**3GPP TSG-CT WG1 Meeting #141eC1-23xxx**

**Online 17– 21 April 2023**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** | **1** | **Current version:** |  |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network | **x** |

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| ***Title:*** | To update UAS UE registration procedure | | | | | | | | | |
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| ***Source to WG:*** | InterDigital Inc. | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | UASAPP\_Ph2 | | | | |  | ***Date:*** | | | 2023-04-10 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | TS 23.255 has updated the UAS UE registration, and UAS UE registration update procedures for supporting multi-USS capability, i.e. the change of UAS application specific server, and DAA capability, i.e., UAE layer support for DAA services and applications.  This CR is proposing the corresponding updates UAS UE registration, and UAS UE registration update procedures for stage-3 in TS 24.257. | | | | | | | | |
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| ***Summary of change:*** | | Multi-USS capability, DAA assist capability are included in the “UAS-UE-information" IE for the UAS UE registration, and UAS UE registration update messages. | | | | | | | | |
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| ***Consequences if not approved:*** | | Multi-USS and DAA can not be supported. | | | | | | | | |
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| ***Clauses affected:*** | | 6.4.1, 6.6.1, 7.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\*\*\* First change \*\*\*\*\*

## 6.4 UAS UE registration

### 6.4.1 Client procedure

Upon receiving a request from a UAV application to register for receiving UAV application messages from the UAS application specific server, the UAE-C shall generate an HTTP POST request message according to procedures specified in IETF RFC 7231 [5]. In the HTTP POST request message, the UAE-C:

a) shall set the Request-URI to the URI received in the UAE client UE configuration document via the SCM-S;

NOTE 1: The provision of the UAE-S information in the UAE client UE configuration document via the SCM-S is out of scope of 3GPP.

b) shall include a Content-Type header field set to "application/vnd.3gpp.uae-info+xml";

c) shall include an application/vnd.3gpp.uae-info+xml MIME body and in the <registration-info> element in the <UAE-info> root element:

1) shall include a <UAV-id> element set to the identity of the UAV which initiates the UAS UE registration procedure;

2) may include a <UAS-UE-information> element set to the related information (e.g. UAS UE IP address, Multi-USS capability, DAA assist capability) the UAS UE needs to provide to the UAE-S; and

3) may include a <proposed-registration-lifetime> element set to the time during which the UAS UE wants to stay registered to the UAE-S for receiving UAV application messages from the UAS application specific server; and

NOTE 2: If the <proposed-registration-lifetime> element is not included in the <registration-info> element, the registration lifetime is valid until the explicit UAS UE deregistration is performed as specified in clause 6.5.

d) shall send the HTTP POST request message towards the UAE-S.

\*\*\*\*\* Next change \*\*\*\*\*

## 6.6 UAS UE registration update

### 6.6.1 Client procedure

Upon receiving a request from a UAV application, if the UAE-C needs to update the registration for receiving UAV application messages from the UAS application specific server, the UAE-C shall generate an HTTP POST request message according to procedures specified in IETF RFC 7231 [5]. In the HTTP POST request message, the UAE-C:

a) shall set the Request-URI to the URI of the UAE-S for which the UAS UE has successfully registered (see clause 6.4);

b) shall include a Content-Type header field set to "application/vnd.3gpp.uae-info+xml";

c) shall include an application/vnd.3gpp.uae-info+xml MIME body and in the <registration-info> element in the <UAE-info> root element:

1) shall include a <UAV-id> element set to the identity of the UAV which initiates the UAS UE registration update procedure;

2) shall include a <UAS-UE-information> element set to the related information (e.g. UAS UE IP address, Multi-USS capability, DAA assist capability) the UAS UE needs to update; and

3) may include a <proposed-registration-lifetime> element set to the time during which the UAS UE wants to stay registered to the UAE-S for receiving UAV application messages from the UAS application specific server; and

NOTE: If the <proposed-registration-lifetime> element is not included in the <registration-info> element, the registration lifetime is not updated.

d) shall send the HTTP POST request message towards the UAE-S.

\*\*\*\*\* Next change \*\*\*\*\*

## 7.4 Data semantics

The <UAE-info> element is the root element of the XML document. The <UAE-info> element contains the <c2-modes-switching-configuration-info>, <C2-communication-mode-notification-info>, <C2-related-trigger-event-report>, <C2-operation-mode-switching>, <UAV-application-message-info>, <C2-operation-mode-switching-performed>, <registration-info> and <de-registration-info> sub-elements.

<c2- communication-modes-configuration-info> element contains the following elements:

a) <UAS-id>, an element contains identification of the UAS, which could be in form of identifier for the UAS, e.g. group ID, or collection of individual identifiers for the UAV and UAV-C, e.g. CAA ID, GPSI, IP address;

b) <C2-operation-mode-management-configuration>, an element contains the following elements:

1) <C2-operation mode-management-requirement>, an element contains the identification of the type of the C2 mode switching to be supported by the UAE server, which could be either from direct to network-assisted C2, or from network-assisted to direct C2 or to UTM navigated;

2) <allowed-C2-communication-modes>, an element contains a string set to "direct", "network assisted", or "USS/UTM navigated";

3) <primary-C2-communication-mode>, an element contains a string set to "direct", or "network assisted" used to indicate the primary C2 communication mode;

4) <secondary-C2-communication-mode>, an element contains a string set to "direct", or "network assisted" used to indicate the secondary C2 communication mode;

5) <policy-of –C2-switching>, an element contains a string set to the parameters for C2 switching, which are the QoS thresholds on active and target link, and

c) <result>, an element contains a string set to either "positive" or "negative" used to indicate the positive or negative result of the C2 mode switching configuration response.

<C2-communication-mode-notification-info> element contains the following elements:

a) <UAS-id>, an element contains identification of the UAS, which could be in form of identifier for the UAS, e.g. group ID, or individual identifiers for the UAV and UAV-C, e.g. CAA ID, GPSI, IP address;

b) <selected-primary-C2-communication-mode>, an element contains a string set to "direct", or "network assisted" used to indicate the selected primary C2 communication mode;

c) <selected-secondary-C2-communication-mode>, an element contains a string set to "direct", or "network assisted" used to indicate the selected secondary C2 communication mode; and

d) <acknowledgement>, an element contains a string set to either "yes" or "not" used to indicate the acknowledgement of selected C2 communication mode(s).

<C2-related-trigger-event-report> element contains the following elements:

a) <UAE-client-id>, an element contains a string set to the identifier of the UAE client which indicates the QoS downgrade; and

b) <application-QoS-related-event>, an element contains a string indicating the expected or actual application QoS/QoE parameters which were changed (i.e. latency, throughput, reliability, jitter).

<C2-operation-mode-switching> element contains the following elements:

a) <UAE-server-id>, an element contains a string set to the identifier of the UAE server which instructs the UAS to apply the C2 mode switching;

b) <C2-operation-mode-switching-requirement>, an element contains a string set to either "direct to network-assisted" or "network-assisted to direct" used to indicate the type of the C2 mode switching to be applied;

c) <time-validity>, an element contains a string set to the time validity for the C2 switching requirement; and

d) <geographical-area>, an element specifying a geographical area for which the C2 switching applies and has the following sub-elements:

1) <polygon-area>, an optional element specifying the area as a polygon specified in clause 5.4 of 3GPP TS 23.032 [xx]; and

2) <ellipsoid-arc-area>, an optional element specifying the area as an ellipsoid arc specified in clause 5.7 of 3GPP TS 23.032 [xx].

<UAV-application-message-info> element contains the following elements:

a) <UAV-id>, an element contains the unique identifier of a UAV which requests the sending of the UAV application message. The UAV-id is in the form of a 3GPP UE ID (e.g. GPSI, External Identifier) or CAA level UAV ID as assigned by civil aviation authorities (e.g. FAA) via USS/UTM;

b) <application-defined-proximity-range-info>, an element contains the range information over which the UAV application message is to be sent;

c) <application-payload>, an element contains the application payload that is to be delivered to the other UAVs; and

d) <acknowledgement>, an element contains a string set to either "yes" or "not" used to indicate the acknowledgement of communications between UAVs within a geographical area.

<C2-operation-mode-switching-performed> element contains the following elements:

a) <result>, an element contains a string set to either "positive" or "negative" used to indicate the positive or negative result of the reception.

<registration-info> element contains the following elements:

a) <UAV-id>, an element contains the unique identifier of a UAV which initiates the UAS UE registration procedure;

b) <UAS-UE-information>, an element contains the information (e.g. UAS UE IP address, Multi-USS capability, DAA assist capability) the UAS UE needs to provide to the UAE-S;

Editor’s Note: The coding of the <UAS-UE-information> IE to include Multi-USS capability and DAA assist capability is FFS.

c) <proposed-registration-lifetime>, an element contains the time during which the UAS UE wants to stay registered to the UAE-S for receiving UAV application messages from the UAS application specific server;

d) <registration-lifetime>, an element contains the time during which the UAS UE can stay registered to the UAE-S for receiving UAV application messages from the UAS application specific server; and

e) <result>, an element contains a string set to either "success" or "failure" indicating success or failure of the UAS UE registration.

<de-registration-info> element contains the following elements:

a) <UAV-id>, an element contains the unique identifier of a UAV which initiates the UAS UE de-registration procedure; and

b) <result>, an element contains a string set to either "success" or "failure" indicating success or failure of the UAS UE de-registration.

\*\*\*\*\* End of changes \*\*\*\*\*