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Contents

Foreword

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

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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".

[6] 3GPP TS 22.011: "Service accessibility".

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].

MPS session: A session for which priority treatment is applied for allocating and maintaining radio and network resources.

MPS-subscribed UE: A UE having MPS subscription.

Priority Treatment: Refers to mechanisms and features that increase the success rate for MPS session invocation, establishment and maintenance until release.

Service User: An individual authorized to use MPS and who has been granted a user priority level assignment by 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 provides priority treatment to increase the probability of an authorized Service User's Voice, Video, and Data communication session being successful. Some form of priority treatment is applied to the MPS invocation and session establishment, and continues to be applied until the MPS session is released. The priority treatment may be applied before the invocation if a greater probability of success in receiving, recognizing, and processing the invocation is needed.

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). It also involves priority transitioning of MPS service (e.g., Voice) to the CS domain when the network does not support the requested service in the PS domain. MPS Voice, Video and Data sessions are based on providing priority treatment to the corresponding commercial services offered to the public.

MPS includes network functions that fall into the following broad categories:

Service Invocation: The process to recognize and identify a request for an MPS session. A MPS Service Provider network recognizes an MPS invocation based on the presence of an MPS-unique identifier entered by the originating Service User in the service request received by the network from the UE, or based on the subscription profile of the originating UE, or as a regional/operator option the subscription profile of the terminating UE.

NOTE: The option related to "subscription profile of the terminating UE" may not involve end-to-end priority because this option is based on providing priority only in the terminating network based on the terminating UE subscription profile.

Authorization: The process to verify that a Service User is authorized for MPS. This includes capabilities to verify authorization to receive priority treatment in the radio access network and to access the MPS application service (MPS Voice, Video, and Data).

End-to-End Priority Treatment: The process of providing priority treatment in all parts of the path, from one endpoint to the other endpoint(s). End-to-end priority treatment includes priority treatment by all MPS capable networks involved in the MPS session path, the origination network and the termination network as well as any transit networks in between.

Invocation-to-Release Priority Treatment: The process of providing priority treatment to all phases of a session, from invocation until release, including all steps in between.

The combination of End-to-End Priority Treatment and Invocation-to-Release Priority Treatment includes both pre- and post-authorization treatment and includes the following aspects:

1) Priority processing of the Service User's MPS invocation,

2) Admission control and allocation of network resources (including bearer resources) in origination, termination, and transit networks, including handovers,

3) Transport of signaling and media packets,

4) Priority processing within EPS and CN, and

5) Processing of the Service Users release of an MPS service session.

Network Interconnection and Protocol Interworking: A Service User's MPS invocation and session establishment will involve transport and processing, and the end-to-end signaling and media path may traverse multiple MPS Service Provider networks. These end-to-end cases include, but are not limited to:

1) LTE-to-LTE for voice, video, and data services, including signaling for call/session establishment and media;

2) LTE interworking with the CS domain, including a) calls originated in the CS domain and terminated in LTE, and b) calls from LTE to the CS domain;

3) CS Fallback from LTE, for one or both ends of call, with maintenance of existing PS domain MPS services, either in LTE or in a legacy system, e.g., the GPRS Core; and

4) LTE access to MPS data and video services not under IMS control.

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 within a domain and across domains). 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 signalling and media bearer resources for voice, video, and data) in the originating PLMN based on the originating Service User priority information (i.e., priority indication and 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 User's 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 incoming MPS session establishment attempt, the MPS session shall receive priority treatment (priority access to signaling and media bearer resources for voice, video, and data) in the terminating PLMN, based on the originating Service User priority information.

As an operator option, the terminating network may invoke priority treatment for an incoming session from a non-MPS subscriber to a MPS subscriber (see clause 4).

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 Service User's 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

The Priority Data Bearer Service provides LTE access with MPS priority for data and video services not under IMS control.

When a Service User invokes Priority Data Bearer Service for transport of any data packets to and from that Service User, the network should give priority in admission/upgrade of the Priority Data Bearer(s) 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 shall be given priority for admission/upgrade over non-Priority Data Bearer sessions during times of congestion;
- Data packets belonging to a Priority Data Bearer service shall 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.

The 3GPP network shall be able to support at least 5 user priority levels.

Assignment of priority levels is a matter of regional/national and operator policy.

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. However, certain priority treatments are provided prior to invocation as specified in Section 5.13.

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 visited network and home network support MPS, and roaming agreements are in place for MPS.