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TECHNICAL REPORT

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Contents

Foreword

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Introduction

This Technical Report (TR) presents the results of the feasibility study on Multimedia Priority Service. The intent of this feasibility study is to assess the ability of 3GPP specifications to meet high-level requirements identified for Multimedia Priority Service. This feasibility study consisted of a multi-step process, namely:

- Identify high-level requirements for Multimedia Priority Service.
- Determine relevant 3GPP specifications for Multimedia Priority Service.
- Perform a gap analysis to assess the ability of existing 3GPP specifications to meet the high-level Multimedia Priority Service requirements.

As defined in this document, Multimedia Priority Service 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, Multimedia Priority Service supports priority sessions an "end-to-end" priority basis.

Multimedia Priority Service is intended to be used by qualified and authorized users, i.e., emergency service personnel, only during times of emergency situations and network congestion. Access to Multimedia Priority Service is limited to key personnel and those with leadership responsibilities and is not intended for use by all emergency service personnel. This is to ensure that emergency service personnel cannot "take over" the network and deny other non-emergency service subscribers a reasonable level of service.

Multimedia Priority Service providers should adhere to uniform, nationwide operating access procedures. Multimedia Priority Service can provide significant benefits for public safety. There may be times during emergencies when non-Service Users will be unable to obtain access to their wireless services (because Multimedia Priority Service personnel are using the channels); nevertheless, the benefits of Multimedia Priority Service outweigh any inconvenience to non-Service Users.

It is assumed that Multimedia Priority Service will be available at all times in equipped markets in both the HPLMN and VPLMN within a country where the PLMN provider is offering the service. The capability for pre-emption could be supported, with the option to turn it on/off depending on regional requirements. Multimedia Priority Service is applicable to both GERAN and UTRAN and is activated on a per session basis using Multimedia Priority Service procedure described in clause 4.8.

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

1 Scope

This Technical Report (TR) presents the results of the feasibility study on Multimedia Priority Service. The intent of this feasibility study is to assess the ability of 3GPP specifications to meet high-level requirements identified for Multimedia Priority Service. This feasibility study consisted of a multi-step process, namely:

- Identify high-level requirements for Multimedia Priority Service.
- Determine relevant 3GPP specifications for Multimedia Priority Service.
- Perform a Gap Analysis to assess the ability of existing 3GPP specifications to meet the high-level Multimedia Priority Service requirements.

Additional functionalities not documented in this TR are considered outside the scope of this TR. Such additional functionality may be on a network-wide basis, nation-wide basis or particular to a group of users..

The Multimedia Priority Service is intended to be utilised for both Voice and Data in the Packet-switched (PS) domain and the IP Multimedia Subsystem (IMS).

The Multimedia Priority Service is intended to interwork with external networks to provide an end-to-end service. Therefore, service interactions with external networks are considered within the scope of this document, although the specification of these interactions may be in other standards. If this occurs, a reference to that specification is made.

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 TS 22.228: "Service requirements for the Internet Protocol (IP) multimedia core network subsystem (IMS); Stage 1".

[3] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[4] 3GPP TS 24.229: "Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[5] 3GPP TS 23.002: "Network architecture".

[6] 3GPP TR 22.952: "Priority Service Guide".

[7] IETF RFC [4412]: "Communications Resource Priority for Session Initiation Protocol (SIP)".

[8] 3GPP TR 22.950: "Priority Service feasibility study".

3 Definitions and abbreviations

Refer to [1] for definitions and abbreviations used in this document that are not defined below.

3.1 Definitions

Service User: Subscriber to Multimedia Priority Service

3.2 Abbreviations

MPS Multimedia Priority Service

4 High-level requirements

The following clauses describe the high-level requirements to support Multimedia Priority Service. These high-level requirements are used as a basis for the gap analysis described in Clause 6.

4.1 Priority Session origination

A session shall receive priority ingress treatment (priority access to voice or traffic channels) for session origination, when the session is setup by a Service User using the multimedia priority service procedure described in clause 4.8.

4.2 Priority Session establishment to called party

A session shall receive priority egress treatment (priority access to voice or traffic channels) for session delivery to the terminating resource/user (e.g., called party), when the session is setup by a Service User using the priority service procedure described in clause 4.8.

4.3 Priority Session progression

The Service User shall receive priority session treatment/progression through the mobile network(s). A priority session should be given higher priority over normal sessions in the originating mobile network, the interconnected networks and the terminating network.

4.4 Priority radio resource queuing

Multimedia Priority Service assumes a signalling channel is available.

When a Multimedia Priority Service session encounters a "no radio available" condition in the session path involving an ingress or egress air-interface, or both, and,

- at session origination, and upon recognition of the Multimedia Priority Service code, the Multimedia Priority Service session request is queued in the cell serving the calling party and processed for the next available radio channel in that cell in accordance with the caller"s priority level and session initiation time.

- at session termination upon recognition of a priority session indication in an incoming session request, the Multimedia Priority Service session request is queued in the cell serving the called party and processed for the next available radio channel in that cell in accordance with the session"s priority level and request arrival time.

4.5 Priority levels

A Service User shall be assigned one of *n* priority levels. Priority levels are defined as 1, 2, 3, …, *n* , with 1 being the highest priority level and *n* being the lowest priority level.

4.6 Invocation on demand

Multimedia Priority Service is invoked only when requested and an idle voice or traffic channel required for an origination request is not available.

If an idle voice or traffic channel is available when Multimedia Priority Service is requested, the origination request is allowed to proceed normally without delay.

Invocation of Multimedia Priority Service at ingress access (origination), during session progression (end-to-end), or egress access (termination) is considered complete when one of the following occurs:

- A radio (voice or traffic) channel is assigned to the session (at origination or termination),
- The loss of radio contact or roaming to another PLMN provider"s system (at origination only),
- The Service User cancels the request,
- Expiration of the maximum allowed time to hold for the next available radio (voice or traffic) channel (at origination or termination), or
- Deletion of the Multimedia Priority Service request due to arrival of a higher priority request coupled with lack of queue capacity (at origination or termination).

4.7 Applicability to telecommunications services

Multimedia Priority Service shall be applicable to PS-based services.

4.8 Multimedia Priority Service code/identifier

Multimedia Priority Service is requested by including the Multimedia Priority Service code/identifier in the origination request.

4.9 Roaming

Multimedia Priority Service shall be able to be supported during roaming when the roaming network supports Multimedia Priority Service.

4.10 Handover

Multimedia Priority Service shall be able to be supported during handover.

4.11 Charging

The system should record the following Multimedia Priority Service charging information, in addition to non-Multimedia Priority Service information:

- Multimedia Priority Service invocation attempts.
- Session information (origination and/or termination) on which Multimedia Priority Service was used to gain access to the radio channel.
- Recording of appropriate Multimedia Priority Service information (e.g., Priority Level).

4.12 Queuing requests for bearer resources

Multimedia Priority Service shall be able to support queuing of Multimedia Priority Service requests for bearer resources. Queuing request provides the capability to place a Multimedia Priority Service request that has experienced a congestion condition for bearer resources into a queue associated with the resource until the resource becomes available or until a maximum queuing time has expired.