**3GPP TSG-CT WG1 Meeting #127bis-eC1-21xxxx**

**Electronic meeting; 25-29 January 2021**

**Source: Apple**

**Title: Solution to Key Issue #3**

**Spec: 3GPP TR 24.821**

**Agenda item: 17.2.4**

**Document for: Agreement**

**1. Introduction**

Satellite access networks are expected to cover large portions of the globe. This includes international areas. Additionally, in [8], SA3-LI also provided requirements specific to international areas: "Any solution addressing extraterritorial (e.g. international maritime zone and aeronautical) use cases should provide means to notify the HPLMN on roaming in and out of those areas".

The legacy PLMN selection procedure in 3GPP TS 23.122 [3] does not address international areas, i.e. areas that do not belong to any country.

The following questions are expected to be studied within this key issue:

- how the UE selects PLMN if it is determined that the UE is in an international area; and

- what information could be available to aid in the PLMN selection in international areas:

- pre-configured in the UE; and

- provided by PLMN;

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

## 6.x Solution <x>: PLMN selection inside international areas

6.x.1 Target key issue

This is a candidate solution to Key Issue#1 to determine which country the UE is physically located.

The solution is also relevant to Key Issue #3 to determine when the UE enters to international area in deployment scenario C.

6.x.2 Solution description

The UE may indicate its capability for satellite NG-RAN access as part of the registration procedure. Based on UE’s support for satellite NG-RAN access, the HPLMN may provision "PLMN Selection Assistance (PSA)" information to the UE as part of the steering of roaming procedures. Alternatively, PSA may also be configured in the ME or USIM.

Editor’s Note: Architectural impacts on determining the PSA, if any, need to be discussed in SA2.

The PSA information includes a polygon geofence to assist the UE in knowing the geographical boundaries for country A or its contiguous waters.

The UE shall derive its current location based on UE implementation method outside of the scope of 3GPP. If the UE computes that its current location is inside the polygon geofence, the UE shall consider to be within a country A’s territorial area. If the UE computes that current location is outside the polygon geofence, UE shall consider to be within country A’s extraterritorial area.

In order to address the SA3-LI requirement mentioned in KI#3 description in subclause 5.3, if the UE detects that it transits between the extraterritorial area and the territorial area, the UE shall inform the serving network via dedicated NAS signalling, the serving network should then inform the HPLMN. In order to avoid frequent indications, geographical or timer-based hysteresis should be applied.

6.x.3 Impacts

UE supporting satellite NG-RAN access: needs to derive UE’s location periodically and apply the PSA information.

AMF: provision the PSA information to the UE.

UDM: include the PSA information in the steering of roaming information.