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Technical Specification

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Foreword

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The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Contents

Foreword

This Technical Specification 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:

Version x.y.z

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  - 1 presented to TSG for information;
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Introduction

The response to emergency situations (e.g., floods, hurricanes, earthquakes, terrorist attacks) depends on the communication capabilities of public networks. In most cases, emergency responders use private radio systems to aid in the logistics of providing critically needed restoration services. However, certain government and emergency management officials and other authorised users have to rely on public network services when the communication capability of the serving network may be impaired, for example due to congestion or partial network infrastructure outages, perhaps due to a direct or indirect result of the emergency situation.

Multimedia Priority Service, supported by the 3GPP system set of services and features, is one element creating the ability to deliver calls or complete sessions of a high priority nature from mobile to mobile networks, mobile to fixed networks, and fixed to mobile networks.

1 Scope

The present document specifies the service requirements for Multimedia Priority Service (MPS).

The scope of this document is to specify those requirements of MPS necessary to provide an end-to-end service and to interwork with external networks where needed. Service interactions with external networks are considered within the scope of this document although these interactions may be specified in other standards.

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 TS 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TR 22.952: "Priority Service Guide".

[3] 3GPP TS 22.067: "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 1".

[4] 3GPP TS 23.067: "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 2".

[5] 3GPP TS 24.067: "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 3".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 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 TR 21.905 [1].

Service User: An individual who has received a priority level assignment from a regional/national authority (i.e., an agency authorised to issue priority assignments) and has a subscription to a mobile network operator that supports the MPS feature.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 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 TR 21.905 [1].

MPS Multimedia Priority Service

4 General description

MPS allows qualified and authorized users to obtain priority access to the next available radio channel on a priority basis before other PLMN users, during situations when PLMN congestion is blocking session establishment attempts. In addition, MPS supports priority sessions on an "end-to-end" priority basis.

MPS is intended to be utilised for Voice, Video, and Data bearer services in the Packet-switched (PS) domain and the IP Multimedia Subsystem (IMS).

5 High level requirements

5.1 General

Upon invocation of MPS, the system shall provide preferential treatment for access and core network resources associated with the session (i.e., signalling and media bearer related resources). A Service User is assigned a priority level by a regional/national authority i.e., agency authorised to issue priority levels. Upon MPS invocation the calling Service User''s priority level is used to identify the priority to be used for the session being established.

Pre-emption of active sessions shall be subject to regional/national regulatory requirements.

Subject to regional/national regulatory policy, a PLMN should have the capability to retain public access as a fundamental function. Therefore, MPS traffic volumes should be limited (e.g. not to exceed a regional/national specified percentage of any concentrated network resource, such as eNodeB capacity), so as not to compromise this function.

5.2 Priority session treatment in originating network

When an MPS session is originated by a Service User, the session shall receive priority treatment (priority access to voice or traffic channels) in the originating PLMN based on the originating Service User priority level.

When an MPS session is requested by a Service User and the originating network supporting session establishment cannot assign the necessary resources to the MPS session, the MPS session request shall be:

- Queued,
- Processed for the next available resource in accordance with the calling Service Users priority level and session initiation time.

The network shall support the capability to inform the calling Service User about the status of the MPS session (e.g., tones or signalling messages can be used to indicate that the session request has been queued).

If the queued MPS session times out, then normal session processing applies.

5.3 Priority session progression

For an MPS session, a Service User shall receive priority session treatment/progression through the PLMN (s). In case the MPS session traverses or terminates in other networks (e.g., the PSTN), the network providing priority session treatment/progression shall support the capability to indicate to the other network that this is an MPS session.

Note: If there is no agreement on priority handling between networks, the priority does not carry across network boundaries.

5.4 Priority session treatment in terminating network

When a terminating network receives an MPS session establishment attempt, the MPS session shall receive priority treatment (priority access to voice or traffic channels) in the terminating PLMN, based on the originating Service User priority level. The priority level of the terminating party is irrelevant.

When the terminating network supporting session establishment cannot assign the necessary resources to the MPS session, the MPS session request shall be:

- Queued,
- Processed for the next available resource in accordance with the calling Service Users priority level and session arrival time.

The network shall support the capability to inform the calling Service User about the status of the MPS session (e.g., tones or signalling messages can be used to indicate that the session request has been queued).

If the queued MPS session times out, then normal session processing applies.

5.4a Priority Data Bearer Service

When a Service User invokes Priority Data Bearer Service for transport of any data packets to and from a Service User, the network should give priority in admission of the Priority Data Bearer and in packet data scheduling in the event of congestion(for new sessions and upgrade to existing sessions), subject to regional/national regulatory policy. Specifically:

- A Priority Data Bearer service session should be given priority for admission over non-Priority Data Bearer sessions during times of congestion;
- Data packets belonging to a Priority Data Bearer service should not be dropped before data packets belonging to a non-Priority Data Bearer service session, when the network is experiencing congestion, subject to the limitation imposed by public access. Priority Data Bearer session QoS, as required for the type of service invoked (e.g., packet delay), should be maintained throughout the activity of the data session.

5.5 Priority levels

The Service User shall be assigned one of "n" user priority levels. The priority levels are defined with 1 being the highest priority level and "n" being the lowest priority level.

Priority levels are a matter of regional/national and operator policies.

In case of interconnecting networks that have different priority levels, mappings between priority levels should be established.

5.6 Invocation on demand

MPS priority shall be invoked only when requested by the Service User.

MPS is applied when idle resources required for an origination session request are not available.

If idle resources are available when MPS is requested, the request shall be allowed to proceed as normal, but marked as an MPS request..

An indication of an MPS session should be propagated towards the terminating network regardless of the availability of resources in the originating network.

5.7 Multimedia priority service code/identifier

MPS shall be requested by including an MPS code/identifier in the session origination request, or optionally, by using an MPS input string (e.g., an MPS public user identity).

5.8 Roaming

MPS shall be supported when the Service User is roaming and the serving (originating and terminating) network(s) supports MPS.

5.9 Handover

MPS shall be supported during and after the handover (i.e., sessions shall continue to get priority treatment in the network during and after the handover).

5.10 Interworking with CS domain

5.10.1 Mobile origination in the CS domain -> MPS mobile termination

For a Priority Service voice call, as described in [2] and as specified in [3, 4, 5], originated by a Service User in the CS Domain, MPS shall support Mobile Termination of the session in the IMS. The priority level received from the CS domain shall be used in the IMS.

5.10.2 MPS mobile origination -> mobile termination to the CS domain

For an MPS voice session originated by a Service User in the IMS, MPS shall support delivery of the voice session to the serving CS Domain. The calling Service User priority level shall be sent to the CS Domain.

6 MMI aspects

No MMI aspects have been identified specifically for MPS.

7 Security and privacy

Access to MPS shall be determined based on the subscriber's profile. A level of authorisation in addition to authorisation to use the IMS is required.

Unauthorized access to MPS shall be prevented.

8 Charging aspects

A network supporting MPS shall be capable of recording the following charging information, in addition to non-MPS information:

- MPS invocation attempt and successful session set-up,
- Session bearers (originations and/or terminations) on which MPS was used to gain access to resources,
- Recording of MPS information, e.g., priority level.

Annex A (informative): Change history

Change history											
TSG SA#	**SA Doc.**	**SA1 Doc**	**Spec**	**CR**	**Rev**	**Rel**	**Cat**	**Subject/Comment**	**Old**	**New**	**WI**
SP-37	SP-070576	-	22.146	-	-	Rel-8	-	Raised to v.2.0.0 by MCC for approval as v.8.0.0	1.3.0	2.0.0	PRIOR
SP-37	-	-	22.146	-	-	Rel-8	-	Raised to v.8.0.0 by MCC following SA#37 approval	2.0.0	8.0.0	PRIOR
SP-40	SP-080305	S1-080438	22.153	0004	-	Rel-8	D	CR to TS 22.153 on applicability of MPS	8.0.0	8.1.0	PRIOR
SP-40	SP-080310	S1-080727	22.153	0003	1	Rel-9	B	CR to TS 22.153 on an optional service invocation method for MPS	8.0.0	9.0.0	ePRIOR
SP-41	SP-080494	-	22.153	0006	1	Rel-9	A	Trusted domain support	9.0.0	9.1.0	PRIOR
SP-42	SP-080778	S1-084394	22.153	0007	3	Rel-9	F	Correction to priority levels and networks	9.1.0	9.2.0	EPRIOR
SP-42	SP-080778	S1-084365	22.153	0008	1	Rel-9	C	Indication of MPS	9.1.0	9.2.0	EPRIOR
SP-47	SP-100188	S1-100101	22.153	0011	-	Rel-10	F	Clarification of MPS Service Aspects - Video and Data Bearer service	9.2.0	10.0.0	TEI10
SP-47	SP-100188	S1-100458	22.153	0012	3	Rel-10	B	Priority for data bearer services	9.2.0	10.0.0	TEI10
SP-49	SP-100580	S1-102180	22.153	0013	-	Rel-10	B	Priority for data bearer services	10.0.0	10.1.0	TEI10

History

Document history		
V10.1.0	April 2011	Publication