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Foreword

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1 Scope

The present document specifies the stage one description of the Voice Broadcast Service (VBS) which allows the distribution of speech (or other signals which can be transmitted via the speech codec), generated by a service subscriber, into a predefined geographical area to all or a group of service subscribers located in this area.

The Voice Broadcast Service (VBS) is applicable to all mobile stations in a certain network and area which have the technical capability and the respective subscription to receive a VBS call.

NOTE: It is not considered as requirement that normal GSM Phase 2 mobile stations will be able to be used for this service.

The service is described from the service subscriber's and user's point of view; in particular:

- the procedure for normal operation with successful outcome;
- the action to be taken in exceptional circumstances;
- the interaction with other GSM services and features.

The present document does not deal with the Man-Machine Interface (MMI) requirements, but makes reference to the appropriate Global System for Mobile communications (GSM) specifications.

The present document defines a teleservice of the digital cellular telecommunication system GSM. Any interaction with other services and/or networks not dealt within clauses 8 or 9 are outside the scope of the present document.

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.
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- 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] 3GPP TS 22.067: "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 1".
- [3] 3GPP TS 32.005: "Telecommunications management; Charging management; 3G call and event data for the Circuit Switched (CS) domain".

3 Definitions and abbreviations

3.1 Definitions

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

Network operator: Entity which provides the network operating elements and resources for the execution of the VBS.

Service provider: Entity which offers the VBS for subscription. The network operator may be the service provider.

Service subscriber: Mobile subscriber which subscribes to the VBS.

Voice broadcast call: An instance of the VBS initiated by a VBS subscriber. This term is used synonymously with the term "VBS call".

Group identification (group ID): A numerical classification. The maximum number of group Ids which can be defined in one PLMN depends on the maximum number of group call areas defined in this PLMN. The maximum number of group Ids and group call areas shall be 10^8 , Service subscriber shall be provided with one or up to 50 group Ids.

Dispatcher: Particular fixed line or mobile users are identified within the network as dispatchers. Dispatchers shall receive all voice broadcast calls to a certain group ID in a group call area (this shall be done automatically by the network). In addition they can initiate voice broadcast calls to a group ID in a group call area.

Dispatchers shall be connected to a voice broadcast call by means of standard links via radio or via an ISDN. They shall be called by their MSISDN or ISDN number, respectively. When dispatchers initiate voice broadcast calls, they shall call a particular MSISDN number which is related to a group ID and group call area. Dispatchers using the GSM network can be located outside of this group call area.

The identities of the dispatchers are exclusively predefined in the network by the service provider. There may be none, one or more dispatchers involved in a particular voice broadcast call.

As a mandatory network requirement, configuration of up to 5 dispatchers shall be supported. Optionally, up to a maximum of 20 dispatchers may be configured for a particular group call reference.

Destination service subscriber: Service subscriber to which the VBS call is directed.

Calling service subscriber: Service subscriber which originates the VBS call.

Calling dispatcher: Dispatcher which originates the VBS call.

Destination dispatcher: Pre-registered dispatcher to which the VBS call is directed.

Destination subscriber: Destination dispatcher(s) and/ or destination service subscriber(s) to which the VGCS call is directed.

Group call area: Predefined area composed of one or a cluster of cells, to which a particular VBS call is distributed. The maximum number of group call area Ids which can be defined in one PLMN depends on the maximum number of group Ids defined in this PLMN. The maximum number of group Ids and group call areas combined shall be 10^8 , The composition of a group call area is predefined in the network by the service provider. Changing of cell allocations in the network due to operational reasons will need an adaptation of the group call area definition. The group call area may include cells of more than one MSC area and cells of more than one PLMN.

Originator-to-dispatcher information: Information sent by the service subscriber originating a voice group call to the network during call setup for distribution to the dispatchers to be attached to the group call during call setup.

Listener: see Listening service subscriber

Listening service subscriber: Service subscriber who is listening to an ongoing voice group call.

3.2 Abbreviations

Abbreviations used in the present document are listed in 3GPP TR 21.905 [1].

4 Description

The VBS is defined in the following. Figure 1 gives an explanation of the logical concept of the VBS.

- a) The VBS enables a calling service subscriber or calling dispatcher to send speech unidirectional and simultaneously to all entitled dispatchers and to destination service subscribers belonging to a predefined group call area who have a subscription to the applicable group ID.
- b) The calling service subscriber may be any service subscriber which has subscribed to the related group ID and is entitled to establish a voice broadcast call by his subscription. The calling dispatcher may be any dispatcher who is entitled to originate VBS calls to the related call reference.

The destination subscriber may be any service subscriber which has subscribed to the related group ID or any dispatcher who is entitled for it by his identity which is registered in the network.

- c) The broadcast call shall be established in a group call area which is comprised of one or a cluster of cells. Group call areas shall be predefined in the network by the service provider, co-ordinated by the network operator.

In case of a calling service subscriber initiating a VBS call, the group call area is uniquely identified by the actual cell in which the service subscriber resides at the moment of VBS call initialization and by the called group ID.

A calling dispatcher initiating a VBS call will be connected to a related predefined group call area. The entitlement of the dispatcher is checked by the network element responsible for the voice broadcast call management by verification of the calling identity. Since a dispatcher may be registered to more than one group call area and group ID an indication of the wanted group call area and group ID has to be given in form of a dedicated address called by the dispatcher.

- d) Destination subscribers are all destination service subscribers or a group of destination service subscribers identified by the called group ID which have their present location in the group call area, and preregistered destination dispatchers. Destination service subscribers shall be notified with the group ID, not by paging the service subscriber individually. Destination dispatchers shall be called individually with their identity.

Service subscribers which leave the group call area during an on going VBS call cease to be destination subscribers. Service subscribers which enter the group call area during an on going VBS call shall become destination subscribers within 500 ms after reception of the first notification message related to the VBS call.

- e) The calling service subscriber shall remain within the voice broadcast call until she terminates the call, loses contact with the network or leaves the group call area. The VBS call shall be terminated by the network as soon as the network has determined that the calling service subscriber has left the VBS call area.
- f) A voice group call will be considered established as soon as the originating cell in case of a service subscriber originated voice group call, or any one cell within the group call area in case of a dispatcher originated voice group call has been included.

The calling service subscriber or calling dispatcher shall be informed by the network with a suitable indication about the successful establishment of the voice broadcast call so that he can start to speak.

The network shall then continue to try to include all remaining voice group call downlink channels and alert related dispatchers not yet alerted.

- g) Authentication is mandatory at GSM call set up. To allow fast call set up in VBS authentication of the calling service subscriber or calling dispatcher at invocation may optionally be delayed.

Authentication of the destination subscriber, who has no uplink connection, is not required.

Confidentiality on the radio path is optional.

- h) Different levels of priority and pre-emption shall be applied as defined in the corresponding stage 1 description on the enhanced Multi-Level Precedence and Pre-emption service (eMLPP), 3GPP TS 22.067.
- i) A number of voice broadcast calls may exist simultaneously intended for different groups of destination subscribers in the same group call area.

Parallel voice broadcast calls are possible to the same group of destination subscribers in different, possibly overlapping group call areas.

- j) VBS shall also be provided in case of roaming. For this, certain group Ids shall be defined as supra-PLMN group Ids which have to be co-ordinated between the network operators and which shall be known in the networks and in the SIM. A service subscriber which is entitled by his subscription to establish voice broadcast calls while roaming shall only be able to use supra-PLMN group Ids in case of roaming.
- k) For certain levels of priorities an acknowledgement of receipt of a voice broadcast call can be required as an application option (e.g. for railway emergency calls) from all or from nominated destination service subscribers (the nomination is recorded on the SIM). The acknowledgement itself shall be performed at the end of the voice broadcast call. The acknowledgement shall indicate the time the reception started and the time the reception terminated. The acknowledgement has to be given to a predefined recipient.
- l) It shall be possible for a service subscriber to activate or deactivate the voice broadcast reception for different group Ids. The selection list is stored on the SIM corresponding to the subscribed group Ids. It shall be possible to prohibit the deactivation of group Ids used for high priority voice broadcast calls.

Mobile users that are configured as dispatchers and which are registered in the network for a certain voice broadcast call and which have also a subscription for VBS with the same group ID as the voice broadcast call for which they are dispatcher shall deactivate this group ID when they are located in the corresponding group call area in order to avoid conflicts between paging for the dispatcher and notifications for the group ID.

- m) The calling service subscriber may specify, at call setup, information to be presented at call setup to the dispatchers. This information is sent as originator-to-dispatcher information to the network, and sent as UUS1 by the network to the dispatchers in the message for call setup. For normal call setup, the information is subject to the same constraints as UUS1 information in the setup of a point-to-point call. For fast setup, the information is restricted to 12 digits (with leading zeros); inclusion of originator-to-dispatcher information at fast setup is only possible if the mobile station has a valid TMSI. It is a network option to support originator-to-dispatcher information, or to ignore it. The inclusion of originator-to-dispatcher information in the VBS call setup is not subject to provision or withdrawal.