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Contents

Foreword

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1 Scope

The present document specifies the procedures and the SBc Application Part (SBc-AP) messages used on the SBc-AP interface between the Mobility Management Entity (MME) and the Cell Broadcast Centre (CBC).

The present document supports the following functions.

- Warning Message Transmission function in the EPS.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] IETF RFC 2460 (December 1998): "Internet Protocol, Version 6 (IPv6) Specification".

[3] IETF RFC 791 (September 1981): "Internet Protocol".

[4] IETF RFC 4960 (September 2007): "Stream Control Transmission Protocol".

[5] Void

[6] Void

[7] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)"

[8] ITU-T Recommendation X.680 (07/2002): "Information Technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[9] ITU-T Recommendation X.681 (07/2002): "Information Technology - Abstract Syntax Notation One (ASN.1): Information object specification".

[10] ITU-T Recommendation X.691 (07/2002): "Information Technology - ASN.1 encoding rules - Specification of Packed Encoding Rules (PER)".

[11] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[12] Void

[13] 3GPP TS 22.268: "Public Warning System (PWS) requirements".

[14] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".

[15] Void

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

Elementary Procedure: SBc-AP consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between MME and CBC. These Elementary Procedures are defined separately and are intended to be used to build up complete sequences in a flexible manner. If the independence between some EPs is restricted, it is described under the relevant EP description. Unless otherwise stated by the restrictions, the EPs may be invoked independently of each other as stand alone procedures, which can be active in parallel. Examples on using several SBc-APs together with each other and EPs from other interfaces can be found in reference [FFS].

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 and/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).

Successful and Unsuccessful:

- One signalling message reports both successful and unsuccessful outcome for the different included requests. The response message used is the one defined for successful outcome.

Class 2 EPs are considered always successful.

3.2 Symbols

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

<none>
Editor"s note: To be completed or section removed.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

CMAS	Commercial Mobile Alert System
CBC	Cell Broadcast Center
CBS	Cell Broadcast Service
EPC	Evolved Packet Core
EPS	Evolved Packet System
ETWS	Earthquake and Tsunami Warning System
MME	Mobility Management Entity

PWS Public Warning System
SCTP Stream Control Transmission Protocol

4 SBc description

4.1 Transport

4.1.1 General

This subclause specifies the standards for signalling transport to be used across SBc-AP interface. SBc-AP interface is a logical interface between the MME and the CBC. All the SBc-AP messages described in the present document require an SCTP association between the MME and the CBC.

4.1.2 Network layer

The MME and the CBC shall support IPv6 (see IETF RFC 2460 [2]) and/or IPv4 (see IETF RFC 791 [3]).

The IP layer of SBc-AP only supports point-to-point transmission for delivering SBc-AP messages.

4.1.3 Transport layer

SCTP (see IETF RFC 4960 [4]) shall be supported as the transport layer of SBc-AP messages.

Semi-permanent SCTP associations shall be established between MME and CBC, i.e. the SCTP associations shall remain up under normal circumstances.

Local multi-homing should be supported. Remote multi-homing shall be supported.

Multiple local SCTP endpoints may be supported. Multiple remote SCTP endpoints shall be supported. When multiple local or remote SCTP endpoints are configured, several simultaneous SCTP associations shall be supported between MME and CBC.

Checksum calculation for SCTP shall be supported as specified in RFC 4960 [4].

The CBC shall establish the SCTP association.

The registered port number for SBc-AP is 29168.

The registered payload protocol identifier for SBc-AP is 24.

4.1.4 Services expected from signalling transport

The signalling connection shall provide in-sequence delivery of SBc-AP messages. SBc-AP shall be notified if the signalling connection breaks.

4.2. SBc-AP functions

4.2.1 Function of SBc-AP

SBc-AP has the following function:

- Warning Message Transmission function:
  This functionality provides the means to start, overwrite and stop the broadcasting of warning message in support of the Public Warning System (PWS) messages as defined in 3GPP TS 22.268 [13] which include Commercial Mobile Warning System (CMAS) and Earthquake and Tsunami (ETWS) messages.

4.3 SBc-AP procedure

4.3.1 General

This sub-clause describes the parameters and detailed behaviors of different procedures.

4.3.2 List of SBc-AP elementary procedure

Table 4.3.2-1 lists the SBc-AP Elementary Procedures defined as a class 1 procedures.

Table 4.3.2-1: SBc-AP class 1 elementary procedures

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
Write-Replace Warning procedure	WRITE-REPLACE WARNING REQUEST	WRITE-REPLACE WARNING RESPONSE	
Stop Warning Procedure	STOP WARNING REQUEST	STOP WARNING RESPONSE	

Table 4.3.2-2 lists the SBc-AP Elementary Procedures defined as a class 2 procedures.

Table 4.3.2-2: SBc-AP class 2 elementary procedures

Elementary Procedure	Initiating Message
Error Indication procedure	ERROR INDICATION

4.3.3 Write Replace Warning Procedure

4.3.3.1 General

The purpose of Write-Replace Warning procedure is to start, overwrite the broadcasting of warning message, as defined in 3GPP TS 23.041 [14].

4.3.3.2 Successful Operation

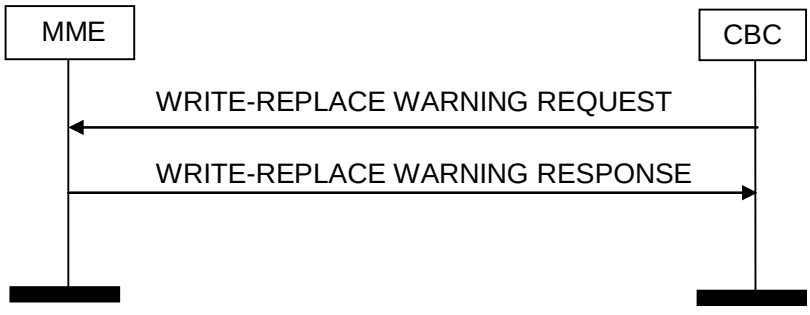

Figure 4.3.3.2-1: Write-Replace Warning procedure. Successful operation.

The CBC initiates the procedure by sending a WRITE-REPLACE WARNING REQUEST message to the MME.

Upon reception of WRITE-REPLACE WARNING REQUEST message, the MME shall forward the message towards the eNBs belonged to the tracking area as indicated in *List of TAIs* IE.

If none of *List of TAIs* IE is present in WRITE-REPLACE WARNING REQUEST message, the MME shall forward the message towards all connected eNBs.

The MME shall return a WRITE-REPLACE WARNING RESPONSE to the CBC immediately after the reception of the WRITE-REPLACE WARNING REQUEST message without waiting responses from eNBs.

The MME shall set the cause IE to "Message accepted" in the WRITE-REPLACE WARNING RESPONSE message.

4.3.3.3 Unsuccessful Operation

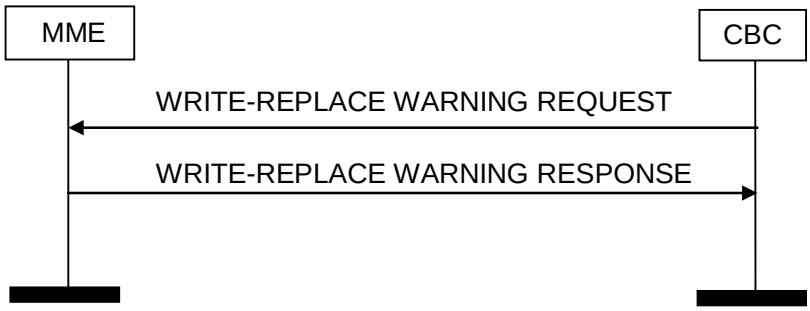

Figure 4.3.3.3-1: Write-Replace Warning procedure. Unsuccessful operation.

The CBC initiates the procedure by sending a WRITE-REPLACE WARNING REQUEST message to the MME.

If MME cannot process the received WRITE-REPLACE WARNING REQUEST message, the MME shall return a WRITE-REPLACE WARNING RESPONSE message towards the CBC and the MME shall not forward the message towards the eNBs belonged to the tracking area as indicated in *List of TAIs* IE.

The MME shall indicate a reason of failure in the cause IE.

4.3.3A Stop Warning Procedure

4.3.3A.1 General

The purpose of Stop Warning Procedure is to stop the broadcasting of warning message.

4.3.3A.2 Successful Operation

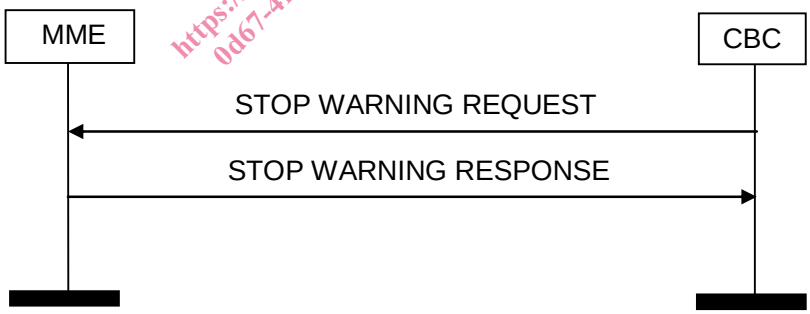

Figure 4.3.3A.2-1: Stop Warning Procedure, Successful Operation.

The CBC initiates the Stop Warning Procedure by sending a STOP WARNING REQUEST message to the MME.

Upon reception of STOP WARNING REQUEST message, the MME shall forward the message towards the eNBs belonged to the tracking area as indicated in *List of TAIs* IE.

If none of *List of TAIs* IE is present in STOP WARNING REQUEST message, the MME shall forward the message towards all connected eNBs.

The MME shall return a STOP WARNING RESPONSE to the CBC immediately after the reception of the STOP WARNING REQUEST message without waiting responses from eNBs.

The MME shall set the cause IE to "Message accepted" in the STOP WARNING RESPONSE message.