**3GPP TSG-SA WG1 Meeting #94e S1-21xxxx**

**Electronic Meeting, 10 – 20 May 2021** *(revision of S1-21xxxx)*

Title: Resident and PINS consolidation table

Agenda Item: 7.11.1 & 7.12.1

Source: KPN

Contact: Toon .norp@ tno .nl

*Abstract: <provide a short description of the content>*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PINS |  | Consolidated | Resident |  |
| Req# | Requirement | ConsReq# | ConsRequirement | Req# | Requirement |
|  |  |  | **Gateway** |  |  |
|  |  |  |  |  |  |
| PR 5.3.6-3 | For a PIN it shall be possible to have more than one gateway UE. | CPR1-001 | The 5G System shall support a [PIN / CPN] to have one or more [gateway UEs / evolved Residential Gateways] |  |  |
| PR 5.5.6-2 | A gateway UE (or eRG) shall be able to store and update a User Profile associated to PIN Device or an application running on or connected to a PIN Device behind the gateway UE and the User Profile shall include one or more pieces of the following information related to this application:  |   |   |  |  |
| PR 5.5.6-1:  | The 5G network shall enable support for an authorized UE to securely access the authenticated and authorized application running on or connected to a PIN Device behind a gateway UE or eRG.  |   |   |  |  |
|  |  |   |   | PR 5.1.6-002 | The 5G system shall enable the evolved Residential Gateway (eRG) to provide backhaul with the required QoS for the services provided via a Premises Radio Access Station (PRAS)connected via the eRG. |
|  |  |   |   | PR 5.3.6-002 | The 5G system shall be able to indicate to the evolved residential gateway that a specific UE connected to it either via 3GPP RAT or non-3GPP (R)AT needs specific QoS and what the required QoS characteristics are. |
|  |  |   |   | PR 5.5.6-003 | The 5G system shall support a mechanism to minimize the security impact on any PLMN or broadband access network when using an Evolved Residential Gateway. |
|  |  |   |   | PR 5.5.6-004 | The 5G system shall support a mechanism to minimize the security impact on the UE when using an Evolved Residential Gateway. |
|  |  |   |   | PR 5.5.6-005 | The 5G system shall enable the network operator associated with an Evolved Residential Gateway to control the security policy of the an Evolved Residential Gateway. |
|  |  |   |   | PR 5.5.6-006 | The 5G system shall ensure an Evolved Residential Gateway does not compromise user privacy for UEs that are using the Evolved Residential Gateway, including communication confidentiality, location privacy and identity protection. |
|  |  |   |   | PR 5.13.6-001 | The 5G system shall be able to support IP traffic offload in eRG. |
|  |  |   |   | PR 5.19.6-001 | The 5G system shall support use of an eRG that is connected to the 5G Core Network over wireless access, fixed broadband access or hybrid access. |
|  |  | CPR-002 | A [PIN Element with gateway capability / PRAS / eRG] shall be able to detect a loss of connection with the 5GC | PR 5.17.6-001 | The PRAS and eRG shall be able to detect a loss of connection with the 5GC. |
| S1-211046 | A PIN Element shall receive a notification if a PIN Element with Gateway Capability does not have 5GC connectivity. | CPR-003 | A [PIN Element with gateway capability / PRAS / eRG] shall be able to notify [PIN Elements / UEs / non-3GPP devices] connected to it when the [PIN Element with gateway capability / PRAS / eRG] loses connection with the 5GC |  |  |
| S1-211046 | A PIN Element can be provisioned with a policy by a 3rd party or user of the PIN Element how to route data when the PIN Element can connect to multiple PIN Elements with Gateway Capability. |  |  |  |  |
| S1-211046 | The 5G system shall support concurrent access to the 5G network and its services for an authorized PIN device (linked to a 3GPP subscription and provisioned with credentials) via one or more PIN Element with Gateway Capability. |  |  |  |  |
| S1-211046 | A PIN Element that requires continuous 5GC connectivity (e.g. heart rate monitor) shall be able to send a notification to a PIN Element with management capability if that PIN Element is unable to communicate with the 5GC. |  |  |  |  |
|  |  |  | **Service discovery** |  |  |
| PR 5.8.6-1 | The 5G system shall enable service discovery of PIN devices (e.g. based on certain device applications) in PIN by UEs in the PIN or via the public network. | CPR2-001 | The 5G system shall enable service discovery of [PIN devices / devices on the CPN] (e.g. based on certain device applications) in the [PIN / CPN] by UEs in the [PIN / CPN] or via the public network. | PR 5.2.6-008 | The 5G system shall provide a mechanism to prevent or allow a (guest) UE to discover and/or use the services provided by the devices on the CPN. |
| PR 5.8.6-1a | The 5G system shall enable an authorized PIN user to configure which UEs connected to the public network can perform service discovery of PIN devices in a PIN. The 5G system shall support configuration per 5GLAN VN, per group of UEs, or per individual UE. | CPR2-002 | The 5G system shall enable an authorized administrator to configure which UEs connected to the public network can perform service discovery of [PIN devices in a PIN / devices on the CPN]. The 5G system shall support configuration per 5GLAN VN, per group of UEs, or per individual UE. |  |  |
| PR 5.8.6-2 | The gateway shall support optimization of service discovery of PIN devices in a PIN by UEs on the public network, e.g. by reducing the amount and frequency of service discovery messages sent from PIN devices. |   |   |  |  |
|  |  |  | **Service hosting** |  |  |
| PR 5.6.6-1 | The 5G network shall enable a Service Hosting Environment hosted by a PIN Element with Gateway Capability. | CPR3-001 | The 5G system shall support 'service hosting' on a [PIN Element with Gateway Capability / eRG] | PR 5.11.6-001 | The 5G system shall support configurations of a Service Hosting Environment connected to the eRG. |
|  |  |  |  | S1-211047 | The 5G system shall support the eRG to host virtualize network application functions provided by the operator or from a trusted third-party provider. |
| PR 5.6.6-4 | The 5G system shall support a secure mechanism to access a service or an application in an operator's Service Hosting Environment hosted by a PIN Element with Gateway Capability. |   |   |  |  |
| PR 5.6.6-3 | The 5G system shall be able to support QoS for applications in a Service Hosting Environment hosted by a PIN Element with Gateway Capability. |   |   |  |  |
| PR 5.6.6-2 | Based on operator policy, the 5G network shall be able to support routing of data traffic between a UE attached to the 5G network and an application in a Service Hosting Environment hosted by a PIN Element with Gateway Capability for specific services. |   |   |  |  |
|  |  |   |   | PR 5.11.6-002 | The 5G system shall be able to maintain QoS for a UE moving from one service hosting environment to another via an eRG. |
|  |  |  | **Identification - privacy** |  |  |
| PR 5.1A.6-1 | The 5G system shall be able to support privacy and identity protection of the guest PIN Elements of a PIN network, e.g. information may be made available to the 5G system subject to MNO and regulatory requirements. |   |   |  |  |
|  |  |   |   | PR 5.2.6-009 | The 5G system shall ensure that communications associated with individual UEs in a CPN be identifiable (e.g., subscriber identifier) in the 5G network. |
|  |  |   |   | PR 5.3.6-001 | The 5G system shall support a mechanism for an evolved residential gateway to identify a UE connected to it via non-3GPP (R)At and associate the UE to its 3GPP identifier. |
|  |  |  |  | S1-211207 | The 5G system shall support an operator to act as User Identity provider and to authenticate a User Identity of a user for accessing to an applications hosted in local cloud behind the eRG in CPN. |
|  |  |  |  | S1-211207 | The 5G system shall be able to provide and update authentication results and level of confidence information to an eRG in CPN about a user with User Identity requesting for accessing based on the information regarding: - authentication mechanism (e.g. voice/fingerprint/face) used on the UE, applications authorizations, and elapsed time since last authentication for the user.- the status of the UE in use (e.g. location). |
|  |  |  |  | S1-211207 | An eRG in CPN shall be able to determine if a user with User Identity is authenticated and authorised to access the CPN and the applications hosted behind it based on the authentication result and its configuration with a set of policies (e.g. time, location, applications) provided by the 5G system. |
| S1-211046 | The 5G system shall support a PIN Element to be configured with credentials of multiple user identities. |  |  |  |  |
|  |  |  | **Direct communication** |  |  |
|  |  | CPR5-001 | The 5G System shall support direct device connections between [PIN Elements in a PIN / UEs in a CPN] |  |  |
|  |  | CPR5-002 | The 5G system shall be able to minimize disruption to the user when a UE switches from a direct communication path between the [PIN Elements / UEs] to an indirect communication path going through the [PIN Element with Gateway Capability / eRG]. | PR 5.10.6-001 | The 5G system shall be able to minimize disruption to the user when a UE switches from a direct communication path between the UEs to an indirect communication path going through the eRG and there is connectivity to the 5G system. |
| PR 5.1.5-4 | The 5G system shall support mechanisms to provision a PIN to use direct device connection in non-operator managed spectrum when it has no connectivity to the 5G system. |   |   |  |  |
| PR 5.2.6-3 | The 5G system shall enable direct device communications between PIN Elements in a PIN to use licensed spectrum (under the control of a MNO) or between PIN Elements to use unlicensed spectrum (may be under the control of the MNO, or not). |   |   |  |  |
| PR 5.7.6-5 | The 5G system shall be able to support a PIN Element shall be able to concurrently use both operator managed and non-operator managed direct device connectivity with another PIN Element. |   |   |  |  |
| PR 5.4.6-1 | The PIN Element can act upon user and operator preferences to aggregate, switch or split the service between non-3GPP RAT and operator managed direct device connection services.  |   |   |  |  |
| PR 5.4.6-2 | When operator managed direct connections are used for inter PIN UE Element communications the 5G System shall be able to collect charging data, including data transmitted over the operator managed direct device connection between the PIN Elements, time, the operator managed resources used for the data transmission, e.g. operators managed spectrum and etc. |   |   |  |  |
| PR 5.4.6-3 | When PIN UE Element uses unlicensed spectrum for direct device connections for intra PIN UE device communications the 5G System may, subject to local/regional regulations and user consent, collect statistics data, including if 3GPP authentication was used. |   |   |  |  |
|  |  |  | **Connectivity - QoS - charging** |  |  |
| PR 5.3.6-1 | For intra-PIN communications, a PIN Element shall be able to transmit media to one or more PIN Element at the same time. | CPR6-001 | The 5G system shall support efficient communication between one or more [PIN Elements / UEs - non-3GPP devices] in a [PIN / CPN]. NOTE: efficient communication implies that the communication path remains within the [PIN / CPN] | PR 5.5.6-002 | The 5G system shall support routing efficiency for data traffic between two UEs through an Evolved Residential Gateway.  |
|  |  |   |   | PR 5.4.6-001 | The 5G system shall support routing efficiency for data traffic between a UE and a non-3GPP device through an Evolved Residential Gateway. |
|  |  |   |   |  |  |
| PR 5.7.6-6 | The 5G system shall be able to support that a PIN Element can support concurrent communications with PIN Elements in more than one PIN. |   |   |  |  |
| PR 5.3.6-2 | A PIN Element shall support service continuity when a PIN Element changes the communication path from one PIN Element to another PIN Element. The communication path between PIN devices may include both 3GPP and non-3GPP access. |   |   |  |  |
| PR 5.7.6-7 | The 5G system shall be able to provide secure communications between PIN Elements in a PIN or across different PIN. |   |   |  |  |
| S1-211184 | 5G system shall be able to support secured communications between two or more individual PIN elements within a PIN. |  |  |  |  |
| PR 5.1A.6-2 | The 5G system shall be able to collect charging information related to data exchanged via a PIN network by a guest PIN Element, e.g. timestamp for start and stop of communications, amount of data sent/received, etc. |   |   |  |  |
| PR 5.1.5-2 | A PIN shall support both delay and non-delay tolerant services. Maximum delay for non-delay tolerant services can be up to 200ms [4] from the sending PIN Element to the receiving PIN Element (e.g. ask the voice assistant [sending PIN Element] to turn a light on [receiving PIN Element]). Other communication KPIs are shown in Table 5.1.5-1. |   |   |  |  |
| PR 5.1.5-3 | The PIN shall support fault tolerant operations. |   |   |  |  |
|  |  |   |   | PR 5.7.6-001 | The 5G system shall provide a mechanism for supporting real time E2E QoS monitoring for the data traffic path (i.e., from/to a UE to/from the 5GC via a Premises Radio Access Station and a Evolved Residential Gateway). |
|  |  |   |   | PR 5.10.6-002 | The 5G system shall support real time E2E QoS monitoring and control for any data traffic path (i.e. from/to a UE to/from the 5GC and to/from another UE) via a PRAS and an eRG when there is connectivity to the 5G system. |
|  |  |  |  | S1-211082 | The 5G system shall provide mechanisms to attempt maintaining the backhaul with the required QoS for services of an operator that are going via an eRG when the eRG is relocated to a location provisioned by a different 5G core network. |
|  |  |  |  | S1-211083 | The 5G system shall enable an eRG to provide required QoS between a UE connected via the eRG and an application in a local application server connected via another eRG. |
|  |  |  |  | S1-211083 | The 5G system shall provide QoS support for the communication between a UE connected to an eRG and another UE connected via another eRG. |
| S1-211046 | The 5G system shall support a PIN Element to connect to multiple PINs. |  |  |  |  |
| S1-211046 | The 5G system shall support access to operator managed spectrum for a PIN Element. |  |  |  |  |
|  |  |  | **Provisioning** |  |  |
| PR 5.1.5-1 | The 5G system shall support the ability for a network operator or authorised 3rd party to create a Personal IoT Network. | CPR7-001 | The 5G system shall support the ability for a network operator or authorised administrator to create a [PIN / CPN] |  |  |
| PR 5.2.6-2 | The 5G system shall support a PIN Element being added or removed from a PIN by an authorised 3rd party. | CPR7-002 | The 5G system shall support the ability for a network operator or authorised administator to add or remove [PIN Elements / UEs - non-3GPP devices] from a [PIN / CPN] |  |  |
| PR 5.7.6-2 | The 5G system shall support a PIN Element being added or removed from a PIN by an authorised 3rd party. |   |   |  |  |
| PR 5.2.6-1 | The 5G system shall support that a PIN Element may be a member of more than one PIN. |   |   |  |  |
| PR 5.7.6-1 | The 5G system shall support that a PIN Element may be a member of more than one Personal IoT Network. |   |   |  |  |
| PR 5.7.6-4 | The 5G system shall be able to provision PIN Elements that have been authorised to use that PIN with the necessary configuration parameters to use that PIN subject to MNO and local policies. | CPR7-003 | The 5G system shall support provisioning of [PIN Elements / UEs - non-3GPP devices in a CPN] and eRGs with the necessary configuration parameters for that [PIN / CPN] subject to MNO and Authorised Administrator policies. | PR 5.18.6-001 | The 5G system shall enable configuration and management of an eRG by both the operator of the public (mobile) network the eRG is connected to and, within the boundaries defined by the operator, by an Authorised Administrator. |
|  |  |  |  | PR 5.19.6-002 | The 5G system shall support both the operator and the eRG owner the ability to configure the eRG. (S1-211-47) |
|  |  |   |   | PR 5.12.6-002 | The 5G system shall provide means for an authorized user to prioritize access for a certain UE in a PRAS and CPN, within the limits given by the operator policy. |
|  |  |  |  | S1-211082 | The 5G system shall provide mechanisms to perform remote provisioning of the actual settings for the eRG when the eRG is relocated to a location provisioned by a different 5G core network. |
|  |  |  |  | S1-211209 | The 5G network operators shall be able to provide eRG subscriptions for allowing one or multiple PRAS(es) connected to it. |
|  |  |  |  | S1-211209 | The 5G system shall provide mechanisms to create identity and store profiles for a PRAS which does not have 3GPP credentials and connected to an eRG based on the eRG subscriptions for the PRAS. |
|  |  |  |  | S1-211209 | The 5G system shall provide mechanisms to identify, authenticate, and authorize a PRAS which does not have 3GPP credentials and connected to an eRG based on the stored PRAS profile when it firstly connects to the 5G network. |
|  |  |  |  | S1-211209 | The 5G system shall provide mechanisms to provision configuration with operation settings and authorizations to an authenticated and authorized PRAS which does not have 3GPP credentials and connected to an eRG based on the stored PRAS profile and eRG’s subscription for the PRAS. |
|  |  |  |  | S1-211209 | The 5G system shall be able to update or revoke authorizations of the PRAS configuration for an PRAS connected to an eRG. |
|  |  |  |  | S1-211209 | The 5G system shall be able to update PRAS configuration for operational settings for an PRAS connected to an eRG. |
| S1-211184 | 5G system shall be able to support creation / termination / modification of an PIN in certain location for a requested period of time (e.g., hours) with the authorization from the operator based on the subscription of the PIN. |  |  |  |  |
| S1-211184 | 5G system shall be able to allow authorized PIN Elements to S1-automatically or manually to identify and select a PIN. |  |  |  |  |
| S1-211184 | 5G system shall be able to support authentication and authorization of PIN elements whose subscriptions can belong to different operators to access the PIN for a period time (e.g., hours). |  |  |  |  |
| S1-211184 | 5G system shall be able to support PIN elements knowing the remaining operation time of an PIN with limited life span, to prevent service disruption when the PIN is terminated. |  |  |  |  |
| S1-211184 | 5G system shall be able to support an authorized 3rd party to set policies on which PIN Elements can access which services or PIN elements in an PIN. |  |  |  |  |
| S1-211184 | 5G system shall be able to support an authorized 3rd party to set policies duration of access, IP connectivity type (local break out 5GC etc) local services etc. |  |  |  |  |
| S1-211198 | The 5G system shall be able to create a list of managed PIN Elements for a PIN.  |  |  |  |  |
| S1-211198 | For each PIN Element in the list of managed PIN Elements, the 5G system shall be able to store information such as an identity, connectivity capabilities, credentials, communication restrictions (e.g. other PIN Elements it cannot communicate with), etc. |  |  |  |  |
| S1-211198 | The 5G system shall be able to detect when a new PIN Element is connected to a PIN. |  |  |  |  |
| S1-211198 | The 5G system shall be able to add/delete a PIN element to/from the list of managed PIN Elements in a PIN after the PIN-user provides authorization.  |  |  |  |  |
| S1-211198 | The 5G system shall be able to create an identity that can uniquely identify a PIN Element that is included in the list of managed PIN Elements for a PIN. |  |  |  |  |
| S1-211198 | The 5G system shall be able to define communication restrictions (e.g. to prevent PIN direct communication with other PIN Elements) for a PIN Element that is included in the list of managed PIN Elements for a PIN.  |  |  |  |  |
|  |  |  | **Positioning** |  |  |
| PR 5.2.6-4 | The 5G system shall be able to support positioning for PIN Elements in a PIN. |   |   |  |  |
|  |  |  | **Premises Radio Access Station** |  |  |
|  |  |   |   | PR 5.1.6-001 | The 5G system shall enable the network operator to provide any 5G services to any 5G UE via a Premises Radio Access Station (PRAS) connected via an evolved Residential Gateway (eRG). |
|  |  |   |   | PR 5.2.6-001 | The 5G system shall enable the network operator to provide any 5G services via a Premises Radio Access Station (PRAS) to any 5G UE with a valid subscription to the HPLMN associated with the PRAS. |
|  |  |   |   | PR 5.2.6-002 | The 5G system shall enable the network operator to provide any 5G services via a Premises Radio Access Station (PRAS) to any 5G UE with a valid subscription to any VPLMN that has a roaming agreement with the HPLMN. |
|  |  |   |   | PR 5.2.6-003 | The 5G system shall ensure the use of a Premises Radio Access Station (PRAS) does not compromise the security of any PLMN or broadband access network. |
|  |  |   |   | PR 5.2.6-004 | The 5G system shall ensure the use of a Premises Radio Access Station (PRAS) does not compromise the security of the UE. The PRAS (and its associated backhaul connectivity) shall provide a level of security equivalent to regular 5G base stations. |
|  |  |   |   | PR 5.2.6-005 | The 5G system shall enable the network operator associated with the Premises Radio Access Station (PRAS) to control the security policy of the PRAS. |
|  |  |   |   | PR 5.2.6-006 | The 5G system shall ensure the Premises Radio Access Station (PRAS) does not compromise user privacy for UEs that are using the PRAS, including communication confidentiality, location privacy and identity protection. |
|  |  |   |   | PR 5.2.6-007 | The 5G system shall be able to generate charging information that can differentiate between UEs connected to the Premises Radio Access Station (PRAS) and between backhaul for the PRAS and other data traffic over the same access. |
|  |  |   |   | PR 5.5.6-001 | The 5G system shall be able to provide QoS control for the communication path between a UE and an Evolved Residential Gateway via a Premises Radio Access Station. |
|  |  |   |   | PR 5.7.6-002 | The 5G system shall provide mechanisms for the network operator or an Authorised Administrator (e.g. a homeowner) to perform remote provisioning of Premises Radio Access Stations, which includes verification and configuration of Premises Radio Access Station identity and initial OA&M provisioning. |
|  |  |   |   | PR 5.12.6-001 | The 5G system shall provide means to enable/disable a UE to connect to a Customer Premises Network device via a particular Premises Radio Access Station. |
|  |  |   |   | PR 5.12.6-003 | The 5G system shall minimize service disruption when a CPN communication path changes between two PRASes. |
|  |  |   |   | PR 5.14.6-001 | The 5G system shall be able to support PRAS sharing between multiple PLMNs. |
|  |  |   |   | PR 5.18.6-003 | The 5G system shall enable configuration and management of a PRAS by a PLMN and, within the boundaries defined by the operator, by an Authorised Administrator. Specifically the PLMN shall be able to configure: radio settings pertaining to licensed spectrum shall be configured by the PLMN that owns the spectrum. Specifically the Authorised Administrator shall be able to configure:Whether visitor access network via the PRAS is allowed (allowing all or no visitors, or allowing specific visitors only) |
|  |  |  |  | S1-211128 | The 5G system shall be able to support the licensed resource negotiation with the PRAS. |
|  |  |  |  | S1-211140 | The 5G system shall support a UE to receive traffic from PRAS and a macro base station simultaneously. |
|  |  |  | **Broadcast / multicast** |  |  |
|  |  |  |  | S1-211142 | PRAS node of residential network shall be able to support Multicast/Broadcast communication. |
|  |  |  |  | S1-211078 | The 5G system shall provide means for delivering 5G multicast/broadcast services to devices in the Customer Premise Network. |
|  |  |  |  | S1-211133 | The 5G system shall support a non-3GPP device (e.g. STB) behind an eRG to access its authorized multicast services based on eRG subscription. |
|  |  |  |  | S1-211131 | The 5G system shall be able to support MBMS via PRAS or eRG, based on the requirement of an UE. |
|  |  |  |  | S1-211131 | The 5G system shall provide a simple mechanism for users to discover available MBMS target terminals. |
|  |  |  | **5G LAN** |  |  |
|  |  |   |   | PR 5.8.6-001 | The 5G system shall be able to support large amounts of small 5G LAN-VNs targeting residential deployments. |
|  |  |   |   | PR 5.8.6-002 | The 5G system shall support authorized 3rd parties to authorize/deauthorize UEs to be able to access a 5G LAN-VN. |
|  |  |   |   | PR 5.9.6-001 | The 5G system shall support the use of an evolved Residential Gateway to connect 5G devices from the 5G LAN VN it belongs to with non-3GPP devices on an in-home LAN. |
|  |  |   |   | PR 5.16.6-001 | The 5G system shall support interconnection of a 5G LAN-Virtual Network (5G LAN-VN) with a fixed IP VPN. |