**3GPP TSG-SA3 Meeting #116 *S3-242532-r1***

Jeju, Korea, 20 – 24 May 2024

**Source: Qualcomm Incorporated**

**Title: A new solution for multihop U2U relay discovery security**

**Document for: Approval**

**Agenda Item: 5.12**

# 1 Decision/action requested

***This contribution proposes a new solution to address the key issue #2.***

# 2 References

[1] Draft TR 33.743 v0.1.0

# 3 Rationale

This contribution proposes a new solution for multi-hop UE-to-UE Relay discovery security.

# 4 Detailed proposal

It is proposed that SA3 approved the below changes for inclusion in the draft TR [1].

**\*\*\*\* START OF CHANGES \*\*\*\***

## 6.Y Solution #Y: Multi-hop UE-to-UE Relay discovery security

### 6.Y.1 Introduction

This solution addresses the first, third and fourth security requirements in the key issue #2 regarding the multi-hop UE-to-UE (U2U) Relay discovery. This solution assumes the architecture and procedures proposed in the solution #3 of TR 23.700-03 [1]. This means that 5G ProSe UE-to-UE Relays discover each other to form a 5G ProSe UE-to-UE Relay cloud, and 5G ProSe End UEs first discover nearby 5G ProSe UE-to-UE Relay and discover a target 5G ProSe End UE at IP layer (e.g., based on MANET routing protocol) via 5G ProSe UE-to-UE Relay cloud.

This solution proposes to reuse the security procedure for 5G ProSe UE-to-Network Relay discovery with Model A and Model B as specified in clause 6.1.3.2.2 of TS 33.503 [5]. That is, the discovery messages are protected based on the discovery security materials associated with an RSC for multi-hop UE-to-UE Relay.

### 6.Y.2 Solution details

Based on the architecture and procedures in the solution #3 of TR 23.700-3 [1], this solution consists of two types of relay discovery: one for Relay discovery among 5G ProSe UE-to-UE Relays and the other one for Relay discovery between an 5G ProSe End UE and 5G ProSe UE-to-UE Relay.

1. Relay discovery among 5G ProSe UE-to-UE Relays

5G ProSe UE-to-UE Relays perform a Relay discovery to form a 5G ProSe UE-to-UE Relay cloud. For the provisioning of discovery security materials and discovery message protection based on the discovery security materials associated with an RSC for multi-hop UE-to-UE Relay, the security procedures for 5G ProSe UE-to-Network Relay discovery with Model A and Model B as specified in clause 6.1.3.2.2 of TS 33.503 [5] are used with the following changes:

- One 5G ProSe UE-to-UE Relay plays the role of a 5G ProSe Remote UE and the other 5G ProSe UE-to-UE Relay plays the role of a 5G ProSe UE-to-Network Relay.

2. Relay discovery between an 5G ProSe End UE and 5G ProSe UE-to-UE Relay

The 5G ProSe End UE performs a Relay discovery to discover a 5G ProSe UE-to-UE Relay that supports a multi-hop UE-to-UE Relay. For the provisioning of discovery security materials and discovery message protection based on the discovery security materials associated with an RSC for multi-hop UE-to-UE Relay, the security procedures for 5G ProSe UE-to-Network Relay discovery with Model A and Model B as specified in clause 6.1.3.2.2 of TS 33.503 [5] are used with the following changes:

- A 5G ProSe End UE plays the role of a 5G ProSe Remote UE and a 5G ProSe UE-to-UE Relay plays the role of a 5G ProSe UE-to-Network Relay.

Editor’s Note: Alignment with SA2’s conclusion about the procedure is needed.

### 6.Y.3 Evaluation

TBD

**\*\*\*\* END OF CHANGES \*\*\*\***