ECMA

Standardizing Information and Communication Systems

Liaison to ETSI 3GPP SA

Committee:	**ETSI 3GPP SA (for action)**
Source:	**ECMA TC32**
Subject:	**New ECMA QSIG Standard on Short Message Service (SMS) in a Private Network (PISN)**
Date:	**15th January 2001**

ECMA TC32-TG14 is currently drafting a new QSIG standard for gaining the Short Message Service (SMS) within a Private Network (PISN).

This new Standard will allow (either fixed network or mobile) users of a PISN to send and receive Short Messages either within a PISN or to another (e.g. GSM based) network. Thereby the functionality, procedures and principles as described in the ETSI GSM Standards for SMS Service Centers (SCs) are used identically for the QSIG protocol. This will allow an already existing GSM based SC to provide the services it offers also to the users of a PISN, by implementing the QSIG interface as described in the new standards.

Attached please find the current second draft of the stage 1 and 2 description of the QSIG SMS standard and a first proposal for a stage 3 description (including ASN.1 coding) as well as a mapping description from GSM to QSIG based SMS. These drafts were discussed during the last ECMA TC32 TG14 meeting and have been updated with the outcome of the discussion.

3GPP SA members are kindly invited to comment on the attached draft preferably by e-mail to the contact person before the next ECMA TC32-TG14 meeting which will take place on 26th and 27th March 2001 at Seville / Spain.

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Draft Standard ECMA-SMS-SD

December 2000

ECMA

Standardizing Information and Communication Systems

Private Integrated Services Network (PISN) –
Specification, Functional Model and Information Flows –
Short Message Service Supplementary Service

Second Draft – December 2000

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(SMS-SD)

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Brief History

This Standard is one of a series of ECMA Standards defining services and signalling protocols applicable to Private Integrated Services Networks (PISNs). The series uses ISDN concepts as developed by ITU-T and conforms to the framework of International Standards for Open Systems Interconnection as defined by ISO/IEC. It has been produced under ETSI work item DEN/ECMA-XXXXX.

This particular Standard specifies the Short Message Service supplementary service.

This Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC1, ITU-T, ETSI and other international and national standardization bodies. It represents a pragmatic and widely based consensus.

This ECMA Standard is contributed to ISO/IEC JTC1 under terms of the fast-track procedure, for adoption as an ISO/IEC International Standard.

Drafting Statements

First draft was edited by Lars Kiessling and Georg Mayer, Siemens AG, Germany (Lars.Kiessling@icn.siemens.de, Georg.Mayer@icn.siemens.de).

Second draft was edited by Lars Kiessling and Georg Mayer, Siemens AG, Germany (Lars.Kiessling@icn.siemens.de, Georg.Mayer@icn.siemens.de).

This ECMA Standard has been adopted by the ECMA General Assembly of ...

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1 Scope

This Standard specifies the Supplementary Service Short Message Service (SS-SMS).

SMS is a supplementary service which enables a user to send and receive Short Messages (SMs) to and from another user.

NOTE

This supplementary service is based on ETSI TS 100 901 (GSM 03.40). The Service Centre functionality described in this Standard is equal to the functionality of a Service Centre in ETSI TS 100 901 (GSM 03.40). Thus it is only necessary to implement a QSIG interface and some interworking in the Service Centre in order to use it in the herein described network.

Supplementary service specifications are produced in three stages, according to the method described in ETS 300 387. This Standard contains the stage 1 and stage 2 specifications of SS-SMS. The stage 1 specification (clause 6) specifies the supplementary service as seen by users of PISNs. The stage 2 specification (clause 7) identifies the functional entities involved in the supplementary service and the information flows between them.

2 Conformance

In order to confirm to this Standard, a stage 3 standard shall specify signalling protocols and equipment behaviour that are capable of being used in a PISN which supports the supplementary services specified in this Standard. This means that, to claim conformance a stage 3 standard is required to be adequate for the support of those aspects of clause 6 (stage 1) and clause 7 (stage 2) which are relevant to the interface or equipment to which the stage 3 standard applies.

3 References

The following standards contain provisions which, through references in this text, constitute provisions of this Standard. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

In the case of references to ECMA Standards that are aligned with ISO/IEC International Standards, the number of the appropriate ISO/IEC International Standard is given in brackets after the ECMA reference.

Editor's NOTE:	
Which references shall be used for ETSI, which references are ISO conform (GSM 03.40 or TS 100 901)?	

ECMA-142	Private Integrated Services Network – Circuit-mode 64 kbit/s Bearer Services – Service Description, Functional Capabilities and Information Flows (International Standard ISO/IEC 11574)
ISO/IEC 11579-1	Information technology – Telecommunications and information exchange between systems – Private Integrated Services Network – Part 1: Reference configuration for PISN Exchanges (PINX)
ETSI TS 100 900	Digital cellular telecommunications systems (Phase 2+); Alphabets and language-specific information (1998)(GSM 03.38)
ETSI TS 100 901	Digital cellular telecommunications systems (Phase 2+); Technical realization of the Short Message Service (SMS) (1998) (GSM 03.40)
ETSI TS 100 942	Digital cellular telecommunications systems (Phase 2+); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface (1999)(GSM 04.11)
ETSI TS 100 974	Digital cellular telecommunications systems (Phase 2+); Mobile Application Part (MAP) specification (1999)(GSM 09.02)
ETSI TS 101 032	Digital cellular telecommunications systems (Phase 2+); Compression algorithm for text messaging services (1998) (GSM 03.42)

ETS 300 387   Private Telecommunication Network (PTN); Method for the specification of basic and supplementary services (1994)

ITU-T Rec. I.112   Vocabulary of terms for ISDNs (1993)

ITU-T Rec. I.210   Principles of telecommunication services supported by an ISDN and the means to describe them (1993)

ITU-T Rec. Z.100   Specification and description language (1993)

4 Definitions

For the purpose of this Standard, the following definitions apply.

4.1 External definitions

This Standard uses the following terms defined in other documents:

- Basic Service	(ITU-T Rec. I.210)
- Private Integrated Services Network (PISN)	(ISO/IEC 11579-1)
- Private Integrated Services Network Exchange (PINX)	(ISO/IEC 11579-1)
- Service	(ITU-T Rec. I.112)
- Signalling	(ITU-T Rec. I.112)
- Supplementary Service	(ITU-T Rec. I.210)
- User	(ECMA-142)

Editor's Note: Is that still necessary?

This Standard refers to the following basic call functional entities (FEs) defined in ECMA-142:

- Call Control (CC)

- Call Control Agent (CCA)

This Standard refers to the following basic call inter-FE relationships defined in ECMA-142:

- r1

- r2

- r3

This Standard refers to the following basic call information flows defined in ECMA-142:

- Release request/indication

- Release response/confirmation

- Setup request/indication

- Setup response/confirmation

4.2 Other definitions

4.2.1 Command

Short Message data unit which enables the Sending User to invoke an operation at the Service Centre.

As far as acknowledging and delivery is concerned, Commands are treated like Short Messages. In the case of certain Commands a Status Report may be sent in response from the SC which contains the outcome of the operation.

4.2.2 Message Centre

The entity which activates or deactivates the Message Waiting Indication as a result of the storage or retrieval of Short Messages. The Message Centre can serve as a Sending, Storing and Receiving Entity for Short Messages.

4.2.3 Report

A report can be a response from

- the Service Centre upon a Short Message received from the Sending User (Submit Report);

- the Receiving User upon a Short Message received from the Service Centre (Delivery Report);

- the Sending User upon a Status Report received from the Service Centre (Delivery Report);

- the Service Centre upon a Command received from the Sending User (Submit Report).

A report may be an acknowledge report, which confirms the reception of a Short Message, a Status Report or a Command; or it may be an error report, which indicates that the Short Message, Status Report or the Command was not received, including the reason why.

NOTE

Report as used here does not refer to the Status Report capabilities of the SMS.

4.2.4 ScAlert

Information provided to an SC which has previously initiated unsuccessful Short Message delivery attempt(s) to a specific user, that the user is now recognised to have recovered operation or to have memory available again.

4.2.5 Service Centre (SC)

A function within the network which is responsible for the relaying and store-and-forwarding of a Short Message. If a Receiving User is not able to receive a Short Message, the Service Centre has to store the Short Message and attempt to deliver the Short Message again at a later time. The Service Centre is responsible for the Short Message until it is successfully delivered to the Receiving User or the Validity Period expires.

Depending on the implementation of Short Message Waiting Data the SC either repeats the delivery attempt automatically in certain intervals or attempts to deliver the Short Message upon reception of a ScAlert information.

NOTE

The functionality of the Service Centre is as described in ETSI TS 100 901 (GSM 03.40).

4.2.6 Short Message (SM)

Data unit containing the Short Message Text and additional data necessary for the transmission of the Short Message Text from the Sending to the Receiving User.

4.2.7 Short Message Waiting Data

SMS user specific information containing address information of one or more SCs which unsuccessfully attempted to deliver a Short Message to a Receiving User while the user was not able to receive the Short Message (e.g. did not have memory available or was not reachable). The Short Message Waiting Data is used to alert the SC when the user has memory available or is reachable again.

4.2.8 Status Report

Information sent from the SC to the Sending User containing the status of a Short Message submitted to a Receiving User or the outcome of a Command submitted to an SC. A Status Report is sent from the SC to the Sending User of the Command or Short Message if it is requested in the Short Message or Command.

The status report capabilities of SS-SMS are optional, i.e. the choice, of whether to offer Status Report or not, is left to the Service Provider.

5 Acronyms

Editors Note:
Is that still necessary?
CC   Call Control (functional entity)

CCA	Call Control Agent (functional entity)
FE	Functional Entity
PINX	Private Integrated Services Network Exchange
PISN	Private Integrated Services Network
PNP	Private Numbering Plan
SC	Service Centre
SCTS	Service-Centre-Time-Stamp
SDL	Specification and Description Language
SM	Short Message
SMS	Short Message Service
SS-SMS	Supplementary Service - Short Message Service
VP	Validity Period

6 SS-Short Message Service stage 1 specification

6.1 Description

The Supplementary Service Short Message Service provides a means of sending messages of limited size point-to-point between network users. The provision of SMS makes use of a Service Centre which acts as a store-and-forward centre for Short Messages, i.e. all Short Messages are sent using a Service Centre which receives Short Messages from the Sending User, stores them and delivers them to the Receiving User. Thus the network needs to support the transfer of Short Messages between Sending User, Service Centre and Receiving User.

The Sending User sends the Short Message to the Service Centre where the Short Message is stored. The Service Centre attempts to deliver the Short Message to the Receiving User. If a Short Message can not be delivered within a specific time (Validity Period) the Service Centre deletes the Short Message.

The Sending User and the Service Centre shall be informed about the outcome of a submission or delivery, respectively, by means of a submit or delivery report.

Other messages besides the user defined Short Messages can be sent using SMS:

– Status Reports inform the Sending User about the status of a previously sent Short Message or Command;

– Commands allow users to manipulate Short Messages already stored in a Service Centre or the behaviour of the Service Centre with regard to the Status Report procedure.

NOTE

The functionality of the Service Centre in this specification is identical to the functionality of a Service Centre in GSM.

6.2 Procedures

6.2.1 Provision/withdrawal

SS-SMS may be provided after pre-arrangement with the service provider, or may be available generally to all users. SS-SMS may be withdrawn on request of the user or for administrative reasons.

6.2.2 Normal procedures

6.2.2.1 Activation/deactivation/registration/interrogation

Not applicable.

6.2.2.2   Invocation and Operation
6.2.2.2.1   Normal Operation

A Sending User shall be able to submit a Short Message to a Service Centre at any time, independently of whether or not there is a call in progress. A report will always be returned to the Sending User; either confirming that the SC received the Short Message or informing the Sending User that it was not possible to deliver the Short Message to the SC, including the reason why.

A Sending User shall be able to submit a Command to a Service Centre at any time, independently of whether or not there is a call in progress.

The Service Centre shall receive Commands from the Sending User and execute them. Upon reception of a Command the Service Centre shall execute the Command on the Short Message specified by the Short Message Number and the Originating-Address given in the Command information. A report will always be returned to the Sending User, either confirming the reception/ execution of the Command or indicating that the reception/ execution of the command failed, including the reason why.

A Receiving User shall be able to receive a Short Message from a Service Centre at any time, independently of whether or not there is a call in progress. A report will always be returned to the SC; either confirming that the Receiving User received the Short Message, or indicating that the reception of the Short Message failed, including the reason why.

If either a Short Message or a Command submitted to the Service Centre from a Sending User requests a Status Report, and the Status Report capabilities are included in the SC, it shall return (a) Status Report(s) to the Sending User. The Sending User shall be able to receive Status Reports from a Service Centre at any time, independently of whether or not there is a call in progress. A report will always be returned to the Service Centre, either confirming the reception of the Status Report or indicating that the reception failed, including the reason why.

It shall be possible for the Sending User to send several Short Messages which together form a longer Short Message (Concatenated Short Message).

The information transfer of SS-SMS shall only make use of call independent signalling connections (CISC).

NOTE

The acknowledging of a successful reception of a Short Message or a Status Report by the receiving entity does not imply that the Short Message or the Status Report has been displayed or in any other way delivered to the user.

6.2.3   Exceptional Procedures
6.2.3.1   Activation, deactivation and interrogation

Not applicable.

6.2.3.2   Invocation and Operation

If the Service Centre is not able to receive a Short Message from the Sending User it shall return a report to the Sending User containing the Failure-Cause.

If the Service Centre is not able to receive/execute a command submitted from the Sending User it shall return a report to the Sending User containing the Failure-Cause.

If the Receiving User is not able to receive a Short Message delivered from the Service Centre the Receiving User shall return a report to the Service Centre containing the Failure-Cause.

If the Sending User is not able to receive a Status Report from the Service Centre the Sending User shall return a report to the Service Centre containing the Failure-Cause.

If the Service Centre is not able to deliver a Short Message to a Receiving User because there is no memory available or the user is not reachable, the entity responsible for that Receiving User shall set an indication that a Service Centre attempted to deliver a Short Message to this user and store the address of that SC in the Short Message Waiting Data. If the Receiving User has memory available or is reachable again the entity shall send an ScAlert to the Service Centre, containing the address of the

Receiving User and upon reception of a ScAlert confirmation delete the SC address from the SMWD list.

The implementation of the Short Message Waiting Data is optional. If it is not implemented it is up to the SC to repeat the delivery attempt periodically to ensure the delivery of a Short Message.

6.3 Interactions with other Supplementary Services/ Additional Network Features

Interactions with other supplementary services and ANFs for which PISN standards were available the time of this Standard are specified below.

6.3.1 Calling Line Identification Presentation (SS-CLIP)

No Interaction.

6.3.2 Connected Line Identification Presentation (SS-COLP)

No interaction.

6.3.3 Calling/Connected Line Identification Restriction (SS-CLIR)

No interaction.

6.3.4 Calling Name Identification Presentation (SS-CNIP)

No interaction.

6.3.5 Calling/Connected Name Identification Restriction (SS-CNIR)

If calling name identification restriction has been invoked then the Receiving User's name shall not be included in any SMS message.

6.3.6 Connected Name Identification Presentation (SS-CONP)

If the name of the Receiving User is available to the SC it may optionally be included in a SMS message.

6.3.7 Completion of Calls to Busy Subscriber (SS-CCBS)

No interaction.

6.3.8 Completion of Calls on No Reply (SS-CCNR)

No interaction.

6.3.9 Call Transfer (SS-CT)

No interaction.

6.3.10 Call Forwarding Unconditional (SS-CFU)

Call forwarding shall not apply for Short Message Service.

6.3.11 Call Forwarding Busy (SS-CFB)

Call forwarding shall not apply for Short Message Service.

6.3.12 Call Forwarding No Reply (SS-CFNR)

Call forwarding shall not apply for Short Message Service.

6.3.13 Call Deflection (SS-CD)

Call deflection shall not apply for Short Message Service.

6.3.14 Path Replacement (ANF-PR)

No interaction.

6.3.15 Call Offer (SS-CO)

No interaction.

6.3.16 Call Intrusion (SS-CI)

No interaction.

6.3.17 Do Not Disturb (SS-DND)

Do Not Disturb shall not apply for Short Message Service.

6.3.18 Do Not Disturb Override (SS-DNDO)

No interaction.

6.3.19 Advice of Charge (SS-AOC)

No interaction.

6.3.20 Recall (SS-RE)

No interaction.

6.3.21 Call Interception (ANF-CINT)

Call Interception shall not apply for Short Message Service.

6.3.22 Transit Counter (ANF-TC)

No interaction.

6.3.23 Route Restriction Class (ANF-RRC)

No interaction.

6.3.24 Message Waiting Indication (SS-MWI)

The Message Centre may act as a sending entity for Short Messages and Commands and as a storage entity for Short Message and shall indicate the reception of new Short Messages to the Receiving User.

6.3.25 Wireless Terminal Location Registration (SS-WTLR)

No Interaction.

6.3.26 Wireless Terminal Mobility Incoming Call (ANF-WTMI)

No Interaction.

6.3.27 Wireless Terminal Mobility Outgoing Call (ANF-WTMO)

No Interaction.

6.3.28 Authentication of a WTM user (SS-WTAT)

No interaction.

6.3.29 Authentication of the PISN (SS-WTAN)

No interaction.

6.3.30 Private User Mobility Incoming Call (ANF-PUMI)

No Interaction.

6.3.31 Private User Mobility Outgoing Call (ANF-PUMO)

No Interaction.

6.3.32 Private User Mobility Registration (SS-PUMR)

No Interaction.

6.3.33 Common Information (ANF-CMN)

No interaction.

6.3.34 Call Priority Interruption (Protection) (SS-CPI(P))

No interaction.

6.3.35 Single Step Call Transfer (SS-SSCT)

No interaction.

6.3.36 Simple Dialog (SS-SD)

No interaction.

6.3.37 Call Identification and Call Linkage (ANF-CIDL)

No interaction.

6.4 Interworking considerations

A Service Centre may be connected to other networks than a PISN and receive Short Messages from and send Short Messages to the other networks.

6.4   Overall SDL
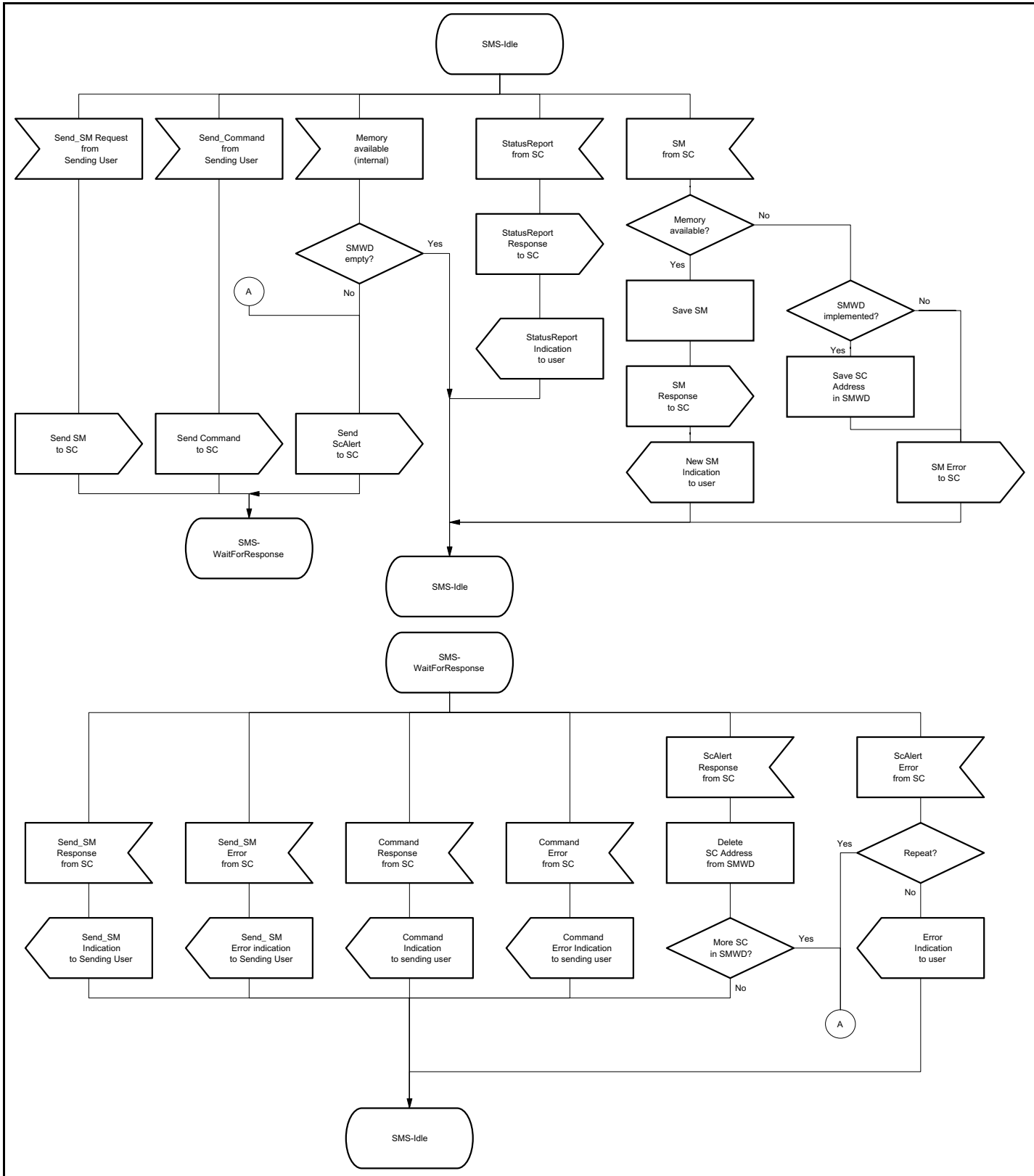
Figure 1SEQARABIC - Overall SDL

7   SS-Short Message Service stage 2 description

7.1   Functional model

7.1.1   Functional model description

The functional model shall comprise the following Functional Entities (FEs):

FE1   Short Message Sending User Agent

FE2   Sending User Service Control Entity

FE3   Service Centre Control Entity

FE4   Receiving User Service Control Entity

FE5   Short Message Receiving User Agent

FE6   Sending User Message Centre

FE7   Receiving User Message Centre

The following relationships shall exist between these FEs:

ra   between FE1 and FE2

rb   between FE2 and FE3 and FE6 and FE3

rc   between FE3 and FE4 and FE4 and FE7

rd   between FE4 and FE5

Figure 3SEQARABIC shows these FEs and relationships.
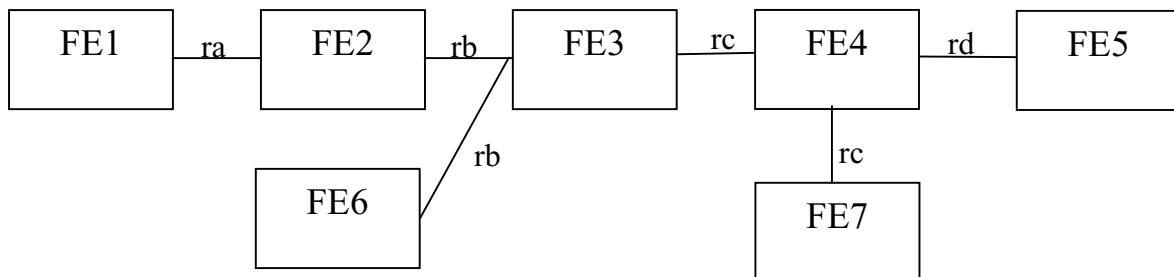
Figure 3SEQARABIC - Functional Entities

7.1.2   Description of Functional Entities

7.1.2.1   Short Message Sending User Agent

This Functional Entity:

-    submits the Short Message Text and optional elements to FE2;

-    submits Command elements to FE2;

-    receives Submit Reports for sent SMs or Commands from FE2;

-    receives Status Reports from FE2;

-    submits Delivery Report elements for received Status Reports to FE2;

7.1.2.2   Sending User Service Control Entity

This Functional Entity:

-    composes Short Messages using the Short Message Text and optional elements from FE1, adding additional elements if necessary, and sends them to FE3;

-    composes Commands using the elements from FE1, adding additional elements if necessary, and sends them to FE3;

- receives Submit Reports and Status Reports from FE3;

- sends Submit Reports and Status Reports to FE1;

- receives Delivery Report elements from FE1 and sends them to FE3.

7.1.2.3 Service Centre Control Entity

This Functional Entity:

- receives Short Messages from FE2 or FE6, stores them and attempts to deliver them to FE4 until the Validity Period expires;

- composes and sends Submit Reports and Status Reports to FE2 or FE6 (e.g. the original Sender of the Short Message);

- deletes Short Messages when the Validity Period is expired;

- receives Commands from FE2 or FE6 and executes them on the Short Message given in the Command Data if they are still available in the SC;

- receives Delivery Reports from FE4 and

- optionally, receives SC-Alert from FE4.

7.1.2.4 Receiving User Service Control Entity

This Functional Entity:

- receives Short Messages from FE3;

- sends the Short Message Text and optional elements to FE5 or

- sends the Short Messages to FE7

- receives Delivery reports from FE5 or FE7and sends them to FE3,

optionally

- keeps a list of SC (SMWD) which attempted to deliver a Short Message while the Receiving User was not reachable and

- sends ScAlert messages to FE3 or

- receives ScAlert from FE7 and sends them to FE3.

7.1.2.5 Short Message Receiving User Agent

This Functional Entity:

- receives Short Message Text and optional elements from FE4;

- submits Delivery Report elements to FE4;

- delivers the Short Message to the Receiving User.

7.1.2.6 Sending User Message Centre

This Functional Entity

- receives Short Message or Command elements;

- composes and sends Short Messages to FE3;

- composes and sends Commands to FE3;

- receives Submit Reports from FE3;

- receives Status Reports from FE3;

- sends Delivery Reports to FE3.

7.1.2.7 Receiving User Message Centre

This Functional Entity:

- receives Short Messages from FE4 and stores them;

- submits Delivery Reports to FE4;

- indicates the reception of a new Short Message to the Receiving User and

optionally

- keeps a list of SC (SMWD) which attempted to deliver a Short Message while the Receiving User was not reachable and

- sends SC-Alert messages to FE4.

7.1.3   Relationship of functional model to Basic Call functional model
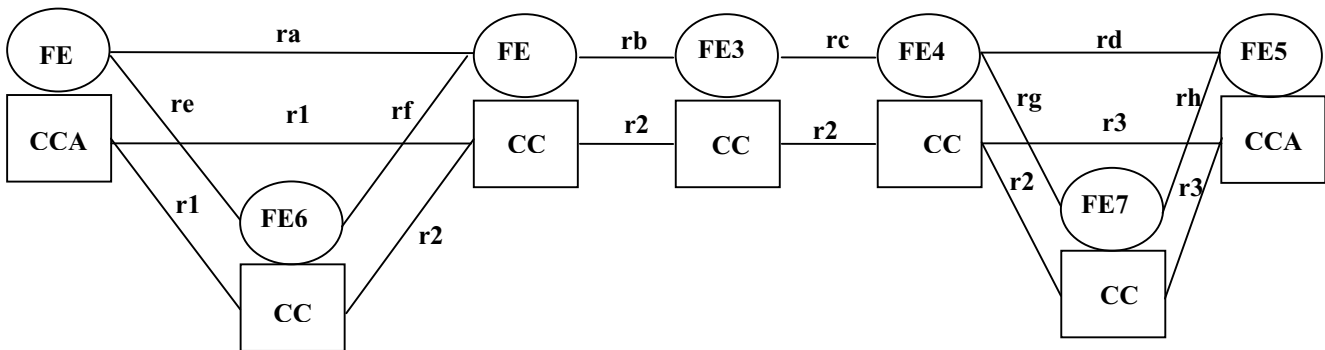
Figure 5SEQARABIC - Functional Entity Model Relationship

Editor's NOTE: Signalling flows are only CISC, therefore it seems reasonable to delete the above section. It is currently not updated!

7.2   Information flows
7.2.1   Definition of Information flows

In the tables listing the elements in information flows, the column headed "Request" indicates which of these elements are mandatory (M) and which are optional (O) in a request/indication information flow, and the column headed "Confirm" (confirmed information flows only) indicates which of these elements are mandatory (M) and which are optional (O) in a response/confirmation information flow.

7.2.1.1   ra_SmsSubmit

ra_SmsSubmit is a confirmed information flow across ra from FE1 to FE2 used to submit Short Message elements from the Short Message Sending User Agent to the Sending User Service Control Entity. Table 1 lists the elements within the ra_SmsSubmit information flow.

Table 1 - Contents of ra_SmsSubmit

Element	Request	Confirm
Receiving User's number	M	
Sending User's number	O	
Short Message Reference	O	
Protocol Identifier	O	O
Status-Report-Request	O	
Reply-Path	O	
Reject-Duplicates	O	
Class	O	O
Compressed	O	O
Short-Message-Text	M	O (NOTE 1)
Validity-Period	O	
User Data Header	O	O
SMSC Control Parameters	O	O
Service-Centre-Time- Stamp		M

NOTE 1

The Short-Message-Text element in an SmsSubmit response/ confirmation is only available for use by the Service Centre.

7.2.1.2   rb_SmsSubmit

rb_SmsSubmit is a confirmed information flow across rb from FE2 to FE3 and from FE6 to FE3 used to submit the Short Message from the Sending User Service Control Entity or Sending User Message Centre, respectively, to the Service Centre Entity. Table 2 lists the elements within the rb_SmsSubmit information flow.

Table 2 - Contents of rb_SmsSubmit

Element	Request	Confirm
Receiving User's number	M	
Sending User's number	M	
Short Message Reference	M	
Protocol Identifier	M	O
Status-Report-Request	M	
Reply-Path	M	
Reject-Duplicates	M	
Class	O	O
Compressed	M	O
Short-Message-Text	M	O (NOTE 2)
Validity-Period	O	
User Data Header	O	O
Service-Centre-Time-Stamp		M

NOTE 2

The Short-Message-Text element in an SmsSubmit response/ confirmation is only available for use by the Service Centre

7.2.1.3   rc_SmsDeliver

rc_SmsDeliver is a confirmed information flow across rc from FE3 to FE4 and from FE4 to FE7 used to submit the Short Message from the Service Centre Entity to the Receiving User Service Control Entity and from the Receiving User Service Control Entity to the Receiving User Message Centre. Table 3 lists the elements within the rc_SmsDeliver information flow.

Table 3 - Contents of rc_SmsDeliver

Element	Request	Confirm
Sending User's number	M	
Receiving User's number	M	
Protocol Identifier	M	O
Service-Centre-Time-Stamp	M	
Priority	M	
More-Messages-to-Send	M	
Status-Report-Indication	M	
Reply-Path	M	
Class	O	O
Compressed	M	O
Short-Message-Text	M	O (NOTE 3)
User Data Header	O	O
Sending User's name	O	

NOTE 3

The Short-Message-Text element in an SmsDeliver response/confirmation flow is only available for use by the Receiving User entity.

7.2.1.4   rd_SmsDeliver

rd_SmsDeliver is a confirmed information flow across rd from FE4 to FE5 used to submit the Short Message from the Receiving User Service Control Entity to the Short Message Receiving User Agent. Table 4 lists the elements within the rd_SmsDeliver information flow.

Table 4 - Contents of rd_SmsDeliver

Element	Request	Confirm
Sending User's number	M	
Receiving User's number	O	
Protocol Identifier	O	O
Service-Centre-Time-Stamp	O	
Priority	O	
More-Messages-to-Send	O	
Status-Report-Indication	O	
Reply-Path	O	
Class	O	O
Compressed	O	O
Short-Message-Text	M	O (NOTE 4)
User Data Header	O	O
Sending User's name	O	

7.2.1.5 ra_SmsStatusReport

ra_SmsStatusReport is a confirmed information flow across ra from FE2 to FE1 used to submit a Status Report from the Sending User Service Control Entity to the Short Message Sending User Agent. Table 5 lists the elements within the ra_SmsStatusReport information flow.

Table 5 - Contents of ra_SmsStatusReport

Element	Request	Confirm
Short Message Reference	O (NOTE 5)	
Service-Centre-Time-Stamp	M	
Discharge-Time	M	
Receiving User's number	M	
Destination Address	M	
Status	M	
Priority	O	
More-Messages-to-Send	O	
Status-Report-Qualifier	O	
Receiving User's Name	O	
Protocol Identifier	O	O
Class	O	O
Compressed	O	O
Short-Message-Text	O	O (NOTE 6)
User Data Header	O	O

7.2.1.6 rb_SmsStatusReport

rb_SmsStatusReport is a confirmed information flow across rb from FE3 to FE2 and from FE3 to FE2 used to submit a Status Report from the Service Centre Entity to the Sending User Service Control Entity and from the Service Centre Entity to the Sending User Message Centre. Table 6 lists the elements within the rb_SmsStatusReport information flow.

Table 6 - Contents of rb_SmsStatusReport

Element	Request	Confirm
Short Message Reference	M	
Service-Centre-Time-Stamp	M	
Discharge-Time	M	
Receiving User's address	M	
Destination Address	M	
Status	M	
Priority	M	
More-Messages-to-Send	M	
Status-Report-Qualifier	M	
Receiving User's Name	O	
Protocol Identifier	O	O
Class	O	O
Compressed	O	O
Short-Message-Text	O	O (NOTE 7)
User Data Header	O	O

NOTE 7

The Short-Message-Text element in an SmsStatusReport response/ confirmation is only available for use by the Receiving User.

7.2.1.7 ra_SmsCommand

ra_SmsCommand is a confirmed information flow across ra from FE1 to FE2 used to transfer a Command from the Short Message Sending User Agent to the Sending User Service Control Entity. Table 7 lists the elements within the ra_SmsCommand information flow.

Table 7 - Contents of ra_SmsCommand

Element	Request	Confirm
Receiving User's address	M	
Short Message Reference	O	
Short Message Number	M	
Protocol Identifier	M	O
Command-Type	M	
Command-Data	O	
Status-Report-Request	O	
Service-Centre-Time-Stamp		M
Short-Message-Text		O (NOTE 8)
Class		O
Compressed		O
User Data Header		O

NOTE 8

The Short-Message-Text element in an SmsCommand response/ confirmation is only available for use by the Service Centre.

7.2.1.8   rb_SmsCommand

rb_SmsCommand is a confirmed information flow across rb from FE2 to FE3 and FE6 to FE3 used to transfer a Command from the Sending User Service Control Entity to the Service Centre Entity and from the Sending User Message Centre to the Service Centre Control Entity, respectively. Table 8 lists the elements within the rb_SmsCommand information flow.

Table 8 - Contents of rb_SmsCommand

Element	Request	Confirm
Receiving User's address	M	
Short Message Reference	M	
Short Message Number	M	
Protocol Identifier	M	O
Command-Type	M	
Command-Data	O	
Status-Report-Request	O	
Service-Centre-Time-Stamp		M
Short-Message-Text		O (NOTE 9)
Class		O
User Data Header		O
Compressed		O

NOTE 9

The Short-Message-Text element in a SmsCommand response/ confirmation is only available for use by the Service Centre.

7.2.1.9   rd_ScAlert

rd_ScAlert is a confirmed information flow across rd from FE5 to FE4 used to transfer a ScAlert from the Short Message Receiving User Agent to the Receiving User Service Control Entity. Table 9 lists the elements within the rd_ScAlert information flow.

Table 9 - Contents of rd_ScAlert

Element	Request	Confirm
Party Number	O	O

7.2.1.10   rc_ScAlert

rc_ScAlert is a confirmed information flow across rc from FE4 to FE3 and from FE7 to FE4 used to transfer a ScAlert from the Receiving User Service Control Entity to the Service Centre Entity and from the Receiving User Message Centre to the Receiving User Service Control Entity, respectively. Table 10 lists the elements within the rc_ScAlert information flow.

Table 10 - Contents of rc_ScAlert

Element	Request	Confirm
Party Number	M	M

7.2.2   Information flow sequences

A stage 3 standard for SS-SMS shall provide signalling procedures in support of the information flow sequences specified in the figures. In addition, signalling procedures should be provided to cover sequences arising from error situations, interactions with Basic Calls, interactions with other supplementary services, different topologies etc.

Within a column representing an SS-SMS Functional Entity, the numbers refer to Functional Entity actions listed in 7.3.

7.2.2.1   Submission of a Short Message

Figure 7SEQARABIC shows in generic form the information flow sequence for submission of a Short Message when in the case when the Short Messages are stored in and sent from a Terminal.
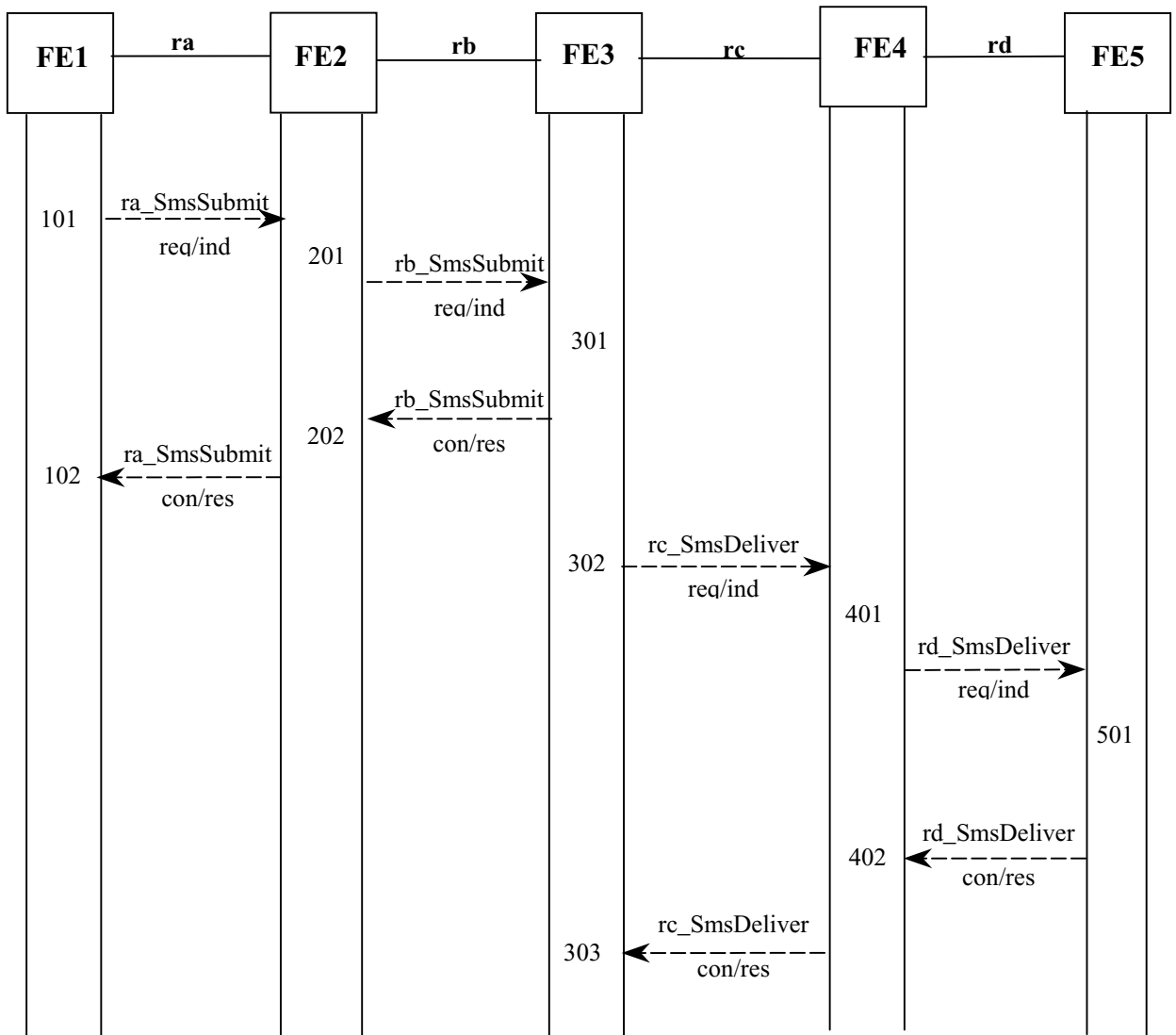
Figure 7SEQARABIC - Information flow sequence for Short Message Transfer, Terminal-case

Figure 9 shows in generic form the information flow sequence for submission of a Short Message from FE6 to FE7.
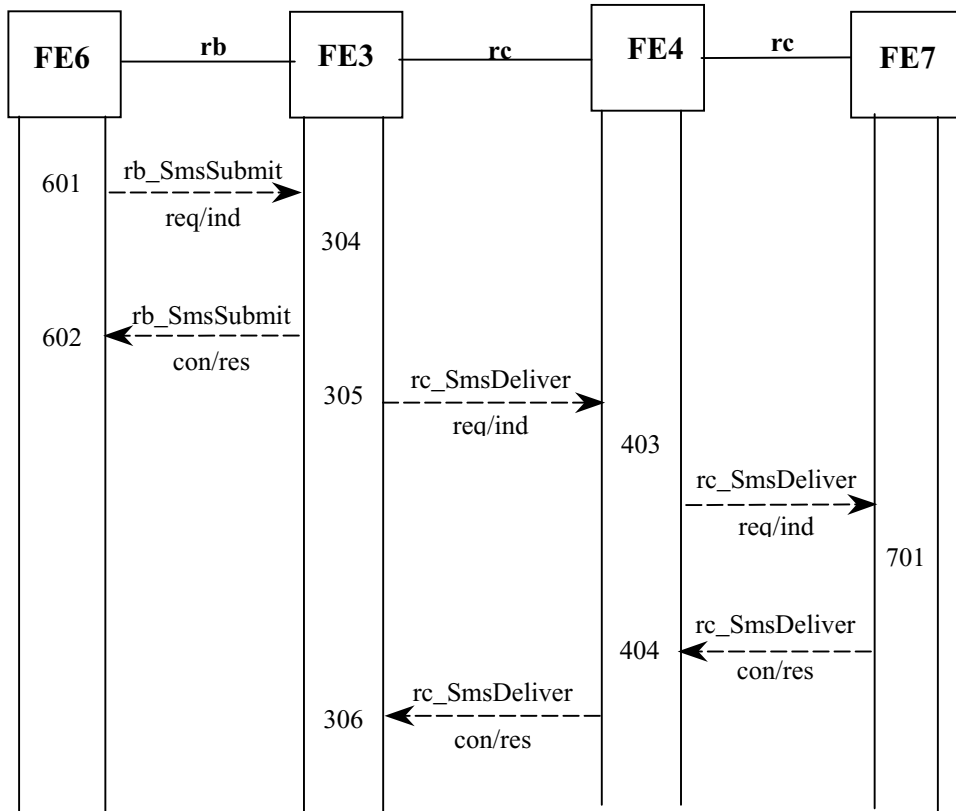
Figure 9 - Information flow sequence for Short Message transfer - Message-Centre-case

7.2.2.2 Delivery of a Status Report

Figure 10 shows in generic form the information flow sequence for the submission of a Status Report from FE3 to FE1.
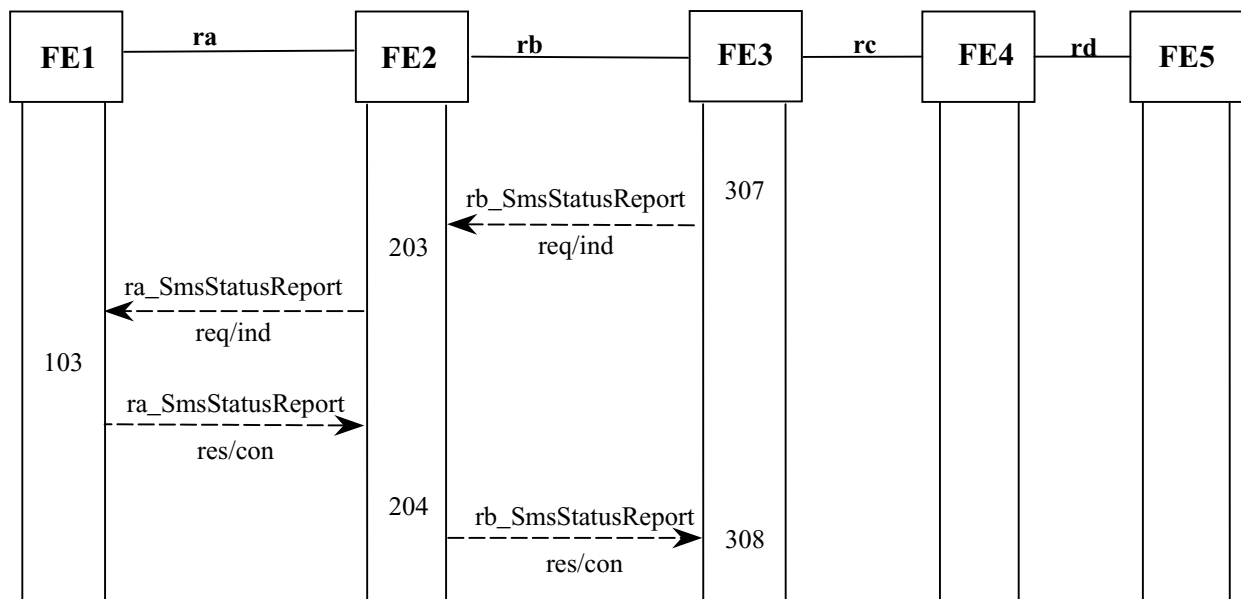
REFMERGEFORMATFigure 10 - Information flow sequence for Status Report Transfe - Terminal-case

Figure 11 shows in generic form the information flow sequence for the submission of a Status Report from FE3 to FE6.
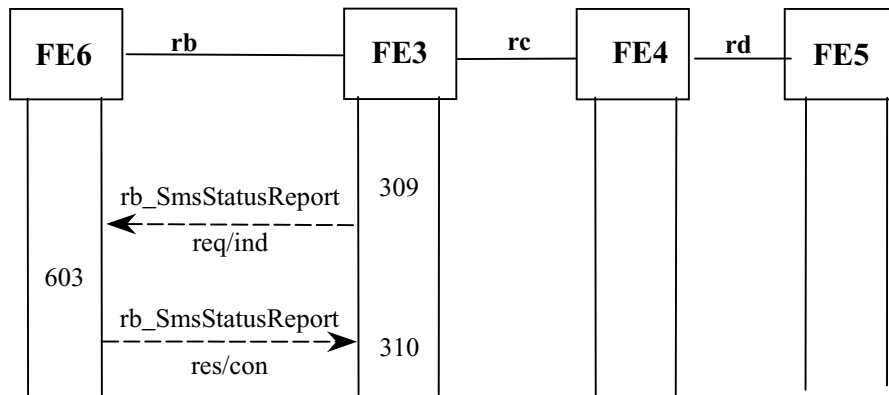
Figure 11 - Information flow sequence for Status Report Transfer - Message-Centre-case

7.2.2.3 Transfer of an SmsCommand

Figure 14SEQARABIC shows in generic form the information sequence flow for the transfer of an SmsCommand from FE1 to FE3.
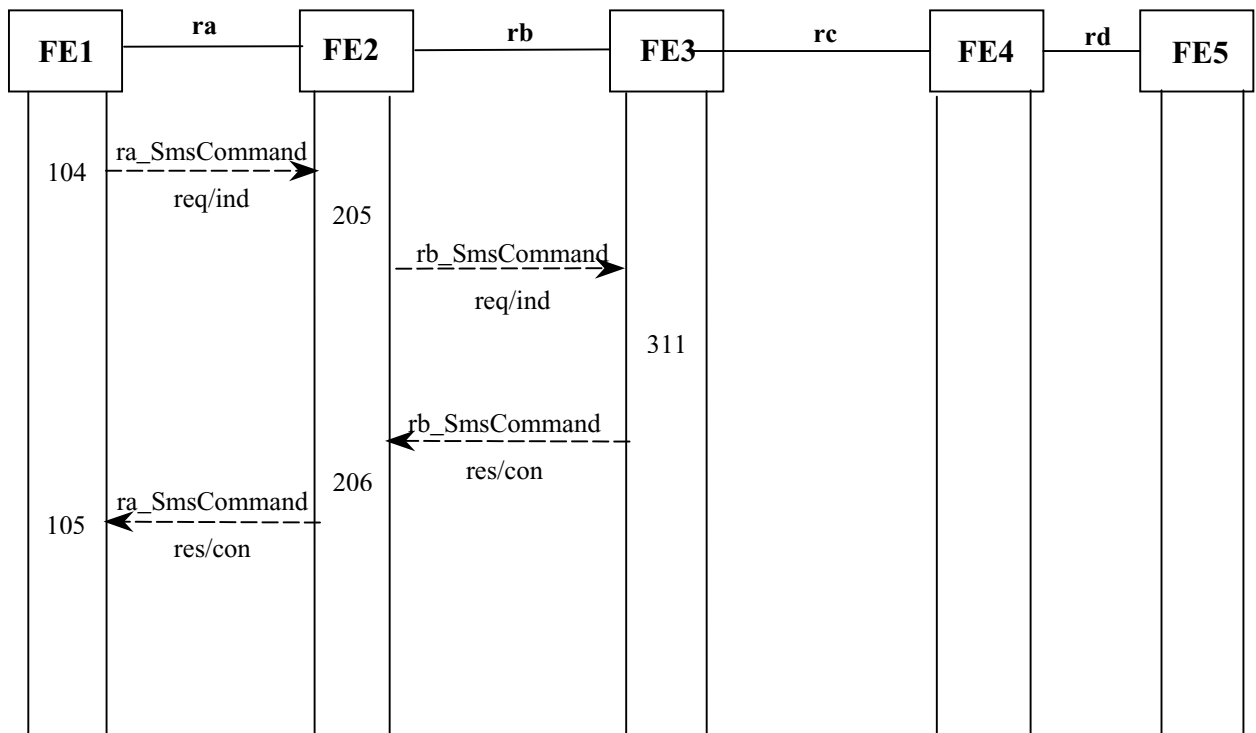
Figure 14SEQARABIC - Information flow sequence for Command Transfer - Terminal-case

Figure 16 shows in generic form the information flow sequence for the submission of a Command from FE6 to FE3.
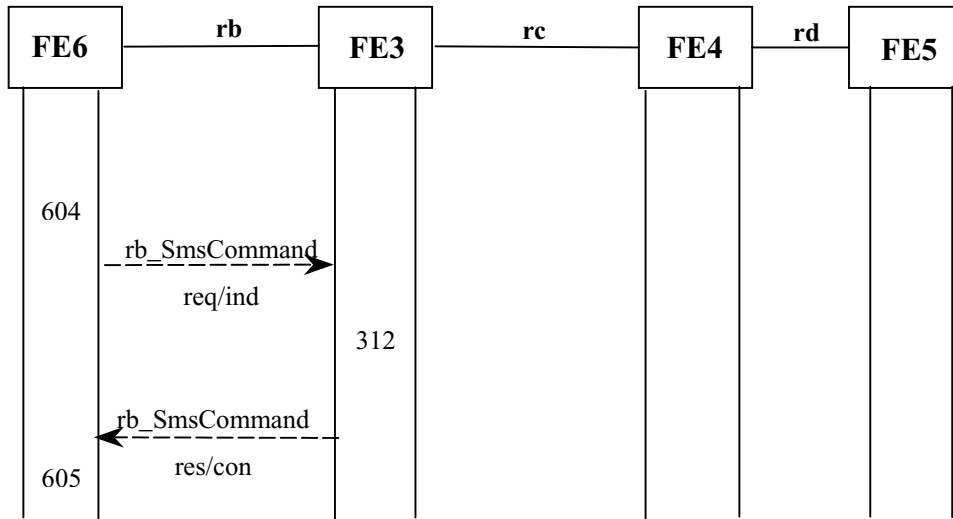
Figure 16 - Information flow sequence for Command Transfer - Message-Centre-case

7.2.2.4   Transfer of an ScAlert

Figure 17SEQARABIC shows in generic form the information flow sequence for the transfer of an ScAlert from FE4 to FE3.
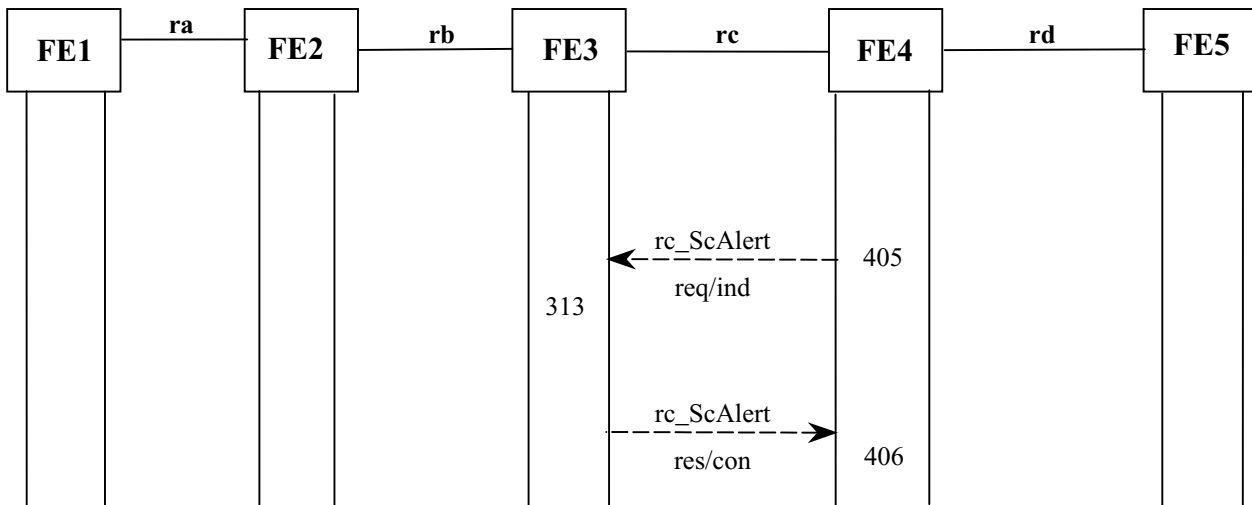

Figure 17SEQARABIC - Information flow sequence for ScAlert Transfer - Terminal-case

Figure 19 shows in generic form the information flow sequence for the transfer of an ScAlert from FE7 to FE3.
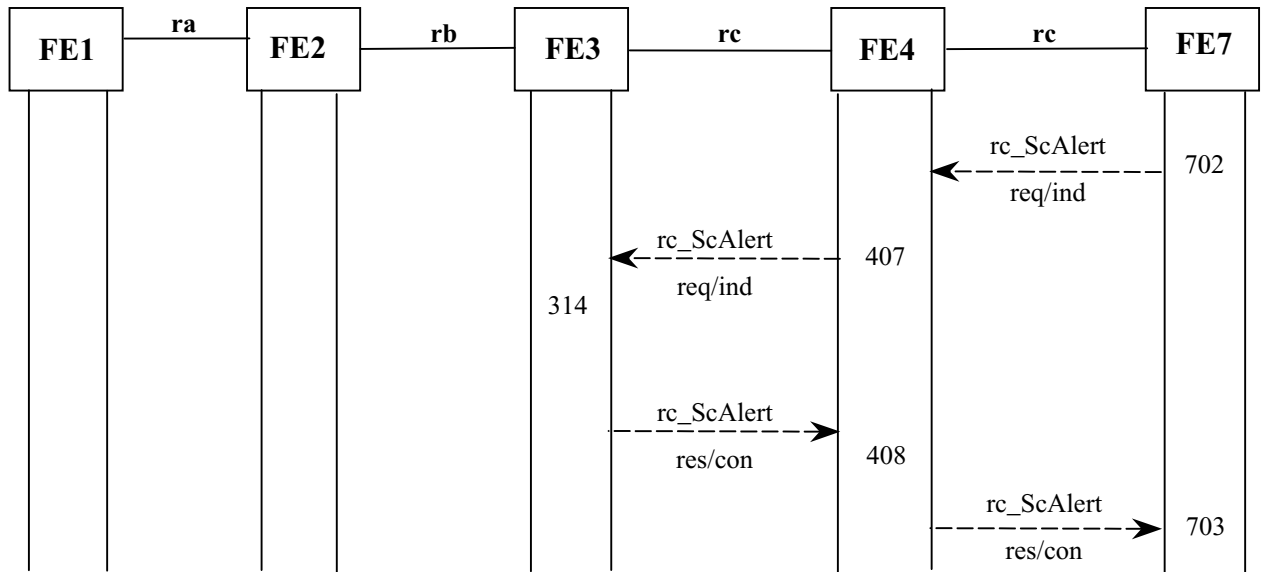
Figure 19 - Information flow sequence for ScAlert Transfer - Message-Centre-case

7.3 Functional Entity Actions

7.3.1 Functional Entity actions of FE1

101   Send ra_SmsSubmit request/indication to FE2 as received from the user.

102   Receive ra_SmsSubmit response/confirmation from FE2 and deliver it to the user.

103   Receive ra_SmsStatusReport request/indication from FE2 and deliver it to the user. Send ra_SmsStatusReport response/confirmation to FE2.

104   Send ra_SmsCommand request/indication to FE2 as received from the user.

105   Receive ra_SmsCommand response/confirmation from FE2 and deliver it to the user.

7.3.2 Functional Entity actions of FE2

201   Receive ra_SmsSubmit request/indication from FE1, add additional elements if necessary and send rb_SmsSubmit request/indication to FE3.

202   Receive rb_SmsSubmit response/confirmation from FE3 and send ra_SmsSubmit response/confirmation to FE1.

203   Receive rb_SmsStatusReport request/indication from FE3, check the elements and send ra_SmsStatusReport request/indication to FE1.

204   Receive ra_SmsStatusReport response/confirmation from FE1 and send rb_SmsStatusReport response/confirmation to FE3.

205   Receive ra_SmsCommand request/indication from FE1, add additional elements if necessary and send rb_SmsCommand request/indication to FE3.

206   Receive rb_SmsCommand response/confirmation from FE3 and send ra_SmsCommand response/confirmation to FE1.

7.3.3 Functional Entity actions of FE3

301   Receive rb_SmsSubmit request/indication from FE2, check if parameters are correct and store the Short Message. Send rb_SmsSubmit response/confirmation to FE2.

302   Compose rc_SmsDeliver request/indication message using the stored Short Message data and send it to FE4.

303   Receive rc_SmsDeliver response/confirmation from FE4; this may trigger the sending of rb_SmsStatusReport (see action 307).

304   Receive rb_SmsSubmit request/indication from FE6, check if parameters are correct and store the Short Message. Send rb_SmsSubmit response/confirmation to FE6.

305   Compose rc_SmsDeliver request/indication message using the stored Short Message data and send it to FE4.

306   Receive rc_SmsDeliver response/confirmation from FE4; this may trigger the sending of rb_SmsStatusReport (see action 309).

307   If the user requested a Status Report in a previously sent SmsSubmit or SmsCommand then compose rb_SmsStatusReport request/indication message and send it to FE2.

308   Receive rb_SmsStatusReport response/confirmation from FE2.

309   If the user requested a Status Report in a previously sent SmsSubmit or SmsCommand then compose rb_SmsStatusReport request/indication message and send it to FE6.

310   Receive rb_SmsStatusReport response/confirmation from FE6.

311   Receive rb_SmsCommand request/indication from FE2 and action it on the Short Message identified by the elements in the command. Send rb_SmsCommand response/confirmation to FE2.

312   Receive rb_SmsCommand request/indication from FE6 and action it on the Short Message identified by the elements in the command. Send rb_SmsCommand response/confirmation to FE6.

313   Receive rc_ScAlert request/indication from FE4 and send rc_ScAlert response/confirmation to FE4. If there are Short Messages or Status Reports waiting to be delivered to this Receiving User invoke delivery procedure (see action 302).

314   Receive rc_ScAlert request/indication from FE4 and send rc_ScAlert response/confirmation to FE4. If there are Short Messages or Status Reports waiting to be delivered to this Receiving User invoke delivery procedure (see action 305).

7.3.4   Functional Entity actions of FE4

401   Receive rc_SmsDeliver request/indication from FE3, check if elements are correct and send rd_SmsDeliver request/indication to FE5.

402   Receive rd_SmsDeliver response/confirmation from FE5 or FE7 and send rc_SmsDeliver response/confirmation to FE3.

403   Receive rc_SmsDeliver request/indication from FE3, check if elements are correct and send rc_SmsDeliver request/indication to FE7.

404   Receive rc_SmsDeliver response/confirmation from FE7 and send rc_SmsDeliver response/confirmation to FE3.

405   Send rc_ScAlert request/indication to FE3.

406   Receive rc_ScAlert response/confirmation from FE3.

407   Receive rd_ScAlert request/indication from FE7, add additional elements if necessary, and send rc_ScAlert request/indication to FE3.

408   Receive rc_ScAlert response/confirmation from FE3 and send rd_ScAlert response/confirmation to FE7.

7.3.5   Functional Entity actions of FE5

501   Receive rd_SmsDeliver request/indication from FE4, deliver the Short Message to the user and send rd_SmsDeliver response/confirmation to FE4.

7.3.6   Functional Entity actions of FE6

601   On request of the user send rb_SmsSubmit request/ indication to FE3.

602   Receive rb_SmsSubmit response/ confirmation from FE3 and indicate result to the user.

603   Receive rb_SmsStatusReport request/indication from FE3 and indicate it to the user. Send rb_SmsStatusReport response/confirmation to FE3.

604   On user request send rb_SmsCommand request/indication to FE3.

605   Receive rb_SmsCommand response/confirmation from FE3 and indicate result to the user.

7.3.7   Functional Entity actions of FE7

701   Receive rc_SmsDeliver from FE4, store the Short Message if possible, indicate the reception of the new message to the user and send rc_SmsDeliver response/ confirmation to FE4.

702   On an internal indication send an rc_ScAlert request/indication to FE4.

703   Receive an rc_ScAlert response/confirmation from FE4.

ANNEX A

1. Description of PDU elements

1.1 Class

Indication how the message was handled at the originating entity (concerning displaying, storage, acknowledging).

1.2 Command Data

Data relating to the operation requested by the Sending User which is to be performed by the Service Centre.

1.3 Command Type

Type of operation that the Service Centre is to perform.

1.4 Compressed

Indication whether the text of the Short Message is compressed or not.

1.5 Discharge Time

Indicates the time at which a previously submitted Short Message was successfully deliver to or attempted to deliver to the Receiving User's Service Control Entity or disposed of by the Service Centre.

1.6 More-Messages-to-Send

Indication that there are more messages waiting in that Service Centre to be sent to that particular Receiving User.

1.7 Priority

Requests a delivery attempt to a terminal irrespective of whether or not it has been identified as temporarily absent or having no memory available.

1.8 Protocol Identifier

This refers to a higher layer protocol or indicates interworking with a certain type of telematic device. The terminal will interpret unsupported values as the value (0) but shall store them exactly as received. In the case of interworking the sending terminal requests the SC to convert the SM into a format suitable for the receiving terminal.

1.9 Receiving User's Name

This is the Receiving User's name.

1.10 Receiving User's Number

This is the Receiving User's PISN number.

1.11 Reject-Duplicates

Instructs the SC to reject or accept a Short Message still held in the Service Centre.

1.12 Reply-Path

Requests a SC to handle a reply sent in response to a previously sent Short Message. This may happen even though this SC is not known to the receiving terminal.

1.13 Sending User's Name

This is the Name of the Sending User.

1.14 Sending User's Number

This is the Sending User's PISN number.

1.15 Service-Centre-Time-Stamp

Time of Arrival of the Short Message at the Service Centre. The same time value will also be carried in the SmsStatusReport relating to a particular Short Message. This will allow the entity receiving the Status

Report to associate a particular SmsSubmit with a subsequent SmsStatusReport by correlating the two SCTS values.

1.16 Short Message Number

Reference Number of a previously submitted Short Message on which to operate on. For Command Types which are not for a specific Short Message this field shall be ignored when received.

1.17 Short Message Reference

This is a Reference-Number identifying the Short Message uniquely to the Service Centre.

1.18 Short Message Text

140 octet of data containing the message text.

1.19 SMSC Control Parameters

Control Parameters specifying when the SC shall return a Status Report to the Sending User. Status-Report-Request must be set for SMSC Control Parameters to be enable.

1.20 Status

Indicates the Status of a previously submitted Short Message and certain Commands for which a Status Report has been requested.

1.21 Status Report Indication

Indication of whether or not the Sending User has requested a Status Report.

1.22 Status Report Qualifier

Indication of whether this Status Report is a response to an SmsCommand or to an SmsSubmit.

1.23 Status-Report-Request

Request to the Service Centre to send Status Report.

1.24 User Data Header

Sequence of a single or several User Data Header(s).

1.25 Validity-Period

Time to live for a Short Message in a Service Centre.

Draft Standard ECMA-QSIG-SMS

ECMA

Standardizing Information and Communication Systems

**Private Integrated Services Network (PISN) –
Inter–Exchange Signalling Protocol -
Short Message Service Supplementary Service**

First Draft – October 2000

ECMA

Standardizing Information and Communication Systems

**Private Integrated Services Network (PISN) –
Inter–Exchange Signalling Protocol -
Short Message Service Supplementary
Service**

(QSIG-SMS)

Brief History

This Standard is one of a series of ECMA Standards defining services and signalling protocols applicable to Private Integrated Services Digital Networks (PISNs). The series uses ISDN concepts as developed by ITU-T and conforms to the framework of International Standards on Open Systems Interconnection as defined by ISO/ IEC. It has been produced under ITSTC work item XXX and under ETSI work item XXX.

This particular Standard specifies the signalling protocol for use at the Q reference point in support of the Short Message Service supplementary service. The protocol defined in this Standard forms part of the PSS1 protocol (informally known as QSIG).

This Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/ IEC JTC1, ITU-T, ETSI and other international and national standardization bodies. It represents a pragmatic and widely based consensus.

Drafting Statements

First draft was edited by Lars Kiessling and Georg Mayer, Siemens AG, Germany (Lars.Kiessling@icn.siemens.de, Georg.Mayer@icn.siemens.de).

Table of contents

1   Scope

This Standard specifies the signalling protocol for the support of the Short Message Service supplementary service (SS-SMS) at the Q reference point between Private Integrated Services Network Exchanges (PINXs) connected together within a Private Integrated Services Network (PISN).

The Short Message Service is a supplementary service which permits a served user to send a Short Message of limited size to another user in the same the same PISN or another network.

The Q reference point is defined in ISO/IEC 11579-1.

Service specifications are produced in three stages and according to the method specified in ETS 300 387. This Standard contains the stage 3 specification for the Q reference point and satisfies the requirements identified by the stage 1 and stage 2 specifications in ECMA-XXX.

Editor's Note:

The Standard number has to be replaced by the SS-SMS Stage1/2 number.

The signalling protocol for SS-SMS operates on top of the signalling protocol for basic circuit switched call control, as specified in ECMA-143 and uses certain aspects of the generic procedures for the control of supplementary services specified in ECMA-165.

This Standard also specifies additional signalling protocol requirements for the support of interactions at the Q reference point between SS-SMS and other supplementary services and ANFs.

This Standard is applicable to PINXs which can be interconnected to form a PISN.

2   Conformance

In order to conform to this Standard, a PINX shall satisfy the requirements identified in the Protocol Implementation Conformance Statement (PICS) proforma in Annex A.

3   References (normative)

The following standards contain provisions which, through references in this text, constitute provisions of this Standard. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

In the case of references to ECMA Standards that are aligned with ISO/IEC International Standards, the number of the appropriate ISO/IEC International Standard is given in brackets after the ECMA reference.

ECMA-142	Private Integrated Services Network – Circuit-mode 64 kbit/s Bearer Services – Service Description, Functional Capabilities and Information Flows (International Standard ISO/IEC 11574)
ISO/IEC 11579-1	Information technology – Telecommunications and information exchange between systems – Private Integrated Services Network – Part 1: Reference configuration for PISN Exchanges (PINX)
ETSI TS 100 900	Digital cellular telecommunications systems (Phase 2+); Alphabets and language-specific information (1998)(GSM 03.38)
ETSI TS 100 901	Digital cellular telecommunications systems (Phase 2+); Technical realization of the Short Message Service (SMS) (1998) (GSM 03.40)
ETSI TS 100 942	Digital cellular telecommunications systems (Phase 2+); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface (1999)(GSM 04.11)
ETSI TS 100 974	Digital cellular telecommunications systems (Phase 2+); Mobile Application Part (MAP) specification (1999)(GSM 09.02)
ETSI TS 101 032	Digital cellular telecommunications systems (Phase 2+); Compression algorithm for text messaging services (1998) (GSM 03.42)

ETS 300 387   Private Telecommunication Network (PTN); Method for the specification of basic and supplementary services (1994)

ITU-T Rec. I.112   Vocabulary of terms for ISDNs (1993)

ITU-T Rec. I.210   Principles of telecommunication services supported by an ISDN and the means to describe them (1993)

ITU-T Rec. Z.100   Specification and description language (1993)

4 Definitions

For the purpose of this Standard the following definitions apply.

4.1 External Definitions

This Standard uses the following terms defined in other documents:

– Application Protocol Data Unit (APDU)	(ECMA-165)
– Call, Basic Call	(ECMA-165)
– Call Independent	(ECMA-165)
– End PINX	(ECMA-165)
– Private Integrated Services Network (PISN)	(ISO/IEC 11579-1)
– Private Integrated Services Network Exchange (PINX)	(ISO/IEC 11579-1)
– Short Message	ECMA-XXX
– Status Report	ECMA-XXX
– Command	ECMA-XXX

> Editor's Note:
>
> Replace Standard number with SS-SMS Stage 1&2 Standard number.

– Signalling	(ITU-T Rec. I.112)
– Supplementary Service	(ITU-T Rec. I.210)
– User	(ECMA-142)

4.2 Other Definitions

4.2.1 Receiving User

The user receiving Short Messages.

4.2.2 Receiving User PINX

The Receiving User PINX is the PINX serving the Receiving User.

4.2.3 Sending User

The user sending Short Messages or Commands and receiving Status Reports.

4.2.4 Sending User PINX

The Sending User PINX is the PINX serving the Sending User.

4.2.5 Service Centre

The Service Centre is a store and forward unit receiving Short Messages and Commands from a Sending User PINX or Sending User Message Centre and forwarding the Short Messages to the Receiving User PINX.

4.2.6 Sending User Message Centre

The Message Centre serving the Sending User.

4.2.7 Short Message Waiting Data

The ability of a Sending User PINX to store the address of a Service Centre and to inform the Service Centre whenever a Receiving User becomes available again or has memory available again.

4.2.8 Receiving User Message Centre

The Message Centre serving the Receiving User.

5 Acronyms

APDU	Application Protocol Data Unit
ASN.1	Abstract Syntax Notation One
ISDN	Integrated Services Digital Network
PICS	Protocol Implementation Conformance Statement
PINX	Private Integrated Services Network Exchange
PISN	Private Integrated Services Network
SDL	Specification and Description Language
SM	Short Message
SMWD	Short Message Waiting Data
SS	Supplementary Service
SS-SMS	Supplementary Service Short Message Service
TE	Terminal Equipment

6 Signalling Protocol for the support of SS-SMS

6.1 SS-SMS Description

Short Message Service is a supplementary service which is offered to a user in a PISN and which enables the user to send and receive Short Messages to and from another user in a PISN or in another (e.g. GSM) network.

The PISN transfers the Short Message from the Sending User to an SC and from the SC to the Receiving User.

6.2 SS-SMS operational requirements

6.2.1 Provision/Withdrawal

Provision and withdrawal shall be in accordance with 6.2.1 from ECMA-XXX.

Editors note:
The Standard number has to be replaces with the number ascribed to the Standard SS-SMS.

6.2.2 Requirements on a Sending User PINX

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ECMA-165 for an Originating-PINX, shall apply.

6.2.3 Requirements on a Sending User Message Centre

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ECMA-165 for an Originating-PINX, shall apply.

6.2.4 Requirements on a Service Centre

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ECMA-165 for an Originating-PINX and for a Terminating-PINX, shall apply.

6.2.5   Requirements on a Receiving User PINX

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ECMA-165 for an Terminating-PINX , shall apply

6.2.6   Requirements on a Receiving User Message Centre

Generic procedures for the call independent control (connection oriented) of supplementary services, as specified in ECMA-165 for an Terminating-PINX, shall apply.

6.3   SS-SMS coding requirements

6.3.1   Operations

The following operations defined in Abstract Syntax Notation One (ASN.1) in table 1 shall apply.

Table 1 - Operations in Support of SS-SMS

```
DEFINITIONS EXPLICIT TAGS::=

BEGIN

IMPORTS

        OPERATION,

        ERROR

FROM Remote-Operation-Notation

{joint-iso-ccitt(2) remote-operations(4) notation(0)}

        Extension

FROM Manufacturer-specific-service-extension-definition

{iso(1) standard(0) pss1-generic- procedures(11582) msi-definition(0)}

        Name

FROM Name-Operations

{iso(1) standard(0) pss1-name(13868) name-operations(0)}

        supplementaryServiceInteractionNotAllowed

FROM General-Error-List

{ccitt(0) recommendation (0) q950 general-error-list(1)}

        PartyNumber

FROM Addressing-Data-Elements

{iso(1) standard(0) pss1-generic-procedures(11582) addressing-data-elements (9)};


--TYPE DEFINITIONS FOR SMS OPERATIONS FOLLOW

SmsDeliver ::=  OPERATION     --sent from the Service Centre

              ARGUMENT           SmsDeliverArg

              RESULT             SmsDeliverRes

              ERRORS             {smsDeliverError,

                                 unspecified}

SmsSubmit ::=  OPERATION     --sent from the TE

              ARGUMENT           SmsSubmitArg

              RESULT             SmsSubmitRes
```

	ERRORS	{smsSubmitError,	
		unspecified}	
smsStatusReport ::=	OPERATION		
	ARGUMENT	SmsStatusReportArg	
	RESULT	SmsStatusReportRes	
	ERRORS	{smsStatusReportError,	
		unspecified}	
smsCommand ::=	OPERATION		
	ARGUMENT	SmsCommandArg	
	RESULT	SmsCommandRes	
	ERRORS	{smsCommandError,	
		unspecified}	
scAlert ::=	OPERATION		
	ARGUMENT	ScAlertArg	
	RESULT	DummyRes	
	ERRORS	{unspecified}	

--TYPE DEFINITIONS FOR SMS DATA TYPES FOLLOW

SmsSubmitArg ::=	SEQUENCE	{	
destinationAddress		PartyNumber,	
originatingAddress		PartyNumber,	
message Reference		IMPLICIT MessageReference,	
smSubmitParameter		IMPLICIT SmSubmitParameter,	
userData		IMPLICIT UserData,	
argumentExtension		ArgumentExtension	OPTIONAL}
SmsSubmitRes ::=	SEQUENCE	{	
serviceCentreTimeStamp		IMPLICIT ServiceCentreTimeStamp,	
protocolIdentifier		[2] IMPLICIT ProtocolIdentifier	OPTIONAL,
userData		[3] IMPLICIT UserData	OPTIONAL,
argumentExtension		ArgumentExtension	OPTIONAL}
SmsDeliverArg ::=	SEQUENCE	{	
originatingAddress		PartyNumber,	
destinationAddress		PartyNumber,	
originatingName		Name	OPTIONAL,

```
    smDeliverParameter          [5] IMPLICIT SmDeliverParameter,
    userData                    IMPLICIT UserData,
    argumentExtension           ArgumentExtension                        OPTIONAL}




SmsDeliverRes ::=        SEQUENCE    {
    smsDeliverResponseChoice    IMPLICIT SmsDeliverResChoice,
    argumentExtension           ArgumentExtension                        OPTIONAL}

SmsStatusReportArg ::= SEQUENCE     {
    messageReference            IMPLICIT MessageReference,--previously submitted SUBMIT
    serviceCentreTimeStamp      IMPLICIT ServiceCentreTimeStamp,
    dischargeTime               IMPLICIT DischargeTime,
    recipientAddress            PartyNumber,
    recipientName               Name                                     OPTIONAL,
    destinationAddress          PartyNumber,
    status                      [5] IMPLICIT Status,
    priority                    [6] IMPLICIT BOOLEAN DEFAULT FALSE,
    moreMessagesToSend          [8] IMPLICIT BOOLEAN DEFAULT FALSE,
    statusReportQualifier       [9] IMPLICIT BOOLEAN DEFAULT FALSE,
    protocolIdentifier          [10] IMPLICIT ProtocolIdentifier         OPTIONAL,
    userData                    [11] IMPLICIT UserData                   OPTIONAL,
    argumentExtension           ArgumentExtension                        OPTIONAL}

SmsStatusReportRes ::= SEQUENCE     {
    smsStatusReportResponseChoice IMPLICIT SmsStatusReportResponseChoice,
    argumentExtension               ArgumentExtension                    OPTIONAL}

SmsCommandArg ::= SEQUENCE          {
    destinationAddress          PartyNumber,
    messageReference            IMPLICIT MessageReference,
    messageNumber               IMPLICIT MessageReference,
                                --which SM in the SC to
                                --operate on, only necessary for Command that works on a
                                --specific Short Message, else it shall be ignored
    protocolIdentifier          IMPLICIT ProtocolIdentifier,
    commandType                 IMPLICIT CommandType,
```

```
        commandData                 [2] IMPLICIT CommandData                   OPTIONAL,
        statusReportRequest         [3] IMPLICIT BOOLEAN DEFAULT FALSE         OPTIONAL,
        argumentExtension           ArgumentExtension          OPTIONAL}


SmsCommandRes ::= SEQUENCE          {
        serviceCentreTimeStamp      IMPLICIT ServiceCentreTimeStamp,
        protocolIdentifier          [2] IMPLICIT ProtocolIdentifier            OPTIONAL,
        userData                    [3] IMPLICIT UserData                      OPTIONAL,
        argumentExtension           ArgumentExtension                         OPTIONAL}


ScAlertArg ::=   SEQUENCE      {
        originatingAddress          PartyNumber,
        argumentExtension           ArgumentExtension                         OPTIONAL}


DummyRes ::=   CHOICE{
        null                NULL,
        extension           [1] IMPLICIT Extension,
        multipleExtension   [2] IMPLICIT SEQUENCE OF Extension}


SmSubmitParameter ::= SEQUENCE      {
        protocolIdentifier          IMPLICIT ProtocolIdentifier,
        validityPeriod              ValidityPeriod                            OPTIONAL,
        statusReportRequest         [4] IMPLICIT BOOLEAN DEFAULT FALSE,
        replyPath                   [5] IMPLICIT BOOLEAN DEFAULT FALSE,
        rejectDuplicates            [6] IMPLICIT BOOLEAN DEFAULT FALSE}


SmDeliverParameter ::= SEQUENCE     {
        protocolIdentifier          IMPLICIT ProtocolIdentifier,
        serviceCentreTimeStamp      IMPLICIT ServiceCentreTimeStamp,
        priority                    [0] IMPLICIT BOOLEAN DEFAULT FALSE,
        moreMessagesToSend          [1] IMPLICIT BOOLEAN DEFAULT FALSE,
        statusReportIndication      [2] IMPLICIT BOOLEAN DEFAULT FALSE,
        replyPath                   [3] IMPLICIT BOOLEAN DEFAULT FALSE}


SmsDeliverResChoice ::= CHOICE      {
        Null,
        [0] IMPLICIT ProtocolIdentifier,
        [1] IMPLICIT UserData,
```

```
        [2] IMPLICIT SEQUENCE {      ProtocolIdentifier,
                                     UserData}        }



SmsStatusReportResponseChoice ::= CHOICE     {
        Null,
        [0] IMPLICIT ProtocolIdentifier,
        [1] IMPLICIT UserData,
        [2] IMPLICIT SEQUENCE {      ProtocolIdentifier,
                                     UserData}        }


MessageReference ::=    INTEGER(0..255)


ArgumentExtension ::=           CHOICE{
        [0] IMPLICIT Extension,
        [1] IMPLICIT SEQUENCE OF Extension}


ProtocolIdentifier ::= INTEGER           {
        noIw                             (0),
        --the following protocolIdentifier settings do not indicate interworking but the protocol between the SM
        --entities
        telex                            (1),
        group3Telefax                    (2),
        group4Telefax                    (3),
        voiceTelephone                   (4),
        eRMES                            (5),
        nationalPagingSystem             (6),
        videotex                         (7),
        teletexUnspecifiedCarrier        (8),
        teletexPSPDN                     (9),
        teletexCSPDN                     (10),
        teletexAnalogPSTN                (11),
        teletexDigitalISDN               (12),
        uci                              (13),
        messageHandlingFacility          (16),
        x400MessageHandlingSystem        (17),
        internetElectonicMail            (18),
        gsmMobileStation                 (31),
        --the following protocolIdentifiers indicate intworking
```

iwImplicit	(32),
iwTelex	(33),
iwTelefaxGroup3	(34),
iwTelefaxGroup4	(35),
iwVoiceTelephone	(36),
iwERMES	(37),
iwNationalPagingSystem	(38),
iwVideotex	(39),
iwTeletexCarrierUnspecified	(40),
iwTeletexPSPDN	(41),
iwTeletexCSPDN	(42),
iwTeletexAnaloguePSTN	(43),
iwTeletexDigitalISDN	(44),
iwUCI	(45),
iwMessageHandlingFacility	(48),
iwX400MessageHandlingSystem	(49),
iwInternetElectronicMail	(50),
iwGSMMobileStation	(63),
shortMessageType0	(64),
replaceShortMessageType1	(65),
replaceShortMessageType2	(66),
replaceShortMessageType3	(67),
replaceShortMessageType4	(68),
replaceShortMessageType5	(69),
replaceShortMessageType6	(70),
replaceShortMessageType7	(71),
returnCallMessage	(95),

Editor's note:

Can codepoint 127 be used in a PISN?

simDataDownload   (127)} (0..127)

ServiceCentreTimeStamp   ::=   GeneralizedTime(Size(12..19))

--this date and time representation follows ISO 8601

DischargeTime   ::=   GeneralizedTime(Size(12..19))

--this date and time representation follows ISO 8601

ValidityPeriod   ::=   CHOICE{

```
        validityPeriodRel         [0] IMPLICIT ValidityPeriodRel,

        validityPeriodAbs         [1] IMPLICIT ValidityPeriodAbs,

        validityPeriodEnh         [2] IMPLICIT ValidityPeriodEnh}


ValidityPeriodAbs                 ::=       GeneralizedTime(Size(12..19))
                                  --this date and time representation follows ISO 8601


ValidityPeriodRel ::=     INTEGER(0..255)
                  --coding rules:
                  --      value         |                         ValidityPeriodValue
                  --      0 to 143      | (value+1) x 5 minutes (i.e. 5 mins. intervals up to 12 hours)
                  --      144 to 167    | 12 hours + ((value – 143) x 30 minutes)
                  --      168 to 196    | (value-166) x 1 day
                  --      197 to 255    | (value-192) x 1 weeks


ValidityPeriodEnh ::=     SEQUENCE{
        singleShotSM          IMPLICIT BOOLEAN DEFAULT FALSE,
        enhancedVP            IMPLICIT EnhancedVP}


EnhanceVP ::=  CHOICE{
        validityPeriodRel     [0] IMPLICIT ValidityPeriodRel,
        validityPeriodSec     [1] IMPLICIT INTEGER(0..255)          –relative time in seconds, time value
                              --of 0 seconds is undefined
        validityPeriodSemi    [2] IMPLICIT ValidityPeriodSemi}


ValidityPeriodSemi ::=  OCTET STRING(3)
                  --Validity Period is relative in semi-octet representation, see ETSI TS 100 901, section 9.1.2.3
                  --and section 9.2.3.11
```

```
Editor's Note:

Is it possible to define an OCTET STRING like that? There are three octets
which are divided in six semi-octets. Each semi-octet represents a digit.

Octet1      |h1|h1|h1|h1|h2|h2|h2|h2|    hence        0010|0100 = 24 hours
Octet2      |m1|m1|m1|m1|m2|m2|m2|m2|                 0011|0000 = 30 minutes
Octet3      |s1|s1|s1|s1|s2|s2|s2|s2|                 0101|0111 = 57 seconds
```

```
UserData ::=              SEQUENCE{
        userDataHeader            [0] IMPLICIT UserDataHeader             OPTIONAL,
        class                     [1] IMPLICIT INTEGER (0..3)             OPTIONAL,
        compressed                [2] IMPLICIT BOOLEAN DEFAULT FALSE,
```

shortMessageText   ShortMessageText}

ShortMessageText ::=   CHOICE{

    iA5Coded   [0] IMPLICIT IA5String(0..160),

    octetCoded   [1] IMPLICIT OCTET STRING(0..140),

    uniCoded   [2] IMPLICIT SmsDataBMPString,

    compressedCoded   [3] IMPLICIT OCTET STRING(0..140)}

    --compressedCoded data contain Compressed Data Header and

    --Footer according to GSM 03.42

Editor's note: should Data Coding Scheme be defined as an Integer and the text itself as an Octet String which would allow extensibility of the DCS?

SmsDataBMPString ::= OCTET STRING(SIZE(0..140))

                    --shall be used according to ISO/IEC 10646-1

                    -- coded as a BMP String according to
                    -- ITU-T Rec. X.690

Status ::=   INTEGER{

    --SM Transaction completed

    smReceivedBySME   (0),

    smForwardedButSCUnableToConfirmDelivery   (1),

    smReplacedByTheSC   (2),

    --errors below are temporary, SC still trying to transfer SM

    tempCongestion   (32),

    tempSMEBusy   (33),

    tempNoResponseFromSME   (34),

    tempServiceRejected   (35),

    tempQualityOfServiceNotAvailable   (36),

    tempErrorInSME   (37),

    --errors below are permanent, SC is not making any more transfer attempts

    remoteProcedureError   (64),

    incompatibleDestination   (65),

    connectionRejectedBySME   (66),

    notObtainable   (67),

    qualityOfServiceNotAvailable   (68),

    noInterworkingAvailable   (69),

    iwValidityPeriodExpired   (70),

    smDeletedByOriginatingSME   (71),

    smDeletedBySCAdministration   (72),

    smDoesNotExist   (73),

    --errors below are temporary, SC is not making any more transfer attempts

congestion	(96),
sMEBusy	(97),
noResponseFromSME	(98),
serviceRejected	(99),
qualityOfServiceNotAvailable	(100),
errorInSME	(101)} (0..255)

CommandType ::=   INTEGER{

Enquiry	(0), --SRR=1
CancelSRR	(1), --SRR=0
DeletePreviouslySubmittedSM	(2), --SRR=0
EnableSRRrelatingToPreviouslySubmittedSM	(3)} (0..255) --SRR=0

Editors Note:

Command Data contains the data necessary for executing the command. There are no further details given in GSM 03.40.

--CommandData ::= OCTET STRING

Editor's Note: Do we need all the following Error-Causes?

FailureCause ::=INTEGER{

--ProtocolIdentifier-Errors	
telematicInterworkingNotSupported	(128),
shortMessageType0NotSupported	(129),
canNotReplaceShortMessage	(130),
unspecifiedProtocolIdentifierError	(143),
--Data-Coding-Scheme-Errors	
alphabetNotSupported	(144),
messageClassNotSupported	(145),
unspecifiedDcsError	(159),
--Command-Errors	
commandCanNotBeActioned	(160),
commandUnsupported	(161),
unspecifiedCommandError	(175),
--other Errors	
pduNotSupported	(176),
--SC Errors	
scBusy	(192),
noScSubscription	(193),

scSystemFailure	(194),
invalidSmeAddress	(195),
destinationSmeBarred	(196),
smRejectedDuplicateSm	(197),
validityPeriodFormatNotSupported	(198),
validityPeriodNotSupported	(199),
--MS Errors	
simSmsStorageFull	(208),
noSmsStorageCapabilityinSIM	(209),
errorInTE	(210),
memoryCapacityExceeded	(211),
simApplicationToolkitBusy	(212),
simDataDownloadError	(213),
--	
unspecifiedErrorCause	(255)

    -- all other values are reserved}(0..255)

UserDataHeader ::=   SEQUENCE OF UserDataHeaderChoice

UserDataHeaderChoice ::=   CHOICE{

smscControlParameterHeader	[0] IMPLICIT SmscControlParameterHeader,
concatenated8BitSMHeader	[1] IMPLICIT Concatenated8BitSMHeader,
concatenated16BitSMHeader	[2] IMPLICIT Concatenated16BitSMHeader,
applicationPort8BitHeader	[3] IMPLICIT ApplicationPort8BitHeader,
applicationPort16BitHeader	[4] IMPLICIT ApplicationPort16BitHeader,
dataHeaderSourceIndicator	[5] IMPLICIT DataHeaderSourceIndicator,
wirelessControlHeader	[6] IMPLICIT WirelessControlHeader,
genericUserValue	[99] IMPLICIT GenericUserValue}

Editor's note: The UserDataHeaderChoice should be extensible – due to ASN.1 a CHOICE can be extended at any time – if existing implementations have problems with this CHOICE-extensibility, the ArgumentExtension should become a part of the CHOICE.

SmscControlParameterHeader ::=   BIT STRING {

    SRforTransactionCompleted (0), SRforPermanentError (1), SRforTempErrorSCnotTrying (2),
    SRforTempErrorSCstillTrying (3), CancelSRRforConcatenatedSM(6), IncludeOrigUDHintoSR
    (7)}(SIZE(1..8))

Editor's Note

CancelSRRforConcatenatedSM: a SR generated by this Short Message, due to a permanent error or last temporary error, cancels the SRR of the rest of the Short Messages in a Concatenated Short Message. This feature can only

be used where the SC is aware of the segmentation and is therefore an implementation matter. Description of the SmscControlParameters in ETSI TS 100 901, section 9.2.3.24.5.

Bit 4 and 5 are reserved and not included in the BIT STRING. Is that possible or do they have to be included?

Concatenated8BitSMHeader ::= SEQUENCE{

    concatenated8BitSMReferenceNumber   IMPLICIT INTEGER(0..255),
    maximumNumberOf8BitSMInConcatenatedSM   IMPLICIT INTEGER(0..255),

    sequenceNumberOf8BitSM   IMPLICIT INTEGER(0..255)}

Concatenated16BitSMHeader ::=   SEQUENCE{

    concatenated16BitSMReferenceNumber   IMPLICIT INTEGER(0..65536),
    maximumNumberOf16BitSMInConcatenatedSM IMPLICIT INTEGER(0..255),
    sequenceNumberOf16BitSM   IMPLICIT INTEGER(0..255)}

ApplicationPort8BitHeader ::=   SEQUENCE{

    destination8BitPort   IMPLICIT INTEGER(0..255),

    originator8BitPort   IMPLICIT INTEGER(0..255)}

    --   Value (port number)   Meaning

    --   0 – 239   Reserved

    --   240 – 255   Available for allocations by applications

ApplicatonPort16BitHeader ::=   SEQUENCE{

    destination16BitPort   IMPLICIT INTEGER(0..65536),

    originator16BitPort   IMPLICIT INTEGER(0..65536)}

    --   Value (port number)   Meaning

    --   0 – 15999   As allocated by IANA (http://www.IANA.com)

    --   16000 – 16999   Available for allocation by applications

    --   17000 – 65535   Reserved

DataHeaderSourceIndicator ::=   INTEGER{

    OriginalSender   01,   --valid in case of Status Report

    OriginalReceiver   02,   --valid in case of Status Report

    SMSC   03}(0..255)   --can occur in any message or report

WirelessControlHeader ::=   OCTET STRING

GenericUserValue ::=   SEQUENCE{

    parameterValue   IMPLICIT INTEGER(0..255),

    genericUserData   OCTET STRING}

```
SmsDeliverError ::=       ERROR
                          PARAMETER   SEQUENCE{
      failureCause              FailureCause,
      protocolIdentifier        [0] IMPLICIT ProtocolIdentifier              OPTIONAL,
      userData                  [1] IMPLICIT userData                       OPTIONAL,
      scAddressSaved            [2] IMPLICIT BOOLEAN DEFAULT FALSE}


SmsSubmitError            ERROR
                          PARAMETER SEQUENCE{
      failureCause                  FailureCause,
      serviceCentreTimeStamp        IMPLICIT ServiceCentreTimeStamp,
      protocolIdentifier            [0] IMPLICIT ProtocolIdentifier          OPTIONAL,
      userData                      [1] IMPLICIT UserData                    OPTONAL}


SmsStatusReportError      ERROR
                          PARAMETER SEQUENCE{
      FailureCause              FailureCause,
      protocolIdentifier        [0] IMPLICIT ProtocolIdentifier              OPTIONAL,
      userData                  [1] IMPLICIT userData                       OPTIONAL,
      ScAddressSaved            [2] IMPLICIT BOOLEAN DEFAULT FALSE}


SmsCommandError           ERROR
                          PARAMETER SEQUENCE{
      failureCause                  FailureCause,
      serviceCentreTimeStamp        IMPLICIT ServiceCentreTimeStamp,
      protocolIdentifier            [0] IMPLICIT ProtocolIdentifier          OPTIONAL,
      userData                      [1] IMPLICIT UserData                    OPTONAL}


smsSubmit             SmsSubmit ::= localvalue {($$a)}
smsDeliver            SmsDeliver ::= localvalue {($$b)}
smsStatusReport       smsStatusReport ::= localvalue {($$c)}
smsCommand            smsCommand ::= localvalue {($$d)}
scAlert               scAlert ::= localvalue {($$e)}


smsDeliverError       SmsDeliverError ::= localvalue{($$A)}
smsSubmitError        SmsSubmitError ::= localvalue {($$B)}
smsStatusReportError  SmsStatusReportError ::= localvalue{($$C)}
smsCommandError       SmsCommandError ::= localvalue {($$D)}
```

Editors Note:

The Operation- and Error-Values have to be replaced by valid values

6.3.2 Information Elements

6.3.2.1 Facility information element

The operations defined in 6.3.1 for the support of SS-SMS shall be coded in the Facility information element in accordance with ECMA-165.

When conveying the invoke APDU of the operations defined in 6.3.1 the destinationEntity data element of the NFE shall contain value endPINX. The Interpretation APDU in the Facility information element shall be omitted or have the value "rejectAnyUnrecognizedInvokeAPDU (0)".

6.3.2.2 Other information elements

Any other information elements shall be coded in accordance with ECMA-143.

6.3.3 Messages

The Facility information element shall be conveyed in messages as specified in clause 10 of ECMA-165.

6.4 SS-SMS State Definitions

6.4.1 States at a Sending User PINX and at the Sending User Message Centre

The procedures at the Sending User PINX/ Sending User Message Centre are written in terms of the following conceptual states existing within the SS-SMS control entity in that Sending User PINX/ Sending User Message Centre in association with a particular send Short Message request or send Command request from the Sending User.

6.4.1.1 SMS-Send-Idle

SS-SMS is not operating.

6.4.1.2 SMS-Send-Submit-Wait

A smsSubmit invoke APDU has been sent to the Service Centre. The Sending User PINX/Sending User Message Centre is waiting for a response.

6.4.1.3 SMS-Send-Command-Wait

The Sending User-PINX/Sending User Message Centre has received a command request from the Sending User, has sent a smsCommand invoke APDU to the Service Centre and is waiting for receipt of a smsCommand return result, return error or reject APDU.

6.4.2 States at a Service Centre

The procedures at the Service Centre are written in terms of the following conceptual states existing within the SS-SMS control entity in that Service Centre.

6.4.2.1 SMS-SC-Idle

SMS is not operating

6.4.2.2 SMS-SC-Deliver-Wait

The Service Centre has received an smsSubmit invoke APDU from the Sending User PINX/Sending User Message Centre, saved the Short Message, sent a smsDeliver invoke APDU to the Receiving User PINX and is waiting for receipt of a smsDeliver return result, return error or reject APDU.

6.4.2.3 SMS-SC-SR-Wait

The Service Centre has sent an smsStatusReport invoke APDU to the Sending User PINX/Sending User Message Centre and is waiting for receipt of a smsStatusReport return result, return error or reject APDU.

NOTE

This state may exist parallel and independently of the normal states for Short Messages.

6.4.2.4 SMS-SC-SR-Idle

The Service Centre is waiting for an internal request to send a Status Report.

NOTE

This state may exist parallel and independently of the normal states for Short Messages.

6.4.2.5 SMS-SC-Await-Alert

The Service Centre has received an smsDeliver return error APDU with failureCause "memoryCapacityExceeded" or "simSmsStorageFull" or with an additional Cause Information Element and is now waiting for receipt of a scAlert invoke APDU from the Receiving User PINX.

6.4.3 States at a Receiving User PINX

The procedures at the Receiving User PINX are written in terms of the following conceptual states existing within the SS-SMS control entity in that PINX.

6.4.3.1 SMS-Rec-User-case-Idle

SMS is not operating.

6.4.3.2 SMS-Rec-User-case-AlertWait

The Receiving User PINX unsuccessfully attempted to deliver a Short Message to a terminal and is waiting for an internal indication that the Receiving User is available again for further smsDeliver invoke APDUs.

6.4.3.3 SMS-Rec-User-case-AlertResp

The Receiving User PINX has sent an scAlert invoke APDU to the Service Centre and is now waiting for receipt of a scAlert return result, return error or reject APDU from the Service Centre.

6.4.3.4 SMS-Rec-MC-case-Idle

The Receiving User PINX has received APDUs from the Service Centre and forwarded them to the Receiving User Message Centre or has received APDUs from the Receiving User Message Centre and forwarded them to the Service Centre.

6.4.4 States at a Receiving User Message Centre

The procedures at the Sending User Message Centre are written in terms of the following conceptual states existing within the SS-SMS control entity in that Message Centre.

6.4.4.1 SMS-Rec-MC-Idle

SMS is not operating.

6.4.4.2 SMS-Rec-MC-AWait

The Message Centre has received a smsDeliver reject APDU and is waiting for the Receiving User to become available or having memory available again.

6.4.4.3 SMS-Rec-MC-AResp

The Message Centre has sent a scAlert invoke APDU and is waiting for receipt of a scAlert return result, return error or reject APDU from the Receiving User PINX.

6.5 SS-SMS signalling procedures

References in this clause to protocol states refer to basic call protocol states defined in ECMA-143.

6.5.1 Actions at a Sending User PINX/ Sending User Message Centre

NOTE

The APDU elements are described in annex E.

All invoke, return error, return result and reject APDUs shall be transported using the Call Reference of an already existing call independent or call related signalling connection. If no such connection exists, and no call has to be established, the Sending User PINX/Sending User Message Centre shall set up a call independent signalling connection in accordance with the procedures described in 7.3 in ECMA-165.

The Sending User PINX/Sending User Message Centre is responsible for the clearing of this call independent signalling connection.

6.5.1.1 Normal Procedures

6.5.1.1.1 Short Message

On request of the Sending User to send a Short Message the Sending User PINX/ Sending User Message Centre shall

1) check if the Sending User is permitted to use the SS-SMS; if so

2) generate a smsSubmit invoke APDU, based on the Short Message elements received from the Sending User which shall include the following mandatory elements:

   - the Party Number of the Receiving User in element destinationAddress,

   - the Party Number of the Sending User in element originating Address,

   - a Message Reference in element messageReference which is allocated by the Sending User PINX for each new Short Message that is sent (see Annex E for further details)

   - Short Message specific Parameters in element smsSubmitParameters (see Annex E for further details)

   - the Short Message Text and related information in element userData (see Annex E for further details)

3) send the smsSubmit invoke APDU to the Service Centre,

4) start timer T1 and enter state SMS-Send-Submit-wait.

On receipt in state SMS-Send-Submit-wait of a smsSubmit return result APDU the Sending User PINX shall

1) stop timer T1;

2) send an indication to the Sending User that the submission of the Short Message was successful and

3) enter state SMS-Send-Idle.

6.5.1.1.2 Command

On request of the Sending User to send a Command the Sending User PINX/ Sending User Message Centre shall

1) check if the Sending User is permitted to use the SMS, if so

2) generate a smsCommand invoke APDU based on the Command information received from the Sending User, which shall include the following mandatory elements:

   - the Party Number of the Receiving User of the Short Message to which the Command refers in element destinationAddress,

   - a Message Reference in element messageReference which is allocated by the Sending User PINX/Sending User Message Centre for each new Command that is sent (see Annex E for further details),

   - the Message Reference of the Short Message to which the Command refers in element messageNumber,

   - the Protocol Identifier identifying the above layer protocol in element protocolIdentifier (see Annex E for further details)

   - the Command Type in element commandType (see Annex E for further details)

   - optional elements as described in 6.3.1.

3) send the smsCommand invoke APDU to the Service Centre,

4) start timer T2 and enter state SMS-Send-Command-wait.

On receipt in state SMS-Send-Command-wait of a smsCommand return result APDU the Sending User PINX/ Sending User Message Centre shall

1) stop timer T2,

2) send an indication to the Sending User that the submission of the Command was successful and

3) enter state SMS-Send-Idle.

6.5.1.1.3 Status Report

On receipt in state SMS-Send-Idle of a smsStatusReport invoke APDU the Sending User PINX/ Sending User Message Centre shall

1) send a positive result indication to the Sending User,

2) send a smsStatusReport return result to the Service Centre and

3) enter state SMS-Send-Idle.

6.5.1.2 Exceptional procedures

The Sending User PINX/ Sending User Message Centre shall return an error indication to the Sending User if

1) the Sending User is not permitted to use the SS-SMS;

2) the smsSubmit/smsCommand elements are incorrect or if mandatory elements are missing.

6.5.1.2.1 Short Message

On receipt in state SMS-Send-Submit-wait of a smsSubmit reject or return error APDU the Sending User PINX/ Sending User Message Centre shall

1) stop timer T1,

2) send an indication including the error reason to the Sending User and

3) enter state SMS-Send-Idle.

On expiry of timer T1 the Sending User PINX/ Sending User Message Centre shall either

- re-send the smsSubmit invoke ADPU, start timer T1 and enter state SMS-Send-Submit-wait or

- send an indication including the error reason to the Sending User and enter state SMS-Send-Idle.

NOTE

The number of times the Sending User PINX may repeat the smsSubmit is an implementation matter.

6.5.1.2.2 Command

On receipt in state SMS-Send-Command-wait of a smsCommand reject or return error APDU the Sending User PINX/ Sending User Message Centre shall

1) stop timer T2;

2) send an indication including the error reason to the Sending User and

3) enter state SMS-Send-Idle.

On expiry of timer T2 the Sending User PINX/ Sending User Message Centre shall either

1) re-send the smsCommand invoke APDU, start timer T2 and enter state SMS-Send-Command-wait or

2) send an indication including the error reason to the Sending User and enter state SMS-Send-Idle.

NOTE

The number of times the Sending User PINX may repeat the smsCommand is an implementation matter.

6.5.1.2.3 Status Report

On receipt in state SMS-Send-Idle of a smsStatusReport invoke APDU the Sending User PINX/ Sending User Message Centre shall in case of an error send a smsStatusReport return error APDU with the mandatory elements

- Failure Cause transported in element failureCause,

- indication if the Service Centre address could be saved transported in scAddressSaved

to the Service Centre and enter state SMS-Send-Idle.

6.5.2 Actions at a Sending User Message Centre

The procedures for the Sending User Message Centre are as described in 6.5.1 for the Sending User PINX.

6.5.3 Actions at a Service Centre

All invoke, return error, return result and reject APDUs shall be transported using the Call Reference of an already existing call independent or call related signalling connection. If no such connection exists, and no call has to be established, the Service Centre shall set up a call independent signalling connection in accordance with the procedures described in 7.3 in ECMA-165. The Service Centre is responsible for the clearing of this call independent signalling connection.

NOTE

The APDU elements are described in annex E.

6.5.3.1 Normal procedures

6.5.3.1.1 Short Message

On receipt in state SMS-SC-Idle of a smsSubmit invoke APDU from the Sending User PINX/Sending User Message Centre the Service Centre shall

1) check if the received smsSubmit invoke APDU contains a Short Message with the same messageReference and destinationAddress as a previously received Short Message from the same originatingAddress.
In case such a Short Message exists and the rejectDuplicates APDU element is set to FALSE or in case that the messageReference is different to the messageReference of the previously received Short Message the Service Centre shall

2) check the APDU element Protocol Identifier and

if it is set to Replace Short Message check the originating address and replace any existing stored Short Message having the same Protocol Identifier Code and originating address with the new Short Message and other parameter values. If there is no message to be replaced the Service Centre shall store the Short Message in the normal way.

if no Replace Short Message code is present the Service Centre shall store the Short Message locally,

3) analyse and store the smsSubmit invoke APDU,

4) assign and store a serviceCentreTimeStamp for the Short Message,

5) send an smsSubmit return result APDU to the Sending User PINX/Sending User Message Centre,

6) send an smsDeliver invoke APDU to the Receiving User PINX using the call reference of a call-independent-signalling-connection. The smsDeliver invoke APDU contains the received elements from the smsSubmit invoke ADPU and the following additional elements:

optionally, the originatingName of the Sending User if available and not restricted;

serviceCentreTimeStamp;

priority;

moreMessagesToSend: set to TRUE if there are more Short Messages waiting in that Service Centre for that particular destinationAddress;

statusReportIndication: set to TRUE if the statusReportRequest information element is set to TRUE in the original smsSubmit invoke APDU;

replyPath: set to TRUE if the Service Centre supports the Reply Path.

7) start timer T3 and enter state SMS-SC-Deliver-Wait.

On receipt in state SMS-SC-Deliver-Wait of a smsDeliver return result APDU the Service Centre shall

1) stop timer T3 and

2) generate an internal request to send a Status Report with value "smReceivedBySME" if the internal StatusReportRequest bit is set to TRUE and, if included, according to the settings of the element smscControlParameterHeader and

3) enter state SMS-SC-Idle.

Editor's Note:

Is it necessary to include the mapping between the smsSubmit and smsDeliver APDUs?

Editor's Note:

Do we have to include: *ME Data download, ME de-personalization Short Message* as Protocol Identifier?

6.5.3.1.2 Command

On receipt in any state except SMS-SC-Idle of an smsCommand invoke APDU the Service Centre shall

– identify a specific locally stored Short Message by the received smsCommand invoke APDU elements

  originatingAddress

  messageNumber, including the messageReference of the stored Short Message

– execute the requested commandType on this message, i.e. for commandType

  "Enquiry" set the internal field StatusReportRequest to TRUE;

  "CancelSRR" set the internal field StatusReportRequest to FALSE;

  "EnableSRRrelatingToPreviouslySubmittedSM" set the internal field StatusReportRequest to TRUE;

  "DeletePreviouslySubmittedSM" delete the identified Short Message;

afterwards send an smsCommand return result APDU to the Sending User PINX/Sending User Message Centre and generate an internal request to send a Status Report if the StatusReportRequest bit is set to TRUE for commandType

– "Enquiry" with a value according to the actual status of the Short Message

– "DeletePreviouslySubmittedSM" with value "smDeletedByOriginatingSME"

and maintain the current state.

6.5.3.1.3 Status-Report

NOTE

The Status Report-related states within the Service Centre are independent of those for the normal Short Message, i.e. parallel states may exist.

In state SMS-SC-SR-Idle on an internal request to send a Status Report for a specific Short Message if the StatusReportRequest bit is set to TRUE and according to the settings in smscControlParameterHeader, if available, the Service Centre shall send a smsStatusReport invoke APDU to the Sending User PINX/Sending User Message Centre using the following smsStatusReport APDU elements:

– messageReference: value contained in the previously received smsSubmit or smsCommand invoke APDU. If the Status Report is the result of an smsCommand where the Command Type was "Enquiry" the messageReference used in the Status Report shall be the messageNumber contained in the smsCommand invoke APDU (i.e. the messageReference of the previously submitted Short Message to which the "Enquiry" refers).

– dischargeTime: time at which a previously submitted smsSubmit was successfully delivered to or attempted to deliver to the Receiving User or disposed of by the SC,

– serviceCentreTimeStamp: the serviceCentreTimeStamp of the assigned to the original smsSubmit invoke APDU

and other elements as described in 6.3.1, start timer T6 and enter state SMS-SC-SR-Wait.

On receipt in state SMS-SC-SR-Wait of a smsStatusReport return result APDU the Service Centre shall stop timer T6 and enter state SMS-SC-SR-Idle.

6.5.3.2   Exceptional procedures

> Editors Note:
>
> Is it necessary to describe all relevant error cases here or shall they be included in the annex?

6.5.3.2.1   Short Message

On receipt in state SMS-SC-Idle of a smsSubmit invoke APDU from the Sending User PINX/Sending User Message Centre the Service Centre shall

1) check if the received smsSubmit invoke APDU contains a Short Message with the messageReference and destinationAddress of a previously received Short Message from the same originatingAddress.
    In case such a Short Message exists and the rejectDuplicates APDU element is set to TRUE or in case that the messageReference is the same as the messageReference of the previously received Short Message the Service Centre shall send an smsSubmit return error APDU to the Sending User PINX/Sending User Message Centre with failureCause "smRejectedDuplicateSM", discard the smssubmit invoke APDU and enter state SMS-SC-Idle.

2) check the APDU element Protocol Identifier and

    if it indicates interworking the Service Centre is requested to convert the Short Message into a form suited for that device type. These procedures are outside the scope of this standard. Following these procedures the Service Centre shall enter state SMS-SC-Idle. If interworking is not supported the Service Centre shall return a smsSubmit return error APDU with failureCause "telematicInterworkingNotSupported" and enter state SMS-SC-Idle.

> Editors Note:
>
> failureCause "cannotReplaceShortMessage" exists but it is unclear when this can happen.

On receipt in state SMS-SC-Del-Wait of a smsDeliver return error APDU the Service Centre shall check the APDU element failureCause.

If it contains the value "memoryCapacityExceeded" or "simSmsStorageFull" or if an additional Cause Information Element has been received, the Service Centre shall

    stop timer T3,

    send an internal request with value "errorInSme" for a Status Report if the internal StatusReportRequest bit is set to TRUE and, if available, according to the settings in smscControlParameterHeader,

    start timer T4 if the smsDeliver return error APDU element "scAddressSaved" is set to TRUE and

    enter state SMS-SC-Await-Alert.

On receipt of a different failureCause the Service Centre shall

> stop timer T3,

> delete the Short Message,

> send an internal request for a Status Report if the internal StatusReportRequest bit is set to TRUE and, if available, according to the setting of smscControlParameterHeader and

> enter state SMS-SC-Idle.

On receipt in state SMS-SC-Del-Wait of a smsDeliver reject APDU the Service Centre shall

> stop timer T3,

> delete the Short Message,

> send an internal request for a Status Report with value "connectionRejectedBySME" if the internal StatusReportRequest bit is set to TRUE and, if available, according to the settings of smscControlParameterHeader, and

> enter state SMS-SC-Idle.

On expiry of timer T3 in state SMS-SC-Deliver-Wait the Service Centre may

> either re-send the smsDeliver invoke APDU to the Receiving User PINX, start timer T3, send an internal request for a Status Report with value "noResponseFromSME" if StatusReportRequest is set to TRUE and, if available, according to the settings of smscControlParameterHeader, enter state SMS-SC-Deliver-Wait

> or delete the Short Message, send an internal request for a Status Report with value "smDeletedByScAdministration" if StatusReportRequest bit is set to TRUE and enter state SMS-SC-Idle.

On receipt in state SMS-SC-Await-Alert of a scAlert invoke APDU from the Receiving User PINX the Service Centre shall

– stop timer T4 if running, check the scAlert invoke APDU and depending on the outcome send an scAlert return result or return error APDU to the Receiving User PINX. If the scAlert is valid the SC shall

> send the smsDeliver invoke APDU to the Receiving User PINX,

> start timer T3 and

> enter state SMS-SC-Deliver-Wait.

On expiry of timer T4 in state SMS-SC-Await-Alert the Service Centre shall

– send the smsDeliver invoke APDU to the Receiving User PINX,

– start timer T3 and

– enter state SMS-SC-Deliver-Wait.

NOTE

The number of times the Service Centre may repeat the delivery attempt for a Short Message is an implementation matter.

On receipt in state SMS-SC-Await-Alert of an internal indication that the Validity Period for a Short Message expired the Service Centre shall

– stop timer T4 if running and can, as an implementation matter, either

> start timer T3, send the smsDeliver invoke APDU to the Receiving User PINX with priority set to TRUE and enter state SMS-SC-Deliver-Wait or

> delete the Short Message, send an internal request for a Status Report with value "smValidityPeriodExpired" if the internal StatusReportRequest bit is set to TRUE and enter state SMS-SC-Idle.

6.5.3.2.2 Command

On receipt in any state of an smsCommand invoke APDU, if no Short Message can be identified, the Service Centre shall

– return an smsCommand return error APDU to the Sending User PINX/Sending User Message Centre with failureCause "commandCannotBeActioned",

– generate an internal request to send a Status Report with value "smDoesNotExist" if the StatusReportRequest bit is set to TRUE and

– maintain the current state

6.5.3.2.3 Status Report

On receipt in state SMS-SC-SR-Wait of an smsStatusReport return error APDU or an smsStatusReport reject APDU or on expiry of timer T6 the Service Centre shall stop timer T6 (if running) and enter the SMS-SC-SR-Idle and may afterwards

– re-send the smsStatusReport invoke APDU according to the procedures described in section 6.5.3.1.1.

6.5.4 Actions at a Receiving User PINX

NOTE

The APDU elements are described in annex E.

Due to internal administration, the Receiving User PINX shall, upon starting operation for a specific user,

– either enter state SM-Rec-MC-case-Idle if the Short Messages are stored and managed at a Message Centre

– or enter state SM-Rec- -User-case-Idle if the Short Messages are stored and managed locally, either by the Receiving User or by the Receiving User PINX.

6.5.4.1 Normal procedures

In state SM-Rec-MC-case-Idle upon receipt of a smsDeliver return result , reject, return error APDU or a scAlert invoke APDU from the Receiving User Message Centre the Receiving User PINX shall send these APDUs unchanged on the call reference of a call-independent-signalling-connection to the Service Centre.

In state SM-Rec-MC-case Idle upon receipt of a smsDeliver invoke APDU, a scAlert return result, return error or reject APDU the Receiving User PINX shall send these APDUs unchanged on the call reference of a call independent signalling connection to the Receiving User Message Centre.

On receipt in state SMS-Rec-User-case-Idle of a smsDeliver invoke APDU from the Service Centre the Receiving User PINX shall attempt to deliver the SM to the Receiving User. If the SM can successfully be delivered the Receiving User PINX shall send a smsDeliver return result APDU to the Service Centre and enter state SMS-Rec-User-case-Idle.

If element protocolIdentifier is set to "shortMessageType0" the Receiving User PINX must acknowledge the receipt of the Short Message but may discard its contents

6.5.4.2 Exceptional procedures

If the attempt by the Receiving User PINX to deliver a Short Message received from the Service Centre to the Receiving User is not successful, the Receiving User PINX shall

– if SMWD is not implemented,

send to the Service Centre a smsDeliver return error APDU with the following elements

- failureCause set to "errorInMS",

- optionally protocolIdentifier as received in the original smsDeliver invoke APDU,

- optionally userData as received in the original smsDeliver invoke APDU,

- scAddressSaved set to FALSE and

enter state SMS-Rec-User-case-Idle.

– if SMWD is implemented

save the Service Centre Address as indicated in the Calling Party Number Information Element of the call-independent-signalling-connection on which the smsDeliver invoke APDU was received,

send to the Service Centre a smsDeliver return error APDU with the following elements

- failureCause set to "errorInMS",

- optionally protocolIdentifier as received in the smsDeliver invoke APDU,

- optionally userData as received in the smsDeliver invoke APDU,

- scAddressSaved set to ONE and

enter state SMS-Rec-User-case-AlertWait.

On receipt in state SMS-Rec-User-case-AlertWait of an internal indication that the user is reachable or that the user has memory available again the Receiving User PINX shall send an scAlert invoke APDU to the Service Centre, start timer T7 and enter state SMS-Rec-User-case-AlertResp.

On receipt in state SMS-Rec-User-case-AlertWait of a smsDeliver invoke APDU with element priority set to TRUE the Receiving User PINX shall attempt to deliver the SM to the Receiving User.

If the SM can be delivered the Receiving User PINX shall

1) return an smsDeliver return result APDU to the Service Centre,

2) send an scAlert invoke APDU to the Service Centre with element originatingAddress set to the Party Number of the Receiving User,

3) start timer T7 and enter state SMS-Rec-User-Alert-Resp.

If the SM can not be delivered then, if the SC Address is not yet stored in SMWD, the SC Address as indicated in the Calling Party Number Information element of the call-independent-signalling-connection shall be saved in SMWD and the Receiving User PINX shall send an smsDeliver return error APDU to the Service Centre with scAddressSaved set to TRUE.

On receipt in state SMS-Rec-User-case-AlertWait of an smsDeliver invoke APDU the Receiving User PINX shall,

1) if the SC Address is not saved already in SMWD, save it,

2) return a smsDeliver return error APDU to the Service Centre with scAddressSaved set to TRUE and

3) enter state SMS-Rec-User-case-AlertWait.

On receipt in state SMS-Rec-User-case-AlertResp of an scAlert return result APDU the Receiving User PINX shall stop timer T7 and enter state SMS-Rec-User-case-Idle.

On receipt in state SMS-Rec-User-case-AlertResp of an scAlert return error or reject APDU the Receiving User PINX shall stop timer T7 and may optionally

– enter state SMS-Rec-User-case-Idle or

– send an scAlert invoke APDU to the Service Centre, start timer T7 and enter state SMS-Rec-User-case-AlertResp.

On receipt in state SMS-Rec-User-case-AlertResp of an expiry of timer T7 the Receiving User PINX may either

– enter state SMS-Rec-User-case-Idle or

– send an scAlert invoke APDU to the Service Centre, start timer T7 and enter state SMS-Rec-User-case-AlertResp.

6.5.5 Actions at a Receiving User Message Centre

NOTE

The APDU elements are described in annex E.

6.5.5.1 Normal procedures

On receipt in state SMS-Rec-MC-Idle of a smsDeliver invoke APDU from the Receiving User PINX the Receiving User Message Centre shall check the APDU element protocolIdentifier. If it is set to

– shortMessageType0 the Receiving User Message Centre shall send a smsDeliver return result APDU to the Service Centre but may discard the contents of the Short Message.

– replaceShortMessage the Receiving User Message Centre shall check the originatingAddress and replace any existing stored message having the same protocolIdentifier code and originatingAddress with the new Short Message and other APDU elements. If there is no message to be replaced the Receiving User Message Centre shall store the message in the normal way. The Receiving User Message Centre may also check the Service Centre address as indicated in the Calling Party Number Information element of the call-independent-signalling-connection as well as the originatingAddress. However, in a network which has multiple SCs it is possible for a Replace Message type for a SM to be sent via different SCs and so it is recommended that the SC address should not be checked by the Receiving User Message Centre unless the application specifically requires such a check. The Replace Short Message feature is optional but if implemented it shall be performed as described above. If a Replace Short Message Type code is not present then the Receiving User Message Centre will store the message in the normal way.

If the Short Message is saved the Receiving User Message Centre shall send a smsDeliver return result APDU to the Sending User PINX, indicate the reception of a new Short Message to the Receiving User using the SS-MWI and enter state SMS-Rec-MC-Idle.

6.5.5.2 Exceptional procedures

On receipt in state SMS-Rec-MC-Idle of a smsDeliver invoke APDU from the Receiving User PINX if it is not possible for the Receiving User Message Centre to save the SM it shall, if SMWD is implemented,

1) save the SC address as indicated in the Calling Party Number Information element of the call-independent-signalling-connection,

2) return an smsDeliver return error APDU to the Service Centre with failureCause "memoryCapacityExceeded", in the case of SMWD being implemented the element scAddressStored set to TRUE and

3) enter state SMS-Rec-MC-AWait.

If SMWD is not implemented the Receiving User Message Centre shall return an smsDeliver return error APDU to the Receiving User PINX with failureCause "memoryCapacityExceeded" and enter state SMS-Rec-MC-Idle.

On receipt in state SMS-Rec-MC-AWait of an internal indication that the user is reachable or that the user has memory available again the Receiving User Message Centre shall

1) send an scAlert invoke APDU to the Service Centre,

2) start timer T8 and enter state SMS-Rec-MC-AResp.

On receipt in state SMS-Rec-MC-AWait of a priority smsDeliver invoke APDU the Receiving User Message Centre shall attempt to save the SM. If the SM can be saved the Receiving User Message Centre shall

1) return an smsDeliver return result APDU to the Receiving User PINX,

2) send an scAlert invoke APDU to the Receiving User PINX,

3) start timer T8 and enter state SMS-Rec-MC-AResp.

If the SM can not be saved then, if the SC Address is not yet stored in SMWD, the SC address as indicated in the Calling Party Number Information element of the call-independent-signalling-connection shall be saved in SMWD, the Receiving User Message Centre shall

1) send an smsDeliver return error APDU to the Receiving User with scAddressStored set to TRUE and

2) enter state SMS-Rec-MC-AWait.

On receipt in state SMS-Rec-MC-AWait of an smsDeliver invoke APDU the Receiving User Message Centre shall

1) if the SC Address is not saved already in SMWD save it as indicated in the Calling Party Number Information element of the call-independent-signalling-connection,

2) return an smsDeliver return error APDU with scAddressStored set to TRUE to the Receiving User PINX and

3) enter state SMS-Rec-MC-AWait.

On receipt in state SMS-Rec-MC-AResp of an scAlert return result APDU the Receiving User Message Centre shall

1) stop timer T8

2) delete the SC Address from the SMWD field and

3) enter state SMS-Rec-MC-Idle.

On receipt in state SMS-Rec-MC-AResp of an scAlert return error or reject APDU the Receiving User Message Centre shall stop timer T8 and may optionally

– enter state SMS-Rec-MC-Idle or

– send an scAlert invoke APDU to the Service Centre, start timer T8 and enter state SMS-Rec-MC-AResp.

On expiry of timer T8 in state SMS-Rec-MC-AResp the Receiving User Message Centre may either

– enter state SMS-Rec-MC-Idle or

– send an scAlert invoke APDU to the Service Centre, start timer T8 and enter state SMS-Rec-MC-AResp.

6.6   SS-SMS impact on interworking with public ISDNs

6.7   SS-SMS impact on interworking with non-ISDNs

6.8   Protocol Interactions between SS-SMS and other supplementary services and ANFs

This clause specifies protocol interactions with other supplementary services and ANFs for which stage 3 standards had been published at the time of publication of this Standard. For interactions with supplementary services and ANFs for which stage 3 standards are published subsequent to the publication of this Standard, see those other stage 3 standards.

NOTE 1

Simultaneous conveyance of APDUs for SS-SMS and another supplementary service or ANF in the same message, each in accordance with the requirements of its respective stage 3 standard, does not, on its own, constitute a protocol interaction.

NOTE 2

Additional interactions that have no impact on the signalling protocol at the Q reference point can be found in the relevant stage 1 specification.

6.8.1 Calling Line Identification Presentation (SS-CLIP)
No protocol interaction.

6.8.2 Connected Line Identification Presentation (SS-COLP)
No protocol interaction.

6.8.3 Calling/ Connected Line Identification Restriction (SS-CLIR)
No protocol interaction.

6.8.4 Calling Name Identification Presentation (SS-CNIP)
No protocol interaction.

6.8.5 Calling/ Connected Name Identification Restriction (SS-CNIR)
No protocol interaction.

6.8.6 Connected Name Identification Presentation (SS-CONP)
No protocol interaction.

6.8.7 Completion of Calls to Busy Subscriber (SS-CCBS)
No protocol interaction.

6.8.8 Completion of Calls on No Reply (SS-CCNR)
No protocol interaction.

6.8.9 Call Transfer (CT)
No protocol interaction.

6.8.10 Call Forwarding Unconditional (SS-CFU)
No protocol interaction.

6.8.11 Call Forwarding Busy (SS-CFB)
No protocol interaction.

6.8.12 Call Forwarding No Reply (SS-CFNR)
No protocol interaction.

6.8.13 Call Deflection (SS-CD)
No protocol interaction.

6.8.14 Path Replacement (ANF-PR)
No protocol interaction.

6.8.15 Call Offer (SS-CO)
No protocol interaction.

6.8.16 Call Intrusion (SS-CI)
No protocol interaction.

6.8.17 Do Not Disturb (SS-DND)
No protocol interaction.

6.8.18 Do Not Disturb Override (SS-DNDO)
No protocol interaction.

6.8.19 Advice of charge (SS-AOC)
No protocol interaction.

6.8.20 Recall (SS-RE)
No protocol interaction.

6.8.21 Call Interception (ANF-CINT)
No protocol interaction.

6.8.22   Transit Counter (ANF-TC)

No protocol interaction.

6.8.23   Route Restriction Class (ANF-RRC)

No protocol interaction.

6.8.24   Message Waiting Indication (SS-MWI)

The Receiving User Message Centre shall, upon receipt and storage of a smsDeliver invoke APDU, send a mwiActivate invoke APDU with element basicService set to "shortMessageService" to the Receiving User PINX.

6.8.25   Cordless Terminal Location Registration (SS-CTLR)

No protocol interaction.

6.8.26   Cordless Terminal Mobility Incoming Call (SS-CTMI)

No protocol interaction

6.8.27   Cordless Terminal Mobility Outgoing Call (SS-CTMO)

No protocol interaction.

6.8.28   Authentication of a CTM user (SS-CTAT)

No protocol interaction.

6.8.29   Authentication of the PISN (SS-CTAN)

No protocol interaction.

6.8.30   Private User Mobility Incoming Call (ANF-PUMI)

No protocol interaction.

6.8.31   Private User Mobility Outgoing Call (ANF-PUMO)

No protocol interaction.

6.8.32   Private User Mobility Registration (SS-PUMR)

No protocol interaction.

6.8.33   Common Information (ANF-CMN)

No protocol interaction.

6.8.34   Call Priority Interruption (Protection) (SS-CPI(P))

No protocol interaction.

6.8.35   Single Step Call Transfer (SS-SSCT)

No protocol interaction.

6.8.36   Simple Dialog (SS-SD)

No protocol interaction.

6.8.37   Call Identification and Call Linkage (ANF-CIDL)

No protocol interaction.

6.9   SS-SMS Parameter values (Timers)

Editors Note:
Values for timers still to be defined.

Timer T1

Timer T1 shall operate at the Sending User PINX during state SMS-Send-Submit-wait. Its purpose is to protect against an absence of response to smsSubmit invoke APDU sent during the call.

Timer T1 shall have a value in the range XX.

Timer T2

Timer T2 shall operate at the Sending User PINX during state SMS-Send-Command-wait. Its purpose is to protect against an absence of response to smsCommand invoke APDU sent during the call.

Timer T2 shall have a value in the range XX.

Timer T3

Timer T3 shall operate at the Service Centre during state SMS-SC-Deliver-Wait. Its purpose is to protect against absence of response to smsDeliver invoke APDU sent during the call.

Timer T3 shall have a value in the range XX.

Timer T4

Timer T4 may operate optionally at the Service Centre, if Short Message Waiting Data is not implemented, during state SMS-SC-Await-Alert. Its purpose is to ensure the automatic repetition of the delivery attempt of a Short Message .

Timer T4 shall have a value in the range XX.

Timer T5

Timer T5 shall operate at the Service Centre during state SMS-SC-Prio-Wait. Its purpose is to protect against absence of response to smsDeliver APDU sent during the call.

Timer T5 shall have a value in the range XX.

Timer T6

Timer T6 shall operate at the Service Centre during state SMS-SC-SR-Wait. Its purpose is to protect against absence of response to smsStatusReport invoke APDU sent during the call.

Timer T6 shall have a value in the range XX.

Timer T7

Timer T7 shall operate at the Receiving PINX in the case where the Short Messages are sent to a Terminal. It shall operate during state SMS-Rec-User-case-AlertResp. Its purpose is to protect against an absence of response to scAlert invoke APDU sent during the call.

Timer T7 shall have a value in the range XX.

Timer T8

Timer T8 shall operate at the Receiving User Message Centre during state SMS-Rec-MC-AResp. Its purpose is to protect against absence of response to scAlert invoke APDU sent during the call.

Timer T8 shall have a value in the range XX.

ANNEX E

Description of APDU elements

1. Elements in smsSubmit invoke APDU

1.1 messageReference

The messageReference is a value between 0 and 255 which is incremented by one and allocated to each Short Message that is sent by the Sending User. If the value is 255 and the messageReference is incremented, it starts again with value 0.

If the Sending User wants to overwrite an already sent Short Message, the new Short Message shall be assigned the same messageReference as the already sent one. Additionally element rejectDuplicates within smsSubmitParameter of the smsSubmit invoke APDU shall be set to TRUE.

1.2 smsSubmitParameter

1.2.1 protocolIdentifier

The protocolIdentifier indicates either a higher layer protocol being used or interworking with a certain type of telematic device.

For the straightforward case of simple Short Message transfer the element protocolIdentifier is set to "noIw" (0).

For protocolIdentifier values between (1) and (31) it indicates the protocol used between the Sending and Receiving Short Message entity.

If the protocolIdentifier contains values between (32) and (63) it indicates interworking with a certain type of telematic device and requests the Service Centre to convert the SM into a form suited for that device type. If the destination network is ISDN the SC must also select the correct service indicators for connecting to a device of that type.

It the protocolIdentifier contains a "replaceShortMessageTypeX" then the Service Centre on receipt of such a protocolIdentifier will check the originatingAddress and replace any existing Short Message having the same protocolIdentifier value and originatingAddress with the new Short Message and other elements. If there is no message to be replaced the Service Centre shall store the new Short Message in the normal way.

If a "replaceShortMessageTypeX" type code is not present the Service Centre shall store the message in the normal way.

1.2.2 validityPeriod

The Validity Period enables the Sending User to indicate the time period during which the Sending User considers the Short Message to be valid, i.e. for how long the SC shall guarantee its existence in the SC memory before delivery to the Receiving User has been carried out.

1.2.3 statusReportRequest

If statusReportRequest is set to TRUE a Status Report is requested from the Sending User for this particular Short Message.

1.2.4 replyPath

If replyPath is set to TRUE in a smsSubmit invoke APDU the Sending User requests the Service Centre to handle a Short Message sent in reply to this smsSubmit via the same Service Centre.

Editors Note:

The description of the replyPath procedures still have to be included!

1.2.5 rejectDuplicates

Reject Duplicates indicates to the SC whether it shall accept or reject a Short Message with the same messageReference and destinationAddress as a previously submitted Short Message from the same

originatingAddress. If the Short Message is rejected an appropriate failureCause will be returned to the Sending User in the smsDeliver return error APDU.

1.3 userData

1.3.1 userDataHeader

If a userDataHeader is present it indicates a special Short Message. The userDataHeader may contain one or more of the following headers.

1.3.1.1 smscControlParameterHeader

This header makes is possible to expand the userDataHeader in a flexible way and controls the Service Centre with regard to the request for Status Reports. The Sending User may request a Status Report for

–   Transaction completed (bit 0),

–   permanent Error (bit 1)

–   temporary Error, SC not trying anymore (bit 2),

–   temporary Error, SC still trying (bit 3),

–   cancel a Status Report Request for concatenated Short Messages (bit 6) and

–   request the original userDataHeader to be included into the Status Report (bit 7).

If bit 6 is set to TRUE then a Status Report generated by this Short Message due to a permanent error or last temporary error cancels the statusReportRequest of the rest of the Short Messages in a concatenated Short Message. This feature can only be used where the Service Centre is aware of the segmentation and is therefore an implementation matter.

The smscControlParameterHeader element is only enabled if the internal statusReportRequest bit of the Short Message is set to TRUE.

In the case of concatenated Short Messages smscControlParameterHeaders must be present in every Short Message making up that concatenated Short Message.

1.3.1.2 concatenated8BitSMHeader

Longer messages (which exceed the length of one Short Message) can be formed by concatenating several Short Messages.

The concatenated8BitSMHeader contains a concatenated8BitSMReferenceNumber, a maximumNumberOf8BitSMInConcatenatedSM and a sequenceNumberOf8BitSM element.

The concatenated8BitSMReferenceNumber element contains a modulo 255 counter and indicates the Reference Number of a particular concatenated Short Message. This Reference Number shall remain constant for every Short Message which makes up a particular concatenated Short Message.

The maximumNumberOf8BitSMInConcatenatedSM element is a value in the range 0 to 255 and indicates the total number of Short Messages within the concatenates Short Message. The value shall start at 1 and remain constant for every Short Message which makes up the concatenated Short Message.

The sequenceNumberOf8BitSM element is a value in the range 0 to 255 and indicates the sequence number of a particular Short Message within the concatenated Short Message. The value shall start at 1 and increment by one for every Short Message sent within the concatenated Short Message.

1.3.1.3 concatenated16BitSMHeader

The concatenated16BitSMHeader is an enhanced variant of the concatenated8BitSMHeader. The enhancement is a 16-bit Reference Number instead of the short 8-bit Reference Number. The elements are as described in 1.3.1.2 apart from the concatenated8BitSMReferenceNumber which is replaced by a concatenated16BitSMReferenceNumber.

The concatenated16BitSMReferenceNumber element contains a modulo 65536 counter and indicates the Reference Number of a particular concatenated Short Message. This Reference Number shall remain constant for every Short Message which makes up a particular concatenated Short Message.

1.3.1.4 applicationPort8BitHeader

The applicationPort8BitHeader element allows Short Messages to be routed directly to one of multiple applications in the Terminal Equipment. The applicationPort8BitHeader contains a destination8BitPort and a originator8BitPort element.

The destination8BitPort element is a value in the range 0 to 255 and indicates the receiving port, i.e. application, in the receiving device.

The originating8BitPort is a value in the range 0 to 255 and indicates the sending port, i.e. application, in the sending device.

Port numbers in the range 0 to 239 are reserved and port numbers in the range 240 to 255 are available for allocation by applications.

In the case of concatenated Short Messages the applicationPort8BitHeader shall be included in every Short Message making up the concatenated Short Message.

1.3.1.5 applicationPort16BitHeader

The applicationPort16BitHeader element allows Short Messages to be routed directly to one of multiple applications in the Terminal Equipment. The applicationPort8BitHeader contains a destination16BitPort and a originator16BitPort element.

The destination16BitPort element is a value in the range 0 to 65535 and indicates the receiving port, i.e. application, in the receiving device.

The originating16BitPort is a value in the range 0 to 65535 and indicates the sending port, i.e. application, in the sending device.

Port numbers in the range 0 to 15999 are as allocated by IANA (http://www.IANA.com), port numbers in the range 16000 to 16999 are available for allocation by applications an all other values are reserved.

In the case of concatenated Short Messages the applicationPort8BitHeader shall be included in every Short Message making up the concatenated Short Message.

1.3.1.6 dataHeaderSourceIndicator

The dataHeaderSourceIndicator element is used to separate the userDataHeader of the original message, a userDataHeader created by the Service Centre and a userDataHeader provided by the Receiving User. The dataHeaderSourceIndicator is placed in front of the content inserted by the source.

The dataHeaderSourceIndicator may contain the values originalSender (1), originalReceiver (2) or SMSC (3).

1.3.1.7 wirelessControlHeader

The wirelessControlHeader element is used to transport Wireless-Control-Message-Protocol (WCMP) messages. The OCTET STRING associated with the wirelessControlHeader shall contain a WCMP protocol data unit.

In the case of concatenated Short Messages the wirelessControlHeader shall be included in every Short Message making up the concatenated Short Message.

1.3.1.8 genericUserValue

The genericUserValue element is reserved for further extensions introduced in GSM 03.40.

1.3.2 class

The class element indicates how to handle a received Short Message with respect to displaying, storing and acknowledging.

If element class is set to 0 the Receiving User PINX/ Receiving User Message Centre shall display the Short Message immediately and send an smsDeliver return result APDU to the Service Centre when the Short Message has successfully reached the Receiving User PINX/Receiving User Message Centre, irrespective of whether there is memory available or not. The Short Message shall not automatically be stored.

If element class is set to 1 the Receiving User PINX/Receiving User Message Centre shall send a smsDeliver return result APDU to the Service Centre when the Short Message has reached the Receiving User PINX/ Receiving User Message Centre and can be stored.

Editors Note:
Is it necessary to include the description of class 2?

1.3.3 compressed

Indicates that the text contained in shortMessageText is compressed using the standard compression algorithm. The compression algorithm is described in ETSI TS 101 032 (GSM 03.42).

1.3.4 shortMessageText

The shortMessageText element contains one of the following elements

1.3.4.1 iA5Coded

The iA5Coded element contains between 0 and 160 byte Short Message Text.

1.3.4.2 octetCoded

The octetCoded element contains between 0 and 140 byte Short Message Text.

1.3.4.3 uniCoded

The uniCoded element contains between 0 and 140 byte Short Message Text coded according to ISO/IEC 10646-1.

1.3.4.4 compressedCoded

The compressedCoded element contains between 0 and 140 byte compressed Short Message Text including the Compressed Data Header and Footer described in GSM 03.42.

2. Elements in smsSubmit return result APDU

2.1 serviceCentreTimeStamp

The serviceCentreTimeStamp indicates the time of arrival of a Short Message at the Service Centre. The Service-Centre-Time-Stamp, and any other times that are defined in this specification, represent the time local to the sending entity.

The date and time representation follows ISO 8601.

The serviceCentreTimeStamp contains the time of arrival with an accuracy of a second. If two or more messages arrive at the Service Centre at the same time the SC shall modify the serviceCentreTimeStamp in such a way that:

- all messages to one Receiving User contain different time stamps,

- the modification of the time stamps is kept to a minimum.

2.2 protocolIdentifier

As described in 1.2.1 in Annex E.

2.3 userData

The userData element in a smsSubmit return result APDU is only available for use by the Service Centre. The elements shall be used as described in 1.3 in Annex E.

It is possible for the Service Centre to include further userDataHeader in the smsSubmit return result APDU by adding the dataHeaderSourceIndicator and other userDataHeader elements.

3. Elements in smsSubmit return error APDU

3.1 failureCause

The failureCause element contains the reason for the smsSubmit failure. All possible failureCauses are contained in 6.3.1.

> Editors Note:
>
> The occurrence of the different error causes and their assignment to possible error scenarios still have to be defined

3.2   serviceCentreTimeStamp

As described in 2.1 of Annex E.

3.3   protocolIdentifier

As described in 1.2.1 in Annex E.

3.4   userData

The userData element in a smsSubmit return error APDU is only available for use by the Service Centre. The elements shall be used as described in 1.3 in Annex E.

It is possible for the Service Centre to include further userDataHeader in the smsSubmit return result APDU by adding the dataHeaderSourceIndicator and other userDataHeader elements.

4.   Elements in smsDeliver invoke APDU

4.1   originatingName

Name of the Sending User if available to the Service Centre and not restricted.

4.2   smsDeliverParameter

4.2.1   protocolIdentifier

> Editors Note:
>
> How is it possible to describe the following text for QSIG?
>
> If the protocolIdentifier is set to values between (32) and (63) it indicates that the Short Message Entity is a telematic device of the indicated type.
>
> If the protocolIdentifier is set to values between (1) and (31) it identifies the application layer protocol used between the Short Message entity and the Mobile Station.

If the protocolIdentifier contains a "replaceShortMessageTypeX" then the Receiving User PINX/ Receiving User Message Centre on receipt of such a protocolIdentifier will check the originatingAddress and replace any existing Short Message having the same protocolIdentifier value and originatingAddress with the new Short Message and other elements. If there is no message to be replaced the Receiving User PINX/ Receiving User Message Centre shall store the new Short Message in the normal way.

If a "replaceShortMessageTypeX" type code is not present the Receiving User PINX/ Receiving User Message Centre shall store the message in the normal way.

4.2.2   serviceCentreTimeStamp

As described in 2.1 of Annex E.

4.2.3   priority

If the priority element is set to FALSE the message transfer should be stopped if the SC address is already contained in the SMWD field.

4.2.4   moreMessagesToSend

If the moreMessagesToSend element is set to TRUE it indicates that there are more messages waiting for this Receiving User in that particular Service Centre.

4.2.5   statusReportIndication

If the statusReportIndication element is set to TRUE it indicates that a Status Report will be returned to the Sending User of the Short Message.

4.2.6   replyPath

If the replyPath is set to TRUE it indicates that the reply path for the Short Message exists, e.g. that the Receiving User may reply via this Service Centre although it may not be the default Service Centre.

> Editors Note:
>
> The reply path procedures still have to be included in the standard draft.

4.3 userData

The userData element contains the userData element received from the Sending User PINX/Sending User Message Centre as included in the smsSubmit invoke APDU as described in 1.3 in Annex E.

It is possible for the Service Centre to include further userDataHeader in the smsDeliver invoke APDU by adding the dataHeaderSourceIndicator and other userDataHeader elements.

5. Elements in smsDeliver return result APDU

The smsDeliver return result APDU shall either contain one or both of the following elements.

5.1 protocolIdentifier

As described in 4.2.1 in Annex E.

5.2 userData

The userData element in a smsDeliver return result APDU is only available for use by the Receiving User PINX/Receiving User Message Centre.

It is possible for the Receiving User PINX/ Receiving User Message Centre to include further userDataHeader in the smsDeliver return result APDU by adding the dataHeaderSourceIndicator and other userDataHeader elements.

6. Elements in smsDeliver return error APDU

6.1 failureCause

The failureCause element contains the reason for the smsDeliver failure. All possible failureCauses are contained in 6.3.1.

> Editors Note:
>
> The occurrence of the different error causes and their assignment to possible error scenarios still have to be defined

6.2 protocolIdentifier

As described in 1.2.1 in Annex E.

6.3 userData

The userData element in a smsDeliver return error APDU is only available for use by the Receiving User PINX/Receiving User Message Centre. The userData element shall be used according to 1.3 in Annex E.

It is possible for the Receiving User PINX/ Receiving User Message Centre to include further userDataHeader in the smsDeliver return error APDU by adding the dataHeaderSourceIndicator and other userDataHeader elements.

6.4 scAddressSaved

If the scAddressSaved element is set to TRUE it indicates that the Receiving User PINX/ Receiving User Message Centre stored the Service Centre address, hence the Service Centre does not have to repeat the delivery procedure periodically.

7. Elements in smsStatusReport invoke APDU

7.1 messageReference

The messageReference in a smsStatusReport invoke APDU shall contain the messageReference of the smsSubmit or smsCommand invoke APDU to which the Status Report refers. If the Status Report refers to a smsCommand invoke APDU an the commandTyp was an "Enquiry" the messageReference element shall contain the messageNumber contained in that smsCommand invoke APDU (e.g. the messageReference of the previously received Short Message to which the Enquiry refers).

7.2 serviceCentreTimeStamp

The serviceCentreTimeStamp element shall contain the serviceCentreTimeStamp of the Short Message to which the Status Report refers. This will allow the Sending User to associate a Short Message with a Status Report by correlating the serviceCentreTimeStamps.

7.3 dischargeTime

The dischargeTime element indicates the time at which a previously submitted Short Message was successfully delivered to the Receiving User or attempted to deliver to the Receiving User or disposed of by the SC. The representation of the dischargeTime follows ISO 8601.

7.4 recipientAddress

The recipientAddress element contains the address of the Receiving User of the previously submitted Short Message.

7.5 recipientName

The recipientName element contains the name of the Receiving User of the previously submitted Short Message if it is available to the Service Centre and not restricted.

7.6 status

The status element indicates the status of a previously submitted Short Message and certain Commands for which a StatusReport has been requested. All possible values are described in 6.3.1 and the concerned procedures.

7.7 priority

As described in 4.2.3 in Annex E.

7.8 moreMessagesToSend

As described in 4.2.4 in Annex E.

7.9 statusReportQualifier

If the statusReportQualifier is set to FALSE the Status Report is the result of a Short Message, if it is set to TRUE the Status Report is the result of a Command, e.g. a Enquiry.

7.10 protocolIdentifier

The protocolIdentifier element in a smsStatusReport invoke APDU shall contain the same settings as received in the related smsSubmit invoke APDU, described in 1.2.1 in Annex E.

7.11 userData

The userData element in a smsStatusReport invoke APDU contains information related to a smsDeliver invoke APDU, can contain information transported in the userData of a smsDeliver return result APDU and information inserted by the Service Centre.

The Service Centre can include further userDataHeader in the smsStatusReport invoke APDU by adding the dataHeaderSourceIndicator and other userDataHeader elements.

The default content of the userDataHeader in a smsStatusReport invoke APDU is the userDataHeader copied from the smsDeliver return result APDU.

8. Elements in smsStatusReport return result APDU

The smsStatusReport return result APDU shall either contain one or both of the following elements.

8.1 protocolIdentifier

As described in 5.1 in Annex E.

8.2 userData

As described in 5.2 in Annex E.

9. Elements in smsStatusReport return error APDU

9.1 failureCause

As described in 6.1 of Annex E.

9.2 protocolIdentifier

As described in 6.2 of Annex E.

9.3 userData

As described in 6.3 of Annex E.

9.4 scAddressSaved

As described in 6.4 of Annex E.

10. Elements in smsCommand invoke APDU

10.1 messageReference

The messageReference is a value between 0 and 255 which is incremented by one and allocated to each Command that is sent by the Sending User. If the value is 255 and the messageReference is incremented, it starts again with value 0.

10.2 messageNumber

The messageNumber element contains the messageReference of the Short Message to which the Command refers, e.g. the messageReference of a previously submitted Short Message. The messageNumber is only necessary for Commands that operate on a specific Short Message, else it shall be ignored.

10.2 protocolIdentifier

As described in 1.2.1 of Annex E.

10.3 commandType

The commandType element specifies which operation is to be performed on a Short Message. The commandType can be set to "Enquiry" (0), "CancelSRR" (1), "DeletePreviouslySubmittedSM" (2) and "EnableSRRrelatingToPreviouslySubmittedSM" (3).

If the commandType is set to "Enquiry" and the operation was successful the Service Centre will send a Status Report for the Short Message to which the "Enquiry" refers. In the case where the SC has a number of Short Messages which have the same messageReference, the same destinationAddress and have come from the same originatingAddress the Service Centre will send a Status Report for each Short Message.

In the case where the commandType is set to "DeletePreviouslySubmittedSM" (2) the Service Centre will send a Status Report indicating that the Short Message has been deleted if the statusReportRequest in the original smsSubmit invoke APDU was set to TRUE.

10.4 commandData

The commandData element contains data related to the operation requested by the Sending User.

Editors Note:
There are no further details given in GSM 03.40 for the usage and content of commandData

10.5 statusReportRequest

The statusReportRequest element indicates whether or not the Command requests a Status Report. It shall be set TRUE for commandType "Enquiry", otherwise it shall be set FALSE.

11. Elements in smsCommand return result APDU

11.1 serviceCentreTimeStamp

As described in 2.1 of Annex E.

11.2 protocolIdentifier

As described in 2.2 of Annex E.

11.3 userData

As described in 2.3 of Annex E.

12. Elements in smsCommand return error APDU

12.1 failureCause

As described in 3.1 of Annex E.

12.2. serviceCentreTimeStamp

As described in 3.2 of Annex E.

12.3 protocolIdentifier

As described in 3.3 of Annex E.

12.4 userData

As described in 3.4 of Annex E.

1.8 Originating-Address

Address (e.g. E.164, PNP) of the Sending User.

1.11 Receiving User

The terminating user, i.e. the user receiving a Short Message.

1.14 Sending User

The originating user, i.e. the user sending a SM.

ANNEX F

1. User Data Headers

1.1 Concatenated Short Message

It shall be possible for the user to send several Short Messages which together form a longer message. To achieve that, the Concatenated Short Message information must be present in all Short Messages that together form the Concatenated Short Message. The Concatenated Short Message information shall contain:

- the Concatenated Short Message Reference,

- the Maximum-Number-of-concatenated-SMs and

- the Sequence-Number of the actual Short Message.

The elements in the Short Messages forming a Concatenated Short Message should remain unchanged apart from the Short-Message-Text and the Sequence-Number. The Sequence-Number and the Maximum-Number-of-concatenated-SMs are used to assemble the Short-Message-Text again at the Receiving User side. The Concatenated Short Message Reference is used to differentiate between different Concatenated Short Messages.

1.2 SMSC Control Parameters

This information element enables the Sending User to determine in more detail in which cases a Status Report shall be returned from the SC. The following settings are possible:

- Status Report for Short Message transaction completed;

- Status Report for permanent error when SC is not making any more transfer attempts;

- Status Report for temporary error when SC is not making any more transfer attempts;

- Status Report for temporary error when SC is still trying to transfer Short Message;

- cancel all Status Report requests generated by the Short Messages in a Concatenated Short Message.

All above mentioned settings can be used independently of each other, hence several Status Reports can be sent for the same Short Message. The Status Report Request bit must be set in order for the SMSC Control Parameters to be enabled.

1.3 Application port addressing

This information element allows Short Messages to be routed to one of multiple applications in the terminal equipment, using a method similar to TCP/UDP ports in a TCP/IP network. An application is uniquely identified by the pair of Destination/ Originating Address and the port address. The port addressing is transparent to the transport and also useful in Status Reports.

1.4 User Data Header Source Indicator

This information element is used to separate the User Data Header of the original message, a User Data Header created by the SMSC and a UDH provided by the original receiving entity. The source indicator is placed in front of the content inserted by the source. The indicated content (one or more Information Elements) ends at the next UDH-Source Indicator or at the end of the UDH. The Separator is intended to be used especially in Status Report, but can also be used by the SMSC to add information into a Short Message. The default content for a UDH in a smsDeliver is the headers inserted by the sending device and the default content for a UDH in a smsStatusReport is the headers copied from the smsDeliver-Report.

1.5 Wireless Control Message Protocol

The Wireless Control Message Protocol (WCMP) is part of the WAP suit of protocols; an open standard specified by the WAP-Forum Ltd.

The protocol specifies a set of messages that can be user by the receiver to notify the sender if an error occurs. This can be due to routing problems, no application listening at the destination port number, or due to insufficient buffer capacity. The error messages can be used by the sender to avoid retransmitting packets, that can not be properly handled at the receiver. WCMP can also be used for diagnostics and informational purposes. WCMP messages are usually generated by a datagram transport layer or a management entity.

2. Special Short Messages

2.1   SMS and Internet Electronic Mail interworking

The interworking between Internet electronic mail and SMS is offered in both directions. The formatting rules for transferring email in either direction are described in 3.8 in ETSI TS 100 901 (GSM 03.40) and shall be followed by a user of a private network wishing to send Internet electronic mail using SMS.

2.2   SMS Compression

Short Messages may be compressed in accordance with the compression algorithm described in ETSI TS 101 032 (GSM 03.42) and according to the rules described in 3.9 in ETSI TS 100 901 (GSM 03.40).

REFMERGEFORMATLINKMERGEFORMAT**SEQARABICLINKMERGEFORMATREF**LINKMERGEFO
RMAT**REF**REFLINKMERGEFORMAT**SEQARABIC**LINKMERGEFORMAT**REF**LINKMERGEFORMAT**REF**LINK
MERGEFORMAT**REF**LINKMERGEFORMAT**REF**REFLINKMERGEFORMAT**SEQARABIC**LINKMERG
EFORMAT**REF**REFMERGEFORMATLINKMERGEFORMAT**SEQARABIC**LINKMERGEFORMAT**REFM
ERGEFORMAT**LINKMERGEFORMAT**REF**REFMERGEFORMATLINKMERGEFORMAT**SEQARABIC**LINKMER
GEFORMAT**REF**

SmsSubmit (QSIG)	SmsSubmit (GSM)
Calling Party Number	RP-Originating-Address (RP-OA) 1 Octet Address-Length 1 Octet Type-of-Address 1-n Octet Address-Value
Called Party Number	RP-Destination-Address (RP-DA) –SCA see RP-OA
SmsSubmitArg	
DestinationAddress	TP-Destination-Address (TP-DA) see RP-OA
OriginatingAddress	RP-Originating-Address (RP-OA) see RP-OA
MessageReference	TP-Message-Reference (TP-MR) 1 Octet (0..255)
SmsSubmitParameter	
ProtocolIdentifier	TP-Protocol-Identifier (TP-PID) 1 Octet section 9.2.3.9 GSM 03.40
ValidityPeriod	TP-Valitiy-Period (TP-VP)
ValidityPeriodRel	1 Octet
ValidityPeriodAbs	7 Octets
ValidityPeriodEnh	7 Octets
singleShotSM	
enhanceVP	
validityPeriodRel	relative case, see above
validityPeriodSec	0..255 seconds
validityPeriodSemi	as Service-Centre-Time-Stamp
StatusReportRequest	TP-Status-Report-Request (TP-SRR) 1 Bit
ReplyPath	TP-Reply-Path (TP-RP) 1 Bit
RejectDuplicates	TP-Reject-Duplicates (TP-RD) 1 Bit
UserData	TP-User-Data (TP-UD)
UserDataHeader	
UserDataHeaderChoice{	

smscControlParameterHeader	IEI SMSC Control Parameter	
	1 Octet	
concatenated8BitSMHeader	IEI Concatenated SM, 8-bit Reference	
concatenated8BitSMReferenceNumber	1 Octet	
maximumNumberOf8BitSMInConcatenatedSM	1 Octet	
sequenceNumberof8BitSM	1 Octet	
concatenated16BitSMHeader	IEI Concatenated SM, 16-bit Reference	
concatenated16BitSMReferenceNumber	2 Octet	
maximumNumberOf16BitSMInConcatenatedSM	1 Octet	
sequenceNumberof16BitSM	1 Octet	
applicationPort8BitHeader	IEI Application port addressing scheme	
destination8BitPort	1 Octet	
originator8BitPort	1 Octet	
applicationPort16BitHeader	IEI Application port addressing scheme	
destination16BitPort	2 Octet	
originator16BitPort	2 Octet	
dataHeaderSourceIndicator	1 Octet	
OriginalSender		
OriginalReceiver		
SMSC}		
wirelessControlHeader	1-n Octet(s)	
GenericUserValue		
parameterValue		
genericUserData		
Class	TP-Data-Coding-Scheme (TP-DCS) 2 Bit	
Compressed	1 Bit	
ShortMessageText CHOICE{	2 Bit	
IA5coded		
OctetCoded		
UniCoded		
compressedCoded}		
ArgumentExtension CHOICE{		
Extension		
SEQUENCE OF EXTENSION}		

SmsDeliver (QSIG)	SmsDeliver (GSM)
Calling Party Number	RP-Originating-Address (RP-OA) - SCA 1 Octet Address-Length 1 Octet Type-of-Address 1-n Octet Address-Value
Called Party Number	RP-Destination-Address (RP-DA) see RP-OA
SmsDeliverArg	
OriginatingAddress	TP-Originating-Address (TP-OA) see RP-OA
DestinationAddress	TP-Destination-Address (TP-DA) see RP-OA
OriginatingName	
SmDeliverParameter	
ProtocolIdentifier	TP-Protocol-Identifier (TP-PID)
ServiceCentreTimeStamp	TP-Service-Centre-Time-Stamp (TP-SCTS)
Priority	RP-Priority-Request (RP-PRI)
MoreMessagesToSend	TP-More-Messages-To-Send (TP-MMS)
StatusReportIndication	TP-Status-Report-Indication (TP-SRI)
ReplyPath	TP-Reply-Path (TP-RP)
UserData	TP-User-Data (TP-UD)
UserDataHeader	
UserDataHeaderChoice{	
smscControlParameterHeader	1 Octet
concatenated8BitSMHeader	
concatenated8BitSMReferenceNumber	
maximumNumberOf8BitSMInConcatenatedSM	
sequenceNumberof8BitSM	
concatenated16BitSMHeader	
concatenated16BitSMReferenceNumber	
maximumNumberOf16BitSMInConcatenatedSM	
sequenceNumberof16BitSM	
applicationPort8BitHeader	
destination8BitPort	
originator8BitPort	
applicationPort16BitHeader	

destination16BitPort	
originator16BitPort	
dataHeaderSourceIndicator	
OriginalSender	
OriginalReceiver	
SMSC}	
wirelessControlHeader	
GenericUserValue	
parameterValue	
genericUserData	
Class	TP-Data-Coding-Scheme (TP-DCS)
Compressed	
ShortMessageText CHOICE{	
iA5coded	
octetCoded	
uniCoded	
compressedCoded}	
argumentExtension CHOICE{	
Extension	
SEQUENCE OF EXTENSION}	

SmsStatusReport (QSIG)	SmsStatusReport (GSM)
Calling Party Number	RP-Originating-Address (RP-OA) - SCA 1 Octet Address-Length 1 Octet Type-of-Address 1-n Octet Address-Value
Called Party Number	RP-Destination-Address (RP-DA) see RP-OA
SmsStatusReportArg	
MessageReference	TP-Message-Reference (TP-MR)
ServiceCentreTimeStamp	TP-Service-Centre-Time-Stamp (TP-SCTS)
DischargeTime	TP-Discharge-Time (TP-DT)
RecipientAddress	TP-Recipient-Address (TP-RA)
RecipientName	
DestinationAddress	
Status	TP-Status (TP-ST)
priority	RP-Priority-Request (RP-PRI)
MoreMessagesToSend	TP-More-Messages-To-Send (TP-MMS)
StatusReportQualifier	TP-Status-Report-Qualifier (TP-SRQ)
ProtocolIdentifier	TP-Protocol-Identifier (TP-PID)
UserData	TP-User-Data (TP-UD)
UserDataHeader	
UserDataHeaderChoice{	
smscControlParameterHeader	1 Octet
concatenated8BitSMHeader	
concatenated8BitSMReferenceNumber	
maximumNumberOf8BitSMInConcatenatedSM	
sequenceNumberof8BitSM	
concatenated16BitSMHeader	
concatenated16BitSMReferenceNumber	
maximumNumberOf16BitSMInConcatenatedSM	
sequenceNumberof16BitSM	
applicationPort8BitHeader	
destination8BitPort	
originator8BitPort	
applicationPort16BitHeader	

destination16BitPort	
originator16BitPort	
dataHeaderSourceIndicator	
OriginalSender	
OriginalReceiver	
SMSC}	
wirelessControlHeader	
GenericUserValue	
parameterValue	
genericUserData	
Class	TP-Data-Coding-Scheme (TP-DCS)
Compressed	
ShortMessageText CHOICE{	
IA5coded	
OctetCoded	
UniCoded	
compressedCoded}	
ArgumentExtension CHOICE{	
Extension,	
Sequence of Extension}	

SmsCommand (QSIG)	SmsCommand (GSM)
SmsCommandArg	
destinationAddress	TP-Destination-Address (TP-DA)
messageReference	TP-Message-Reference (TP-MR)
messageNumber	TP-Message-Number (TP-MN)
protocolIdentifier	TP-Protocol-Identifier (TP-PID)
commandType	TP-Command-Type (TP-CT)
commandData	TP-Command-Data (TP-CD)
statusReportRequest	TP-Status-Report-Reqquest (TP-SRR)
* argumentExtension CHOICE{*	
* Extension,*	
* Sequence of Extension}*	

SmsDeliverReport – Error (QSIG)	SmsDeliverReport – Error (GSM)
SmsDeliverError SEQUENCE{	
failureCause	Failure-Cause
protocolIdentifier	Protocol-Identifier
userData	Data-Coding-Scheme
	User-Data

SmsSubmitReport – Error (QSIG)	SmsSubmitReport – Error (GSM)
SmsSubmitError SEQUENCE{	
failureCause	Failure-Cause
serviceCentreTimeStamp	Service-Centre-Time-Stamp
protocolIdentifier	Protocol-Identifier
userData	Data-Coding-Scheme
	User-Data

SmsDeliverReport – Ack (QSIG)	SmsDeliverReport – Ack (GSM)
SmsDeliverResponseChoice{	
Null,	
ProtocolIdentifier,	TP-Protocol-Identifier (TP-PID)
userData,	TP-User-Data (TP-DU)
Sequence of{	
ProtocolIdentifier,	
userData}}	
argumentExtension	

SmsSubmitReport – Ack (QSIG)	SmsSubmitReport – Ack (GSM)
SmsSubmitRes{	
serviceCentreTimeStamp,	TP-Service-Centre-Time-Stamp (TP-SCTS)
protocolIdentifier,	TP-Protocol-Identifier (TP-PID)
userData,	TP-User-Data (TP-DU)
argumentExtension}	

FACILITY		
Protocol discriminator (1 Octet)	M	0000 1000 ITU-T Q.931 user-network call control message
Call Reference	M	see 11.2 ECMA-165
Message Type	M	0110 0010 Facility 0110 1110 Notify
Facility	M	0001 1100 Facility
		Length of information element contents
		1001 1111 Protocol Profile: Networking Extensions
		Network Facility Extension (NFE) – see below
		Network Protocol Profile – see below
		Interpretation APDU (IAPDU) – see below
		Service APDU – see 11.3.3.4/5/6 ECMA-165
Notification Indicator	O	0010 0111 IEI
		Length of IE contents
		Notification Description
		ASN.1-encoded Notification Data Structure
Calling Party Number	O	0110 1100 IEI
		Length of information element contents
		Type of Number | Numbering Plan identification
		Presentation Indicator | Screening Indicator
		Number digits
Called Party Number	O	0111 0000 IEI
		Length of IE contents
		Type of number | Numbering Plan identification
		Number digits

```
Network-Facility-Extension
        {iso(1) standard(0) pss1-generic-procedures(11582) network-facility-extension(2)}
DEFINITIONS  ::=
BEGIN
EXPORTS      NetworkFacilityExtension;
IMPORTS      PartyNumber FROM Addressing-Data-Elements
        {iso(1) standard(0) pss1-generic-procedures(11582) addressing-data-elements(9)}
NetworkFacilityExtension        ::=      [10] IMPLICIT SEQUENCE
                {       sourceEntity            [0] IMPLICIT EntityType,
                        sourceEntityAddress     [1] AddressInformation       OPTIONAL,
                        destinationEntity       [2] IMPLICIT EntityType,
                        destinationEntityAddress [3] AddressInformation      OPTIONAL,
                }
EntityType      ::=     ENUMERATED
                        {       endPINX(0),
                                anyTypeOfPINX(1)
                        }
AddressInformation      ::=      PartyNumber

END     -- of Network Facility Extension
```

```
Network-Protocol-Profile-definition
        {iso(1) standard(0) pss1-generic-procedures(11582) network-protocol-profile-definition(8)}
DEFINITIONS             ::=
BEGIN
EXPORTS                 NetworkProtocolProfile;

NetworkProtocolProfile          ::=      [18] IMPLICIT INTEGER
                                        {acse(19),
                                        dse(32)}(0..254)

END -- of Network Protocol Profile definition
```

```
Interpretation-Apdu
        {iso(1) standard(0) pss1-generic-procedures(11582) interpretation-apdu(3)}

DEFINITIONS  ::=
BEGIN
EXPORTS              InterpretationApdu;

InterpretationApdu        ::=       [11] IMPLICIT ENUMERATED
                    {       discardAnyUnrecognisedInvokePdu(0),
                            clearCallIfAnyInvokeApduNotRecognised(1),
                            --this value also applies to Call independent signalling connections
                            --see ECMA-165 clause 8.1.2
                            rejectAnyUnrecognisedInvokePdu(2)
                            --this coding is implied by the absence of an interpretation APDU
                    }

END     -- of Interpretation-Apdu
```

HYPERLINK
SEQARABIC
SEQARABIC
SEQARABIC
SEQARABIC
SEQARABIC
SEQARABIC
SEQARABIC
SEQARABIC