3GPP TSG-T (Terminals) Meeting #10
Bangkok, Thailand, 6 - 8 December, 2000

Tdoc TP-000201

Source: T3

Title: Change Request to GSM 03.19 "SIM API for Java Card™"

Agenda item: 5.3.3

Document for: Approval

This document contains change requests to GSM 03.19 v7.3.0 agreed by T3.

T3 Doc	Spec	CR	Rv	Rel	Subject
T3-000575	03.19	A005		R98	Clarification of applet triggering by EVENT_STATUS_COMMAND event
T3-000612	03.19	A006		R98	Correction of the export file version of the API
T3-000613	03.19	A007		R98	Clarification to the SIM Toolkit Framework behaviour
T3-000614	03.19	A008		R99	Upgrade for release 99

3GPP T3 Meeting #16
Seoul, Korea, 13 - 15 November, 2000

Tdoc T3-000575
(revised from T3-000528)

CHANGE REQUEST

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GSM 03.19 **CR** **A005** Current Version: 7.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-T #10
list expected approval meeting # here ↑

for approval ☒
for information □

strategic □
non-strategic □
(for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: (U)SIM ☒ ME □ UTRAN / Radio □ Core Network □
(at least one should be marked with an X)

Source: T3 **Date:** 13/11/2000

Subject: Clarification of applet triggering by EVENT_STATUS_COMMAND event

Work item: SIM API

Category: *(only one category shall be marked with an X)*

F Correction ☒
A Corresponds to a correction in an earlier release □
B Addition of feature □
C Functional modification of feature □
D Editorial modification □

Release:

Phase 2 □
Release 96 □
Release 97 □
Release 98 ☒
Release 99 □
Release 4 □

Reason for change: The second line of comment on the *EVENT_STATUS_COMMAND* can lead to confusion and make believe that the applet registered for this event may not be systematically activated on a STATUS command reception by the SIM : the confusion can be prevented by removing the comment.

Clauses affected: 6.2

Other specs affected:

Other 3G core specifications □ → List of CRs:
Other GSM core specifications □ → List of CRs:
MS test specifications □ → List of CRs:
BSS test specifications □ → List of CRs:
O&M specifications □ → List of CRs:

Other comments:

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6.2 Applet Triggering

The application triggering portion of the SIM Toolkit Framework is responsible for the activation of toolkit applets, based on the APDU received by the GSM application.

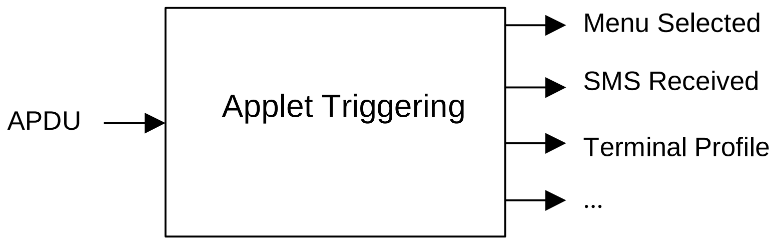

Figure 3: toolkit applet triggering diagram

The ME shall not be adversely affected by the presence of applets on the SIM card. For instance a syntactically correct Envelope shall not result in an error status word in case of a failure of an applet. The only application as seen by the ME is the SIM application. As a result, a toolkit applet may throw an exception, but this error will not be sent to the ME.

The difference between a Java Card applet and a Toolkit applet is that the latter does not handle APDUs directly. It will handle higher level messages. Furthermore the execution of a method could span over multiple APDUs, in particular, the proactive protocol commands (Fetch, Terminal Response).

As seen above, when the GSM applet is the selected application and when a toolkit applet is triggered the *select*() method of the toolkit applet shall not be launched since the toolkit applet itself is not really selected.

Here after are the events that can trigger a toolkit applet :

EVENT_PROFILE_DOWNLOAD

Upon reception of the Terminal Profile command by the SIM, the SIM Toolkit Framework stores the ME profile and then triggers the registered toolkit applet which may want to change their registry. A toolkit applet may not be able to issue a proactive command.

[...]

EVENT_UNRECOGNIZED_ENVELOPE

The unrecognized Envelope event will allow a toolkit applet to handle the evolution of the GSM 11.14 specification.

EVENT_STATUS_COMMAND

At reception of a STATUS APDU command, the SIM Toolkit Framework shall trigger the registered toolkit applet.

~~As the SIM Toolkit Framework has control of the EVENT_STATUS_COMMAND event, it decides how often to trigger toolkit applets registered to this event. The result is that toolkit applets may be triggered more or less often than they are expecting. It is recommended that toolkit applet writers bear this in mind. Polling Interval cannot be used as an accurate timer.~~

A range of events is reserved for proprietary usage (from –128 to –1). The use of these events will make the toolkit applet incompatible.

The toolkit applet shall be triggered for the registered events upon reception, and shall be able to access to the data associated to the event using the methods provided by the *sim.toolkit.ViewHandler.EnvelopeHandler* class.

The order of triggering the toolkit applet shall follow the priority level of each toolkit applet defined at its loading. If several toolkit applets have the same priority level, the last loaded toolkit applet takes precedence.

3GPP T3 Meeting #16
Seoul, Korea, 13 - 15 November, 2000

Tdoc T3-000612
(REVISED VERSION OF T3-000566)

CHANGE REQUEST

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03.19	**CR**	**A006**	Current Version:	7.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ ↑ *CR number as allocated by MCC support team*

For submission to:	TSG-T #10	for approval	X	strategic		*(for SMG*
list expected approval meeting # here ↑		for information		non-strategic		*use only)*

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM	X	ME		UTRAN / Radio		Core Network	

Source: T3 **Date:** 14/11/2000

Subject: Correction of the export file version of the API

Work item: SIM API

Category:	F	Correction	X	**Release:**	Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature			Release 97	
shall be marked	C	Functional modification of feature			Release 98	X
with an X)	D	Editorial modification			Release 99	
					Release 00	

Reason for change: To correct the version of the API export files as they didn't change.

Clauses affected: ANNEX D

Other specs affected:	Other 3G core specifications		→ List of CRs:	
	Other GSM core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:

help.doc

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Annex D (Normative):
SIM API package version management

The following table describes the relationship between each GSM 03.19 specification version and its SIM API packages AID and Major, Minor versions defined in the export files.

GSM 03.19 version	sim.access package		sim.toolkit package	
	AID	Major, Minor	AID	Major, Minor
7.0.0	A000000009 0003FFFFFFFF8910700001	1.0	A000000009 0003FFFFFFFF8910700002	1.0
7.1.0	A000000009 0003FFFFFFFF8910710001	2.0	A000000009 0003FFFFFFFF8910710002	2.0
7.2.0	A000000009 0003FFFFFFFF8910710001	2.~~1~~0	A000000009 0003FFFFFFFF8910710002	2.~~1~~0
7.3.0	A000000009 0003FFFFFFFF8910710001	2.~~2~~0	A000000009 0003FFFFFFFF8910710002	2.~~2~~0

The package AID coding is defined in EG 201 220 [10]. The SIM API packages' AID are not modified by changes to Major or Minor Version.

The Major Version shall be incremented if a change to the specification introduces byte code incompatibility with the previous version.

The Minor Version shall be incremented if a change to the specification does not introduce byte code incompatibility with the previous version.

3GPP T3 Meeting #16
Seoul, Korea, 13 - 15 November, 2000

Tdoc T3-000613
(revised version of T3-000567)

CHANGE REQUEST

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03.19	**CR**	**A007**	Current Version:	7.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ ↑ *CR number as allocated by MCC support team*

For submission to:	TSG-T #10	for approval	☒	strategic	□	*(for SMG*
list expected approval meeting # here ↑		for information	□	non-strategic	□	*use only)*

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: (U)SIM ☒ ME □ UTRAN / Radio □ Core Network □
(at least one should be marked with an X)

Source: T3 **Date:** 14/11/2000

Subject: Clarification to the SIM Toolkit Framework behaviour

Work item: SIM API

Category:	F	Correction	☒	**Release:**	Phase 2	□
	A	Corresponds to a correction in an earlier release	□		Release 96	□
(only one category	B	Addition of feature	□		Release 97	□
shall be marked	C	Functional modification of feature	□		Release 98	☒
with an X)	D	Editorial modification	□		Release 99	□
					Release 00	□

Reason for change: Clarify the SIM Toolkit Framework behaviour and the API.
The Minor Version of the Export files shall be incremented.

Clauses affected: §4.1, §6.2, §6.5

Other specs affected:	Other 3G core specifications	□	→ List of CRs:
	Other GSM core specifications	□	→ List of CRs:
	MS test specifications	□	→ List of CRs:
	BSS test specifications	□	→ List of CRs:
	O&M specifications	□	→ List of CRs:

Other comments:

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4 Description

The present document describes an API for the GSM SIM. This API allows application programmers access to the functions and data described in GSM 11.11 [2] and GSM 11.14 [3], such that SIM based services can be developed and loaded onto SIMs, quickly and, if necessarily, remotely, after the card has been issued.

This API is an extension to the Java Card 2.1 API [7] based on the Java Card 2.1 Runtime Environment [8].

4.1 GSM Java Card Architecture

The over all architecture of the SIM Toolkit API based on Java Card 2.1 is:

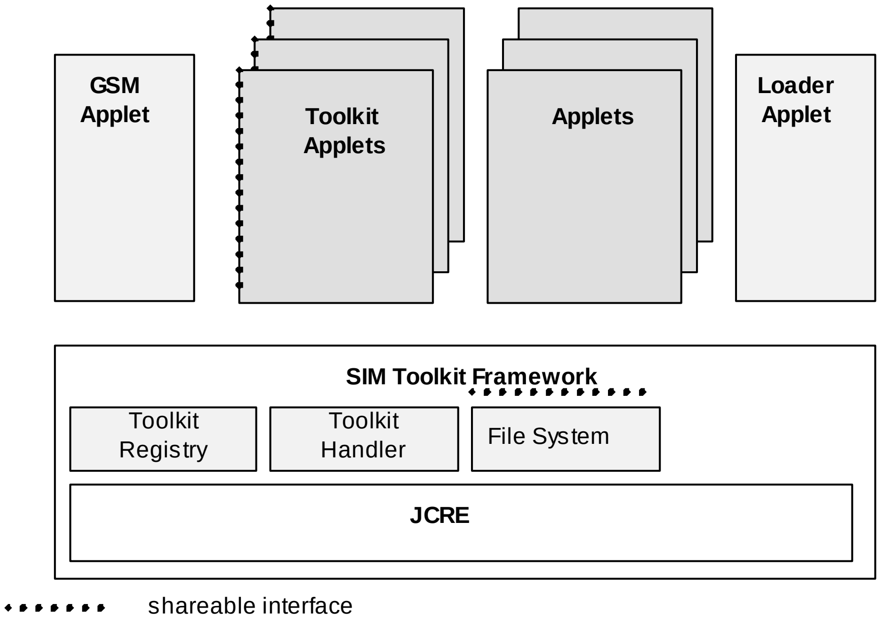


Figure 1: GSM Java Card Architecture

SIM Toolkit Framework: this is the GSM Java Card runtime environment, it is composed of the JCRE, the Toolkit Registry, the Toolkit Handler and the File System.

JCRE: this is specified in Java Card 2.1 Runtime Environment Specification [8] and is able to select any specific applet and transmit to it the process of its APDU.

Toolkit Registry: this is handling all the registration information of the toolkit applets, and their link to the JCRE registry.

Toolkit Handler: this is handling~~es~~ the availability of the system handler and the toolkit protocol (i.e. toolkit applet suspension).

File System: this contains the card issuer file system, and handles the file access control and the applet file context. It is a JCRE owned object implementing the shareable interface *sim.access.SIMView*.

Applets: these derive from javacard.framework.applet and provide the entry points : *process, select, deselect, install* as defined in the Java Card 2.1 Runtime Environment Specification [8].

Toolkit applets: these derive from javacard.framework.applet, so provide the same entry points, and implement the shareable interface *sim.toolkit.ToolkitInterface* so that these applets can be triggered by an invocation of their *processToolkit* method. These applets' AID is defined in EG 201 220[10].

GSM Applet: this is the default applet as defined in Java Card 2.1 Runtime Environment Specification [8], it behaves as regular applet e.g. when another applet is selected via the SELECT AID APDU its *deselect* method is invoked. It's AID is defined in EG 201 220[10]. This applet handles the GSM 11.11[2] APDUs, CHV1/2, the GSM authentication algorithm and the subscriber file access control according to GSM 11.11[2].

Loader applet: this is handling the installation and uninstallation of the applets as specified in the applet loading specification GSM 03.48 [4].

Shareable interface: this is defined in the Java Card 2.1 specifications.

4.2 Java Card Selection Mechanism

The Java Card selection mechanism is defined in the Java Card Runtime Environment Specification [8].

5 GSM Framework

5.1 Overview

The GSM Framework consists of the GSM applet and the JCRE File System Object.
The GSM Framework is based on two packages:

- The GSM low level package [FFS];

- The *sim.access* package, which allows applets to access the GSM files.

5.2 GSM file data access

The following methods shall be offered by the API to card applets, to allow access to the GSM data:

select Select a file without changing the current file of any other applet or of the subscriber session. At the invocation of the *processToolkit* method of a toolkit applet, the current file is the MF. The toolkit applet file context remains unchanged during the whole execution of the *processToolkit* method, the current record may be altered if the current file is a cyclic file and the content of the current file may be altered. This method returns the selected file information;

status Read the file status information of the current DF;

readBinary Read data bytes of the transparent EF currently selected by the applet;

readRecord Read data bytes of the linear fixed or cyclic EF currently selected by the applet without changing the current record pointer of any other applet / subscriber. This method allows reading part of a record;

updateBinary Modify data bytes of the transparent EF currently selected by the applet. The toolkit applet shall send the corresponding refresh ;

updateRecord Modify data bytes of the linear fixed or cyclic EF currently selected by the applet. The current record pointer of other applets / subscriber shall not be changed in case of linear fixed EF but the record pointer of a cyclic EF shall be changed for all other applets / subscriber to the record number 1. This method allows updating part of a record. The toolkit applet shall send the corresponding refresh ;

seek Search a record of the linear fixed file currently selected by the applet starting with a given pattern. The current record pointer of any other applet or of the subscriber session shall not be changed;

increase Increase the value of the last updated record of the cyclic EF currently selected. It becomes than record number 1 for every other applet and subscriber session. This method returns the increased value. The toolkit applet shall send the corresponding refresh;

rehabilitate Rehabilitate the EF currently selected by the applet with effect for all other applets / subscriber. The toolkit applet shall send the corresponding refresh;

invalidate Invalidate the EF currently selected by the applet with effect for all other applets / subscriber. The toolkit applet shall send the corresponding refresh.

These methods are described in the *sim.access.SIMView* interface in Annex A.

5.3 Access control

The Access Control privileges of the applet are granted during installation according to the level of trust. When an applet requests access to GSM or operator specific files, the SIM Toolkit Framework checks if this access is allowed by examination of the file control information stored on the card. If access is granted the SIM Toolkit Framework will process the access request, if access is not granted, an exception will be thrown.
[Contents and coding of the file(s) containing access control information will be defined in GSM 11.11]

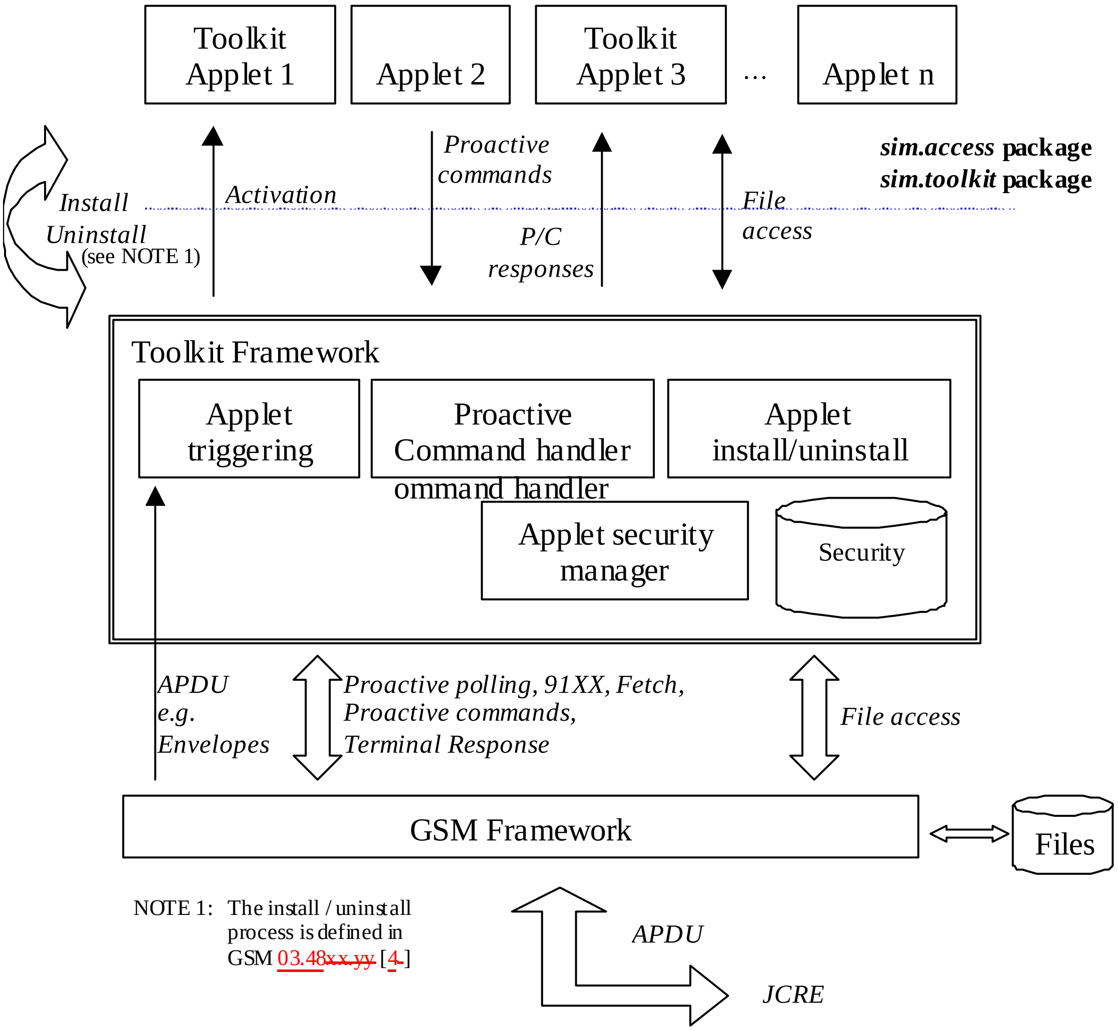
5.4 GSM low Level API

[FFS. This API allows the implementation of the GSM applet]

6 SIM Toolkit Framework

6.1 Overview

The SIM API shall consist of APIs for GSM 11.14 [3] (pro-active functions) and GSM 11.11 [2] (transport functions).



NOTE 1: The install / uninstall process is defined in GSM 03.48~~xx.yy~~ [4]

Figure 2: SIM Toolkit Framework functional description

In this model, the GSM data field structure is viewed as a series of data objects to the API. In the physical model of course, they may still be stored in elementary fields, but classes will access these data as part of the objects within those classes.

6.2 Applet Triggering

The application triggering portion of the SIM Toolkit Framework is responsible for the activation of toolkit applets, based on the APDU received by the GSM application.

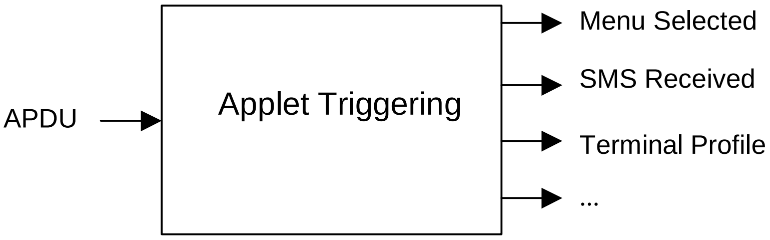


Figure 3: toolkit applet triggering diagram

The ME shall not be adversely affected by the presence of applets on the SIM card. For instance a syntactically correct Envelope shall not result in an error status word in case of a failure of an applet. The only application as seen by the ME is the SIM application. As a result, a toolkit applet may throw an exception, but this error will not be sent to the ME. The difference between a Java Card applet and a Toolkit applet is that the latter does not handle APDUs directly. It will handle higher level messages. Furthermore the execution of a method could span over multiple APDUs, in particular, the proactive protocol commands (Fetch, Terminal Response).

As seen above, when the GSM applet is the selected application and when a toolkit applet is triggered the *select*() method of the toolkit applet shall not be launched since the toolkit applet itself is not really selected.
Here after are the events that can trigger a toolkit applet :

EVENT_PROFILE_DOWNLOAD

Upon reception of the Terminal Profile command by the SIM, the SIM Toolkit Framework stores the ME profile and then triggers the registered toolkit applet which may want to change their registry. A toolkit applet may not be able to issue a proactive command.

EVENT_MENU_SELECTION, EVENT_MENU_SELECTION_HELP_REQUEST

A toolkit applet might be activated upon selection in the ME's menu by the user, or request help on this specific menu.

In order to allow the user to choose in a menu, the SIM Toolkit Framework shall have previously issued a SET UP MENU proactive command. When a toolkit applet changes a menu entry of its registry object, the SIM Toolkit Framework shall ~~automatically~~ dynamically update the menu stored in the ME during the current card session. The SIM Toolkit Framework shall use the data of the EFsume file when issuing the SET UP MENU proactive command.

The positions of the toolkit applet menu entries in the item list, the requested item identifiers and the associated limits (e.g. maximum length of item text string) are defined at the loading of the toolkit applet.

If at least one toolkit applet registers to EVENT_MENU_SELECTION_HELP_REQUEST, the SET UP MENU proactive command sent by the SIM Toolkit Framework shall indicate to the ME that help information is available.A toolkit applet registered for one or more menu entries, may be triggered by the event EVENT_MENU_SELECTION_HELP_REQUEST, even if it is not registered to this event. A toolkit applet registered for one or more menu entries should provide help information.

EVENT_FORMATTED_SMS_PP_ENV, EVENT_UNFORMATTED_SMS_PP_ENV, EVENT_FORMATTED_SMS_PP_UPD, EVENT_UNFORMATTED_SMS_PP_UPD

A toolkit applet can be activated upon the reception of a short message.

There are two ways for a card to receive an SMS : via the Envelope SMS-PP Data Download or the Update Record EFsms instruction.

The reception of the SMS by the toolkit applet cannot be guaranteed for the Update Record EFsms instruction.

The received SMS may be :

- formatted according to GSM 03.48[4] or an other protocol to identify explicitly the toolkit applet for which the message is sent ;
- unformatted or using a toolkit applet specific protocol the SIM Toolkit Framework will pass this data to all registered toolkit applets.

EVENT_FORMATTED_SMS_PP_ENV

This event is triggered by an envelope APDU containing an SMS_DATADOWNLOAD BER TLV with an SMS_TPDU simple TLV according to GSM03.48[4].

The SIM Toolkit Framework shall:

- verify the GSM03.48[4] security of the SMS TPDU ;
- trigger the toolkit applet registered with the corresponding TAR defined at applet loading;
- take the optional Application Data posted by the triggered toolkit applet if present;
- secure and send the response packet.

The toolkit applet will only be triggered if the TAR is known and the security verified, application data will also be deciphered.

EVENT_UNFORMATTED_SMS_PP_ENV

The registered toolkit applets will be triggered by this event and get the data transmitted in the APDU envelope SMS_DATADOWNLOAD.

But only the first toolkit applet triggered will be able to send back a response as defined by the rules in chapter 6.6.

EVENT_FORMATTED_SMS_PP_UPD

This event is triggered by Update Record EFsms with an SMS TP-UD field formatted according to GSM03.48[4].

The SIM Toolkit Framework shall :

- update the EFsms file with the data received, it is th~~a~~en up to the receiving toolkit applet to change the SMS stored in the file (i.e. the toolkit applet need to have access to the EFsms file)
- verify the GSM03.48[4] security of the SMS TPDU ;
- convert the Update Record EFsms in a TLV List, an EnvelopeHandler ;
- trigger the toolkit applet registered with the corresponding TAR defined at applet loading;

The Update Record EFsms APDU shall be converted in a TLV list as defined below :

UPDATE RECORD APDU	nb bytes	Handler TLV LIST	size
CLA, INS	2	specific event	1
P1,P2	2	device Identity rec-number	1
P3 = 176	1		1
status	1	device Identity rec-status	1
TS-SCA (RP-OA)	<= 12	Address	Y
SMS TPDU	var	SMS TPDU	Y
padding bytes	var		Y

The EnvelopeHandler provided to the applet shall:

- return *BTAG_SMS_PP_DOWNLOAD* to the *getEnvelopeTag()* method call;
- return the Simple TLV list length to the *getLength()* method call;
- contain the Simple TLV list :

EnvelopeHandler TLV List
Device identities
Address
SMS TPDU

The applet should use the findTLV() methods to get each Simple TLV.

The Device Identity Simple TLV is used to store the information about the absolute record number in the EFsms file and the value of the EFsms record status byte, and formatted as defined below:

Device identities Simple TLV
Device identities tag
length = 02
Absolute Record Number
Record Status

With the absolute record number the toolkit applet can update EFsms in absolute mode to change the received SMS in a readable text.

EVENT_UNFORMATTED_SMS_PP_UPD

The SIM Toolkit Framework will first update the EFsms file, convert the received APDU as described above, and then trigger all the registered toolkit applets. All of them may modify the content of EFsms (i.e. the toolkit applets need to have access to the EFsms file).

EVENT_UNFORMATTED_SMS_CB

When the ME receives a new cell broadcast message, the cell broadcast page may be passed to the SIM using the envelope command. E.g. the application may then read the message and extract a meaningful piece of information which could be displayed to the user, for instance.

EVENT_CALL_CONTROL_BY_SIM

When the SIM is in call control mode and when the user dials a number, this number is passed to the SIM. Only one toolkit applet can handle the answer to this command: call barred, modified or accepted.

EVENT_EVENT_DOWNLOAD_MT_CALL, EVENT_EVENT_DOWNLOAD_CALL_CONNECTED, EVENT_EVENT_DOWNLOAD_CALL_DISCONNECTED, EVENT_EVENT_DOWNLOAD_LOCATION_STATUS, EVENT_EVENT_DOWNLOAD_USER_ACTIVITY, EVENT_EVENT_DOWNLOAD_IDLE_SCREEN_AVAILABLE, EVENT_EVENT_DOWNLOAD_CARD_READER_STATUS

The toolkit applet will be triggered by the registered event download trigger, upon reception of the corresponding Envelope command.

In order to allow the toolkit applet to be triggered by these events, the SIM Toolkit Framework shall have previously issued a SET UP EVENT LIST proactive command. When a toolkit applet changes one or more of these requested events of its registry object, the SIM Toolkit Framework shall ~~automatically~~ dynamically update the event list stored in the ME during the current card session.

EVENT_MO_SHORT_MESSAGE_CONTROL_BY_SIM

Before sending an SMS MO entered by the user, the SMS is submitted to the SIM. Only one toolkit applet can register to this event

EVENT_TIMER_EXPIRATION

At the registration to this event the toolkit applet gets the reference to its timer. The toolkit applet can then manage the timer, it will be triggered at the reception of the APDU Envelope TIMER EXPIRATION.

The SIM Toolkit Framework shall reply busy to this Envelope APDU if it cannot guaranty to trigger the corresponding toolkit applet.

EVENT_UNRECOGNIZED_ENVELOPE

The unrecognized Envelope event will allow a toolkit applet to handle the evolution of the GSM 11.14 specification.

EVENT_STATUS_COMMAND

At reception of a STATUS APDU command, the SIM Toolkit Framework shall trigger the registered toolkit applet.

As the SIM Toolkit Framework has control of the EVENT_STATUS_COMMAND event, it decides how often to trigger toolkit applets registered to this event. The result is that toolkit applets may be triggered more or less often than they are expecting. It is recommended that toolkit applet writers bear this in mind. Polling Interval cannot be used as an accurate timer.

A range of events is reserved for proprietary usage (from –128 to –1). The use of these events will make the toolkit applet incompatible.

The toolkit applet shall be triggered for the registered events upon reception, and shall be able to access to the data associated to the event using the methods provided by the *sim.toolkit.ViewHandler.EnvelopeHandler* class.

The order of triggering the toolkit applet shall follow the priority level of each toolkit applet defined at its loading. If several toolkit applets have the same priority level, the last loaded toolkit applet takes precedence.

6.3 Registration

During it's installation the toolkit applet shall register to the JCRE and the SIM Toolkit Framework so that it can be triggered by both selection mechanisms.

The toolkit applet will have to call the *getEntry()* method to get a reference to it's registry and then to explicitly register to each event it requires.

The toolkit applet can change the events to which it is registered during its life cycle.

The toolkit applet will ~~automatically~~ register itself to some event e.g. *EVENT_MENU_SELECTION* by calling the corresponding method e.g. *initMenuEntry().*

The API is described in the *sim.toolkit.ToolkitRegistry* class in Annex A.

6.4 Proactive command handling

The SIM application toolkit protocol (i.e. 91xx, Fetch, Terminal Response) is handled by the GSM applet and the Toolkit Handler, the toolkit applet shall not handle those events.

The SIM Toolkit Framework shall provide a reference of the *sim.toolkit.ViewHandler.EditHandler.ProactiveHandler* to the toolkit applet so that when the toolkit applet is triggered it can :

- initialise the current proactive command with the *init()* method ;

- append several Simple TLV as defined in GSM 11.14 [3] to the current proactive command with the *appendTLV()* methods ;

- ask the SIM Toolkit Framework to send this proactive command to the ME and wait for the reply, with the *send()* method.

The GSM applet and the SIM Toolkit Framework shall handle the transmission of the proactive command to the ME, and the reception of the response. The SIM Toolkit Framework will then return in the toolkit applet just after the *send()* method. It shall then provide to the toolkit applet the *sim.toolkit.ViewHandler.ProactiveResponseHandler*, so that the toolkit applet can analyse the response.

The proactive command is sent to the ME as defined and constructed by the toolkit applet without any check of the SIM Toolkit Framework.

The toolkit applet shall not issue the following proactive commands : SET UP MENU, SET UP EVENT LIST, POLL INTERVAL, POLLING OFF ; as those are system proactive commands that will affect the services of the SIM Toolkit Framework.

The SIM Toolkit Framework cannot guarantee that if the SET UP IDLE MODE TEXT proactive command is used by a toolkit applet, another toolkit applet will not overwrite this text at a later stage.

6.5 Envelope response handling

To allow a toolkit applet to answer to some specific events (e.g. EVENT_CALL_CONTROL_BY_SIM) the SIM Toolkit Framework shall provide the *sim.toolkit.ViewHandler.EditHandler.EnvelopeResponseHandler*.

The toolkit applet can then post a response to some events with the *post()* or the *postAsBERTLV()* methods, the toolkit applet can continue it's processing (e.g. prepare a proactive command) the SIM Toolkit Framework will return the response APDU defined by the toolkit applet (i.e. 9F xx or 9E xx).

6.6 Handler availability

The system handlers : ProactiveHandler, ProactiveResponseHandler, EnvelopeHandler and EnvelopeResponseHandler are Temporary JCRE Entry Point Object as defined in the Java Card Runtime Environment Specification [8].
The following table describes the minimum availability of the handlers for all the events at the invocation of the processToolkit method of the toolkit applet.

Table 1: Handler availability for each event

EVENT_	Reply busy	ProactiveHandler ProactiveResponseHandler	EnvelopeHandler	EnvelopeResponseHandler	Nb of triggered / registrered Applet
_FORMATTED_SMS_PP_ENV	Y	Y	Y	Y	1 / n (per TAR)
_FORMATTED_SMS_PP_UPD	N	Y	Y	N	1 / n (per TAR)
_UNFORMATTED_SMS_PP_ENV	Y	Y	Y	Y	n / n
_UNFORMATTED_SMS_PP_UPD	N	Y	Y	N	n / n
_UNFORMATTED_SMS_CB	Y	Y	Y	N	n / n
_MENU_SELECTION	Y	Y	Y	N	1 / n (per Item Id)
_MENU_SELECTION_HELP_REQUEST	Y	Y	Y	N	1 / n (per Item Id)
_CALL_CONTROL	N	Y/N (see Note 2)	Y	Y	1 / 1
_SMS_MO_CONTROL	N	Y/N (see Note 2)	Y	Y	1 / 1
_TIMER_EXPIRATION	Y	Y	Y	N	1/ 8 (per timer) (see Note 1)
_EVENT_DOWNLOAD					
_MT_CALL	Y	Y	Y	N	n / n
_CALL_CONNECTED	Y	Y	Y	N	n / n
_CALL_DISCONNECTED	Y	Y	Y	N	n / n
_LOCATION_STATUS	Y	Y	Y	N	n / n
_USER_ACTIVITY	Y	Y	Y	N	n / n
_IDLE_SCREEN_AVAILABLE	Y	Y	Y	N	n / n
_CARD_READER_STATUS	Y	Y	Y	N	n / n
_UNRECOGNISED_ENVELOPE	Y	Y	Y	Y	n / n
_STATUS_COMMAND	N	Y/N (see Note 2)	N	N	n / n
_PROFILE_DOWNLOAD	N	Y/N (see Note 2)	N	N	n / n

NOTE 1: One toolkit applet can register to several timers, but a timer can only be allocated to one toolkit applet.
Note 2: Y/N means that handlers may / may not be available depending whether a proactive session is ongoing.

The following rules define the minimum requirement for the availability of the system handlers and the lifetime of their content.

ProactiveHandler:

- The ProactiveHandler is valid from the invocation to the termination of the processToolkit method.
- If a proactive command is pending the ProactiveHandler may not be available.
- At the processToolkit method invocation the TLV-List is cleared.
- At the call of it's init method the content is cleared and then initialised.
- After a call to ProactiveHandler.send method the handler will remain unchanged (i.e. previously send proactive command) until the ProactiveHandler.init or appendTLV methods are called.

ProactiveResponseHandler:

- The ProactiveResponseHandler may not be available before the first call to ProactiveHandler.send method, if available the content is cleared.
- The ProactiveResponseHandler is available after the first call to the ProactiveHandler.send method to the termination of the processToolkit method.
- If a proactive command is pending the ProactiveResponseHandler may not be available.
- The ProactiveResponseHandler content is changed after the call to ProactiveHandler.send method and remains unchanged until next call to the ProactiveHandler.send method.

EnvelopeHandler:

- The EnvelopeHandler and its content are available for all triggered toolkit applets (see Table1), from the invocation to the termination of their processToolkit method.

- The SIM Toolkit Framework guarantees that all registered toolkit applet are triggered and receive the data.

EnvelopeResponseHandler:

- The EnvelopeResponseHandler is available for all triggered toolkit applets, until a toolkit applet has posted an envelope response or sen~~d~~t a proactive command. After a call to the post method the handler is not longer available.

- The EnvelopeResponseHandler content must be posted before the first invocation of a ProactiveHandler.send method or before the termination of the processToolkit, so that the GSM applet can offer these data to the ME (eg 9Fxx/9Exx). After the first invocation of the ProactiveHandler.send method the EnvelopeResponseHandler is no more available.

The following diagram illustrates these rules.

Applet		Applet 1							Applet 2			
method invocation		*processToolkit*	*init*	*post*	*send*	*init*	*send*	*termination*	*processToolkit*	*init*	*send*	*init*
Envelope Handler		▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨
EnvelopeResponseHandler		▨	▨									
ProactiveHandler		▨	▨	▨	▨	▨	▨		▨	▨	▨	▨
Proactive ResponseHandler					▨	▨	▨				▨	▨

Figure 5: Typical handler availability for toolkit applets (see Table 1 for detail)

6.7 SIM Toolkit Framework behaviour

The following rules define the SIM Toolkit Framework behaviour for :

- Triggering of a toolkit applet (invocation of the *processToolkit()* method from the *ToolkitInterface* shareable interface) :
    - The current context is switched to the toolkit applet .
    - A pending transaction is aborted.
    - There is no invocation of the *select()* or the *deselect()* methods.
    - The CLEAR_ON_DESELECT transient object can not be accessed and not created as defined in Java Card 2.1 Runtime Environment Specification [8], as the current selected application is unchanged (eg GSM applet) and does not correspond to the current context which is the toolkit applet.
    - The current file context of the toolkit applet is the MF.
    - The current file context of the current selected applet is unchanged.
    - The toolkit applet cannot access the APDU object.
- Termination of a toolkit applet (return from the *processToolkit()* method):
    - The JCRE switches back to the context of the current selected applet, the GSM applet.
    - There is no invocation of the *select()* or the *deselect()* methods.
    - A pending toolkit applet transaction is aborted.
    - The transient data are unchanged.
    - The current file context of the toolkit applet is lost.
    - The current file context of the current selected applet is unchanged.

    - The GSM applet shall not rely on the APDU object content. The APDU content may be changed by the system [For Further Study as the interface between the toolkit system and the GSM applet is not defined yet]

- Invocation of *ProactiveHandler.send()* method :

    - During the execution there might be other context switches, but at the return of the *send()* method the toolkit applet context is restored.

    - There is no invocation of the *select()* or the *deselect()* methods.

    - A pending toolkit applet transaction at the method invocation is aborted.

    - The current file context of the toolkit applet is unchanged (see chapter 5.2). The *send()* method will never return if the GSM applet is deselected and another applet is explicitly selected.

- Emission of system proactive commands (SIM Toolkit framework dynamic behaviour)

    - The SIM Toolkit Framework shall send its system proactive command as soon as no proactive session is pending and all the applets registered to the current events have been triggered and have returned from the processToolkit method invocation.

6.8 Usage of ViewHandler and EditHandler

The ViewHandler and EditHandler classes have been defined to group the properties of the system handler, and may be used in the future to provide a simple mechanism to the toolkit applet to handle TLV lists.

7 SIM toolkit applet

7.1 Applet Loading

The SIM API card shall be compliant to the Java Card 2.1 VM Architecture Specification [9] and to the Annex B to guarantee interoperability at byte code Level.
The applet loading mechanism, protocol and applet life cycle are defined in GSM 03.48 [4]

7.2 Object Sharing

The sharing mechanism defined in Java Card 2.1 API Specification [7] and Java Card 2.1 Runtime Environment Specification [8] shall be used by the applet to share data.

The byte parameter of the *getShareableInterfaceObject()* method shall be set to zero (i.e. '00') when the *ToolkitInterface* reference is required.

Annex A (normative): Java Card SIM API

The attached file "0319_~~710~~740_AnnexA.zip" contains source files for the Java Card SIM API.

[the HTML and JAVA source files will be included]

Annex B (normative): Java Card SIM API identifiers

The attached file "0319_~~710~~740_AnnexB.zip" contains source files for the Java Card SIM API identifiers.
[the export files will be included]

Annex C (Normative):
SIM API package version management

The following table describes the relationship between each GSM 03.19 specification version and its SIM API packages AID and Major, Minor versions defined in the export files.

GSM 03.19 version	sim.access package		sim.toolkit package	
	AID	Major, Minor	AID	Major, Minor
7.0.0	A000000009 0003FFFFFFFF8910700001	1.0	A000000009 0003FFFFFFFF8910700002	1.0
7.1.0	A000000009 0003FFFFFFFF8910710001	2.0	A000000009 0003FFFFFFFF8910710002	2.0
7.2.0	A000000009 0003FFFFFFFF8910710001	2.1	A000000009 0003FFFFFFFF8910710002	2.1
7.3.0	A000000009 0003FFFFFFFF8910710001	2.2	A000000009 0003FFFFFFFF8910710002	2.2

The package AID coding is defined in EG 201 220 [10]. The SIM API packages' AID are not modified by changes to Major or Minor Version.

The Major Version shall be incremented if a change to the specification introduces byte code incompatibility with the previous version.

The Minor Version shall be incremented if a change to the specification does not introduce byte code incompatibility with the previous version.

Annex D (informative): Toolkit applet example

```
/**
 * Example of Toolkit Applet
 */

package ToolkitAppletExample;

import sim.toolkit.*;
import sim.access.*;
import javacard.framework.*;


public class MyToolkitApplet extends javacard.framework.Applet implements ToolkitInterface,
ToolkitConstants{

    public static final byte MY_INSTRUCTION          = (byte)0x46;
    public static final byte SERVER_OPERATION        = (byte)0x0F;
    public static final byte CMD_QUALIFIER           = (byte)0x80;
    public static final byte EXIT_REQUESTED_BY_USER  = (byte)0x10;
    private byte[] menuEntry =    {(byte)'S',(byte)'e',(byte)'r',(byte)'v',(byte)'i',(byte)'c',
                                   (byte)'e', (byte)'1'};
    private byte[] menuTitle=     {(byte)'M',(byte)'y',(byte)'M',(byte)'e',(byte)'n' ,(byte)'u'};
    private byte[] item1 =        {(byte)'I',(byte)'T',(byte)'E',(byte)'M',(byte)'1' };
    private byte[] item2 =        {(byte)'I',(byte)'T',(byte)'E',(byte)'M',(byte)'2' };
    private byte[] item3 =        {(byte)'I',(byte)'T',(byte)'E',(byte)'M',(byte)'3' };
    private byte[] item4 =        {(byte)'I',(byte)'T',(byte)'E',(byte)'M',(byte)'4' };
    private Object[] ItemList =   { item1, item2, item3, item4 };
    private byte[] textDText =    {(byte)'H',(byte)'e',(byte)'l',(byte)'l',(byte)'o',(byte)' ',
                                   (byte)'w',(byte)'o',(byte)'r',(byte)'l',(byte)'d',(byte)'2'};
    private byte[] textGInput =    {(byte)'Y',(byte)'o',(byte)'u',(byte)'r',(byte)' ',(byte)'n',
                                   (byte)'a',(byte)'m',(byte)'e',(byte)'?'};

    private byte[]  baGSMAID =
{(byte)0xA0,(byte)0x00,(byte)0x00,(byte)0x00,(byte)0x09,(byte)0x00,(byte)0x01};
    private ToolkitRegistry reg;
    private SIMView gsmFile;
    private byte buffer[] = new byte[10];
    private byte itemId;
    private byte result;
    private boolean repeat;

    /**
     * Constructor of the applet
     */
    public MyToolkitApplet() {

        // get the GSM application reference
        gsmFile = SIMSystem.getTheSIMView();

        // register to the SIM Toolkit Framework
        reg = ToolkitRegistry.getEntry();

        // Define the applet Menu Entry and register to the EVENT_MENU_SELECTION
        itemId = reg.initMenuEntry(menuEntry, (short)0x0000, (short)menuEntry.length,
                                   PRO_CMD_DISPLAY_TEXT, false, (byte) 0x00, (short) 0x0000);
        // register to the EVENT_UNFORMATTED_SMS_PP_ENV
        reg.setEvent(EVENT_UNFORMATTED_SMS_PP_ENV);
    }

    /**
     * Method called by the JCRE at the installation of the applet
     */
    public static void install(byte bArray[], short bOffset, byte bLength) {
        MyToolkitApplet MyApplet = new MyToolkitApplet ();
        MyApplet.register();
    }

    /**
     * Method called by the GSM Framework
     */
    public Shareable getShareableInterfaceObject ( AID clientAID, byte parameter)
    {
        if (parameter == (byte) 0x00)
        {
            if ( clientAID.partialEquals(baGSMAID, (byte) 0x00, (byte) baGSMAID.length) == true )
                    return ((Shareable) this);
        }
        return(null);
    }

     /**
      * Method called by the SIM Toolkit Framework
      */
     public void processToolkit(byte event) {

        // get the handler references
        EnvelopeHandler          envHdlr = EnvelopeHandler.getTheHandler();
        ProactiveHandler         proHdlr = ProactiveHandler.getTheHandler();
        ProactiveResponseHandler rspHdlr;

         switch(event) {
            case EVENT_MENU_SELECTION:
                // Prepare the Select Item proactive command
                proHdlr.init(PRO_CMD_SELECT_ITEM,(byte)0x00,DEV_ID_ME);
                // Append the Menu Title
                proHdlr.appendTLV((byte) (TAG_ALPHA_IDENTIFIER | TAG_SET_CR),
                                    menuTitle,(short)0x0000,(short)menuTitle.length);
                // add all the Item
                for (short i=(short) 0x0000; i<(short) 0x0004; i++) {
                    proHdlr.appendTLV((byte) (TAG_ITEM | TAG_SET_CR),(byte) (i+1),
                                      (byte[])ItemList[i],(short) 0x0000,
                                      (short)((byte[])ItemList[i]).length);
                }
                // ask the SIM Toolkit Framework to send the proactive command and check the result
                if ((result = proHdlr.send()) == RES_CMD_PERF){
                    rspHdlr = ProactiveResponseHandler.getTheHandler();
                    // SelectItem response handling
                    switch (rspHdlr.getItemIdentifier()) {
                        case 1:
                        case 2:
                        case 3: // DisplayText
                            proHdlr.init(PRO_CMD_DISPLAY_TEXT, CMD_QUALIFIER,
                                        DEV_ID_DISPLAY);
                            proHdlr.appendTLV((byte)(TAG_TEXT_STRING| TAG_SET_CR), DCS_8_BIT_DATA,
                                        textDText,(short)0x0000, (short)textDText.length);
                            proHdlr.send();
                            break;
                        case 4: // Ask the user to enter data and display it
                            do {
                                repeat = false;
                                try {

                                    // GetInput asking the users name
                                    proHdlr.initGetInput((byte)0x01, DCS_8_BIT_DATA,
textGInput,(byte)0x00,

                                        (short)textGInput.length,(short)0x0001,(short)0x0002);
                                    proHdlr.send();

                                    // display the entered text
                                    rspHdlr.copyTextString(textDText,(short)0x0000);
                                    proHdlr.initDisplayText((byte)0x00,DCS_8_BIT_DATA, textDText,
                                        (short)0x000~~1~~0,(short) textDText.length);
                                    proHdlr.send();
                                }
                                catch (ToolkitException MyException) {
                                    if (MyException.getReason() ==
ToolkitException.UNAVAILABLE_ELEMENT) {
                                        if (rspHdlr.getGeneralResult() != EXIT_REQUESTED_BY_USER)
                                            repeat = true;
                                        break;
                                    }
                                }
                            }
                            while (repeat);
                            break;
                    }
                }
                break;

            case EVENT_UNFORMATTED_SMS_PP_ENV:
                // get the offset of the instruction in the TP-UD field
                short TPUDOffset = (short) (envHdlr.getTPUDLOffset() + SERVER_OPERATION);

                // start the action requested by the server
                switch (envHdlr.getValueByte((short)TPUDOffset) ) {
                case 0x41 : // Update of a gsm file
                    // get the data from the received SMS
                    envHdlr.copyValue((short)TPUDOffset+1,buffer, (short)0x0000,(short)0x0003);
                    // write these data in the EFpuct
                    gsmFile.select(SIMView.FID_DF_GSM);
                    gsmFile.select(SIMView.FID_EF_PUCT);
                    gsmFile.updateBinary((short)0x0000,buffer,(short)0x0000,(short)0x0003);

                    break;

                case 0x36 : // change the MenuTitle for the SelectItem
                    envHdlr.copyValue((short)TPUDOffset+1, menuTitle,(short)0x0000,(short)0x0006);
                    break;
                }
                break;
            }

    }

     /**
      * Method called by the JCRE, once selected
      */
     public void process(APDU apdu) {
         // Handle the Select AID apdu
         if (selectingApplet()) return;

         switch(apdu.getBuffer()[1]) {
            // specific APDU for this applet to configure the MenuTitle from SelectItem
            case (byte)MY_INSTRUCTION:
                if (apdu.setIncomingAndReceive()>(short)0) {
                    Util.arrayCopy(apdu.getBuffer(),(short)0x0005,menuTitle,(short)0x0000,
                               (short)0x0006);
                }
                break;
            default:
                ISOException.throwIt(ISO7816.SW_INS_NOT_SUPPORTED);
         }
     }
}
```

List of changes to the API

Interface sim.access.SIMView,

Methods readRecord() and updateRecord()

⇨ +CR Add :
If mode is REC_ACC_MODE_NEXT and the record pointer is at the last record the RECORD_NUMBER_NOT_AVAILABLE SIMViewException shall be thrown.

⇨ +CR Add :
If mode is REC_ACC_MODE_PREVIOUS and the record pointer is at the first record, the RECORD_NUMBER_NOT_AVAILABLE SIMViewException shall be thrown.

Method seek()

⇨ +CR Add :
if pattLength is greater than the current record size than the OUT_OF_RECORD_BOUNDARIES SIMViewException shall be thrown.

⇨ +CR Add :
if pattLength is zero then PATTERN_NOT_FOUND SIMViewException shall be thrown.

⇨ +CR Add :
If mode is SEEK_FROM_NEXT_FORWARD and the record pointer is at the last record the PATTERN_NOT_FOUND SIMViewException shall be thrown.

⇨ +CR Add :
If mode is SEEK_FROM_PREVIOUS_BACKWARD and the record pointer is at the first record, the PATTERN_NOT_FOUND SIMViewException shall be thrown.

Constants:

⇨ +CR Define the constant in uppercase FID_DF_GRAPHICS, and deprecate FID_DF_Graphics.

Class sim.toolkit.ProactiveHandler,

Method send()

⇨ +CR Add exception:
UNAVAILABLE_ELEMENT if the Result Simple TLV is missing.

⇨ +CR Add exception :
OUT_OF_TLV_BOUNDARIES if the general result byte is missing in the Result Simple TLV.

Class sim.toolkit.ProactiveResponseHandler,

Method getItemIdentifier()

⇨ +CR Add exception :
OUT_OF_TLV_BOUNDARIES if the item identifier byte is missing in the Item Identifier Simple TLV.

Method getGeneralResult()

⇨ +CR Add exception :
OUT_OF_TLV_BOUNDARIES if the general result byte is missing in the Result Simple TLV.

Method copyTextString()

⇨ +CR change exception :
java.lang.ArrayIndexOutOfBoundsException - if dstOffset or dstOffset or dstOffset + (length of the TextString to be copied, without the Data Coding Scheme included), as specified for the returned value, would cause access outside array bounds

Interface sim.toolkit.ToolkitConstants

⇨ +CR For the field EVENT_STATUS_COMMAND correct the value of the constant in the comments from 127 to 19 as the real of the constant.

⇨ +CR Add BTAG_SMS_PP_DOWNLOAD, and deprecate BTAG_SMS_PP_DONWLOAD.

Class sim.toolkit.ToolkitException

- ⇨ +CR Change EVENT_ALREADY_REGISTERED exception description to :
  This reason code (= 7) is used to indicate that the maximum number of registered applet for this event is already reached (e.g. Call Control)

Class sim.toolkit.ToolkitRegistry,

Methods setEvent(), setEventList(), clearEvent(), isEventSet(),

- ⇨ +CR Change "Toolkit Registry" to "Toolkit Registry entry of the applet" for all the methods of Toolkit Registry.

Method setEvent()

- ⇨ +CR Add in the description:
  No exception shall be thrown if the applet registers more than once to the same event.

Method setEventList()

- ⇨ +CR add in description:
  In case of any exception the state of the registry is undefined. The toolkit applet has to include this call within a transaction if necessary

Method initMenuEntry(), allocateTimer(), releaseTimer()

- ⇨ +Change :
  "The Applet automatically de/registers…." to "The applet is de/registered… "

Methods enableMenuEntry(), disableMenuEntry()

- ⇨ +Change :
  - " After invocation of this method the SIM Toolkit Framework should automatically update the menu stored in the ME." to
  " After invocation of this method, during the current card session, the SIM Toolkit Framework shall dynamically update the menu stored in the ME."

Method changeMenuEntry()

- ⇨ +Add in the description:
  "After invocation of this method, during the current card session, the SIM Toolkit Framework shall dynamically update the menu stored in the ME."

3GPP T3 Meeting #16
Seoul, Korea, 13 - 15 November, 2000

Tdoc T3-000614
(revised version of T3-000569)

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

03.19 CR A008 Current Version: 7.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-T #10	for approval	☒	strategic	□	(for SMG use only)
list expected approval meeting # here ↑	for information	□	non-strategic	□	

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

Proposed change affects: (U)SIM ☒ ME □ UTRAN / Radio □ Core Network □
(at least one should be marked with an X)

Source: T3 **Date:** 14/11/2000

Subject: Upgrade for release 99

Work item: SIM API

Category:	F	Correction	□	**Release:**	Phase 2	□
	A	Corresponds to a correction in an earlier release	□		Release 96	□
(only one category	B	Addition of feature	☒		Release 97	□
shall be marked	C	Functional modification of feature	□		Release 98	□
with an X)	D	Editorial modification	□		Release 99	☒
					Release 00	□

Reason for change: To let the SIM Toolkit applets use the features defined in the release 99 of the referenced specifications.
The Minor version of the export files shall be incremented.

Clauses affected: §6.2, §6.6, Annex A, Annex B

Other specs affected:	Other 3G core specifications	□	→ List of CRs:	
	Other GSM core specifications	□	→ List of CRs:	
	MS test specifications	□	→ List of CRs:	
	BSS test specifications	□	→ List of CRs:	
	O&M specifications	□	→ List of CRs:	

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

6.2 Applet Triggering

[..]

EVENT_FORMATTED_SMS_CB, EVENT_UNFORMATTED_SMS_CB

When the ME receives a new cell broadcast message, the cell broadcast page may be passed to the SIM using the envelope command according to the content of the EF$_{CBMID}$ file. E.g. the application may then read the message and extract a meaningful piece of information which could be displayed to the user, for instance.

The received cell broadcast page can be either:
- formatted according to GSM 03.48[4] or an other protocol to identify explicitly the toolkit applet for which the message is sent ;
- unformatted or using a toolkit applet specific protocol the SIM Toolkit Framework will pass this data to all registered toolkit applets.

EVENT_FORMATTED_SMS_CB

This event is triggered by an envelope APDU containing an CELL_BROADCAST_DATADOWNLOAD BER TLV with a Cell Broadcast Page simple TLV according to GSM03.48[4].

The SIM Toolkit Framework shall:

- verify the GSM03.48[4] security of the Cell Broadcast Page;
- trigger the toolkit applet registered with the corresponding TAR defined at applet loading.

The toolkit applet will only be triggered if the TAR is known and the security verified, application data will also be deciphered.

The TAR value is the same as the one used in the events *EVENT_FORMATTED_SMS_PP_ENV* and *EVENT_FORMATTED_SMS_PP_UPD.*

EVENT_UNFORMATTED_SMS_CB

The registered toolkit applets will be triggered by this event and get the data transmitted in the APDU envelope CELL_BROADCAST_DATADOWNLOAD.

EVENT_CALL_CONTROL_BY_SIM

When the SIM is in call control mode and when the user dials a number, this number is passed to the SIM. Only one toolkit applet can handle the answer to this command: call barred, modified or accepted.

EVENT_EVENT_DOWNLOAD_MT_CALL, EVENT_EVENT_DOWNLOAD_CALL_CONNECTED, EVENT_EVENT_DOWNLOAD_CALL_DISCONNECTED, EVENT_EVENT_DOWNLOAD_LOCATION_STATUS, EVENT_EVENT_DOWNLOAD_USER_ACTIVITY, EVENT_EVENT_DOWNLOAD_IDLE_SCREEN_AVAILABLE, EVENT_EVENT_DOWNLOAD_CARD_READER_STATUS, EVENT_EVENT_DOWNLOAD_LANGUAGE_SELECTION, EVENT_EVENT_DOWNLOAD_BROWSER_TERMINATION

The toolkit applet will be triggered by the registered event download trigger, upon reception of the corresponding Envelope command.

In order to allow the toolkit applet to be triggered by these events, the SIM Toolkit Framework shall have previously issued a SET UP EVENT LIST proactive command. When a toolkit applet changes one or more of these requested events of its registry object, the SIM Toolkit Framework shall automatically update the event list stored in the ME.

[…]

6.6 Handler availability

The system handlers : ProactiveHandler, ProactiveResponseHandler, EnvelopeHandler and EnvelopeResponseHandler are Temporary JCRE Entry Point Object as defined in the Java Card Runtime Environment Specification [8].

The following table describes the minimum availability of the handlers for all the events at the invocation of the processToolkit method of the toolkit applet.

Table 1: Handler availability for each event

EVENT_	Reply busy	ProactiveHandler ProactiveResponseHandler	EnvelopeHandler	EnvelopeResponseHandler	Nb of triggered / registrered Applet
_FORMATTED_SMS_PP_ENV	Y	Y	Y	Y	1 / n (per TAR)
_FORMATTED_SMS_PP_UPD	N	Y	Y	N	1 / n (per TAR)
_UNFORMATTED_SMS_PP_ENV	Y	Y	Y	Y	n / n
_UNFORMATTED_SMS_PP_UPD	N	Y	Y	N	n / n
_FORMATTED_SMS_CB	Y	Y	Y	N	1 / n (per TAR)
_UNFORMATTED_SMS_CB	Y	Y	Y	N	n / n
_MENU_SELECTION	Y	Y	Y	N	1 / n (per Item Id)
_MENU_SELECTION_HELP_REQUEST	Y	Y	Y	N	1 / n (per Item Id)
_CALL_CONTROL	N	Y/N (see Note 2)	Y	Y	1 / 1
_SMS_MO_CONTROL	N	Y/N (see Note 2)	Y	Y	1 / 1
_TIMER_EXPIRATION	Y	Y	Y	N	1/ 8 (per timer) (see Note 1)
_EVENT_DOWNLOAD					
_MT_CALL	Y	Y	Y	N	n / n
_CALL_CONNECTED	Y	Y	Y	N	n / n
_CALL_DISCONNECTED	Y	Y	Y	N	n / n
_LOCATION_STATUS	Y	Y	Y	N	n / n
_USER_ACTIVITY	Y	Y	Y	N	n / n
_IDLE_SCREEN_AVAILABLE	Y	Y	Y	N	n / n
_LANGUAGE_SELECTION	Y	Y	Y	N	n / n
_BROWSER_TERMINATION	Y	Y	Y	N	n / n
_CARD_READER_STATUS	Y	Y	Y	N	n / n
_UNRECOGNISED_ENVELOPE	Y	Y	Y	Y	n / n
_STATUS_COMMAND	N	Y/N (see Note 2)	N	N	n / n
_PROFILE_DOWNLOAD	N	Y/N (see Note 2)	N	N	n / n

NOTE 1: One toolkit applet can register to several timers, but a timer can only be allocated to one toolkit applet.

N~~ote~~OTE 2: Y/N means that handlers may / may not be available depending whether a proactive session is ongoing.

Annex A (normative): Java Card SIM API

The attached file "0319_~~710~~800_AnnexA.zip" contains source files (Java and HTML) for the Java Card SIM API.

[the HTML and JAVA source files will be included]

Annex B (normative):
Java Card SIM API identifiers

The attached file "0319_~~710~~800_AnnexB.zip" contains source files for the Java Card SIM API identifiers.

[the export files will be included]

List of changes to the API html and java source files

Interface sim.access.SIMView

Add the constant definitions :

Files under MF:

FID_DF_PDC	0x7F80
FID_DF_TETRA	0x7F90
FID_DF_TIA_EIA_136	0x7F24
FID_DF_TIA_EIA_95	0x7F25

Files under DF Telecom:

FID_EF_ECCP	0x6F4F
FID_EF_CMI	0x6F58

Files under DF GSM:

FID_DF_EIA_TIA_553	0x5F40
FID_DF_MEXE	0x5F3C
FID_EF_PLMNWACT	0x6F60
FID_EF_OPLMNWACT	0x6F61
FID_EF_HPLMNACT	0x6F62
FID_EF_CPBCCH	0x6F63
FID_EF_INVSCAN	0x6F64

Files under DF_EIA_TIA_553:

FID_EF_SID	0x4F80
FID_EF_GPI	0x4F81
FID_EF_IPC	0x4F82
FID_EF_COUNT	0x4F83
FID_EF_NSID	0x4F84
FID_EF_PSID	0x4F85
FID_EF_NETSEL	0x4F86
FID_EF_SPL	0x4F87
FID_EF_MIN	0x4F88
FID_EF_ACCOLC	0x4F89
FID_EF_FC1	0x4F8A
FID_EF_S_ESN	0x4F8B
FID_EF_CSID	0x4F8C
FID_EF_REG_THRESH	0x4F8D
FID_EF_CCCH	0x4F8E
FID_EF_LDCC	0x4F8F
FID_EF_GSM_RECON	0x4F90
FID_EF_AMPS_2_GSM	0x4F91
FID_EF_AMPS_UI	0x4F93

Files under DF_MExE :

FID_EF_MExE_ST	0x4F40
FID_EF_ORPK	0x4F41
FID_EF_ARPK	0x4F42
FID_EF_TPRPK	0x4F43

Interface sim.toolkit.ToolkitConstants

Add the new Event constant definitions:

EVENT_EVENT_DOWNLOAD_LANGUAGE_SELECTION	20
EVENT_EVENT_DOWNLOAD_BROWSER_TERMINATION	21
EVENT_FORMATTED_SMS_CB	24

Add the new Simple-TLV tags constant definition :

TAG_LANGUAGE	0x2D
TAG_TIMING_ADVANCE	0x2E
TAG_AID	0x2F
TAG_BROWSER_IDENTITY	0x30
TAG_URL	0x31
TAG_BEARER	0x32
TAG_PROVISIONING_REFERENCE_FILE	0x33
TAG_BROWSER_TERMINATION_CAUSE	0x34
TAG_CARD_READER_IDENTIFIER	0x3A

Add the new Proactive commands constant definitions :

PRO_CMD_LAUNCH_BROWSER	0x15
PRO_CMD_LANGUAGE_NOTIFICATION	0x35

Add the new General result constant defintions:

RES_CMD_PERF_LIMITED_SERVICE	0x06

RES_CMD_PERF_WITH_MODIFICATION	0x07
RES_TEMP_PB_LAUNCH_BROWSER	0x26

Class sim.toolkit.MEProfile

Update of the profile download table in the class description

```
*  Facility                                             index
*  Envelope Call Control sent during auto. redial       7
*  Event: Language selection                            40
*  Event: Browser termination                           41
*  RFU                                                  42
*  RFU                                                  43
*  Proactive SIM: Get Reader Status (reader status)     51
*  Proactive SIM: Get Reader Status (reader ident.)     52
*  Proactive SIM: Provide Local Info. (BCCH)            66
*  Proactive SIM: Provide Local Info. (language)        67
*  Proactive SIM: Provide Local Info. (Timing Adv.)     68
*  Proactive SIM: Language Notification                69
*  Proactive SIM: Launch Browser                        70
*  RFU                                                  71
*  Soft keys support for Select Item                    72
*  Soft keys support for Set Up Menu                    73
*  RFU                                                  74
*  RFU                                                  75
*  RFU                                                  76
*  RFU                                                  77
*  RFU                                                  78
*  RFU                                                  79
*  Maximum number of softkeys available (b0)            80
*  Maximum number of softkeys available                 81
*  Maximum number of softkeys available                 82
*  Maximum number of softkeys available                 83
*  Maximum number of softkeys available                 84
*  Maximum number of softkeys available                 85
*  Maximum number of softkeys available                 86
*  Maximum number of softkeys available (b7)            87
*  RFU                                                  88
*  RFU                                                  89
*  RFU                                                  90
*  RFU                                                  91
*  RFU                                                  92
*  RFU                                                  93
*  RFU                                                  94
*  RFU                                                  95
*  RFU                                                  96
*  RFU                                                  97
*  RFU                                                  98
*  RFU                                                  99
*  RFU                                                 100
*  RFU                                                 101
*  RFU                                                 102
*  RFU                                                 103
*  Nb of characters down ME display (b0)               104
*  Nb of characters down ME display (b1)               105
*  Nb of characters down ME display (b2)               106
*  Nb of characters down ME display (b3)               107
*  Nb of characters down ME display (b4)               108
*  RFU                                                 109
*  RFU                                                 110
*  Screen Sizing parameters supported                  111
*  Nb of characters accross ME display (b0)            112
*  Nb of characters accross ME display (b1)            113
*  Nb of characters accross ME display (b2)            114
*  Nb of characters accross ME display (b3)            115
*  Nb of characters accross ME display (b4)            116
*  Nb of characters accross ME display (b5)            117
*  Nb of characters accross ME display (b6)            118
*  Variable size fonts supported                       119
*  Display can be resized                              120
*  Text Wrapping supported                             121
*  Text Scrolling supported                            122
*  RFU                                                 123
*  RFU                                                 124
*  Width reduction when in a menu (b0)                 125
*  Width reduction when in a menu (b1)                 126
*  Width reduction when in a menu (b2)                 127
*  RFU                                                 128
*  RFU                                                 129
*  RFU                                                 130
*  RFU                                                 131
*  RFU                                                 132
*  RFU                                                 133
*  RFU                                                 134
*  RFU                                                 135
```

Add exception to the check(byte) method:

- check (byte):

```
/**
 * Checks a facility in the handset profile.
 *
 * @param index the number of the facility to check, according to the table above.
 *
 * @return true if the facility is supported, false otherwise
 *
 * @exception ToolkitException  with the following reason codes: <ul>
 *      <li>ME_PROFILE_NOT_AVAILABLE if Terminal Profile data are not available</ul>
 */
public static boolean check(byte index) throws ToolkitException {
                return false;
}
```

Add the methods :

- check(short):

```
 /**
 * Checks a facility in the handset profile.
 *
 * @param index the number of the facility to check, according to the table above.
 *
 * @return true if the facility is supported, false otherwise
 *
 * @exception ToolkitException  with the following reason codes: <ul>
 *      <li>ME_PROFILE_NOT_AVAILABLE if Terminal Profile data are not available</ul>
 */
public static boolean check(short index) throws ToolkitException {
                return false;
}
```

- getValue():

```
/**
 * Returns the binary value of a parameter, delimited by two indexes, from the handset profile.
 *
 * @param indexMSB index of the Most Significant Bit of the handset profile .
 * @param indexLSB index of the Lowest Significant Bit of the handset profile .
 *
 * @return binary value of the data field indicated in the handset profile.
 *
 * @exception ToolkitException  with the following reason codes: <ul>
 *      <li>ME_PROFILE_NOT_AVAILABLE if Terminal Profile data are not available</ul>
 *      <li>BAD_INPUT_PARAMETER if (indexMSB > indexLSB +16) or (indexMSB < indexLSB) or
 *      (indexMSB < 0) or (indexLSB < 0)
 */
public static short getValue(short indexMSB, short indexLSB) throws ToolkitException {
    return 0;
}
```

- copy():

```
/**
 * Copies a part of the handset profile in a buffer.
 *
 * @param startOffset offset of the handset profile first byte to be copied
 * @param dstBuffer destination byte array
 * @param dstOffset offset within destination byte array to start copy into
 * @param dstLength byte length to be copy
 *
 * @return dstOffset + dstLength
 *
 * @exception ArrayIndexOutOfBoundsException if  <code>dstOffset</code> or <code>dstLength</code> or both would
cause access outside array bounds
 * @exception NullPointerException if <code>dstBuffer<code> is null
 * @exception ToolkitException  with the following reason codes: <ul>
 *      <li>ME_PROFILE_NOT_AVAILABLE if Terminal Profile data are not available</ul>
 */
public static short copy(short  startOffset, byte[] dstBuffer, short dstOffset, short dstLength)
    throws ArrayIndexOutOfBoundsException, NullPointerException, ToolkitException {
    return 0;
}
```

Class sim.toolkit.EnvelopeHandler

Extend the meothd for support of formatted SMS CB:

-getSecuredDataOffset():

/**
 * Looks for the Secured Data from the Command Packet in the first SMS TPDU or Cell Broadcast Page
 * Simple TLV contained in the Envelope handler.
 * This can be used on ~~an~~ the events :

```
    * - EVENT_FORMATTED_SMS_PP_ENV, EVENT_FORMATTED_SMS_PP_UPD, if the SMS TP-UD is formatted
    * according to GSM03.48 Single Short Message,
    * - EVENT_FORMATTED_SMS_CB, if the Cell Broadcast Page is formatted according to GSM 03.48.
    * If the element is available it becomes the TLV selected.
    *
    * @return the offset of the Secured Data first byte in the first SMS TPDU or Cell Broadcast Page TLV element
    *
    * @exception ToolkitException with the following reason codes: <ul>
    *      <li><code>UNAVAILABLE_ELEMENT</code> in case of unavailable SMS TPDU or Cell Broadcast Page TLV element
or missing Secured Data </ul>
    */
    public short getSecuredDataOffset() throws ToolkitException {
                    return 0;
   }
```

-getSecuredDataLength():

```
   /**
    * Looks for the length of the Secured Data from the Command Packet in the first SMS TPDU or Cell Broadcast Page
    * Simple TLV contained in the Envelope handler.
    * This can be used on the ~~an~~ events :
    * - EVENT_FORMATTED_SMS_PP_ENV, EVENT_FORMATTED_SMS_PP_UPD, if the SMS TP-UD is formatted
    * according to GSM03.48 Single Short Message,
    * - EVENT_FORMATTED_SMS_CB, if the Cell Broadcast Page is formatted according to GSM 03.48.
    * If the element is available it becomes the TLV selected.
    *
    * @return the length of the Secured Data contained in the first SMS TPDU or Cell Broadcast Page TLV element (without
padding bytes)
    *
    * @exception ToolkitException with the following reason codes: <ul>
    *      <li><code>UNAVAILABLE_ELEMENT</code> in case of unavailable SMS TPDU or Cell Broadcast Page TLV element
or missing Secured Data </ul>
    */
    public short getSecuredDataLength() throws ToolkitException {
                    return 0;
   }
```