**3GPP TSG-CT WG1 Meeting #129-eC1-212045**

**Electronic meeting; 19-23 April 2021**

**Source: OPPO, Qualcomm Incorporated**

**Title: Discovery procedure overview**

**Spec: 3GPP TS 24.554 v0.1.0**

**Agenda item: 17.2.18**

**Document for: Agreement**

**1. Introduction**

This document provides the contents for discovery overview.

**2. Reason for Change**

Overview for discovery procedures is neccessary.

Also for UE-intiated procedure, UE should perform 5G DDNMF discovery firstly. Based on TS 23.304, the 5G DDNMF discovery is the same way as EPS. Then PDU session to 5G DDNMF for transmitting PC3a signalling is established based on the UE local configuration or URSP as specified in TS 24.526 (TS 23.503 in stage 2).

**3. Proposal**

It is proposed to agree the following changes to 3GPP TS 24.554.

\* \* \* First Change \* \* \* \*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.304: "Proximity based Services (ProSe) in the 5G System (5GS); Stage 2".

[a] IETF RFC 7230: "Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing".

[b] IETF RFC 7231: "Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content".

[d] 3GPP TS 24.526: "UE policies for 5G System (5GS); Stage 3".

[e] OMA-WAP-TS-PushOTA-V2\_1-20110405-A: "Push Over the Air".

[f] [OMA-AD-Push-V2\_2-20110809-A](http://www.openmobilealliance.org/technical/release_program/docs/copyrightclick.aspx?pck=Push&file=V2_2-20110809-A/OMA-AD-Push-V2_2-20110809-A.pdf): "Push Architecture".

[g] [WAP-168-ServiceLoad-20010731-a](http://www.openmobilealliance.org/technical/release_program/docs/copyrightclick.aspx?pck=Push&file=V2_2-20110809-A/WAP-168-ServiceLoad-20010731-a.pdf): "Service Loading".

\* \* \* Second Change \* \* \* \*

## 6.1 Overview

### 6.1.1 Transport protocol for PC3a Control Protocol messages for 5G ProSe direct discovery

The UE and 5G DDNMF shall use HTTP 1.1 as specified in IETF RFC 7230 [a] and IETF RFC 7231 [b] as the transport protocol for 5G ProSe messages over the PC3a interface. The 5G ProSe messages described here shall be included in the body of either an HTTP request message or an HTTP response message.

### 6.1.2 Handling of UE-initiated procedures

#### 6.1.2.1 General

The following rules apply for UE-initiated procedures:

a) the UE initiates 5G ProSe transactions with an HTTP request message containing the PC3a request(s);

b) the 5G DDNMF responds to the requests with an HTTP response message containing the PC3a response(s) for the PC3a request(s); and

c) HTTP POST methods are used for PC3a direct discovery procedures.

The UE may use UE local configuration or URSP, as defined in 3GPP TS 24.526 [d], to establish a PDU session for reaching the HPLMN 5G DDNMF:

a) if a PDU session for reaching the HPLMN 5G DDNMF is not established yet, the UE shall establish the PDU session for reaching the HPLMN 5G DDNMF and shall send the HTTP request message via the PDU session for reaching the HPLMN 5G DDNMF; and

b) if a PDU session for reaching the HPLMN 5G DDNMF is already established (e.g. either due to other 5G ProSe feature or due to other application), the UE shall send the HTTP request message via the PDU session for reaching the HPLMN 5G DDNMF.

#### 6.1.2.2 5G DDNMF discovery

The IP address of the 5G DDNMF in the HPLMN may be pre-configured in the UE. The UE may use the pre-configured IP address or the FQDN of the 5G DDNMF in the HPLMN to discover the 5G DDNMF.

### 6.1.3 Handling of 5G DDNMF-initiated procedures

#### 6.1.3.1 General

The 5G DDNMF-initiated messages for 5G ProSe direct discovery over the PC3a interface shall be contained in an HTTP response message. Either HTTP long polling, or OMA Push, can be used to trigger the HTTP request corresponding to this HTTP response message. The UE and the 5G DDNMF shall support OMA Push for network initiated procedures. The UE and 5G DDNMF should support long polling as well for network initiated procedures.

If the UE supports the HTTP long polling, the UE shall include a Network-Initiated Transaction Method set to "HTTP long polling" in the DISCOVERY\_REQUEST message to the 5G DDNMF.

Upon receiving a DISCOVERY\_REQUEST message containing a Network-Initiated Transaction Method set to "HTTP long polling", if the 5G DDNMF supports the HTTP long polling, the 5G DDNMF shall include a Network-Initiated Transaction Method set to "HTTP long polling" in the DISCOVERY\_RESPONSE message.

If the UE receives a DISCOVERY\_RESPONSE message including a Network-Initiated Transaction Method set to "HTTP long polling", the UE shall use the HTTP long polling for network initiated procedures. Otherwise, the UE shall assume that the 5G DDNMF uses OMA Push for network initiated procedures.

#### 6.1.3.2 HTTP long polling

The HTTP long polling method is described by the following steps:

a) the UE sends an empty HTTP request message as a polling request when it expects network initiated message(s) over the PC3a interface;

b) the 5G DDNMF defers its response to the UE's request until;

1) one or more network-initiated PC3a message(s) for the UE are available. The 5G DDNMF encloses the message(s) in an HTTP response message and send it to the UE; or

2) a particular timeout for HTTP polling has occurred. The 5G DDNMF then sends an empty HTTP response message as the polling response to the UE; and

c) after receiving the response from the 5G DDNMF, the UE may keep polling after some waiting period if:

1) the UE receives an empty polling response; or

2) the UE receives 5G DDNMF-initiated message(s) from the 5G DDNMF but still expects additional network-initiated message(s).

NOTE: The implementation of the HTTP polling process can be coordinated with the SUPL (Secure User Plane Location) procedures to synchronize the SUPL location report procedures and the HTTP polling procedure so as to reduce unnecessary wait time of polling.

If the UE is trigged to send a PC3a message to the 5G DDNMF while it has a pending HTTP polling request, the UE shall open another HTTP connection to the 5G DDNMF to send this new request. Alternately the UE may always use a separate dedicated HTTP connection for polling.

#### 6.1.3.3 OMA Push

The OMA Push method is described by the following steps:

a) if one or more network-initiated PC3a message(s) for the UE are available, the 5G DDNMF sends a push message containing a particular URL to the UE via the OMA-Push Architecture as defined in [OMA-AD-Push-V2\_2-20110809-A](http://www.openmobilealliance.org/technical/release_program/docs/copyrightclick.aspx?pck=Push&file=V2_2-20110809-A/OMA-AD-Push-V2_2-20110809-A.pdf) [e]. The URL is linked to the PC3a message(s) to be sent to the UE. The 5G DDNMF (performing OMA Push Proxy Gateway functionality) generates a Push Message as specified in OMA-WAP-TS-PushOTA-V2\_1-20110405-A [f] with the PDU set according to [WAP-168-ServiceLoad-20010731-a](http://www.openmobilealliance.org/technical/release_program/docs/copyrightclick.aspx?pck=Push&file=V2_2-20110809-A/WAP-168-ServiceLoad-20010731-a.pdf) [g]. The URL information shall be included in the PDU payload;

b) after receiving the push message, the UE retrieves the URL from the payload of the message and sends an HTTP GET request to the 5G DDNMF with this URL; and

c) the 5G DDNMF sends an HTTP response message containing the PC3a message(s) to the UE.

\* \* \* End of Changes \* \* \* \*