**3GPP SA WG2 Meeting #153E S2-220xxxx**

**Electronic meeting, 10 – 14 October 2022 (Revision of S2-220xxxx)**

**Source: vivo**

**Title: New WID: Personal IoT Network**

**Document for: Approval**

**Agenda Item: 10.3**

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: Personal IoT Networks

## Acronym: PIN

## Unique identifier: *{A number to be provided by MCC at the plenary}*

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

|  |  |
| --- | --- |
| X | Feature |
|  | Building Block |
|  | *Work Task* |
|  | Study Item |

### 2.2 Parent Work Item

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| FS\_PIN | SA2 | 940065 | Study on Personal IoT Networks |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
| 930029 | Personal IoT and Residential networks Service Requirements | Stage 1 requirements |

## 3 Justification

In Rel-18, stage 1 service requirements in TS 22.101 clause 30.1, TS 22.261 clause 6.35, and TS 22.115 clause 5.2.14, have been approved for the enhancement of Service Function Chaining (SFC) for 5G networks, including aspects such as allowing third parties to request a chain of service functions provided by the network operators based on operator’s service function chaining policies for their applications as well as management and charging of service functions and chains of service functions requested by the third parties. This work item aims at specifying system enhancements required for 5G system to support service function chaining.

There are types of IoT device that can be placed around the body (i.e., wearable devices such as cameras, headsets, watches, earphones, health monitors), be scattered in the home (e.g., smart lights, cameras, thermostats, door sensors, voice assistants, speakers, fridge, washing machines, lawn mower, robots), or reside in the office or factory of a small enterprise (e.g., printers, meters, sensors). Some of the IoT devices have very specific requirements in terms of size (e.g., earbuds), some of the IoT devices have very specific requirements in terms of weight (e.g., glasses), and some of the IoT devices have very specific requirements in terms of power consumption (e.g., door sensors, earbuds, glasses, etc.). Furthermore, some IoT devices have very specific requirements across multiple domains (i.e., size, weight, and power consumption). Based on the greatly increasing number of IoT devices, users create (e.g., plan, change the topology) networks out of all these IoT devices mainly in their homes, offices, factories, and/or around their body.

Nowadays, except some wearable devices, IoT devices can only access the internet via relays or gateways that use wireline access, or via UEs that access the mobile network. In both cases, the mobile core network is unaware of the IoT devices. In order to leverage the 5G services and increase the operator’s “value add” options, the 5G system needs to be aware of the IoT devices. The user created network is composed by devices forming the Personal IoT Network and devices that are part of the customer premises network. There are three types of devices (A.K.A PIN Element) in the Personal IoT Network: device with communication capability, device with gateway capability (A.K.A PIN Element with Gateway Capability), and device with management capability (A.K.A PIN Element with Management Capability). The device with communication capability (e.g., earphone, camera) can communicate with other devices either directly or via device with gateway capability, or can communicate with UEs via a device with gateway capability, which is capable of accessing 5GS, and the device with management capability can manage the Personal IoT Network with assistance of 5GS, which also is a UE. The device with management capability may also be a device with communication capability in some ways, e.g., when it accesses the 5GS via the device with gateway capability, and the device with communication capability may also be a UE in some ways, e.g., smartwatch, when it accesses the 5GS directly if it has the capability.

Due to some constraints such as those illustrated by the examples described in first paragraph, a lot of IoT devices could only have limited capabilities, e.g., lack of USIM facilitation, for accessing 5G system with assistance of, e.g., a device with management capability. This work item aims at specifying system enhancements required for 5GC to support Personal IoT Network.

## 4 Objective

The objective is to specify enhancements to 5GC for Personal IoT Network (PIN) as per conclusions reached within TR 23.700-88 for the following aspects:

- To enable SMF managing PDU Sessions related to a PIN session according to whether the PIN session includes PEGC or not;

- To enable SMF authorizing whether a UE is allowed to allocate IP addresses for PINEs according to whether the UE supports PEGC and determining the IP range for the UE;

- To enable SMF provisioning N4 rules for network local switch for PIN signalling and PIN traffic according to the information received from PEGC during the PDU Session Modification procedure initiated by PEGC or PDU Session Establishment procedure;

- To enable PEGC proxying the PIN communication configuration data subscription from PEMC to SMF without impact on PEMC in order to help user detecting PEGC malfunction;

- To enhance URSP handling by PEGC for initiating PDU Session Establishment when URSP rules are associated with PIN sessions;

- To enable AF provisioning PIN service parameters to 5GC for PIN session management including following aspects;

- Information for generating URSP rule per PIN session needs to be provided, which does not include PEMC and PEGC information.

- Information for QoS authorization per PIN session may be provided.

- The PCF subscribes event notification of application data modification from UDR for AM Policy Control per PIN service subscription

- The PCF subscribes event notification of application data modification from UDR for SM Policy Control per PIN session;

- To enable AF provisioning non-3GPP access QoS assistance information to a PEGC.

- To enable NEF authorizing the PIN session management from an AF according to user’s PIN service subscription;

NOTE:  This work considers network local switch among the PDU Sessions of a PIN session that are anchored at same SMF.

## 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 | N/A | N/A | N/A | N/A | 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 |
| 23.501 | Architectural enhancements to support the stated objectives | SA#99 (March 2023) |  |
| 23.502 | Procedural enhancements to support the stated objectives | SA#99 (March 2023) |  |
| 23.503 | Procedural enhancements to support the stated objectives | SA#99 (March 2023) |  |

## 6 Work item Rapporteur(s)

Zhenhua Xie, vivo Mobile Communications Ltd, (zhenhua.xie@vivo.com)

## 7 Work item leadership

SA2

## 8 Aspects that involve other WGs

SA3 for the security aspects, SA6 for application-level aspects.

## 9 Supporting Individual Members

|  |
| --- |
| **Supporting IM name** |
| vivo Mobile Communications Ltd |
| CATT ? |
| China Mobile ? |
| China Telecom ? |
| Convida Wireless ? |
| InterDigital ? |
| KPN ? |
| OPPO ? |
| Philips ? |
| Spreadtrum Communications ? |
| T-Mobile USA ? |
| Tencent ? |
| Futurewei ? |
| Xiaomi ? |
| Inspur ? |
| Guangdong Genius ? |
| Apple ? |
| Toyota ? |
| Sennheiser ? |