**3GPP TSG-SA5 Meeting #137-e *S5-213152rev1***

electronic meeting, online, 10 May - 19 May 2021

**Source: CATT**

**Title: pCR Add possilbe solution for Broadcast mode ProSe Direct Communication**

**Document for: Approval**

**Agenda Item: 7.5.3**

# 1 Decision/action requested

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

# 2 References

[1] 3GPP TR 32.846: “Study on charging aspects of Proximity-based Services in 5GS”.

# 3 Rationale

This contribution adds possible solutions for Broadcast mode ProSe Direct Communication.

# 4 Detailed proposal

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| **1st Modified Section** |

#### 6.2.4.x Solution #2.1: ProSe Broadcast mode of Direct Communication charging for Key issues #2.1

##### 6.2.4.x.1 Consideration for Broadcast mode of Direct Communication charging

For broadcast mode of ProSe direct communication over PC5 reference point, the UE is configured with the Destination Layer-2 ID(s) to be used for ProSe applications. The Destination Layer-2 ID for a ProSe direct communication is selected based on the configuration.

The transmitting UE in broadcast communication determines the destination Layer-2 ID for broadcast and and assigns itself a source Layer-2 ID. The receiving UE determines the destination Layer-2 ID for broadcast reception. The transmitting UE sends the service data using the source Layer-2 ID and the destination Layer-2 ID.

The 5GS may collect the following charging information in addition to the charging information described in Figure 6.2.4.1.1-1:

- ProSe Source Layer-2 ID

- ProSe Destination Layer-2 ID

- Indication whether the UE should use IPv4 or IPv6 for broadcast

- Application specific data, e.g. application specific session floor control information

For Broadcast mode ProSe Direct Communication charging, the chargeable events could be:

- Received Direct Communication Usage Report (for broadcast).

If event based charging is used, upon this event, a Charging Data Request[Event] for broadcast is generated.

If session based charging is used, either a Charging Data Request[Initial], Charging Data Request[Update], or Charging Data Request[Termination] is generated.

##### 6.2.4.x.2 Architecture Description

The possible solutions for ProSe broadcast mode Direct Communication charging are based on the potential converged charging architectures defined in clause 6.2.4.1.2.

##### 6.2.4.x.3 Flow Description

6.2.4.x.3.1 ProSe broadcast mode of Direct Communication event-based charging - PEC



Figure 6.2.4.x.3.1: ProSe broadcast mode of Direct Communication event-based charging – PEC

1. The receiving UE(s) determine the destination Layer-2 ID for broadcast reception. The destination Layer-2 ID is passed down to the AS layer of receiving UE(s) for the reception.

2. The transmitting UE ProSe application layer provides data unit and may provide ProSe Application Requirements to ProSe layer.

3. The transmitting UE determines the destination Layer-2 ID for broadcast, and self-assigns the source Layer-2 ID.

4. The transmitting UE sends the ProSe data using the source Layer-2 ID and the destination Layer-2 ID as defined in TS 23.304 [11].

5. When the UE decides that reporting criteria are met, according to the configuration, and the connection to the network is available, the UE creates the corresponding usage information report.

NOTE 1: Both transmitting UE and receiving UE(s) can decide that reporting criteria are met and trigger the usage reporting procedure.

NOTE 2: When the UE is out of NR coverage and has no connection to the 5G network, the usage information is stored in a secure environment in the UE, it will trigger the reporting when UE comes back to NR coverage, as described in TS32.277[4].

6. UE triggers the usage reporting procedure. UE (CTF-AMC) sends the usage information report to the ProSe NF（CTF-ADF), according to the configuration.

7ch-a. Upon reception of Direct Communication usage information report, the NF(CTF) triggers the Charging Data Request [Event]. The NF(CTF) sends Charging Data Request [Event] to CHF.

7ch-b. The ProSe broadcast mode Direct Communication CDR is generated by CHF.

7ch-c. The CHF acknowledges by sending Charging Data Response [Event] to the NF(CTF).

6.2.4.x.3.2 ProSe broadcast mode of Direct Communication session-based charging – SCUR



Figure 6.2.4.x.3.2: ProSe broadcast mode of Direct Communication session-based charging – SCUR

1-4 These steps are the same as described in Figure 6.2.4.x.3.1.

5. When the UE decides that reporting criteria are met, according to the configuration, and the connection to the network is available, the UE creates the corresponding usage information report.

NOTE 1: Both transmitting UE and receiving UE(s) can decide that reporting criteria are met and trigger the usage reporting procedure.

NOTE 2: When the UE is out of NR coverage and has no connection to the 5G network, the usage information is stored in a secure environment in the UE, it will trigger the reporting when UE comes back to NR coverage, as described in TS32.277[4].

6. UE (CTF-AMC) sends the usage information report to the NF (CTF-ADF).

7ch-a. If the CTF located with ProSe Service is configured to use session based charging, upon reception of direct communication usage information report for a broadcast, the NF (CTF) triggers the Charging Data Request[Init] when there is no open charging session. The NF (CTF) sends the Charging Data Request[Interim] to the corresponding CDF, and starts a charging session.

7ch-b. Based on policies, the CHF opens a CDR related to the service.

7ch-c. The CHF grants authorization to NF (CTF) for the service to start, and returns Charging Data Response.

8. UE triggers the usage reporting procedure when the reporting criteria are met.

9ch-a. If there is a charging session, upon reception of direct communication usage information report, the NF (CTF) triggers the Charging Data Request[Update]. The NF (CTF) sends the Charging Data Request[Update] to the corresponding CHF.

9ch-b. The CDR is updated by CHF for the UE.

9ch-c. The CHF returns Charging Data Response corresponding to the received Charging Data Request.

NOTE 3: The Step 9ch-a to 9ch-c may occur multiple times for update.

10. UE triggers the usage reporting procedure when the reporting criteria are met.

11ch-a. The NF (CTF) decides that the charging session should be closed, and triggers the Charging Data Request[Termination]. The NF (CTF) sends the Charging Data Request[Termination] to the corresponding CHF.

11ch-b. The CDR is closed by CHF for the UE.

11ch-c. The CHF returns Charging Data Response corresponding to the received Charging Data Request.

##### 6.2.4.x.4 Solution evaluation

TBD

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| **Next Modified Section** |