**3GPP TSG-SA4 meeting #112-e *S4-210253***

**Electronic Meeting, 1-10th February, 2021**

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| *CR-Form-v12.0* | | | | | | | | |
| **PSEUDO CHANGE REQUEST** | | | | | | | | |
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|  | **TR 26.803** | **CR** | **–** | **rev** | **2** | **Current version:** | **0.4.0** |  |
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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 |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Clarification of EAS discovery solutions during UE mobility in SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei Technologies Co. Ltd,BBC | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_EMSA | | | | |  | ***Date:*** | | | 2021-1-26 |
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| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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)*. | | | | | | | |  | |
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| ***Reason for change:*** | | In the contribution “S4aI201095” discussed in the Telco held in 3rd Dec 2020, it points out there are some confusion about the EAS discovery solution from SA2. A clarification is needed to avoid such confusion here. | | | | | | | | |
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| ***Summary of change:*** | | EAS rediscovery during UE mobility and NOTE about the DNS based discovery. | | | | | | | | |
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| ***Consequences if not approved:*** | |  | | | | | | | | |
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| ***Clauses affected:*** | | 4.3.2 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
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| ***This CR's revision history:*** | |  | | | | | | | | |

FIRST CHANGE

## 4.3.2 Process of Discovering EAS

#### 4.3.2.1 General

DNS-based solutions have been concluded as the final solution for discovering the Edge Application Server for the above three connectivity models.

#### 4.3.2.2 DNS-based solutions for Multiple PDU Sessions

This solution proposes to enhance the NEF service(s) to allow the AF to influence PCF decisions for URSP rules so that Domain Descriptors are used to steer the DNS and the Application traffic into specific PDU sessions with the PDU Session Anchor UPF that is servicing the EAS.

The following clarifications are therefore required in normative specification(s) on how the Domain Descriptors in URSP are used by the UE:

- When a UE attempts to resolve an FQDN, the PDU Session through which to send the DNS query message is controlled by URSP rules.

- The UE should be able to use URSP procedures to set up the PDU session prior to sending a DNS query.- The IP address of the DNS server for the PDU Session is configured on the UE by the SMF using one of the methods already specified.

The solution is not guaranteed to work when:

a) The UE doesn't support URSP rules provisioned from the PCF.

b) The DNS Server configuration at the UE has been overridden by the user.

c) The Application Client deliberately circumvents the Operating System’s default DNS libraries, for example by using DNS-over-TCP (DoT), DNS-over-HTTPS (DoH) or any other over-the-top mechanism.

NOTE: This can correspond to devices doing tethering, or to devices deployed for specific corporate purposes. Whether URSP rules work in the OS level is up to implementations. How the cooperation between the OS level and the modem works depends on the further studies.

These limitations and informative guidelines will be captured in a technical specification to cover scenarios where the Operating System, user or applications may override the operator-provided URSP or DNS settings. The guidelines should assume no restriction on the Operating System, user or application.

#### 4.3.2.3 DNS-based solutions for Distributed Anchors

The decision for anchoring the UE in the distributed anchor point scenario for Edge Computing will be described in a technical specification as:

a) Using subscription policy information to set proper UE policy (e.g. URSP via usage of dedicated DNN); and/or

b) Applying proper policies at session (SMF) level to apply PCC rules based on the Nnef\_TrafficInfluence service and based on the user subscription.

#### 4.3.2.4 DNS-based solutions for Session Breakout

For Session Breakout connectivity mode, the LDNSR, a new stand-alone 5GC network function is proposed. It allows coordination of EAS Discovery using DNS and 5GC connectivity. The LDNSR facilitates selection of an EAS closer to the edge, and it allows Dynamic ULCL/BP/Local PSA insertion.

1. The LDNSR is dynamically configured with address records of the EAS instances it is to handle so that it can respond appropriately when a local UE attempts to resolve one of these FQDNs.

2. The SMF selects the LDNSR serving the PDU session and configures the UE to use the LDNSR as its DNS Server for that PDU Session.

3. The LDNSR maintains a PDU session context during the lifetime of the PDU session and needs to be made aware of the release of the PDU Session.

4. The LDNSR is able to inform SMF with the IP address of an EAS resolved by DNS, which that may trigger the SMF to perform local UPF insertion/relocation if needed.

Editor’s Note: The name of “LDNSR” would be up to SA2’s final WID outcome.

#### 4.3.2.5 Summary of DNS based EAS Discovery

The DNS-based EAS Discovery solution depends on DNS message parsing. The Core Network can decide the location of the local PDU Session Anchor and can deliver the DNS query message to DNS with UE’s location indicated. Then the DNS can return the IP address of EAS. Finally, the UE connects to the Edge Application Server via the PDU Session.

When the UE moves, the 5GC (SMF) may change the user plane path according to the UE’s new location, i.e. TA granularity. Then the User Plane path change notification may be sent to the AF and AF decides whether to trigger the EAS relocation procedure or not.

NOTE: Currently, the DNS-based EAS discovery solution is only useful with Operator-provided DNS Setting. If the DNS server is overwritten by a third party, or if the application or application library uses DNS over TCP (DoT) or DNS over HTTPS (DoH), the solution is still under development in SA2. The Operated-provided DNS can also be the recursive DNS.

Editor’s Note: Alternative solutions for the cases where enhanced/controlled DNS resolution won’t work will be up to SA2’s WID conclusion.

#### 4.3.2.6 Discussion

With the concluded solutions in SA2, the application client can directly discover and connect to the EAS before any application layer exchanges between the client and EAS. There will be less impact for SA4 aspects without frequent exchanges at the application layer.

However, without the exchanges between clients and application servers, which capability does this application need? Especially when the capability of EAS need to be determined based on the capability and requirements of clients. The SA2 solutions may need to be enhanced for discovering EAS with specific capabilities to avoid additional re-discovering the appropriate EAS.