**3GPP TSG CT WG1 Meeting #141e C1-232030**

**Online, 17-21 April 2023** **(revision of CP-230287)**

**Source: MediaTek Inc., Sateliot, Novamint, GateHouse**

**Title: New WID on Attach suspend/resume for satellite IoT devices**

**Document for: Approval**

**Agenda Item: 18.1.1.**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: New WID on Attach suspend/resume for satellite IoT devices

Acronym: TEI18\_ATTSAT\_IoT

Unique identifier: xxx

Potential target Release: Rel-18

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  | x |  | x |  |
| No | x |  | x |  | x |
| Don't know |  |  |  |  |  |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
|  | Study  |
|  | Normative – Stage 1 |
|  | Normative – Stage 2 |
| x | Normative – Stage 3 |
|  | Normative – Other\* |

**\* Other = e.g. testing**

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| N/A |  |  |  |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| N/A |  |  |

**Dependency on non-3GPP (draft) specification:** N/A

# 3 Justification

A minimum support for discontinuous coverage (e.g., SIB32 and expected UE behaviour) has been already addressed in IoT NTN Rel-17 specs to facilitate, among others, cost-effective deployments of IoT NTN services with sparse LEO constellations. However, Rel-17 specifications for IoT NTN, for EPS, were developed under the assumption that satellites offer transparent payload during the satellite coverage.

The assumption of the transparent payload fails in sparse LEO constellations having limited number of ground stations or when a LEO satellite is flying over oceans. The satellite IoT NTN system may consist of embarking network functionality such as eNB, MME and S/P-GW in the satellite and this satellite can communicate with IoT NTN devices when flying over but in its current position the satellite has no simultaneous connection to NTN GW on the ground (e.g., incl. HSS).

Therefore, in addition to discontinuous coverage, another important dimension is the possibility for satellite operators to provide sufficient service to delay-tolerant IoT devices even when their satellites are not simultaneously connected to the ground network via a feeder link. This would allow LEO constellation with a limited number of ground stations to provide an operational service for delay tolerant IoT devices.

To support IoT NTN deployments having sparse LEO constellations and limited number of ground stations, and to allow satellite operators to provide sufficient service to delay-tolerant IoT devices, modifications to be addressed in NAS EMM protocol layer to support the most critical procedure, i.e., initial attach, in Rel-18.

# 4 Objective

The objective of this Rel-18 work item is to specify solutions for an IoT NTN UE and network to support the attach procedure completion in the sparse LEO constellations with the limited number of ground stations. Solutions are optional for the UE and the network.

The following work is expected in CT1:

* a network serving a UE over E-UTRAN satellite access supporting the suspend of the attach procedure and determining the procedure must be suspended to providing the UE with
	+ an ATTACH REJECT message with a new reject cause indicating the UE that the procedure needs to be suspended and that the UE can re-attempt the procedure after a period; and
	+ potentially a timer value for the UE to indicate a proper time when the UE can re-attempt the attach procedure in the PLMN over the E-UTRAN satellite access
* the IoT NTN UE operating over E-UTRAN satellite access
	+ to abort the attach procedure when receiving the new reject cause and consider that the procedure can be re-attempted at a later point
	+ to control the re-attempt of the procedure by
		- an existing NAS timer; or
		- a new timer started with a value (pre-)configured in the UE or with a value received from the network

# 5 Expected Output and Time scale

|  |
| --- |
| New specifications {One line per specification. Create/delete lines as needed} |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| N/A |  |  |  |  |  |
|  |  |  |  |  |  |

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| TS 24.301 | Network and UE to handle the case where attach procedure is suspended due to temporarily missing UE information, a new reject cause and new timer | TSG CT#102 | CT1 |
|  |  |  |  |

# 6 Work item Rapporteur(s)

Niemi, Marko, MediaTek Inc., marko.niemi@mediatek.com

# 7 Work item leadership

CT1

# 8 Aspects that involve other WGs

None

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| MediaTek Inc. |
| Sateliot |
| Novamint |
| GateHouse |
| Airbus |
|  |