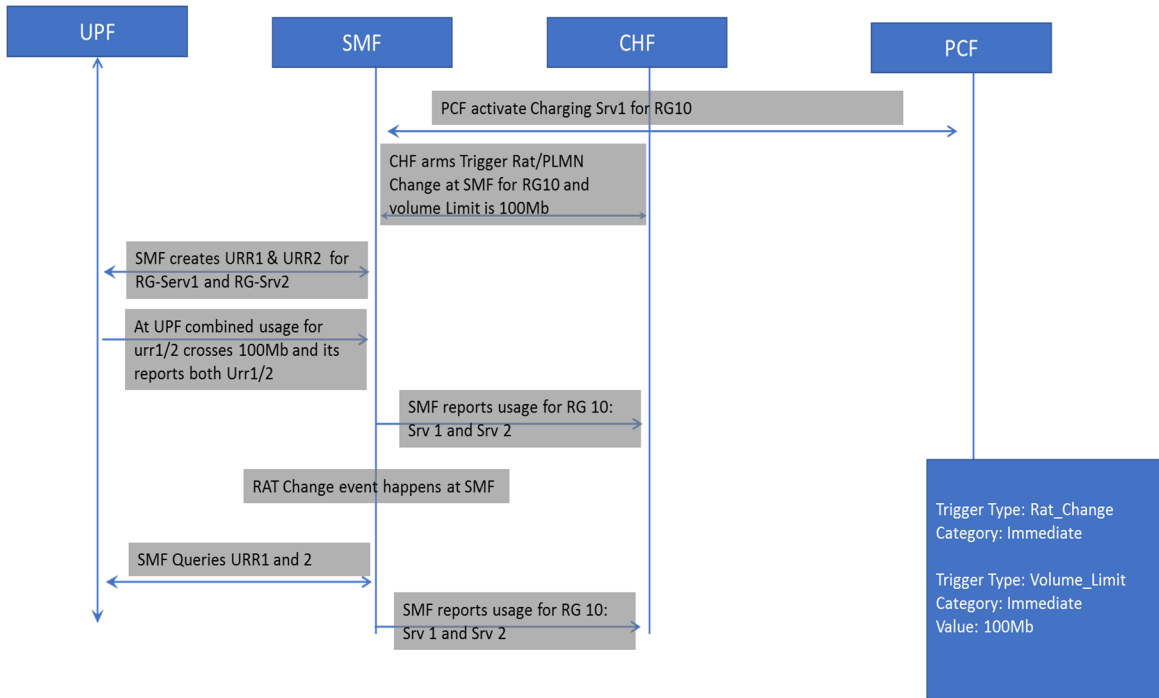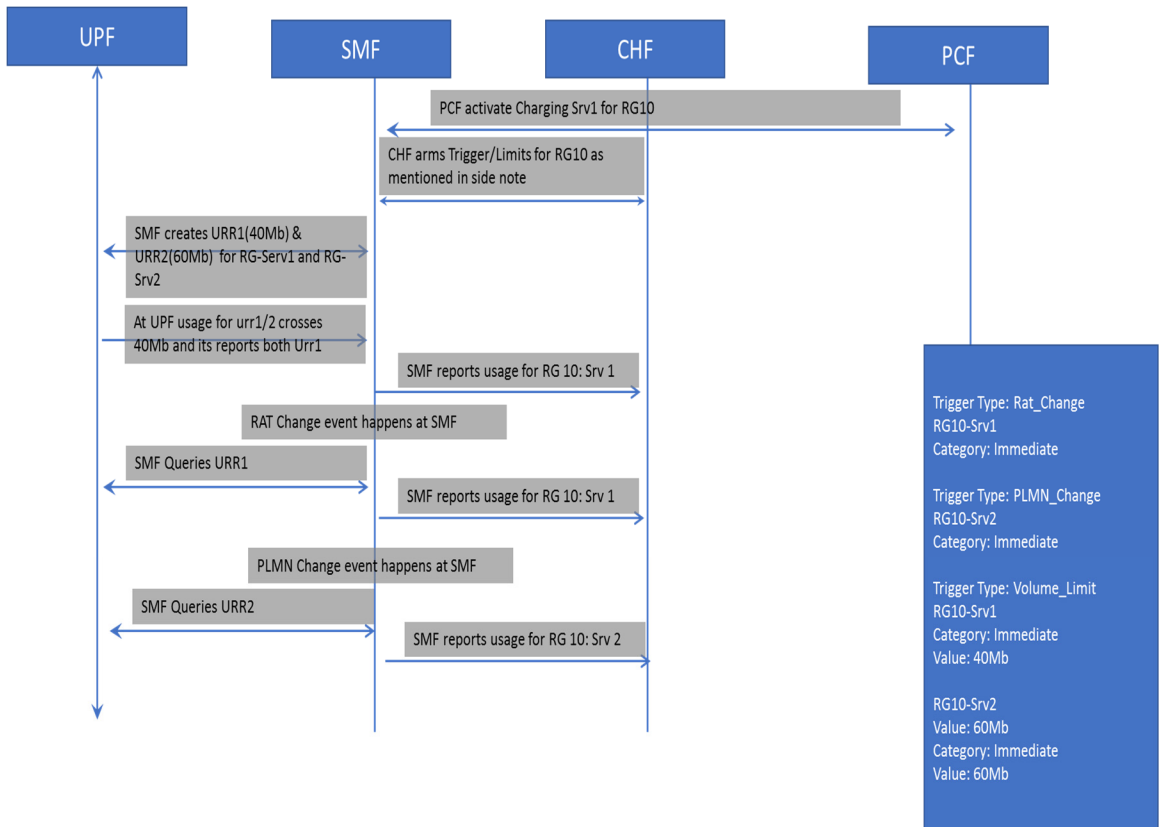
Figure 1: Current 5G Behavior

Figure 2: 5G Behavior Utilizing the Technique of this Proposal

4   6548

In summary, this proposal involves a technique that may provide a mobile network operator with the ability to control all charging triggers and/or limits at a RG level or at a RG and Service ID level. This technique may also be utilized to provide a network operator with the ability control Quotas, similar to that of a 4G architecture. Hence, a mobile network operator can leverage the technique presented herein in order to better control bandwidth allocation to services within an RG, when desired.