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Digital cellular telecommunications system (Phase 2+) (GSM); enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 2 (GSM 03.67 version 5.1.1)

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ICS:

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**Digital cellular telecommunications system (Phase 2+);
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(eMLPP) - Stage 2
(GSM 03.67 version 5.1.1)**

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Foreword

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

This ETS specifies the stage two description of the enhanced Multi-Level Precedence and Pre-emption Service (eMLPP) within the digital cellular telecommunications system.

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:

- y the third digit is incremented when editorial only changes have been incorporated in the specification;
- x the second digit is incremented for all other types of changes, i.e. technical enhancements, corrections, updates, etc.

Transposition dates	
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1 Scope

This European Telecommunication Standard (ETS) specifies the stage 2 description of the enhanced Multi-Level Precedence and Pre-emption Service (eMLPP) which provides different call priorities in combination with fast call set-up and pre-emption for different applications according to GSM 02.67.

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 02.40: "Digital cellular telecommunications system; Procedures for call progress indications".
- [3] GSM 02.67 (ETS 300 924): "Digital cellular telecommunications system (Phase 2+); enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 1".
- [4] GSM 03.11 (ETS 300 928): "Digital cellular telecommunications system; Technical realization of supplementary services".
- [5] GSM 03.68 (ETS 300 933): "Digital cellular telecommunications system (Phase 2+); Voice Group Call Service (VGCS) - Stage 2".
- [6] GSM 03.69 (ETS 300 934): "Digital cellular telecommunications system (Phase 2+); Voice Broadcast Service (VBS) - Stage 2".
- [7] GSM 08.08: "Digital cellular telecommunications system (Phase 2+); Mobile Switching Centre - Base Station System (MSC - BSS) interface; Layer 3 specification".
- [8] ITU-T recommendation Q.85: "Stage 2 description for community of interest supplementary services (clause 3: Multi-Level Precedence and Pre-emption MLPP)".
- [9] ITU-T recommendation Q.735: "Stage 3 description for community of interest supplementary services using SS No. 7 (clause 3: Multi-Level Precedence and Pre-emption (MLPP))".

3 Definitions and abbreviations

3.1 Definitions

Definitions used in this ETS are also defined in GSM 02.67.

resource pre-emption: The termination of a call of a low priority user such that resources can be made available for a precedence call of higher priority. Resource pre-emption could be initiation resource pre-emption or handover resource pre-emption.

called-party pre-emption: Termination of a call to a particular user when a higher priority call is directed towards that specific user. Called party pre-emption is decided by the Mobile Station. In case of point-to-point calls, this shall be performed by Call Waiting with automatic acceptance of the waiting call by the Mobile Station.

compatible Mobile Station: Mobile stations which support eMLPP and therefore have precedence and pre-emption capabilities.

non-compatible Mobile Station: Mobile stations which do not support eMLPP.

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply in addition to those listed in GSM 01.04:

eMLPP	enhanced Multi-Level Precedence and Pre-emption
VBS	Voice Broadcast Service
VGCS	Voice Group Call Service.

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4 Main concepts

The enhanced Multi-Level Precedence and Pre-emption service (eMLPP) provides different levels of precedence for call set-up and for call continuity in case of handover.

There are seven priority levels which are defined in GSM 02.67. The two highest levels are reserved for network internal use. These two levels can only be used locally, i.e. in the domain of one MSC. The other five priority levels are offered for subscription and can be applied globally, e.g. on inter switch trunks, if supported by all related network elements, and also for interworking with ISDN networks providing the MLPP service.

The seven priority levels are defined as follows:

A	(highest, for network internal use)
B	(for network internal use)
0	(for subscription)
1	(for subscription)
2	(for subscription)
3	(for subscription)
4	(lowest, for subscription)

Levels A and B shall be mapped to level 0 for priority treatment outside of the MSC area in which they are applied.

As a network specific configuration, the ability to pre-empt other calls of lower priority and the application of fast call set-up procedures can be assigned to each priority level. An example for an eMLPP configuration is given in GSM 02.67.

NOTE 1: The present ETS defines the concepts for handling of priorities in the network including the indication whether pre-emption or fast call set-up procedures are to be applied. Note that the call set-up procedures themselves are specified in the corresponding stage 2 descriptions of the services where they are to be used. There is presently only a requirement for VBS and VGCS (GSM 03.69 and GSM 03.68, respectively).

NOTE 2: The network operator has to assure that the particular eMLPP configuration he applies and the subscriptions he issues are co-ordinated with the network planning (especially for blocking) and the implementation options applied (e.g. the use of OACSU) in order to guarantee the service performance for the subscriber.

Considering aspects of priority handling, the following issues can be considered for each call:

- contention during the initial random access (no specific definitions apply for eMLPP. Delays due to access collision have to be managed by a corresponding planning of the network resources);
- contention in gaining radio resources during the call set-up phase and during handover (this item relates to the assignment of SDCCH and TCH for which queuing and pre-emption mechanisms are applied for eMLPP);

A pre-emption might already be performed as a network option on the basis of the establishment cause if a network specific eMLPP configuration assigns a certain priority level to a particular establishment cause.

- contention in gaining terrestrial resources inside the GSM network (this item relates to the assignment of terrestrial channels between the GSM network nodes. Priority actions shall be performed on basis of the MLPP service implementations. The eMLPP priority levels A and B shall be mapped to the MLPP priority level 0. No further specific definitions apply for eMLPP);

- d) contention in gaining terrestrial resources in external networks (this item relates to interworking with external networks which shall be performed on basis of the MLPP service if provided in the related external networks);
- e) application of different call set-up procedures in relation to the priority levels and the network specific configuration (three classes of set-up performance are defined in GSM 02.67, one very fast class for VBS or VGCS emergency call services, one class for fast but normal set-up times and one class allowing some delay in the set-up. The application of the corresponding procedures shall be decided by the network on the basis of the requested priority level);
- f) automatic answering of calls if the incoming call is of or exceeds a defined priority level, respectively, or called party pre-emption (if the called GSM subscriber is engaged in communication of a lower priority);
- g) the means by which the called user is informed of priority issues and is able to make appropriate decisions if no called party pre-emption applies;
- h) the accommodation of non-compatible Mobile Stations.

The definitions in the present ETS focus on the issues under item b), e), f), g) and h). Items c) and d) are related to the MLPP service implementation for the signalling system No. 7 according to ITU-T Recommendations Q.85 and Q.735.

For a call establishment, a subscriber shall be able to select any one of the priority levels he has subscribed to.

Priorities shall be treated in the network as defined in GSM 02.67. Priority treatment is different for point-to-point calls and voice broadcast calls or voice group calls, respectively.

- mobile originated point-to-point call:
The priority level depends on the calling subscriber. If the user has no eMLPP subscription, the call shall have a default priority level defined in the network. If the user has an eMLPP subscription, the call shall have the priority level selected by the user at set-up or the priority level predefined by the subscriber as default priority level by registration.
- mobile terminated point-to-point calls:
The priority level depends on the calling party. For this, interworking with the ISDN MLPP service is required. If the call is not an MLPP call, i.e. no priority level is defined, the call shall be treated in the mobile network with a default priority level. If the call is an MLPP call, the call shall be treated with the priority level provided by the interfacing network.
- mobile to mobile point-to-point calls:
The priority shall be treated for the calling subscriber as for mobile originated calls and for the called subscriber as for mobile terminated calls. However, an interworking with MLPP is not required if both the calling subscriber and the called subscriber are located in the same MSC area.
- Voice Broadcast Calls (VBS) and Voice Group Calls (VGCS):
The link on the voice broadcast call channel or voice group call channel shall have the priority level as defined in the corresponding registration for the related voice broadcast call or voice group call in the GCR. At the early stage of a voice broadcast call or voice group call establishment, before the GCR request is made and the voice broadcast call channel or voice group call channels are assigned, the procedure shall be the same as for point-to-point calls.

Queuing and resource pre-emption shall then be applied as appropriate according to the network service configuration. In addition, automatic answering or called party pre-emption shall be applied as appropriated according to the Mobile Station's internal service configuration.

The MSC shall maintain a record of the priority level of each call in progress in its area such that it can arbitrate over resources in a defined manner.