**3GPP TSG-SA3 Meeting #116 *S3-242532-r2***

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: How is privacy of End UE during discovery preserved when Relays share End UE User info (with associated IP address) to other Relays when using MANET based routing discovery is FFS.

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

### 6.Y.3 Evaluation

TBD

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