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Foreword

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Introduction

Traditionally a single integrated device with integrated radio access means formed the User Equipment (UE) for access to mobile communication services. Now, however, many subscribers possess more than one device for running mobile communication services, which may be connected to form a Personal Network (PN). The devices differ in their capabilities and these capabilities qualify the devices more or less for specific end-to-end applications or particular media like audio, video and pictures. A part of the devices offers own network access means for accessing the PLMN via UTRA, WLAN, or other access technologies. The other devices are Terminal Equipments without radio access capabilities.

Personal Network Management (PNM) allows the users to manage their devices and PN's. This TS specifies requirements for allowing the users to manage their devices. The considered management functions of Personal Network Management comprise the setup and configuration of Personal Networks, the personalization for the termination of services within the Personal Network as well as the enabling of secure connections between the Personal Network Elements. This includes the management of Personal Area Networks with their local device connections and their available radio access means.

Two different scenarios are distinguished for Personal Network Management:

1 Personal UE Networks: This addresses the management of multiple UEs belonging to a single PN-User. It contains the UE Redirecting application that provides for redirect terminating services to selected UEs and PN Access Control that provide for privacy and enable restricted access to a PN.

2 PNE Networks: This extends the scope of considered managed objects from UEs to physically separated UE components and to attached MEs. It does not only extend the PN UE Redirecting application and PN Access Control by PAN-specific aspects but addresses the PAN Management with interactions of TEs and MEs.

These two scenarios are handled separately within the TS as the requirements of Personal UE Networks and PNE Networks are focussed on different types of services. Personal UE Networks aim at an easy-to-use UE management whereas PNE Networks enable complex scenarios of local networks with alternative network access means.

1 Scope

The present document describes the service requirements for the Personal Network Management (PNM). Aspects of data synchronisation and management of user data are out of scope.

2 References

The following documents contain provisions, which through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   3GPP TS 22.004: "General on supplementary services".

[2]   3GPP TS 22.101: "Service aspects; Service principles".

[3]   3GPP TS 22.105: "Service aspects; Services and service capabilities".

[4]   3GPP TR 22.944: "Report on service requirements for UE functionality split".

[6]   Void

[7]   3GPP TS 23.101: "General Universal Mobile Telecommunications System (UMTS) architecture".

[8]   3GPP TS 22.082: "Call Forwarding (CF) supplementary services".

[9]   3GPP TS 22.228: "Service requirements for the Internet Protocol (IP) multimedia core network subsystem"..

[10]   3GPP TS 23.228: "IP Multimedia Subsystem (IMS)".

[11]   3GPP TS 23.279: "Combining Circuit Switched (CS) and IP Multimedia Subsystem (IMS) services".

[12]   3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [12] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [12].

Personal Network: A Personal Network (PN), in the context of Personal Network Management, consists of more than one Personal Network Element under the control of one PN-User providing access to the serving PLMNs. There shall be at least one Personal Network Element with a USIM subscription in a PN. Authentication of the user for each PLMN access is based on the USIM(s) of the PN. The Personal Network Elements are managed in a way that the user perceives a continuous secure connection regardless of their relative locations. The Personal Network Elements belonging to the PN-User's PN maybe registered to different PLMNs at a time. The PN-User controls the PN using facilities provided by the Personal Network Management (PNM).

Personal Network Element: A Personal Network Element (PNE) is the basic component making up a PN-User's Personal Network. A Personal Network Element is handled as a single entity in PNM but physically it may be either a single device or a group of devices. The Personal Network Element may be a TE, MT, ME or even a complete UE.

Personal Area Network: A Personal Area Network (PAN) is a local network of the PN-User. In the context of Personal Network Management, the PAN consists of at least one UE and may additionally comprise a number of MEs/MTs, with own radio access means that allow them to directly access the PLMN of the UE. The UE and locally connected additional MEs/MTs are the PNEs of the PAN. Alternatively the UE components, i.e TEs and MT, may be handled as separate PNEs. The UE contains the single active USIM of the PAN.

PNE Identifier: The PNE Identifier uniquely identifies each PNE of a PN within the PN. The PNE Identifier of MTs and MEs is the IMEI. Other PNEs have PNM-specific identifiers that are allocated for enabling PNM functions.

PN-User: For the purpose of Personal Network Management the PN-User is the person who owns the Personal Network Elements with respective subscriptions at one service provider.

Registration: In the context of Personal Network Management registration is the procedure by which a particular entity is either added to the Personal Network or to the Personal Area Network. Entities are physically separated devices or groups of devices. The entity stays registered till deregistration of the entity is performed. The status of registration to a Personal Network or Personal Area Network is not affected by the status of registration/attachment to the PLMN.

Configuration: In the context of Personal Network Management Configuration contains the procedure by which a PN-User can configure the PN settings for the PN UE and the PN Access Control applications.

Interrogation: In the context of Personal Network Management Interrogation is the procedure by which a PN-User can interrogate the PN settings which are configured by the PN-User before.

For further definitions see [12].

3.2 Abbreviations

For the purposes of the present document, the following abbreviations given in TR 21.905 [12] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [12].

PNM   Personal Network Management
PN   Personal Network
PAN   Personal Area Network
PNE   Personal Network Element

4 Personal UE networks

4.1 General description

Personal UE Network features enable the management of multiple UEs belonging to a single PN-User. In particular, customer needs who own more than one terminal and subscription are addressed, e.g. ordinary handset for telephony, car phone, PDA for emails when on the move, data card with laptop for work when in semi-stationary mode. Although those devices are mainly held for a particular usage, many are able to support more than one sort of services, e.g. telephony is supported by all but the data card. Personal UE Networks are not aware of the presence of other PNEs belonging to a user.

Functionality enabled by Personal UE Networks comprises PN UE redirection and PN Access Control.

Registration, configuration and interrogation procedures for PNM are supported via IMS capable PN UEs, via a web client or by administrative procedures.

4.2 PN UE Redirecting application

Customers may not carry always their full set of "gadgets", but still want to be reachable. Currently management of all the terminals for the PN-User by setting forwarding options, switch on and off terminals, providing partners with multiple addresses is not very customer friendly.
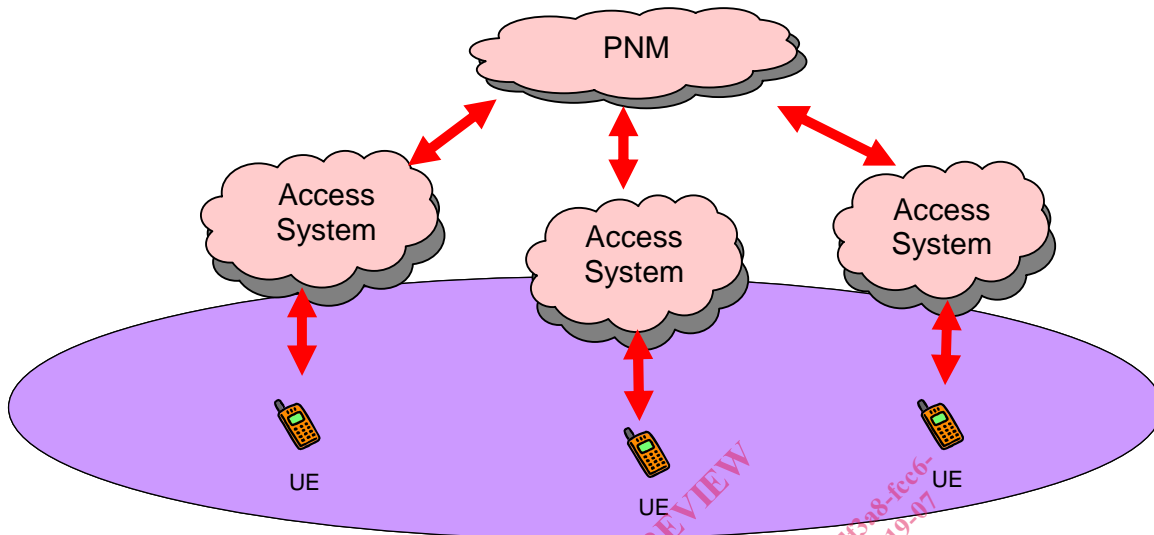

Fig 1: UEs managed by PN e.g. UE Redirecting application

4.2.1 Requirements for PN UE redirecting application

- PNM shall be provided to a subscription upon customers request via administrative procedures.

- PNM shall be withdrawn upon customer request or for administrative reasons via administrative procedures.

- The PN-Users shall be able to register and deregister UEs to their PN.

- Successful registration shall add the UE as new Personal Network Element to the Personal Network. The information on the UE and the public user identities belonging to the UE shall be written to the service profile in the network. A deregistration procedure shall be performed to remove a registered UE from the Personal Network.

- Each UE shall only be registered in one PN and the network shall reject the registration request of a UE that is already registered in another PN.

- The PN-Users shall be able to "activate" a certain UE of their PN as the default UE for terminating services addressed to any of the UEs belonging to the PN. Activation shall be possible

  - On a global level for all services supported by the UE capabilities and subscription

  - On a per service basis for selected services supported by the UE capabilities and subscription

  - On a per service component basis for the different media of a supported service (in line with [9])

- The PN-Users shall be able to configure priorities of a UEs list with priority for terminating a specific service.

- Note: the priority may be based on parameters such as time, device capability and PN-User choice.

- The PN-User shall be able to interrogate the PNM network database for the current PN-User settings of their own PN.

- The registration and configuration procedures shall include a validation and update of identities and capabilities associated with the UE. For this reason, registration and activation of a UE shall only be done for UEs that are currently attached/registered to the network. The UE shall either send an registration/activation request to the network or the network shall "invite" the UE based on a request received from another UE belonging to the PN. Registration and activation may be also provided via administrative procedures.

- The UE or the network shall deny activation as default UE for terminating a particular service or service component, in case the UE does not provide the capability or the subscription to terminate the service.

- Deactivation and deregistration should not always require the involvement of the UE affected by the setting. However the network shall only process deactivation and deregistration requests from UEs belonging to the same PN.

- A UE performing activations shall have the capability to perform the deactivations for these settings.

- For terminating services without an activated UE, the services shall not be redirected but shall be terminated by the addressed target UE. Information shall be offered to the PN-User when the only active device for terminating a service is deactivated.

- In case more than one device is activated for a terminating service, e.g. IMS devices with the same Public User Identity, the service should be directed to all devices that are currently reachable for the network (PS attached or IMS registered). It shall be possible to make the PN-User aware on charging implications caused by activation of more than one UE for directing of the same service.

- If activations are configured for one or more media types of a service then the overall service directing setting shall be overwritten for directing these service components.

- Directing media of a service to different devices should be up to the choice and responsibility of the PN-User. For instance, in case of synchronized media the redirection to different devices may result in a loss of synchronization.

- A new activation overrides the previous activation status when successful.

- Deregistration of active UEs shall comprise the global deactivation of the UEs.

- It shall be possible to allow two sets of activation settings. One set is always present and contains the default configuration. On a temporary basis, a second set of activation settings is configured. The temporary activations shall provide a means for saving and restoring current activation settings. While temporary activations are switched on, these settings shall override the non-temporary configuration.

- The network shall assume that the non-temporary settings are still valid after fallback from temporary to non-temporary activation settings. For this reason, it shall be possible for the UE to access and change temporary as well as non-temporary settings.

- If capabilities or subscriptions of an active UE change and activated services are no longer supported by the UE, e.g. TEs providing these capabilities are removed, then the UE shall deactivate the affected services and offer appropriate information to the user and the PN service.

- It shall be possible for a UE to offer capability lists to the PNM service, where the capability list contains the capabilities that the UE is capable of terminating or is interested in receiving updates regarding them.

- It shall be possible for UEs of the PN to update PN configuration after an attachment/registration of the UE to the network.

- PNM settings may comprise current UE capabilities and redirection settings of a PN. The PNM service shall update the PNM settings to the UEs, selectively based on their respective capability lists, when other UE capabilities of the PN change.

- Means shall be provided to enable redirection to a particular UE for dealing with situations where UEs share the same Public User Identity.