Presentation of Specification/Report to TSG-T

Presentation to:	**TSG-T Meeting #11**
Document for presentation:	**TS 23.227 Application and User Interaction in the UE-Principles and Specific Requirements; Version 1.0.0**
Presented for:	**Approval**

Abstract of document:

This specification introduces a generic model approach for the ME environment. The purpose of the specification is to structure the events that are external to, and has to be handled by, the ME Core Functions.

Changes since last presentation:

New specification

Outstanding Issues:

T2 is asking for approval of the present specification, to have a version available for Rel-4, as it was agreed in last T2#12 meeting.

Some concerns have been shown, from T3 delegates, about the need that T3 checks the specification since it has some references to the USAT. T might wish to postpone the approval of the specification until T3 has checked this issue.

Contentious Issues:

There are some suggestions about giving to the specification a broader scope than it has today, including architectural and multi-task aspects.

3GPP TS 23.227 V1.0.0 (2001-03)

Technical Specification

3rd Generation Partnership Project;
Technical Specification Group Terminals;
Application and User Interaction in the UE - Principles and Specific Requirements;

3GPP

Contents

Foreword

This Technical Specification has been produced by the 3GPP.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 Indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the specification;

Introduction

The present rapid development of a diversity of new applications and application environments for mobile usage creates a complexity of previously unseen proportions that the Mobile Equipment has to handle.

This specification introduces a generic model approach for the ME environment; the purpose is *not* to categorise the applications / peripherals, but to try to structure the events that are internal and external to, and has to be handled by, the ME Core Functions. This means that the structure or grouping of the events should be made from a *ME centric* perspective. Some applications run on the ME side have counterparts in the network. This specification does not address the functions in the network.

1   Scope

This 3GPP Technical Specification defines the principles for scheduling resources between applications in different application execution environment (e.g. MExE, USAT etc.) and internal and external peripherals (e.g. infra-red, Bluetooth, USIM, radio interface, MMI, memory etc.).

This specification is divided in two parts: Chapter 5 defines a framework for event handling. Chapter 6 addresses some specific issues.

Appendix A contains an informative background to the problem area.

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.

[1]   3GPP TR 21.905 3G Vocabulary

[2]   3GPP TS 23.057: " Mobile Station Application Execution Environment (MExE); Functional description; Stage 2".

[3]   WAP, WAP Forum, "WAP Technical Specifications Suite", version 1.1, June 1999. (http://www.wapforum.com/)

[4]   3GPP TS 31.101: "3rd Generation Partnership Project (3GPP); UICC / Terminal Interface; Physical and Logical Characteristics".

[5]   3GPP TS 31.102: "3rd Generation Partnership Project (3GPP); Characteristics of the USIM application".

[6]   3GPP TS 31.111: "USIM Application Toolkit (USAT)".

[7]   3GPP TS 22.038: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects ; USIM/SIM Application Toolkit (USAT/SAT); Service description; Stage 1".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of this document the following abbreviations apply in addition to those defined in the referred documents:

call: The term call means voice and data calls, USSD, SMS, fax, GPRS calls, supplementary services, etc.

preferences: includes authorisations, priorities, options, etc.

authorisation: means permission to set up and / or receive any call or only certain types of call and access rights to user data.

ME Core Functions: software functions that contain the central logic for the ME, including for instance the scheduling of events.

3.2 Abbreviations

For the purposes of the present document the following abbreviations apply:

MExE: *Mobile Execution Environment*

MM: *Mobility Management*

RR: *Radio Resource*

USAT: *USIM Application Toolkit*

WAP: *Wireless Application Protocol*

5 Principles for the Framework

The model presented in appendix A defines a framework specifying *principles* for event handling, with the focus on issues related to application interaction. Principles for the framework are given below, using the stated definitions. The list is not necessarily complete.

5.1 Basic principles

1. Irrespective of the principles given below, emergency calls shall override all other calls.

2. The ME is the central resource and schedules internal and external entities according to the user's preferences and external environment .

5.2 User requirements

1. The user shall have the capability to make the ultimate decisions as elaborated below. Additionally, in the case where an UE is unmanned, none of the issues below shall render the UE inoperable such that it requires manual intervention locally at the UE to restore its use.

2. The user shall have the capability of selecting preferences interactively and / or via prior set-up in one or more user profiles. These shall be valid on a global or on a per application basis. The user's preferences shall be retained even in the event of loss of power.
   Preferences can be selected for an application when it is installed, or at any other time thereafter.
   Preferences, notably but not exclusively the priorities, can be modified at any time and this shall have effect at the earliest possible opportunity thereafter.

3. The user shall have the capability to modify authorisations assigned to applications. These shall be valid on a global or on a per application basis in one or more user profiles.

4. The user shall have the option to be advised to what extent an application has been authenticated at installation-time, and prevent the application from being installed based on this advice.
   The user shall have the option to be advised about the integrity of an application at installation-time, and prevent the application from being installed based on this advice.

5. The user shall have the capability to abort or suspend any on-going call that has been set up automatically by an application.

6. The user shall have the capability to require that the ME request permission from the user for individual calls, sets of calls (for instance all calls by a certain application) or all calls. The user shall have the capability to request the ME to record information on individual calls, sets of calls or all calls.

7. The user shall have the capability to distinguish which entity / application caused a specific event. The ME uses this information to support the user's preferences. The ME shall be able to inform the network of entity / application at set up time to support trace-ability when a call is set up.

8. The user's privacy shall be protected. Access to user data (including user profiles and any personal information in the UE) and audio functions (this would prevent for instance a mechanism that allows eavesdropping) shall not be possible without the user's prior permission.

9. The user shall have the capability to request from the ME which applications are present in the MExE environment and the (U)SIM, and whether they are running. The user shall also have the capability to request from the ME the status of other interfaces as shown in Figure 1, where implemented.

5.3   Additional requirements on applications

1. An application shall not assume that it is the only one active. For example where several applications use the same interface the application and / or the protocols used over the interface must be able to handle contention.

2. An application shall not interfere (terminate, suspend or degrade) with on-going calls set up by another application without authorisation from the user. For certain combinations of call (e.g., voice/data and USSD messages), interference can happen resulting in a level of degradation.

3. An application shall not assume that it has priority over another application, and shall comply with the user's currently selected preferences.

5.4   Additional requirements on the ME

1. The ME shall have the capability to authenticate the source of the application.

2. The ME shall have the capability to assure the integrity of an application.

6   Specific Interaction Requirements

The following sections detail specific interaction requirements

6.1   Bearer Independent Data Transfer

Bearer Independent Data Transfer is a USIM feature that allows the USIM to request the ME to set up and manage a data channel (using a CSD, GPRS, SMS or USSD bearer) using information provided by the USIM. Once the call is established, data may be transferred through that data call. The details for the USIM/ME interface are specified in TS 31.101, 31.102, and 31.111. The Service Requirements for this are specified in TS 22.038.

6.1.1   Interaction between Core ME functions and Bearer Independent Data Transfer Service

When a Bearer Independent Data Transfer Service is requested by the USIM, the ME shall:

*   If the ME is idle, set up the data channel as requested, indicating to the user by appropriate means, e.g., with an icon, that one or more calls are in progress and confirming to the USIM.

*   If the ME is not idle and can not service the request without negative impact on ongoing services, then the ME shall indicate to the USIM that the data channel can not be set up. However, if the user has indicated a preference for servicing such requests despite the negative impact then the ME may proceed as in the bullet point above.

*   If the user requests that the call be terminated via MMI or other interface, then the call shall be terminated and the USIM shall be informed.

*   If an external device (TE, Bluetooth device etc.) requests the same resource then that request shall be denied.

The above behaviour may be modified by a change of user preferences, for example the user may request the ME to deny access by the USIM to a data channel, or the user may request the ME to prioritise a particular external device such that a call set up by a USIM is cleared in order for the external device to be able to make a call.

6.2   Services and applications external to the MT

In the tele- and datacom community there exist today use cases for moving internal interfaces out of the MT; they are required to fulfil user expectations of what services and features 3G MTs should offer.

However, discussions on security clearly show that services should be terminated in the MT, while applications can, as today, terminate in the TE. A possible UE functionality split should not allow internal interfaces (including USIM) to be moved to external interfaces, neither using USAT local link nor other interfaces.

This is a precaution that shall be taken until suitable procedures against misuse have been found and standardised.

Annex A (informative):
Interaction handling

In this specification we illustrate possible types of interaction handling for a ME that already can be required or that currently are being developed in standards and industry fora. Although it is probable that only a subset of these entities will exist at the same time, there is no way of knowing the particular combination of applications or a particular users needs relative to this in advance; *a general way to handle the co-existence must still be defined*.

A framework, defining general rules for handling this co-existence of several external functions is outlined in this document. The framework states requirements for the behaviour of the external functions as well as principles for the co-existence as such. As an example, several of the external functions below, or protocols used by them (e.g., the AT-commands) assume a one-to-one relation between them and the ME Core Functions, implying a lack of specified mechanisms to handle a multitask environment.

A.1 The model approach

The model below proposes a *conceptual* split, meaning that the entities and their interfaces are *logical* and need not correspond to any physical division. Before the figure is presented some clarifications and general comments are needed:

- The *ME Core Functions* should be understood as the (collection of) software functions that contain the central logic for the ME, including for instance the scheduling of events.

- With *external event* is meant interaction that an application / peripheral wants (requests / commands), as well as necessary handling of network signalling, user request via the keys, etc. External does not imply whether an external interface is used or not.

- Some *network signalling* is easy to refer to basic network functions, such as Location Update, while other signalling has been invoked by an application.

- The user can interact / intervene *directly* via keys, etc. This is indicated with the *Manual User Interaction* entity. The user can of course do the same via, e.g., a PC or a MExE application, but the events that such actions create is here viewed like the other events that these entities can create.

- The *USIM* / general *Smart Card Functions* are split into several logical entities: the Transport Layer Security, meaning "basic" 2G/3G security; the USIM Application Toolkit; USIM Application Toolkit Run AT-command; and other functions, such as the WIM, the WAP Identity Module, that is being specified.

- The *TE*, Terminal Equipment, is a PC or another piece of equipment that can run applications independently.

- An *Intelligent Peripheral* could be an advanced charger or a car hands-free installation.

- The *MExE* entities are as defined in [2].

- *Other* includes ME resident applications and allows for future applications, and, if that is needed for the model, could correspond to other external devices such as a microphone.

- The interfaces as shown in the figure are logical. In practice the applications run in the ME, a TA or on its own separate platform, and the interfaces are then ME internal or external via a physical connector, IrDA, or Bluetooth.
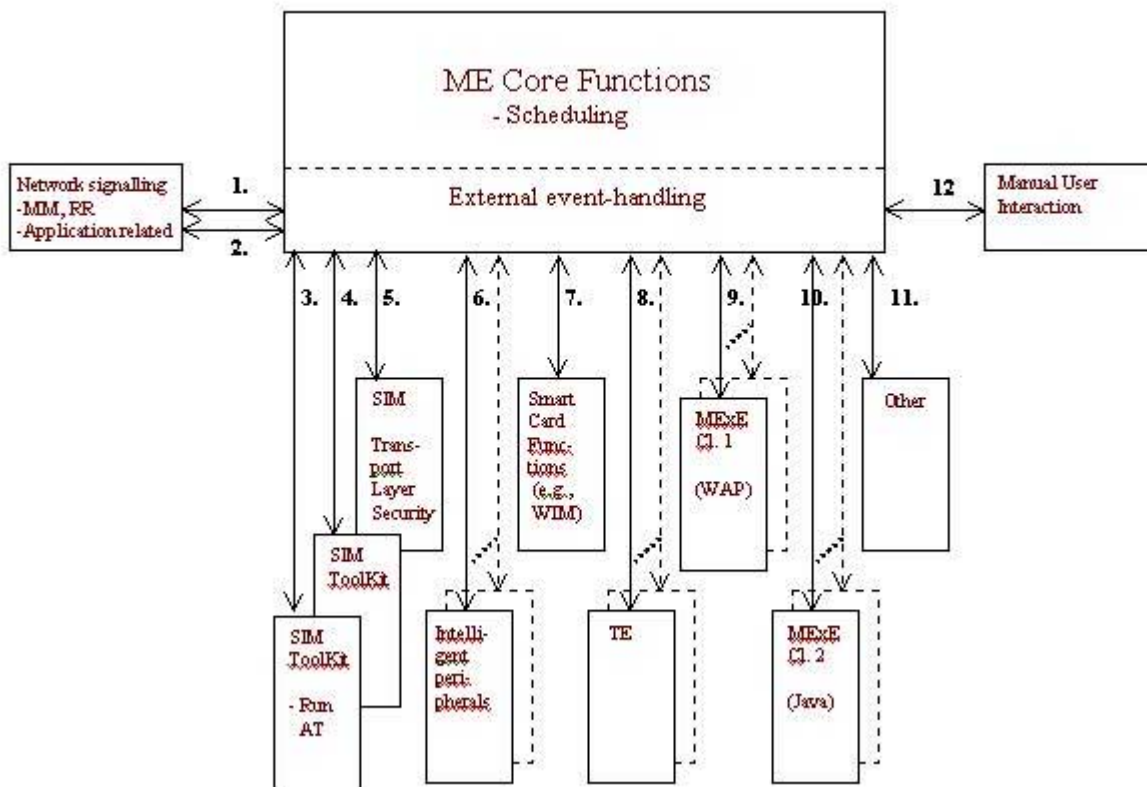
The figure shows the extent of the complexity that the ME will be expected to handle. It is obvious that a generic framework for conflicts, error handling and interactions is needed. In particular, the following issues can be noted:

1. Priorities of the event handling – the ME does the scheduling and this should be according to the user's preferences.

2. User control – the user's wanted / required interaction; his/her knowledge and control of the events; user integrity for instance for personal data, the ME position, etc.

3. Trace-ability – which entity / application has caused a particular event. This information is required input to solve several of the other issues.

4. Consistency - in the actions of the ME Core Functions relative to the specific application. Several applications and priority levels interact.

5. The validity of commands – for instance call validity when the ME is in the Home PLMN or roaming.

6. Network signalling aspects – how does for instance a dual mode ME treat applications specific to only one of the standards.

7. It might be necessary to look into mechanisms for rejection and termination by the ME Core Function (upon user choice) for applications, calls etc.

8. Testability – the ME manufacturer must be able to as far as possible verify the behaviour of the product, and this should be taken into consideration when the framework is specified. Conformance testing, however, is only relevant to the extent that already is tested.

9. Security aspects – for the protection of the ME and the network mechanisms like authentication of the applications might be required.

Further, the entities have different characteristics; this can possibly be used by the framework definitions. The following can for instance be noted:

1. Several of the entities work together with network nodes, some as slaves (e.g., SIM) and others invoking commands (e.g., WAP). Others, like the intelligent peripherals, only communicate "locally".

2. The entities can be active or passive. In the latter case the ME has more knowledge about the expected behaviour, since they only execute functions upon request and cannot issue commands independently.

3. Some events refer to "basic" network handling, some to manual user interaction, and others relate to application invoked functions. "Basic" network interaction should then have priority if such a distinction can be made. Consideration should be given to incoming calls.

Annex B (Informative): Change history

Change history		
V 0.0.0	May 2000	
V 0.1.0	August 2000	Clarification of Section 7.
V 0.1.1	February 2001	Restructure of document to clarify normative parts. T2-010281
V 0.1.2	February 2001	More references included, clarifications in basic principles for the framework and move history chapter T2-010289
V 0.1.3	February 2001	Change to agreed tittle in T2#12 closing plenary Updated reference
V 0.2.0	March 2001	- Removed reference about SyncML - Updated references and abbreviations - Added ME Core Functions definition in chapter "3.1 Definitions" - Moved from last 2 sentence from chapter 4 to chapter "1 Scope" - Move chapter "4 Introduction" after "Foreword" - Chapter 5: re-numbered the requirements, starting with 1. in each chapter. - Added chapter "6.2 Services and applications external to the MT"
V 1.0.0	March 2001	Presentation for approval to TSG-T#11