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Digitalni celiļ ni telekomunikacijski sistem (faza 2+) ï Protokol radiodifuznega klica (BCC) (GSM 04.69, razliļ ica 5.4.1, izdaja 1996)

Digital cellular telecommunications system (Phase 2+) (GSM); Broadcast Call Control (BCC) protocol (GSM 04.69 version 5.4.1 Release 1996)

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Contents

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS specifies the Broadcast Call Control (BCC) protocol within the digital cellular telecommunications system (Phase 2+).

The contents of this ETS is subject to continuing work within TC-SMG and may change following formal TC-SMG approval. Should TC-SMG modify the contents of this ETS, it will be resubmitted for OAP by ETSI with an identifying change of release date and an increase in version number as follows:

Version 5.x.y

where:

5 GSM Phase 2+ Release 1996

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

y the third digit is incremented when editorial only changes have been incorporated in the specification.

Proposed transposition dates	
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1 Scope

This European Telecommunication Standard (ETS) specifies the Broadcast Call Control (BCC) protocol used by the Voice Broadcast Call Service (VBCS) on the radio interface.

2 Normative references

This ETS incorporates by dated and undated references, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] GSM 01.04 (ETR 350) "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2] GSM 02.69 (ETS 300 925): "Digital cellular telecommunications system (Phase 2+); Voice Broadcast Call Service (VBCS) stage 1".

[3] GSM 03.03 (ETS 300 927): "Digital cellular telecommunications system (Phase 2+); Numbering, addressing and identification".

[4] GSM 03.67 (ETS 300 932): "Digital cellular telecommunications system (Phase 2+); enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 2".

[5] GSM 03.69 (ETS 300 934): "Digital cellular telecommunications system (Phase 2+); Voice Broadcast Call Service (VBCS) stage 2".

[6] GSM 04.06 (ETS 300 938): "Digital cellular telecommunications system; Mobile Station - Base Station System (MS - BSS) interface Data Link (DL) layer specification".

[7] GSM 04.07 (ETS 300 939): "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3 General aspects".

[8] GSM 04.08 (ETS 300 940): "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification".

3 Definitions and abbreviations

3.1 Definitions

Definitions used in this ETS are also defined in GSM 02.69.

For the purposes of this ETS, the following terms and definitions apply:

Attachment of the user connection: See GSM 04.08, subclause 5.2.

Broadcast call channel: Downlink channel to be allocated in each cell of the group call area for a particular broadcast call. All MSs of the listening service subscribers in one cell shall listen to the common downlink.

Broadcast call: Is used in the same sense as "voice broadcast call".

Calling user: BCC entity in the Mobile Station (MS) initiating or having initiated a broadcast call.

Clearing the context related to the broadcast call establishment: all running BCC timers in the relevant BCC entity are stopped, all attributes in the relevant BCC entity are deleted.

Downlink: Network to MS direction.

Group receive mode: See GSM 04.08.

Originating mobile station: MS initiating or having initiated the broadcast call.

Uplink: Mobile station to network direction.

3.2 Abbreviations

Abbreviations used in this ETS are also listed in GSM 01.04.

For the purposes of this ETS, the following abbreviation applies:

BCC Broadcast Call Control.

4 Applicability

Support of the broadcast call protocol is optional in the MS and in the network.

5 Main concepts

This ETS describes the broadcast call control (BCC) protocol, which is one of the protocols of the Connection Management (CM) sublayer (see GSM 04.07).

There is in general more than one MS engaged in a broadcast call. Consequently, there is in general more than one MS with a BCC entity engaged in the same broadcast call, and there is one BCC entity in the network engaged in that broadcast call.

Under which conditions a BCC message is passed from lower (sub-)layers to the BCC entity is defined in the specifications of the sub-layers.

The MS shall ignore BCC messages that it receives which were sent in unacknowledged mode and which explicitly specify as destination a mobile identity which is not a mobile identity of the MS.

Higher layers and the MM sub-layer decide when to accept parallel BCC transactions and when/whether to accept BCC transactions in parallel to other CM transactions.

The broadcast call may be initiated by a mobile user or by a dispatcher. Specification of a protocol for dispatchers is out of the scope of this ETS. Hence, in the scope of this ETS, there are

- one BCC entity in the network; and
- one or more than one BCC entities in different MSs

engaged in a broadcast call, and one ore none of the MSs is the originator of the broadcast call (called the originating MS in this ETS).

NOTE: Whereas for the Group Call Control (GCC) protocol (see GSM 04.68), in certain situations, the GCC entity in a MS assumes to be the originator of a broadcast call without being the originator, this is not the case for the BCC protocol.

The originator of the BCC transaction chooses the Transaction Identifier (TI). A MS not assuming to be the originator of the transaction will chose the transaction identifier received from the network, setting the TI flag to 1+x mod 2 where x is the received TI flag.

This ETS describes the broadcast call control protocol only with regard to two peer entities, one in a MS, the other one in the network. The call control entities are described as communicating finite state machines which exchange messages across the radio interface and communicate internally with other protocol (sub)layers. In particular, the BCC protocol uses the MM and RR sublayer specified in GSM 04.08. The BCC entity in a MS that is not the originator of the broadcast call shall not send messages to its peer entity. This description in only normative as far as the consequential externally observable behaviour is concerned. For simplicity, instead of using the terms "BCC entity in the MS" and "BCC entity in the network", this ETS often uses the terms "MS" and "network" if no confusion may arise.

Certain sequences of actions of the two peer entities compose "elementary procedures" which are used as a basis for the description in this ETS. These elementary procedures are defined in clause 6.

The network should apply supervisory functions to verify that the BCC procedures are progressing and if not, take appropriate means to resolve the problems. This, however, is out of the scope of this ETS.

6 Elementary procedures for Broadcast Call Control

6.1 Overview

6.1.1 General

The elementary procedures may be broadcasted into the following classes:

- broadcast call establishment procedures;
- broadcast call termination procedures;
- broadcast call information phase procedures;
- miscellaneous procedures.

6.1.2 Broadcast call control states

6.1.2.1 Broadcast call control states at the MS side of the interface

The BCC entity of the MS is described as an extended finite state machine. It performs transitions between states. It has certain parameters and attributes, e.g. configuration parameters and behaviour parameters, which it sets and changes based on interaction with higher and lower (sub-)layers and on message exchange with its peer entity. If a configuration parameter is set to a certain value, the MS shall also adapt the configuration accordingly. Behaviour parameters decide on (part of) the behaviour of the BCC entity. When the BCC entity in the MS receives a message, it shall first analyse whether it shall ignore the message, see clauses 5 and 7.

6.1.2.1.1 Attributes and Parameters of BCC in the MS

For the following behaviour parameters, the description is informative.

Parameter	Description
ORIG	Depending on the context, the MS assumes to be the originator of the call (ORIG=T) or not to be the originator of the call (ORIG=F).
COMM	Depending on the context, the MS assumes that communication with its peer entity is enabled in both directions (COMM = T) or not (COMM = F).

For the following configuration parameters the MS shall adapt its configuration according to the parameter value and parameter definition.

Parameter	Definition
D-ATT	D-ATT = T means that the MS attaches the user connection for the broadcast call in the downlink. D-ATT = F means that the MS does not attach the user connection for the broadcast call in the downlink.
U-ATT	U-ATT = T means that the MS attaches the user connection for the broadcast call in the uplink. U-ATT = F means that the MS does not attach the user connection for the broadcast call in the uplink.

6.1.2.1.2 NULL (U0)

No broadcast call exists for the BCC entity. When entering the state, parameters shall be set to the following values, and configuration shall be adapted to the new values of configuration parameters: ORIG = F, COMM = F, D-ATT = F, U-ATT = F.

6.1.2.1.3 MM CONNECTION PENDING (U0.p)

The BCC entity has requested the explicit establishment of an MM connection. When entering the state, parameters shall be set to the following values, and configuration shall be adapted to the new values of configuration parameters: ORIG = T, COMM = F, D-ATT = F, U-ATT = F.

6.1.2.1.4 BROADCAST CALL INITIATED (U1)

The BCC entity has requested the peer entity in the network to establish a broadcast call. When entering the state, parameters shall be set to the following values, and configuration shall be adapted to the new values of configuration parameters: ORIG = T, COMM = T, D-ATT = F, U-ATT = F.

6.1.2.1.5 BROADCAST CALL ACTIVE (U2)

The broadcast call is established at least in one cell. When entering the state, parameters shall be set to the following values, and configuration shall be adapted to the new values of configuration parameters: ORIG = T, COMM = T, D-ATT = T, U-ATT = T.

6.1.2.1.6 BROADCAST CALL PRESENT (U3)

The MS has received a notification about an ongoing broadcast call. Higher layers are requested to accept or reject the call. When entering the state, parameters shall be set to the following values, and configuration shall be adapted to the new values of configuration parameters: ORIG = F, COMM = F, D-ATT = F, U-ATT = F.

6.1.2.1.7 BROADCAST CALL CONNECTION REQUESTED (U4)

The MS has received a notification about an ongoing broadcast call. Higher layers have decided to accept the call. When entering the state, parameters shall be set to the following values, and configuration shall be adapted to the new values of configuration parameters: ORIG = F, COMM = F, D-ATT = F, U-ATT = F.

6.1.2.1.8 TERMINATION REQUESTED (U5)

The MS which is the originator of the broadcast call has been in state U1 or U2 and has sent a TERMINATION REQUEST message to the network. When entering the state, parameters shall be set to the following values, and configuration shall be adapted to the new values of configuration parameters: ORIG = T, COMM = T, D-ATT = T, U-ATT = T.

6.1.2.1.9 RECEIVE MODE ACTIVE (U6)

The BCC entity in the MS in state U4, BROADCAST CALL CONNECTION REQUESTED, has got an indication from lower (sub-)layers that RR has entered group receive mode (see GSM 04.08). When entering the state, parameters shall be set to the following values, and configuration shall be adapted to the new values of configuration parameters: ORIG = F, COMM = F, D-ATT = T, U-ATT = F.

6.1.2.1.10 BCC TIMERS IN THE MS

Table 6.1 specifies the timers used in BCC. The denotation of columns is defined as follows:

timer ::=	name of the timer;
set ::=	under which conditions the timer is set (i.e., started);
stopped ::=	under which conditions the timer is stopped;
running in state(s) ::=	in which state(s) the timer may be running;
action at expiry ::=	which actions the BCC entity shall perform at expiry;
value ::=	the duration between setting the timer and expiry of the timer ("s" denotes "second(s)" "xx - yy" means that any value between xx and yy is permitted).