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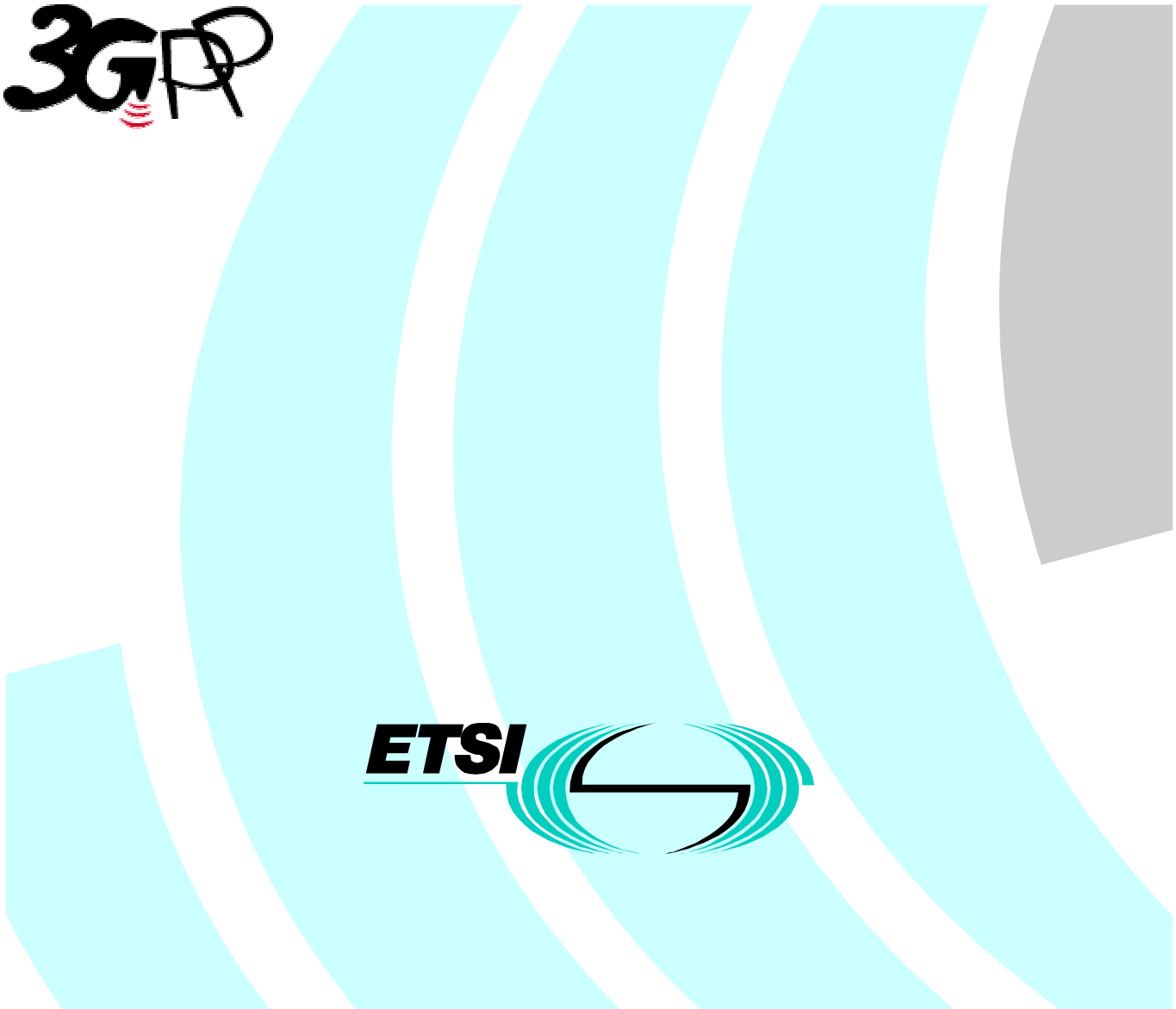
Technical Specification

Universal Mobile Telecommunications System (UMTS);
UTRAN Iu Interface: Service Area Broadcast Protocol SABP
(3G TS 25.419 version 3.1.0 Release 1999)



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Foreword

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Contents

Foreword

This Technical Specification (TS) has been produced by the 3rd Generation Partnership Project (3GPP).

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

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- x the first digit:
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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
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1 Scope

The present document specifies the *Service Area Broadcast Protocol (SABP)* between the Cell Broadcast Centre (CBC) and the Radio Network Controller (RNC). It fulfils the CBC - RNC communication requirements specified in [7] and is defined over the Iu-BC – reference point.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] UMTS 23.930: "Iu Principles".

[2] UMTS 25.410: "UTRAN Iu Interface; General Aspects and Principles".

[3] UMTS 25.401: "UTRAN Overall Description".

[4] UMTS 25.931: "UTRAN Functions, Examples on Signalling Procedures".

[5] UMTS 25.412: "UTRAN Iu Interface Signalling Transport".

[6] UMTS 25.415: "Iu Interface CN-UTRAN User Plane Protocol".

[7] UMTS 23.041: "Technical realization of Cell Broadcast Service (CBS)".

[8] UMTS 25.414: "UTRAN Iu Interface Data Transport and Transport Signalling".

[9] ITU-T Recommendation X.680 (12/94): "Information Technology - Abstract Syntax Notation One (ASN.1):Specification of basic notation".

[10] ITU-T Recommendation X.681 (12/94): "Information Technology - Abstract Syntax Notation One (ASN.1): Information object specification".

[11] ITU-T Recommendation X.691 (12/94): "Information Technology - ASN.1 encoding rules - Specification of Packed Encoding Rules (PER)".

[12] UMTS 25.921: "Guidelines and Principles for Protocol Description and Error Handling".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

Elementary Procedure: The SABP consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between the CN (CBC) and the RNC. An EP consists of an initiating message and possibly a response message. Two kinds of EPs are used:

- **Class 1:** Elementary Procedures with response (success or failure).
- **Class 2:** Elementary Procedures without response.

For Class 1 EPs, the types of responses can be as follows:

Successful

- A signalling message explicitly indicates that the elementary procedure successfully completed with the receipt of the response.

Unsuccessful

- A signalling message explicitly indicates that the EP failed.
- On time supervision expiry (i.e. absence of expected response).

Class 2 EPs are considered always successful.

Message Reference: This is defined as consisting of the following parameters: Message Identifier, Serial Number, and SAI (Service Area Identifier).

3.2 Abbreviations

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

CBC	Cell Broadcast Centre
CBS	Cell Broadcast Service
CN	Core Network
EP	Elementary Procedure
FP	Frame Protocol
PDU	Protocol Data Unit
RNC	Radio Network Controller
SA	Service Area
SABP	Service Area Broadcast Protocol

4 General

The protocol described in the present document is the protocol between CN (CBC) and RNC needed for the CBC Application. The CBC Application is described in [7].

4.1 Specification Notations

For the purposes of the present document, the following notations apply:

Procedure	When referring to an elementary procedure in the specification the Procedure Name is written with the first letters in each word in upper case characters followed by the word "procedure", e.g. Write-Replace procedure.
Message	When referring to a message in the specification the MESSAGE NAME is written with all letters in upper case characters followed by the word "message", e.g. WRITE-REPLACE message.
IE	When referring to an information element (IE) in the specification the *Information Element Name* is written with the first letters in each word in upper case characters and all letters in Italic font followed by the abbreviation "IE", e.g. *Old-Serial-Number* IE.
Value of an IE	When referring to the value of an information element (IE) in the specification the "Value" is written as it is specified in subclause 9.2 enclosed by quotation marks, e.g. "Abstract Syntax Error (Reject)" or "Background ".

5 Services provided by SABP

- During normal operation the CN (CBC) initiates all message transfer and query operations. The RNC responds to the message transfer and query operations initiated by the CBC.
- The RNC will open the connection only in case an error (Failure Indication) or recovery (RestartIndication) is to be reported.
- The initiator of a connection is responsible for the termination of the connection.

6 Services expected from the Transport layer

Following service is expected from the transport layer:

- in sequence delivery of FP PDU.

7 Functions of SABP

The SABP has the following functions:

- Message Handling. This function is responsible for the broadcast of new messages, amend existing broadcasted messages and to stop the broadcasting of specific messages.
- Load Handling. This function is responsible for determining the loading of the broadcast channels at any particular point in time.
- Reset. This function permits the CBC to end broadcasting in one or more Service Areas.
- Error Handling. This function allows the reporting of general error situations, for which function specific error messages have not been defined.

These functions are implemented by one or several SABP elementary procedures described in the following clauses.

8 SABP Procedures

8.1 Elementary Procedures

In the following tables, all EPs are divided into Class 1, and Class 2 Procedures:

Table 1: Class 1

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
Write-Replace	WRITE-REPLACE	WRITE-REPLACE COMPLETE	WRITE-REPLACE FAILURE
Kill	KILL	KILL COMPLETE	KILL FAILURE
Status Load Enquiry	LOAD QUERY	LOAD QUERY COMPLETE	LOAD QUERY FAILURE
Status Message Query	MESSAGE QUERY	MESSAGE QUERY COMPLETE	MESSAGE QUERY FAILURE
Reset	RESET	RESET COMPLETE	RESET FAILURE

Table 2: Class 2

Elementary Procedure	Message
Restart Indication	RESTART
Failure Indication	FAILURE
Error Indication	ERROR INDICATION

8.2 Write-Replace

8.2.1 General

The purpose of this Write-Replace procedure is to broadcast new information or replace a message already broadcast to a chosen Service Area(s).

8.2.2 Successful Operation

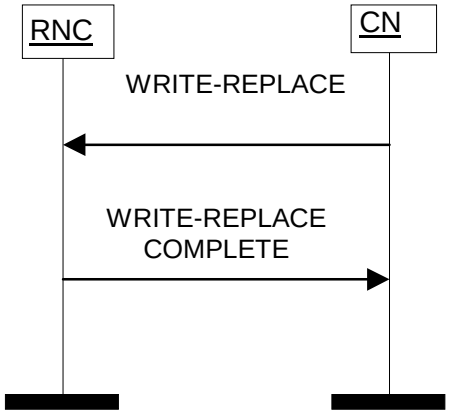

Figure 1: Write-Replace Procedure: Successful Operation

The CN shall initiate the procedure by sending a WRITE-REPLACE message to the RNC.

The presence of a New-Serial-Number will indicate that this is a new broadcast. The presence of both the Old-Serial-Number and the New-Serial-Number will indicate that this is message is a replacement of an existing broadcast. The RNC will initiate broadcasting of a new message or replace a message already broadcast as requested.

Upon receipt of the WRITE-REPLACE message the RNC shall respond using the WRITE-REPLACE COMPLETE message containing a New-Serial-Number indicating that resources are available as requested for the Service Area(s) specified.

8.2.3 Unsuccessful Operation

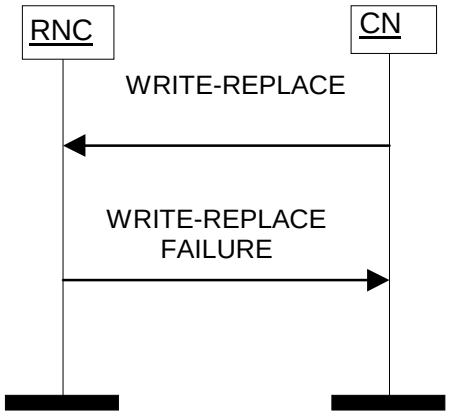

Figure 2: Write-Replace Procedure: Un-Successful Operation

If the RNC cannot allocate all the resources requested for the Service Area(s) specified in the WRITE-REPLACE message, then the RNC shall return a WRITE-REPACE FAILURE message to the CN. A list of Service Area(s) where the requested resources are unavailable will be provided in this WRITE-REPLACE FAILURE message in the Failure-List IE.

This WRITE-REPLACE FAILURE message may also include those Service Area(s) where the requested resources were available and will indicate in the Number-of-Broadcasts-Completed IE those Service Area(s) which completed the request.

8.2.4 Abnormal Conditions

8.3 Kill

8.3.1 General

The purpose of the Kill procedure is to stop the broadcast of the indicated message.

8.3.2 Successful Operation

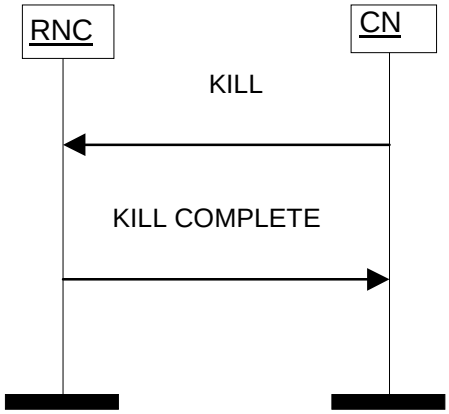

Figure 3: Kill Procedure: Successful Operation

The CN shall initiate the procedure by sending a KILL message to the RNC.

Upon receipt of the KILL message the RNC shall stop broadcasting the indicated message in the indicated Service Area(s). The RNC shall respond using the KILL COMPLETE message, containing the Old-Serial number.

8.3.3 Unsuccessful Operation

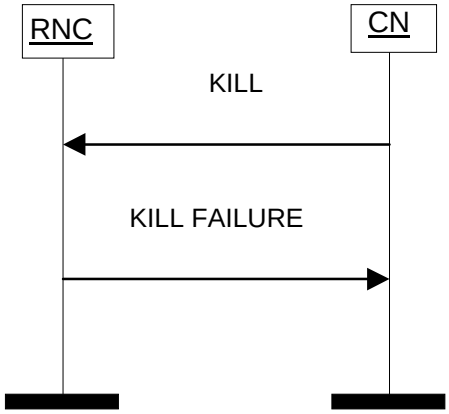

Figure 4: Kill Procedure: Un-Successful Operation

A Failure-List IE indicating the list of Service Area(s) where the message reference is not valid will be provided in a KILL FAILURE message. This response message may also – if applicable - indicate in the Number-of-Broadcasts-Completed-List IE those Service Area(s) which completed the request where the KILL message was successful.

8.3.4 Abnormal Conditions

8.4 Load Status Enquiry

8.4.1 General

The purpose of this Load Status Enquiry procedure is to obtain the current permissible bandwidth available for broadcast within particular Service Area(s).

8.4.2 Successful Operation

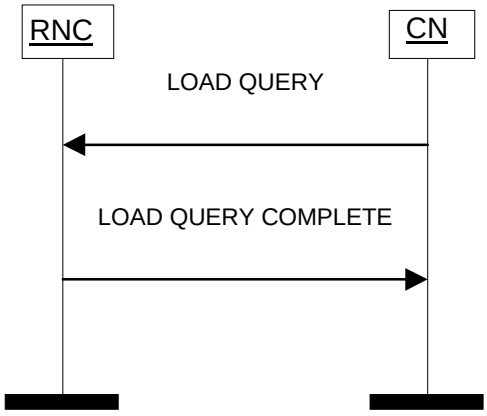

Figure 5: Load Status Enquiry Procedure: Successful Operation

The CN shall initiate the procedure by sending a LOAD QUERY message to the RNC. The message shall include a Service Area List. Upon reception of the LOAD QUERY message the RNC shall respond with LOAD QUERY COMPLETE.

8.4.3 Unsuccessful Operation

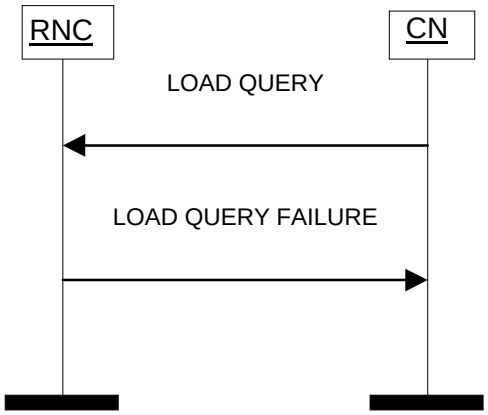

Figure 6: Load Status Enquiry Procedure: Un-Successful Operation

If the RNC contains Service Area(s) for which the RNC was not able to respond to, it shall respond with a LOAD QUERY FAILURE message which includes the Failure-List IE.

The LOAD QUERY FAILURE Message may – if applicable - also contain a Radio-Resource-Loading-List IE for which the LOAD STATUS QUERY reporting was successful.

8.4.4 Abnormal Conditions

8.5 Message Status Query

8.5.1 General

The Message Status Query procedure is used by the CN to obtain the message status of a broadcast message.

8.5.2 Successful Operation

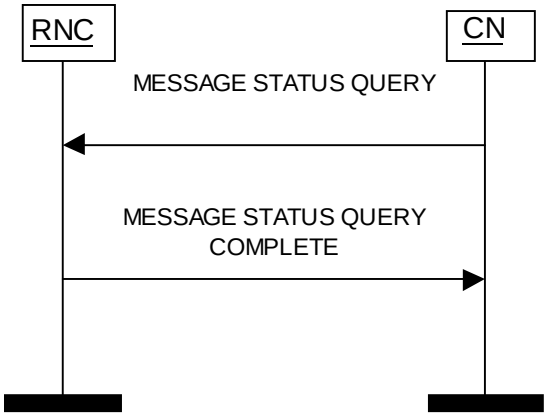

Figure 7: Message Status Enquiry Procedure: Successful Operation

The CN shall initiate the procedure by sending a MESSAGE STATUS QUERY message to the RNC. The message will contain the Old-Serial-Number IE along with the appropriate Service Area List.

Upon receipt of the MESSAGE STATUS QUERY message the RNC shall respond using the MESSAGE STATUS QUERY COMPLETE message.

Within this message the No-of-Broadcasts-Completed-List contains each Service Area which successfully performed the requested operation and for each of these Service Area(s), the number of times this broadcast message has been sent to this particular Service Area(s) for broadcast.

8.5.3 Unsuccessful Operation

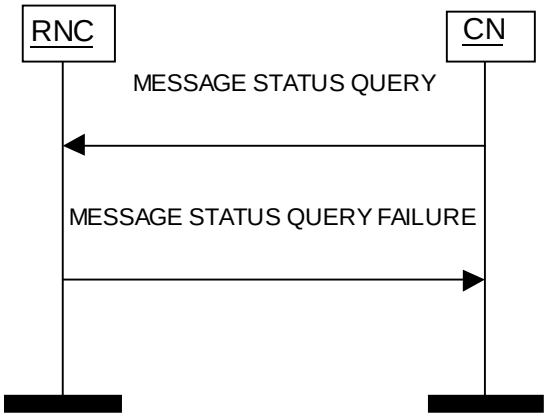

Figure 8: Message Status Enquiry Procedure: Un-Successful Operation

If the requested operation fails (e.g. because the Message Identifier is unknown, or when the RNC cannot send the status for a known Message Identifier) the RNC shall send a MESSAGE STATUS QUERY FAILURE to the CN containing a Failure-List IE for Service Area(s) for which the requested operation failed.

The MESSAGE STATUS QUERY FAILURE message may – if applicable - also include the No-of-Broadcasts-Completed-List IE indicating those Service Area(s) for which the Message Status Enquiry was successful.

8.5.4 Abnormal Conditions

8.6 Reset

8.6.1 General

The purpose of the Reset procedure is to end broadcasting in one or more Service Areas in the RNC.

8.6.2 Successful Operation

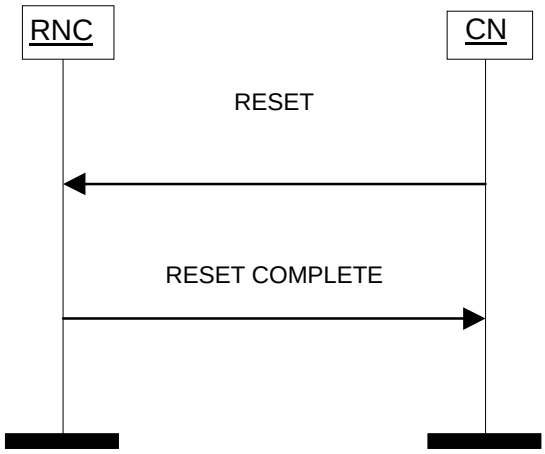

Figure 9: Reset Procedure: Successful Operation

The CN shall initiate the procedure by sending a RESET message to the RNC, in order to end broadcasting in one or more Service Areas of the RNC.

It may also be used by the CN to inquire about the Service Area broadcasting operational state of Service Area(s) who had earlier indicated as having failed.

Upon receipt of this message the RNC shall end broadcasting in indicated Service Area(s) and shall respond using a RESET COMPLETE message.

8.6.3 Unsuccessful Operation

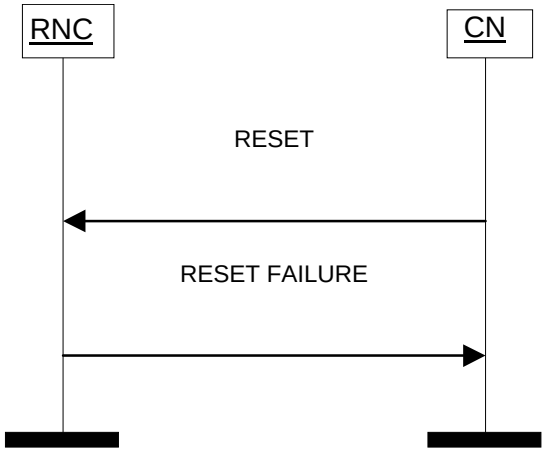

Figure 10: Reset Procedure: Un-Successful Operation

If upon receipt of this message the RNC can not end broadcasting in the indicated Service Area(s), it shall respond using a RESET FAILURE message containing the Service Area List IE indicating the relevant Service Area(s).

The RESET FAILURE message may – if applicable - also include those Service Area(s) for which the RESET message was successful.

8.6.4 Abnormal Conditions

8.7 Restart Indication

8.7.1 General

The purpose of the Restart message is for the RNC to indicate to the CN that a Service Area broadcasting related restart situation has occurred in one or more of its Service Areas e.g. when a Service Area becomes operational or when the RNC is initialised.

8.7.2 Successful Operation

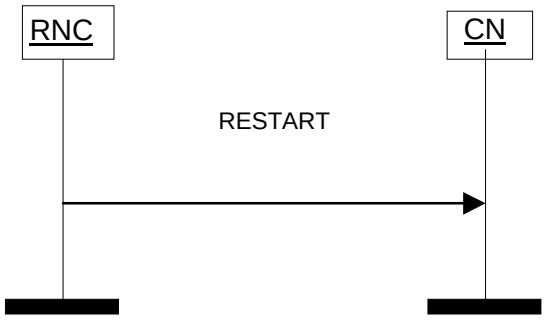

Figure 11: Restart Procedure: Successful Operation

The RNC shall initiate the procedure by sending a RESTART message to the CN. This message shall contain a Service Area List IE for reference and may also include an indication as to whether the previously sent information needs to be re-loaded.

8.7.3 Abnormal Conditions

8.8 Failure Indication

8.8.1 General

The purpose of the Failure Indication message is to indicate to the CN from the RNC that a Service Area broadcasting related problem is occurring in one or more of its Service Areas.

8.8.2 Successful Operation

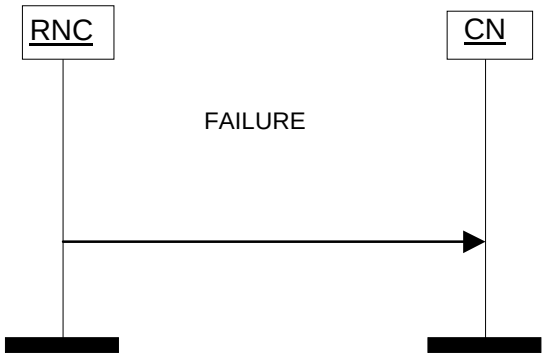

Figure 12: Failure Procedure: Successful Operation

The RNC shall initiate the procedure by sending a FAILURE message to the CN.

Upon receipt of this FAILURE indication, the CN will not generate further WRITE or REPLACE messages for these Service Area(s) until the CN is informed by a RESTART message that the Service Area can resume normal Service Area broadcasting operation.

8.8.3 Abnormal Conditions

8.9 Error Indication

8.9.1 General

The Error Indication procedure is used by the RNC to indicate to the CN that a message is not understood, provided it cannot be reported by an appropriate failure message.

8.9.2 Successful Operation

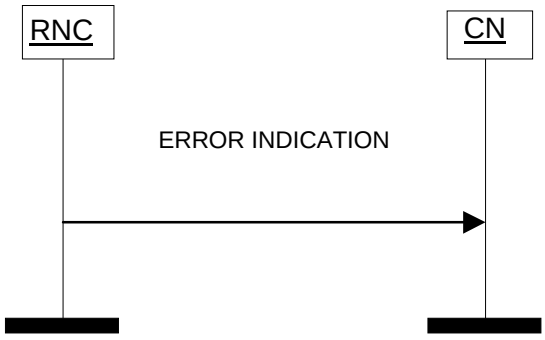

Figure 13: Error Indication Procedure: Successful Operation

The RNC shall initiate the procedure by sending an ERROR INDICATION message to the CN in response to any message that is not understood e.g. invalid parameter or parameter value. This message shall contain information

necessary for the CN to be able to identify which initial message this is in response to, and additional information e.g. Cause Value.

8.9.3 Abnormal Conditions

9 Elements for SABP Communication

9.1 Message Functional Definition and Content

9.1.1 General

NOTE: The messages have been defined in accordance to the guidelines specified in [12].

For each message there is, a table listing the signalling elements in their order of appearance in the transmitted message.

9.1.2 Message Contents

9.1.2.1 Presence

All information elements in the message descriptions below are marked mandatory, optional or conditional according to the following table:

Table 3: Meaning of abbreviations used in SABP messages

Abbreviation	Meaning
M	IE's marked as Mandatory (M) will always be included in the message.
O	IE's marked as Optional (O) may or may not be included in the message.
C	IE's marked as Conditional (C) will be included in a message only if the condition is satisfied. Otherwise the IE is not included.

9.1.2.2 Criticality

Each Information Element or Group of Information Elements may have a criticality information applied to it. Following cases are possible:

Table 4: Meaning of content within "Criticality" column

Abbreviation	Meaning
–	No criticality information is applied explicitly.
YES	Criticality information is applied. This is usable only for non-repeatable IEs
GLOBAL	The IE and all its repetitions together have one common criticality information. This is usable only for repeatable IEs.
EACH	Each repetition of the IE has its own criticality information. It is not allowed to assign different criticality values to the repetitions. This is usable only for repeatable IEs.

9.1.3 WRITE-REPLACE

This message is sent by the CN to the RNC.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Message-Identifier	M		9.2.1	
New-Serial-Number	M		9.2.5	
Old-Serial-Number	O		9.2.4	
Service-Areas-List	M		9.2.6	
Category	O		9.2.7	
Repetition-Period	O		9.2.8	
No-of-Broadcasts-Requested	M		9.2.9	
Data Coding Scheme	M		9.2.15	
Broadcast-Message-Content	M		9.2.2	

9.1.4 WRITE-REPLACE COMPLETE

This message will be sent by the RNC to the CN in a successful response to a WRITE-REPLACE message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Message-Identifier	M		9.2.1	
New-Serial-Number	M		9.2.5	
No-of-Broadcasts-Completed-List	M		9.2.9	
Criticality Diagnostics	O		9.2.17	

9.1.5 WRITE-REPLACE FAILURE

This message will be sent by the RNC to the CN as an unsuccessful response to a WRITE-REPLACE message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Message-Identifier	M		9.2.1	
New-Serial-Number	M		9.2.5	
Failure-List	M		9.2.12	
No-of-Broadcasts-Completed-List	O		9.2.10	
Criticality Diagnostics	O		9.2.17	

9.1.6 KILL

This message is sent by the CN to the RNC to stop broadcasting of a specific message.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and	Semantics Description
Message-Identifier	M		9.2.1	
Old-Serial-Number	M		9.2.4	
Service-Areas-List	M		9.2.6	

9.1.7 KILL COMPLETE

This message is sent by the RNC to the CN as a successful response to a KILL message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Message-Identifier	M		9.2.1	
Old-Serial-Number	M		9.2.4	
No-of-Broadcasts-Completed-List	M		9.2.9	
Criticality Diagnostics	O		9.2.17	

9.1.8 KILL FAILURE

This message is sent by the RNC to the CN as unsuccessful response to a KILL message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Message-Identifier	M		9.2.1	
Old-Serial-Number	M		9.2.4	
Failure-List	M		9.2.12	
No-of-Broadcasts-Completed-List	O		9.2.10	
Criticality Diagnostics	O		9.2.17	

9.1.9 LOAD QUERY

This message is sent by the CN to the RNC to gain an indication of broadcast resources available.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Service-Areas-List	M		9.2.6	

9.1.10 LOAD QUERY COMPLETE

This message will be sent by the RNC as a successful response to the LOAD QUERY message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Radio-Resource-Loading-List	M		9.2.13	
Criticality Diagnostics	O		9.2.17	

9.1.11 LOAD QUERY FAILURE

This message is sent by the RNC to the CN as an unsuccessful response to a LOAD QUERY message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Failure-List	M		9.2.12	
Radio-Resource-Loading-List	O		9.2.13	
Criticality Diagnostics	O		9.2.17	

9.1.12 MESSAGE STATUS QUERY

This message is sent by the CN to the RNC to obtain the current status of a Service Area broadcasting message.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Message-Identifier	M		9.2.1	
Old-Serial-Number	M		9.2.4	
Service-Areas-List	M		9.2.6	

9.1.13 MESSAGE STATUS QUERY COMPLETE

This message is sent by the RNC to the CN as a successful response to a MESSAGE QUERY message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Message-Identifier	M		9.2.1	
Old-Serial-Number	M		9.2.4	
No-of-Broadcasts-Completed-List	M		9.2.10	
Criticality Diagnostics	O		9.2.17	

9.1.14 MESSAGE STATUS QUERY FAILURE

This message is sent by the RNC to the CN in an unsuccessful response to a MESSAGE QUERY message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Message-Identifier	M		9.2.1	
Failure-List	M		9.2.12	
Old-Serial-Number	M		9.2.4	
No-of-Broadcasts-Completed-List	O		9.2.10	
Criticality Diagnostics	O		9.2.17	

9.1.15 RESET

The message is sent by the CN to the RNC to request that the RNC end broadcasting in one or more Service Areas.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and	Semantics Description
Service-Areas-List	M		9.2.6	

9.1.16 RESET COMPLETE

This message is sent from the RNC to the CN as a successful response to a RESET message where indicated Service-Area(s) are now not broadcasting any messages.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and	Semantics Description
Service-Areas-List	M		9.2.6	
Criticality Diagnostics	O		9.2.17	

9.1.17 RESET FAILURE

This message is sent from the RNC to the CN as an unsuccessful response to a RESET message to indicate that a Service Area broadcasting related problem exists in one or more of its Service Areas.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and	Semantics Description
Failure-List	M		9.2.12	
Service-Areas-List	O		9.2.6	
Criticality Diagnostics	O		9.2.17	

9.1.18 RESTART

This message is sent from the RNC to the CN to indicate a Service Area broadcasting related restart situation in one or more of its Service-Areas.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and	Semantics Description
Service-Areas-List	M		9.2.6	
Recovery Indication	O		9.2.16	

9.1.19 FAILURE

This message is sent from the RNC to the CN to indicate that a Service Area broadcastingrelated problem exists in one or more of its Service-Areas.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and	Semantics Description
Service-Areas-List	M		9.2.6	

9.1.20 ERROR INDICATION

This message is sent by the RNC to the CN in response to any message which is not understood (e.g. invalid parameter or parameter value).

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Message-Identifier	M		9.2.1	
Serial Number	O		9.2.3	
Cause	O		9.2.14	
Criticality Diagnostics	O		9.2.17	

9.2 Information Element Definitions

9.2.1 Message-Identifier

This parameter identifies the source/type of a CN message and is passed transparently from the CN to the UE.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Message-Identifier				
>Procedure Code	M		ENUMERATED (Write-Replace, Kill, Load Query, Message Query, Reset, ,…)	
>Type of Message	M		ENUMERATED (Initiating Message, Successful Outcome, Unsuccessful Outcome, Outcome)	

9.2.2 Broadcast-Message-Content

This IE is sent from the CN to the	PRESENCE	RANGE	IE Type and	Semantics Description
Broadcast-Message-Content	M		OCTET STRING (1246)	

9.2.3 Serial-Number

This parameter is a 16-bit integer which identifies a particular message from the source and type indicated by the Message Identifier and is altered every time the message with a given Message Identifier is changed.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Serial-Number	O		INTEGER (16)	

9.2.4 Old-Serial-Number

This IE enables identification of an existing message to be identified. The format of this IE is defined in 9.2.3.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Old-Serial-Number	M		9.2.3	

9.2.5 New-Serial-Number

This IE enables identification of a new message for broadcast to be identified, and is altered every time the message is changes. The format of this IE is defined in 9.2.3.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
New-Serial Number	O		9.2.3	

9.2.6 Service-Areas-List

Service-Area-List is an IE sent from the CN to the RNC. It indicates the group of Service-Area(s) that the message will be broadcast to. The Service-Area-List must include at least one Service-Area.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Service Areas List		1 to <maxno of SAI>		
>Service-Area-Identifier	M		9.2.11	

Range bound	Explanation
MaxnoofSAI	Maximum no. of SAI in Service-Areas-List. Value is 65535

9.2.7 Category

This parameter is sent from the CN to the RNC, and is used to indicate the priority of the message.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Category	O		Enumerated (High Priority, Background, Normal, or Default)	This IE contains the broadcast priority of the message.

9.2.8 Repetition-Period

This IE is sent from the CN to the RNC and indicates the periodicity of message broadcasts.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Repetition-Period	M		INTEGER 1…4096	Range is 1 to 4096 where each unit will represent a repetition of one second to a maximum of once per ~1 hour

9.2.9 No-of-Broadcasts-Requested

This IE is sent from the CN to the RNC and indicates the number of times a message is to be broadcast.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
No-of-Broadcasts-Requested	M	0 to 65535	INTEGER 0…. 65535	This specifies the number of times the message is to be broadcast.

9.2.10 No-of-Broadcasts-Completed-List

This IE is sent from the RNC to the CN, and indicates the number of times that a CN message (all pages) has been sent to each Service-Area in the Service-Area-List for broadcast over the radio interface.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
No-of-Broadcasts-Completed-List		1 to <maxnoof SAI>		
>Service-Area-Identifier	M		OCTET STRING (7)	
>No-of-Broadcasts-Completed	M		INTEGER (0.. 65535)	
>No-of-Broadcasts-Compl-Info	O		ENUMERATED (overflow, unknown)	

Range bound	Explanation
MaxnoofSAI	Maximum no. of SAI in Service-Area-List. Value is 65535

9.2.11 Service-Area-Identifier

This IE is sent from the Service Area Identifier (SAI) is used to uniquely identify an area consisting of one or more cells belonging to the same Location Area. Such an area is called a Service Area and can be used for indicating the location of a UE to the CN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SAI				
>PLMN-ID	M		OCTET STRING (SIZE (3))	- digits 0 to 9, two digits per octet, - each digit encoded 0000 to 1001, - 1111 used as filler - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n -The PLMN-ID consists of 3 digits from MCC followed by either -a filler plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>LAC	M		OCTET STRING (2)	0000 and FFFE not allowed.
>SAC	M		OCTET STRING (2)	

9.2.12 Failure-List

This identifies the list of Service-Area(s) for which the RNC could not complete as requested.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Failure-List		1 to <maxnoof SAI>		
>Service-Area-Identifier	M		9.2.11	
>Cause	M		9.2.14	

Range bound	Explanation
MaxnoofSAI	Maximum no. of SAI in Service-Area-List. Value is 65535

9.2.13 Radio-Resource-Loading-List

This Information Element presents the available bandwidth available for Broadcast purposes of a specific Service Area.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Radio-Resource-Loading-List		1 to <maxnoof SAI>		
>Service-Area-Identifier	M		9.2.11	
>Available-Bandwidth	M		9.2.18	

Range bound	Explanation
MaxnoofSAI	Maximum no. of SAI in Service-Area-List. Value is 65535

9.2.14 Cause

The purpose of the cause information element is to indicate the reason for a particular event for the SABP protocol.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and Reference	Semantics Description
>Cause	-		INTEGER (	Range is 0-255
			Parameter-not-recognised(0),	Sent when the recipient (CN or RNC) was unable to act upon the message received due to an unrecognised parameter. A message should not be rejected only because a parameter is not recognised as this would prevent extensions to the service
			Parameter-value-invalid(1),	Sent when a failure occurred due to the value of a parameter being invalid, e.g. out of range, or in Write-Replace, the parameter "no of pages" does not equal the number of pages received
			Valid-CN-message-not-identified(2),	Sent when the RNC does not recognise the CN message reference
			Service-Area-identity-not-valid(3),	Sent when the RNC does not recognise a Service-Area Identity
			Unrecognised-message(4)	Sent when the RNC did not recognise the message at all
			Missing-mandatory-element(5),	Sent when a mandatory element is missing from the message
			RNC-capacity-exceeded(6),	Sent when a write-replace fails because the RNC cannot meet the requested repetition period because of the cell loading
				Sent when the

IE/GROUP NAME	PRESENCE	RANGE	IE Type and Reference	Semantics Description
			RNC-memory-exceeded(7),	RNC is unable to store a CBS message as the RNC memory has been exceeded.
			Service-Area-broadcast-not-supported(8),	Sent when the SABCH/CN related Radio Resource is not configured for a Service-Area
			Service-Area-broadcast-not-operational(9),	Sent when the SABCH/CN related radio resource is not available because of error conditions or due to maintenance activities
			Message-reference already-used(10),	**Sent when the** recipient was unable to act upon the Write-Replace message received due to a previous Write-Replace received with the same message reference.
			Unspecified-error(11),	Sent when none of the above cause values apply.
			...)	

9.2.15 Data Coding Scheme

This IE is sent from the RNC to the CN and identifies the alphabet or coding employed for the message characters and message handling at the UE (it is passed transparently from the CN to the UE).

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Data Coding Scheme	M		INTEGER (0..255)	

9.2.16 Recovery-Indication

This IE is used to indicate whether the CN related data was lost or is still available.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Recovery-Indication	O		ENUMERATED (Available, Lost)	

9.2.17 Criticality-Diagnostics

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Criticality Diagnostics				
>Procedure Code	O		INTEGER (0..255)	Procedure code is to be used if Criticality diagnostics is part of Error Indication procedure, and not within the response message of the same operation that caused the error
>Triggering Message	O		ENUMERATED(initiating message, successful outcome, unsuccessful outcome, outcome)	The Triggering Message is used only if the Criticality diagnostics is part of Error Indication procedure except when the procedure code is not understood.
>Criticality Response	O		ENUMERATED(reject, ignore, notify)	This Criticality response IE is used for reporting the Criticality of the Triggering message
Information Element Criticality Diagnostics		0 to <maxnoof errors>		
>Criticality Response	M		ENUMERATED(reject, ignore, notify)	The Criticality response IE is used for reporting the criticality of the triggering IE. The value 'ignore' shall not be used.
>IE Id	M		INTEGER (0..65535)	The IE Id of the not understood IE
>Repetition Number	O		INTEGER (0..255)	The repetition number of the not understood IE if applicable

Range bound	Explanation
Maxnooferrors	Maximum no. of IE errors allowed to be reported with a single message. The value for maxnooferrors is 256.

9.2.18 Available-Bandwidth

This IE is used to indicate the Bandwidth available for the broadcast of messages.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Available-Bandwidth	O		INTEGER (0...20480)	The unit is: bit/second

9.3 Message and Information Element Abstract Syntax (with ASN.1)

9.3.0 General

The ASN.1 definition specifies the structure and content of SABP messages. SABP messages can contain any IEs specified in the object set definitions for that message without the order or number of occurrence being restricted by ASN.1. However, for this version of the standard, a sending entity shall construct a SABP message according to the PDU definitions module and with the following additional rules (Note that in the following IE means an IE in the object set with an explicit id. If one IE needed to appear more than once in one object set, then the different occurrences have different IE ids):

- IEs shall be ordered (in an IE container) in the order they appear in object set definitions..
- Object set definitions specify how many times IEs may appear. An IE shall appear exactly once if the presence field in an object has value "mandatory". An IE may appear at most once if the presence field in an object has value "optional" or "conditional". If in a tabular format there is multiplicity specified for an IE (i.e. an IE list) then in the corresponding ASN.1 definition the list definition is separated into two parts. The first part defines an IE container list where the list elements reside. The second part defines list elements. The IE container list appears as an IE of its own. For this version of the standard an IE container list may contain only one kind of list elements.

If a SABP message that is not constructed as defined above is received, this shall be considered as Abstract Syntax Error, and the message shall be handled as defined for Abstract Syntax error in Chapter 10.

9.3.1 Usage of protocol extension mechanism for non-standard use

The protocol extension mechanism for non-standard use may be used:

- for special operator- (and/or vendor) specific features considered not to be part of the basic functionality, i.e. the functionality required for a complete and high-quality specification in order to guarantee multivendor interoperability.
- by vendors for research purposes, e.g. to implement and evaluate new algorithms/features before such features are proposed for standardisation.

The extension mechanism shall not be used for basic functionality. Such functionality shall be standardised.

9.3.2 Elementary Procedure Definitions

```
-- **************************************************************
--
-- Elementary Procedure definitions
--
-- **************************************************************

SABP-PDU-Descriptions -- { object identifier to be allocated }--
DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- IE parameter types from other modules.
--
-- **************************************************************

IMPORTS
    Criticality,
    ProcedureCode
FROM SABP-CommonDataTypes

    Error-Indication,
    Failure,
    Kill,
    Kill-Complete,
    Kill-Failure,
    Load-Query,
    Load-Query-Complete,
    Load-Query-Failure,
    Reset,
    Reset-Complete,
    Reset-Failure,
    Restart,
    Message-Status-Query,
    Message-Status-Query-Complete,
    Message-Status-Query-Failure,
    Write-Replace,
    Write-Replace-Complete,
    Write-Replace-Failure
FROM SABP-PDU-Contents

    id-Error-Indication,
    id-Failure-Indication,
    id-Kill,
    id-Reset,
    id-Restart-Indication,
    id-Status-Load-Enquiry,
    id-Status-Message-Query,
    id-Write-Replace
```

```
FROM SABP-Constants;

-- **************************************************************
--
-- Interface Elementary Procedure Class
--
-- **************************************************************

SABP-ELEMENTARY-PROCEDURE ::= CLASS {
    &InitiatingMessage              ,
    &SuccessfulOutcome              OPTIONAL,
    &UnsuccessfulOutcome                OPTIONAL,
    &procedureCode          ProcedureCode   UNIQUE,
    &criticality            Criticality     DEFAULT ignore
}
WITH SYNTAX {
    INITIATING MESSAGE      &InitiatingMessage
    [SUCCESSFUL OUTCOME
```

```
&SuccessfulOutcome]
    [UNSUCCESSFUL OUTCOME       &UnsuccessfulOutcome]
    PROCEDURE CODE          &procedureCode
    [CRITICALITY            &criticality]
}

-- **************************************************************
--
-- Interface PDU Definition
--
-- **************************************************************

SABP-PDU ::= CHOICE {
    initiatingMessage   InitiatingMessage,
    successfulOutcome   SuccessfulOutcome,
    unsuccessfulOutcome UnsuccessfulOutcome,
    ...
}

InitiatingMessage ::= SEQUENCE {
    procedureCode   SABP-ELEMENTARY-PROCEDURE.&procedureCode    ({SABP-ELEMENTARY-PROCEDURES}),
    criticality SABP-ELEMENTARY-PROCEDURE.&criticality      ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value       SABP-ELEMENTARY-PROCEDURE.&InitiatingMessage    ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

SuccessfulOutcome ::= SEQUENCE {
    procedureCode   SABP-ELEMENTARY-PROCEDURE.&procedureCode    ({SABP-ELEMENTARY-PROCEDURES}),
    criticality SABP-ELEMENTARY-PROCEDURE.&criticality      ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value       SABP-ELEMENTARY-PROCEDURE.&SuccessfulOutcome    ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

UnsuccessfulOutcome ::= SEQUENCE {
    procedureCode   SABP-ELEMENTARY-PROCEDURE.&procedureCode    ({SABP-ELEMENTARY-PROCEDURES}),
    criticality SABP-ELEMENTARY-PROCEDURE.&criticality      ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value       SABP-ELEMENTARY-PROCEDURE.&UnsuccessfulOutcome  ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

-- **************************************************************
--
-- Interface Elementary Procedure List
--
-- **************************************************************

SABP-ELEMENTARY-PROCEDURES SABP-ELEMENTARY-PROCEDURE ::= {
    SABP-ELEMENTARY-PROCEDURES-CLASS-1  |
    SABP-ELEMENTARY-PROCEDURES-CLASS-2  ,
    ...
}

SABP-ELEMENTARY-PROCEDURES-CLASS-1 SABP-ELEMENTARY-PROCEDURE ::= {
    write-Replace       |
    kill            |
    status-Load-Enquiry |
    status-Message-Query    |
```

```
    reset           ,
    ...
}

SABP-ELEMENTARY-PROCEDURES-CLASS-2 SABP-ELEMENTARY-PROCEDURE ::= {
    restart-Indication  |
    failure-Indication  |
    error-Indication    ,
    ...
}

write-Replace SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Write-Replace
    SUCCESSFUL OUTCOME  Write-Replace-Complete
    UNSUCCESSFUL OUTCOME    Write-Replace-Failure
    PROCEDURE CODE      id-Write-Replace
}

kill SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Kill
    SUCCESSFUL OUTCOME  Kill-Complete
    UNSUCCESSFUL OUTCOME    Kill-Failure
    PROCEDURE CODE          id-Kill
}

status-Load-Enquiry SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Load-Query
    SUCCESSFUL OUTCOME  Load-Query-Complete
    UNSUCCESSFUL OUTCOME    Load-Query-Failure
    PROCEDURE CODE          id-Status-Load-Enquiry
}

status-Message-Query SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Message-Status-Query
    SUCCESSFUL OUTCOME  Message-Status-Query-Complete
    UNSUCCESSFUL OUTCOME    Message-Status-Query-Failure
    PROCEDURE CODE          id-Status-Message-Query
}

reset SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Reset
    SUCCESSFUL OUTCOME  Reset-Complete
    UNSUCCESSFUL OUTCOME    Reset-Failure
    PROCEDURE CODE          id-Reset
}

restart-Indication SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Restart
    PROCEDURE CODE          id-Restart-Indication
}

failure-Indication SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Failure
    PROCEDURE CODE          id-Failure-Indication
}
```

```
error-Indication SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Error-Indication
    PROCEDURE CODE          id-Error-Indication
}

END
```

9.3.3 PDU Definitions

```
-- **************************************************************
--
-- PDU definitions for SABP.
--
-- **************************************************************

SABP-PDU-Contents -- { object identifier to be allocated }--
DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- IE parameter types from other modules.
--
-- **************************************************************

IMPORTS
    Broadcast-Message-Content,
    Category,
    Cause,
Criticality-Diagnostics,
    Data-Coding-Scheme,
    Failure-List,
    Message-Identifier,
    New-Serial-Number,
    No-of-Broadcasts-Completed-List,
    No-of-Broadcasts-Requested,
    Old-Serial-Number,
    Radio-Resource-Loading-List,
    Recovery-Indication,
    Repetition-Period,
    Serial-Number ,
    Service-Areas-List
FROM SABP-IEs

    ProtocolExtensionContainer{},
    ProtocolIE-Container{},
    SABP-PROTOCOL-EXTENSION,
    SABP-PROTOCOL-IES
FROM SABP-Containers

    id-Broadcast-Message-Content,
    id-Category,
```

```
    id-Criticality-Diagnostics,
    id-Cause,
    id-Data-Coding-Scheme,
    id-Failure-List,
    id-Message-Identifier,
    id-New-Serial-Number,
    id-No-of-Broadcasts-Completed-List,
    id-No-of-Broadcasts-Requested,
    id-Old-Serial-Number,
    id-Radio-Resource-Loading-List,
    id-Recovery-Indication,
    id-Repetition-Period,
    id-Serial-Number,
    id-Service-Areas-List
FROM SABP-Constants;

-- **************************************************************
--
-- Write-Replace
--
-- **************************************************************

Write-Replace ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container      { {Write-Replace-IEs} },
    protocolExtensions      ProtocolExtensionContainer { {Write-Replace-Extensions} } OPTIONAL,
    ...
}

Write-Replace-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY ignore  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-New-Serial-Number   CRITICALITY ignore  TYPE New-Serial-Number      PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY ignore  TYPE Old-Serial-Number      PRESENCE optional } |
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE mandatory } |
    { ID id-Category            CRITICALITY ignore  TYPE Category           PRESENCE optional  } |
    { ID id-Repetition-Period   CRITICALITY ignore  TYPE Repetition-Period      PRESENCE optional  } |
    { ID id-No-of-Broadcasts-Requested
                    CRITICALITY ignore  TYPE No-of-Broadcasts-Requested PRESENCE mandatory } |
    { ID id-Data-Coding-Scheme  CRITICALITY ignore  TYPE Data-Coding-Scheme     PRESENCE mandatory } |
    { ID id-Broadcast-Message-Content
                    CRITICALITY ignore  TYPE Broadcast-Message-Content  PRESENCE mandatory } ,
    ...
}

Write-Replace-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Write-Replace-Complete
--
-- **************************************************************

Write-Replace-Complete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {Write-Replace-Complete-IEs} },
```

```
    protocolExtensions      ProtocolExtensionContainer { {Write-Replace-Complete-Extensions} } OPTIONAL,
    ...
}

Write-Replace-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY ignore  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-New-Serial-Number   CRITICALITY ignore  TYPE New-Serial-Number      PRESENCE mandatory } |
    { ID id-No-of-Broadcasts-Completed-List
                        CRITICALITY ignore  TYPE No-of-Broadcasts-Completed-List
                                                        PRESENCE mandatory  }|
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics    PRESENCE optional },
    ...
}

Write-Replace-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Write-Replace-Failure
--
-- **************************************************************

Write-Replace-Failure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {Write-Replace-Failure-IEs} },
    protocolExtensions      ProtocolExtensionContainer { {Write-Replace-Failure-Extensions} } OPTIONAL,
    ...
}

Write-Replace-Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY ignore  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-New-Serial-Number   CRITICALITY ignore  TYPE New-Serial-Number      PRESENCE mandatory } |
    { ID id-Failure-List        CRITICALITY ignore  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-No-of-Broadcasts-Completed-List
                    CRITICALITY ignore  TYPE No-of-Broadcasts-Completed-List
                                            PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}
Write-Replace-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Kill
--
-- **************************************************************

Kill ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Kill-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Kill-Extensions}}      OPTIONAL,
```

```
    ...
}

Kill-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY ignore  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY ignore  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE mandatory } ,
    ...
}

Kill-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Kill-Complete
--
-- **************************************************************

Kill-Complete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Kill-Complete-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Kill-Complete-Extensions}}     OPTIONAL,
    ...
}

Kill-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY ignore  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY ignore  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-No-of-Broadcasts-Completed-List
                    CRITICALITY ignore      TYPE No-of-Broadcasts-Completed-List
                                                        PRESENCE mandatory }|
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Kill-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Kill-Failure
--
-- **************************************************************

Kill-Failure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Kill-Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Kill-Failure-Extensions}}      OPTIONAL,
    ...
}

Kill-Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY ignore  TYPE Message-Identifier     PRESENCE mandatory } |
```

```
    { ID id-Old-Serial-Number   CRITICALITY ignore  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-Failure-List        CRITICALITY ignore  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-No-of-Broadcasts-Completed-List
                        CRITICALITY ignore  TYPE No-of-Broadcasts-Completed-List
                                                        PRESENCE optional } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Kill-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Load-Query
--
-- **************************************************************

Load-Query ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Load-Query-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Load-Query-Extensions}}    OPTIONAL,
    ...
}

Load-Query-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE mandatory } ,
    ...
}

Load-Query-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Load-Query-Complete
--
-- **************************************************************

Load-Query-Complete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Load-Query-Complete-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Load-Query-Complete-Extensions}} OPTIONAL,
    ...
}

Load-Query-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Radio-Resource-Loading-List
                        CRITICALITY ignore  TYPE Radio-Resource-Loading-List
                                                        PRESENCE mandatory }  |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}
```

```
Load-Query-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Load-Query-Failure
--
-- **************************************************************

Load-Query-Failure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Load-Query-Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Load-Query-Failure-Extensions}} OPTIONAL,
    ...
}

Load-Query-Failure-IEs SABP-PROTOCOL-IES ::= {

    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE mandatory } |
    { ID id-Failure-List        CRITICALITY ignore  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-Radio-Resource-Loading-List
                        CRITICALITY ignore  TYPE Radio-Resource-Loading-List
                                               PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Load-Query-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Message-Status-Query
--
-- **************************************************************

Message-Status-Query ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Message-Status-Query-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Message-Status-Query-Extensions}} OPTIONAL,
    ...
}

Message-Status-Query-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY ignore  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY ignore  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE mandatory } ,
    ...
}

Message-Status-Query-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
-- **************************************************************
--
-- Message-Status-Query-Complete
--
-- **************************************************************

Message-Status-Query-Complete ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Message-Status-Query-Complete-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Message-Status-Query-Complete-Extensions}} OPTIONAL,
    ...
}

Message-Status-Query-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY ignore  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY ignore  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-No-of-Broadcasts-Completed-List
                        CRITICALITY ignore  TYPE No-of-Broadcasts-Completed-List
                                                        PRESENCE mandatory } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Message-Status-Query-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Message-Status-Query-Failure
--
-- **************************************************************

Message-Status-Query-Failure ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Message-Status-Query-Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Message-Status-Query-Failure-Extensions}} OPTIONAL,
    ...
}

Message-Status-Query-Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY ignore  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Failure-List        CRITICALITY ignore  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY ignore  TYPE Old-Serial-Number      PRESENCE mandatory } |

    { ID id-No-of-Broadcasts-Completed-List
                    CRITICALITY ignore  TYPE No-of-Broadcasts-Completed-List
                                                        PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Message-Status-Query-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
```

```
}

-- **************************************************************
--
-- Reset
--
-- **************************************************************

Reset ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Reset-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Reset-Extensions}}     OPTIONAL,
    ...
}

Reset-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List         PRESENCE mandatory } ,
    ...
}

Reset-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Reset-Complete
--
-- **************************************************************

Reset-Complete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Reset-Complete-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Reset-Complete-Extensions}}    OPTIONAL,
    ...
}

Reset-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE mandatory } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Reset-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Reset-Failure
--
-- **************************************************************

Reset-Failure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Reset-Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Reset-Failure-Extensions}}     OPTIONAL,
```

```
    ...
}

Reset-Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Failure-List        CRITICALITY ignore  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics    PRESENCE optional } ,
    ...
}

Reset-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Restart
--
-- **************************************************************

Restart ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Restart-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Restart-Extensions}}   OPTIONAL,
    ...
}

Restart-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE mandatory } |
    { ID id-Recovery-Indication     CRITICALITY ignore  TYPE Recovery-Indication    PRESENCE optional  } ,
    ...
}

Restart-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Failure
--
-- **************************************************************

Failure ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Failure-Extensions}}   OPTIONAL,
    ...
}

Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE mandatory } ,
    ...
}

Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
```

```
    ...
}

-- **************************************************************
--
-- Error-Indication
--
-- **************************************************************

Error-Indication ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Error-Indication-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Error-Indication-Extensions}}  OPTIONAL,
    ...
}

Error-Indication-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY ignore  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Serial-Number       CRITICALITY ignore  TYPE Serial-Number      PRESENCE optional  } |
    { ID id-Cause           CRITICALITY ignore  TYPE Cause              PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics    PRESENCE optional },
    ...
}

Error-Indication-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

END
```

9.3.4 Information Element Definitions

```
-- **************************************************************
--
-- Information Element Definitions
--
-- **************************************************************


SABP-IEs -- { object identifier to be allocated }--
DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS
    maxRadio-Resource-Loading-List,
    maxFailure-List,
    maxNo-of-Broadcasts-Completed-List,
    maxNrOfErrors,
    maxService-Areas-List
FROM SABP-Constants
```

```
    Criticality,
    ProcedureCode,
    TriggeringMessage,
    ProtocolIE-ID
FROM SABP-CommonDataTypes

    ProtocolExtensionContainer{},

    SABP-PROTOCOL-EXTENSION
FROM SABP-Containers;


-- A

Available-Bandwidth         ::= INTEGER (0..20480)
-- bits/sec

-- B

Broadcast-Message-Content ::= OCTET STRING (SIZE (1246))
-- This IE is sent from the CN to the RNC containing user information i.e.
-- the message.

-- C

Category ::= ENUMERATED {
    high-priority,
    background-priority,
    normal-priority,
    default-priority,
    ...
}

Cause                   ::= INTEGER {
    parameter-not-recognised        (0),
    parameter-value-invalid         (1),
    valid-CN-message-not-identified     (2),
    service-area-identity-not-valid     (3),
    unrecognised-message            (4),
    missing-mandatory-element       (5),
    rNC-capacity-exceeded           (6),

    rNC-memory-exceeded             (7),
    service-area-broadcast-not-supported    (8),
    service-area-broadcast-not-operational  (9),


    message-reference-already-used      (10),
    unspecifed-error            (11)} (0..255)

Criticality-Diagnostics         ::= SEQUENCE {
    procedureCode           ProcedureCode           OPTIONAL,
    triggeringMessage       TriggeringMessage       OPTIONAL,
    criticalityResponse     Criticality         OPTIONAL,
    iEsCriticalityResponses     CriticalityDiagnostics-IE-List  OPTIONAL,
```

```
    iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-ExtIEs} } OPTIONAL,
    ...
}

CriticalityDiagnostics-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

CriticalityDiagnostics-IE-List ::= SEQUENCE (SIZE (1..maxNrOfErrors)) OF
    SEQUENCE {
        criticalityResponse     Criticality,
        iE-ID               ProtocolIE-ID,
        repetitionNumber        RepetitionNumber        OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-IE-List-ExtIEs} } OPTIONAL,
        ...
    }

CriticalityDiagnostics-IE-List-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}


-- D

Data-Coding-Scheme          ::= INTEGER (0..255)

-- E

-- F

Failure-List ::= SEQUENCE (SIZE (1..maxFailure-List)) OF Failure-List-Item

Failure-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    cause                   Cause,
        iE-Extensions       ProtocolExtensionContainer { {FailureListItemIE-ExtIEs} } OPTIONAL,
        ...
}

FailureListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

-- G

-- H

-- I

-- J

-- K

-- L
```

```
-- M

Message-Identifier ::= OCTET STRING (SIZE (2))
-- This IE identifies the source/type of a CN message and is passed
-- transparently from the CN to the UE.

-- N

New-Serial-Number               ::= Serial-Number

No-of-Broadcasts-Completed-List ::= SEQUENCE (SIZE (1..maxNo-of-Broadcasts-Completed-List)) OF
    No-of-Broadcasts-Completed-List-Item

No-of-Broadcasts-Completed-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    no-of-broadcasts-compl      INTEGER (0..65535),
    no-of-broadcasts-compl-info No-Of-Broadcasts-Compl-Info         OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {NoOfBroadcastsCompletedListItemIE-ExtIEs} } OPTIONAL,
        ...
}

NoOfBroadcastsCompletedListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

No-Of-Broadcasts-Compl-Info     ::= ENUMERATED {
    overflow,
    unknown,
    ...
}

No-of-Broadcasts-Requested      ::= INTEGER {
    broadcast-indefinitely (0)
} (0..65535)

-- O

Old-Serial-Number               ::= Serial-Number

-- P

-- Q

-- R

Radio-Resource-Loading-List ::= SEQUENCE (SIZE (1..maxRadio-Resource-Loading-List)) OF
    Radio-Resource-Loading-List-Item

Radio-Resource-Loading-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    available-bandwidth     Available-Bandwidth,
    iE-Extensions       ProtocolExtensionContainer { {RadioResourceLoadingListItemIE-ExtIEs} } OPTIONAL,
        ...
}
```

```
RadioResourceLoadingListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

Recovery-Indication ::= ENUMERATED {
    data-lost,
    data-available
}

RepetitionNumber            ::= INTEGER(0..255)

Repetition-Period           ::= INTEGER (1..4096)
-- Each unit represents a repetition of one second to a maximum of
-- once per 4096 seconds (~1 hour).


-- S

Serial-Number               ::= INTEGER (0..65535)


Service-Area-Identifier ::= SEQUENCE {
    plmn-id             OCTET STRING (SIZE (3))
                    -- Digits 0 to 9, two digits per octet.          --
                    -- Each octet encoded 0000 to 1001.              --
                    -- 1111 used as filler                          --
                    -- Bit 4 to 1 of octet n encoding digit 2n-1.    --
                    -- Bit 8 to 5 of octet n encoding digit 2n.      --
                    -- The PLMN-ID consists of 3 digits from MCC     --
                    -- followed by either a filler plus 2 digits     --
                    -- from MNC (in case of 2 digit MNC) or 3 digits --
                    -- from MNC (in case of 3 digit MNC).            -- ,
    lac             OCTET STRING (SIZE (2))
                    -- 0000 and FFFE not allowed                     -- ,
    sac             OCTET STRING (SIZE (2))
}

-- **TODO** The IE type for these parameters is not known as yet
Service-Areas-List ::= SEQUENCE (SIZE (1..maxService-Areas-List)) OF Service-Area-Identifier



-- T

-- U

-- V

-- W

-- X

-- Y

END
```

9.3.5 Common Definitions

```
-- **************************************************************
--
-- Common definitions
--
-- **************************************************************

SABP-CommonDataTypes -- { object identifier to be allocated }--
DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

Criticality     ::= ENUMERATED { reject, ignore, notify }

Presence        ::= ENUMERATED { optional, conditional, mandatory }

ProcedureCode       ::= INTEGER (0..255)

ProtocolExtensionID ::= INTEGER (0..65535)

ProtocolIE-ID       ::= INTEGER (0..65535)

TriggeringMessage       ::= ENUMERATED {initiating-message, successful-outcome, unsuccessful-outcome,...}

END
```

9.3.6 Constant Definitions

```
-- **************************************************************
--
-- Constant definitions
--
-- **************************************************************

SABP-Constants -- { object identifier to be allocated }--
DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- Elementary Procedures
--
-- **************************************************************

id-Write-Replace            INTEGER ::= 0
id-Kill                 INTEGER ::= 1
id-Status-Load-Enquiry          INTEGER ::= 2
id-Status-Message-Query         INTEGER ::= 3
id-Restart-Indication           INTEGER ::= 4
id-Reset                INTEGER ::= 5
id-Failure-Indication           INTEGER ::= 6
```

```
id-Error-Indication         INTEGER ::= 7

-- ********************************************************
--
-- IEs
--
-- ********************************************************

id-Broadcast-Message-Content        INTEGER ::= 0
id-Category                 INTEGER ::= 1
id-Cause                INTEGER ::= 2
id-Criticality-Diagnostics  INTEGER ::=3
id-Data-Coding-Scheme           INTEGER ::= 4
id-Failure-List             INTEGER ::= 5
id-Message-Identifier           INTEGER ::= 6
id-New-Serial-Number            INTEGER ::= 7
id-No-of-Broadcasts-Completed-List  INTEGER ::= 8
id-No-of-Broadcasts-Requested       INTEGER ::= 9
id-Old-Serial-Number                INTEGER ::= 10
id-Radio-Resource-Loading-List      INTEGER ::= 11
id-Recovery-Indication          INTEGER ::= 12
id-Repetition-Period            INTEGER ::= 13
id-Serial-Number            INTEGER ::= 14
id-Service-Areas-List           INTEGER ::= 15

-- ********************************************************
--
-- Extension constants
--
-- ********************************************************

-- ********************************************************
--
-- Lists
--
-- ********************************************************

maxRadio-Resource-Loading-List  INTEGER ::= 65535
maxFailure-List             INTEGER ::= 65535
maxNo-of-Broadcasts-Completed-List  INTEGER ::= 65535
maxNrOfErrors               INTEGER ::= 256
maxService-Areas-List           INTEGER ::= 65535

maxProtocolExtensions           INTEGER ::= 65535
maxProtocolIEs              INTEGER ::= 65535

END
```

9.3.7 Container Definitions

```
-- ********************************************************
--
-- Container definitions
--
```

```
-- **************************************************************

SABP-Containers -- { object identifier to be allocated }--
DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- IE parameter types from other modules.
--
-- **************************************************************

IMPORTS
    Criticality,
    Presence,
    ProtocolExtensionID,
    ProtocolIE-ID
FROM SABP-CommonDataTypes

    maxProtocolExtensions,
    maxProtocolIEs
FROM SABP-Constants;

-- **************************************************************
--
-- Class Definition for Protocol IEs
--
-- **************************************************************

SABP-PROTOCOL-IES ::= CLASS {
    &id             ProtocolIE-ID       UNIQUE,
    &criticality            Criticality     DEFAULT ignore,
    &Value,
    &presence           Presence
}
WITH SYNTAX {
    ID              &id
    CRITICALITY         &criticality
    TYPE                &Value
    PRESENCE            &presence
}

-- **************************************************************
--
-- Class Definition for Protocol Extensions
--
-- **************************************************************

SABP-PROTOCOL-EXTENSION ::= CLASS {
    &id             ProtocolExtensionID     UNIQUE,
    &criticality            Criticality     DEFAULT ignore,
    &Extension,
    &presence       Presence
}
```

```
WITH SYNTAX {
    ID              &id
    CRITICALITY         &criticality
    EXTENSION           &Extension
    PRESENCE            &presence
}

-- **************************************************************
--
-- Container for Protocol IEs
--
-- **************************************************************

ProtocolIE-Container {SABP-PROTOCOL-IES : IEsSetParam} ::=
    SEQUENCE (SIZE (0..maxProtocolIEs)) OF
    ProtocolIE-Field {{IEsSetParam}}

ProtocolIE-Field {SABP-PROTOCOL-IES : IEsSetParam} ::= SEQUENCE {
    id              SABP-PROTOCOL-IES.&id               ({IEsSetParam}),
    criticality         SABP-PROTOCOL-IES.&criticality          ({IEsSetParam}{@id}),
    value               SABP-PROTOCOL-IES.&Value                ({IEsSetParam}{@id})
}

-- **************************************************************
--
-- Container Lists for Protocol IE Containers
--
-- **************************************************************

ProtocolIE-ContainerList {INTEGER : lowerBound, INTEGER : upperBound, SABP-PROTOCOL-IES : IEsSetParam} ::=
    SEQUENCE (SIZE (lowerBound..upperBound)) OF
    ProtocolIE-Container {{IEsSetParam}}

-- **************************************************************
--
-- Container for Protocol Extensions
--
-- **************************************************************

ProtocolExtensionContainer {SABP-PROTOCOL-EXTENSION : ExtensionSetParam} ::=
    SEQUENCE (SIZE (1..maxProtocolExtensions)) OF
    ProtocolExtensionField {{ExtensionSetParam}}

ProtocolExtensionField {SABP-PROTOCOL-EXTENSION : ExtensionSetParam} ::= SEQUENCE {
    id              SABP-PROTOCOL-EXTENSION.&id         ({ExtensionSetParam}),
    criticality         SABP-PROTOCOL-EXTENSION.&criticality        ({ExtensionSetParam}{@id}),
    extensionValue          SABP-PROTOCOL-EXTENSION.&Extension      ({ExtensionSetParam}{@id})
}


END
```

9.4 Message Transfer Syntax

SABP shall use the ASN.1 Basic Packed Encoding Rules (BASIC-PER) Aligned Variant as transfer syntax as specified in ref. [11].

10 Handling of Unknown, Unforeseen or Erroneous Protocol Data

10.1 General

Protocol Error cases can be divided into three classes:

- Transfer Syntax Error;
- Abstract Syntax Error;
- Logical Error.

10.2 Transfer Syntax Error

A Transfer Syntax Error occurs when the receiver is not able to decode the received physical message Transfer syntax errors are always detected in the process of ASN.1 decoding. If a Transfer Syntax Error occurs, the receiver should initiate Error Indication procedure with appropriate cause value for the Transfer Syntax protocol error.

10.3 Abstract Syntax Error

10.3.1 General

An Abstract Syntax Error occurs when the receiving functional SABP entity receives IEs or IE groups that cannot be understood. The abstract syntax error also appears if the logical range of an IE is violated (e.g.: ASN.1 definition: 0 to 15, the logical range is 0 to 10 (values 11 to 15 are undefined), and 12 will be received; this case will be handled as an abstract syntax error using criticality information sent by the originator of the message).

10.3.2 Definition of Criticality Information

In the SABP messages there is criticality information set for individual IEs and/or IE groups. This criticality information instructs the receiver how to act when receiving an IE or an IE group that is not comprehended i.e. the entire item (IE or IE group) which is not (fully or partially) comprehended shall be treated in accordance with its own criticality information as specified in subclause 10.3.3.

If an Abstract Syntax Error occurs, the receiver shall read the remaining message and shall then for each detected Abstract Syntax Error act according to the Criticality Information for the IE/IE group due to which Abstract Syntax Error occurred in accordance with subclause 10.3.3.

The receiving node shall take different actions depending on the value of the Criticality Information. The three possible values of the Criticality Information for an IE/IE group are:

- Reject IE;
- Ignore IE and Notify Sender;
- Ignore IE.

10.3.3 Handling of the Criticality Information at Reception

10.3.3.1 Procedure Code

The receiving node shall treat the different types of criticality information of the *Procedure Code* according to the following:

Reject IE:

- If a message is received with a *Procedure Code* marked with "*Reject IE*" which the receiving node does not comprehend, the receiving node shall reject the procedure using the Error Indication procedure.

Ignore IE and Notify Sender:

- If a message is received with a *Procedure Code* marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the procedure and initiate the Error Indication procedure.

Ignore IE:

- If a message is received with a *Procedure Code* marked with "*Ignore IE*" which the receiving node does not comprehend, the receiving node shall ignore the procedure.

10.3.3.2 IEs other than the Procedure Code

The receiving node shall treat the different types of criticality information of an IE/IE group other than the *Procedure Code* according to the following:

Reject IE:

- If a message *initiating* a procedure is received containing one or more Ies/IE groups marked with "*Reject IE*" which the receiving node does not comprehend; none of the functional requests of the message shall be executed. The receiving node shall reject the procedure and report the rejection of one or more Ies/IE groups using the message normally used to report unsuccessful outcome of the procedure.

- If a message *initiating* a procedure that does not have a message to report unsuccessful outcome is received containing one or more Ies/IE groups marked with "*Reject IE*" which the receiving node does not comprehend, the receiving node shall initiate the Error Indication procedure.

- If a *response* message is received containing one or more IEs marked with "*Reject IE*" which the receiving node does no comprehend, the receiving node shall initiate local error handling.

Ignore IE and Notify Sender:

- If a message *initiating* a procedure is received containing one or more Ies/IE groups marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups, continue with the procedure as if the not comprehended IEs/IE groups were not received (except for the reporting) using only the understood IEs/IE groups, and report in the response message of the procedure that one or more IEs/IE groups have been ignored.

- If a *response* message is received containing one or more IEs/IE groups marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IE/IE groups and initiate the Error Indication procedure.

Ignore IE:

- If a message *initiating* a procedure is received containing one or more IEs/IE groups marked with "*Ignore IE*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups and continue with the procedure as if the not comprehended IEs/IE groups were not received using only the understood IEs/IE groups.

10.4 Logical Error

Logical error situations occur when a message is comprehended correctly, but the information contained within the message is not valid (i.e. semantic error), or describes a procedure which is not compatible with the state of the receiver. In these conditions, the following behaviour shall be performed (unless otherwise specified) as defined by the class of the elementary procedure, irrespective of the criticality information of the IE's/IE groups containing the erroneous values.

Class 1:

Where the logical error occurs in a request message of a class 1 procedure, and the procedure has a failure message, the failure message shall be sent with an appropriate cause value. Typical cause values are:

- Semantic Error;
- Message not compatible with receiver state.

Where the logical error is contained in a request message of a class 1 procedure, and the procedure does not have a failure message, the ERROR INDICATION procedure shall be initiated with an appropriate cause value.

Where the logical error exists in a response message of a class 1 procedure, local error handling shall be initiated.

Class 2:

Where the logical error occurs in a message of a class 2 procedure, the ERROR INDICATION procedure shall be initiated with an appropriate cause value.

Annex A (informative): Change history

Change history					
TSG RAN#	Version	CR	Tdoc RAN	New Version	Subject/Comment
RAN_07	-	-	-	3.0.0	Approved at TSG RAN #7 and placed under Change Control
RAN_08	3.0.0	-	RP-000239	3.1.0	Approved at TSG RAN #8

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