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3RD GENERATION  
PARTNERSHIP  
PROJECT 2  
"3GPP2"

# ***Multimedia Priority Service (MMPS) for MMD-based Networks – Stage 1 Requirements***

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1 **1 INTRODUCTION**

2  
3 Communication during times of disaster/crisis is critical to ensure that needed  
4 resources are deployed to mitigate the effects of a disaster. Unfortunately, times of  
5 disaster are when network resources are strained and it becomes difficult to access the  
6 public network. During times such as this, it is important to provide capabilities in the  
7 network to allow a certain class of subscribers' access to the scarce network resources.  
8 This would enable the public emergency and safety agencies to appropriately respond to  
9 the situation at hand. Wireless Priority Service for CDMA-based networks has already  
10 been defined by TIA [1]. It is important to ensure that priority service continue to be  
11 offered as networks evolve. Authorized users that respond to disaster or crisis  
12 situations should have priority access to network communication resources in MMD-  
13 based Networks. Multimedia Priority Service (MMPS) will provide the needed priority  
14 capabilities for voice, data, video, messaging and multimedia services to these  
15 authorized users. This document defines the requirements to enable Multimedia Priority  
16 Service (MMPS) in MMD-based Networks.

17 **1.1 REFERENCES**

18  
19 [1] TIA-917. Wireless Priority Service. 2004.  
20

21 **1.2 DEFINITIONS AND ABBREVIATIONS**

- 22 1. MMPS Service User – An individual (or organization) who (or which) has received  
23 a user priority level assignment from a regional authority (i.e., government  
24 agency authorized to issue priority assignments) and has a subscription to a  
25 wireless service with a Commercial Mobile Radio Service (CMRS) provider that  
26 provides MMPS.

27 **2 GENERAL DESCRIPTION**

28 Governmental, military, civil authorities and other essential users of public  
29 telecommunications networks have a need for essential telecommunication services  
30 including voice, data, video, and multimedia in crisis and disaster situations. These  
31 telecommunication services will be needed at the same time that access to the public  
32 networks might be restricted due to damage, congestion, or faults. This situation  
33 warrants mechanisms that provide secure and manageable ways to identify authorized  
34 users, and provide priority communications from access and session set up, through  
35 session completion. Priority is established by the session originator, and will only apply  
36 to terminating parties when the originating party has invoked priority. Any network  
37 mechanisms defined should provide priority treatment to authorized users. In addition  
38 to priority treatment for radio system access, priority treatment includes, but is not  
39 limited to, high probability of session completion, quality of service assurances, and  
40 exemption from restrictive network management controls. While mechanisms have been  
41 defined to provide priority service in traditional circuit-switched voice networks, it is  
42 crucial that priority services continue to be provided in MMD-based Networks.

43 The need for mechanisms to provide Multimedia Priority Service is global in scope.  
44 Several industry bodies, of similar scope as 3GPP2, are currently involved in defining  
45 mechanisms in support of Priority Service. The scope of this requirements document is  
46 to define the requirements for Multimedia Priority Service for MMD-based Networks.  
47 The focus of this MMPS effort will be on session based services using MMD  
48 incorporating packet data and IP transport.

1

## 2 **3 HIGH LEVEL SYSTEM REQUIREMENTS**

### 3 **3.1 General**

4

5 **SYS001** - MMPS Service Users shall be capable of using any service to which they have  
6 subscribed and authorized.

7 Subscription to MMPS should not preclude a subscriber from accessing services  
8 available to non-MMPS subscribers.

9

10 **SYS002** – A MMPS Service User shall be capable of using any terminal supporting  
11 MMD to initiate MMPS.

12 MMPS Service Users should not have to use special terminals or be assigned special  
13 identities/phone numbers to invoke MMPS. It is expected that the terminal will have  
14 mechanisms (e.g. feature codes) to identify to the network that a MMPS session is being  
15 attempted.

16

17 **SYS003** – A MMPS Service User shall be capable of invoking priority services for all  
18 applications provisioned to support the MMPS subscriber. These include, but are not  
19 limited to voice calls, data, video conferencing, text messaging, and email.

20 An MMPS Service User should be able to invoke any service offered by the network and  
21 have their traffic get priority.

22

23 **SYS004** – A MMPS Service User shall be capable of invoking more than one priority  
24 session simultaneously if this capability is offered by the network. For example, making  
25 a priority voice call and sending priority video session simultaneously.

26

27 **SYS005** – A MMPS session shall be exempt from restrictive network management  
28 controls. The network shall support policy controls to enable exemption of network  
29 restrictions for MMPS Service Users.

30 Restrictive network management control such as call gapping in overloaded networks  
31 shall not be used for MMPS sessions unless those controls are critical for network  
32 survivability.

33

### 34 **3.2 Multimedia Priority Service Session Origination**

35

36 **PSO001** – A session shall receive priority radio treatment (priority access to voice or  
37 traffic channels) on the originating network when the session is originated by a MMPS  
38 Service User.

39

### 40 **3.3 Multimedia Priority Service Session Establishment**

41

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1 **PST001** – A session shall receive priority treatment (priority access to voice or traffic  
2 channels) in the mobile terminating network, when the session is originated by a MMPS  
3 Service User.

4 Since MMPS is invoked by an explicit user request, it can only be initiated by the originator of a service. It  
5 only applies to terminations when the originator is an MMPS Service User. The priority of the terminating  
6 party is irrelevant.

7

### 8 **3.4 Multimedia Priority Service Session Progression**

9

10 **PCP001** – A MMPS Service User shall receive priority session treatment/progression  
11 through the mobile network(s). Under congestion conditions, an authorized MMPS  
12 session shall be given priority over normal sessions in the originating mobile networks,  
13 and in the terminating mobile network. In case the MMPS session traverses or  
14 terminates in other networks (e.g. the PSTN), the network shall support the capability to  
15 indicate to the other network that this is a MMPS session. Sessions should not be pre-  
16 empted.

17

### 18 **3.5 Priority Radio Resource Queuing**

19 **PRP001** – When a MMPS Service User encounters a “no resource available” condition in  
20 the session origination, the Multimedia Priority Service session request shall be:

- 21 — Queued in the cell serving the calling party,
- 22 — Processed for the next available radio resources in that cell in accordance  
23 with the MMPS Service User’s priority level and session initiation time.

24

25 **PRP002** – When a MMPS Service User encounters a “no resource available” condition in  
26 the session path in the terminating mobile network at session establishment, the  
27 Multimedia Priority Service session shall be:

- 28 — Queued in the cell serving the called party.
- 29 — Processed for the next available radio resources in that cell in accordance  
30 with the MMPS Service User’s priority level and call arrival time.

31

32 **PRP003** – The network shall support the capability to inform the MMPS Service User  
33 about the status of the MMPS session (e.g., tones or signaling messages can be used to  
34 indicate that the session request has been queued).

35

### 36 **3.6 MMPS Service User Priority Levels**

37 **PL001** – The MMPS Service User shall be assigned one of n user priority levels.

38 The user priority levels are defined with 1 being the highest user priority level and n  
39 being the lowest user priority level. In case of interconnecting networks with different  
40 priority levels, mappings between priority levels will have be established based on  
41 service agreements.

42

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### 3.7 Invocation on Demand

**IOD001** – MMPS radio priority shall be invoked only when requested by the MMPS Service User and an idle voice or traffic radio resources required for an origination session request are not available.

**IOD002** – If an idle voice or traffic radio resources are available when MMPS is requested, the originating session request shall be allowed to proceed normally without delay.

An indication that this is a MMPS session should be propagated regardless of availability of resources in the originating network.

### 3.8 Roaming

**RO01** – MMPS shall be supported for the MMPS Service User during roaming when the serving network supports MMPS.

### 3.9 Handoff

**Hand001** – MMPS shall be supported during the handoff.

This requirement is intended to ensure that the sessions continue to get priority treatment in the network after the handoff. This priority treatment applies both to bearer and signaling. This requirement also applies to inter-system and inter-technology handoffs if MMPS is supported by the target network.

### 3.10 Charging Data Record

**CDR001** – A network supporting MMPS shall be capable of recording the following information in addition to non- MMPS information:

- Multimedia Priority Service invocation attempt and successful session set-up
- Call legs (originations and/or terminations) on which MMPS was used to gain access to resources
- Recording of Priority Service information, e.g. priority level

### 3.11 Queuing for Network Bearer Resources

**QBR001** –MMPS shall enable priority capabilities in the core network for a Multimedia Priority Service session for bearer resources (e.g., message queuing, MPLS paths).

### 3.12 Authorization

**Auth001** - Access to MMPS shall be determined based on the subscriber's profile.

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2 **Auth002** – A network supporting MMPS shall be capable of specifying additional levels  
3 of authorization (e.g., use of a pin).

4

5 **Auth003** - The network should be capable of preventing access by unauthorized MMPS  
6 users (e.g. “spoofed” users tying up resources with multiple originations).

7

### **3.13 Multimedia Priority Service (MMPS) Invocation**

9 **PSC001** – MMPS shall be capable of being invoked on a per-session basis by an  
10 explicit user action.

11

## 4 Use Cases

As described in the Introduction, Priority Service has been defined for traditional CDMA and GSM networks, and is currently offered as a service by some network providers. The goal of this document is to define the requirements that need to be supported in MMD-based Networks to enable Multimedia Priority Service. This section presents Use Cases for initial discussion.

### 4.1 Use Case 1 – Mobile to Mobile Voice Call

A hurricane has hit a major metropolitan city. A government official tries to make a regular voice call to report the situation to his superiors but is unable to get access to the MMD-based wireless network. The government official tries the call again by using MMPS. The official dials the MMPS Service Code (SC) and the destination number. The wireless network recognizes the SC and is aware that a MMPS voice call is being attempted. The wireless network checks the subscription profile to ensure that the subscriber is allowed to make MMPS voice calls. The wireless network then attempts to allocate radio resources. All radio resources are busy and therefore the network radio queues the MMPS Service User's call request. The network allocates the next available radio network resource to the MMPS session and allows it to progress in the network. The call is destined to another mobile/wireless phone. The terminating mobile network also provides priority terminating access to the MMPS call. The call is terminated to its destination in the mobile network.

### 4.2 Use Case 2 – Mobile to PSTN Voice Call

This use case illustrates a scenario where a MMPS session originates in the MMD-based wireless network and terminates in the traditional PSTN. A MMPS Service User originates a MMPS session by dialing the SC and the destination number. The wireless network allocates radio network resources to the MMPS Service User with priority over other non-MMPS users under congestion conditions. The session request will be queued if no radio network resources are available. The MMPS session will get priority to radio network resources in the mobile network, and the network will pass on the priority service indication and the user's priority level when the session interconnects with the PSTN. It is expected that the session will receive priority access to resources in the PSTN. The session gets terminated to a PSTN endpoint.

**4.3 Use Case 3 – Streaming Video**

A MMPS Service User initiates a streaming video session to the control center related to a disaster. The MMPS video session is initiated by the MMPS Service User invoking the SC. The MMD-based Network recognizes the session as a MMPS session and tries to allocate radio resources for the video session. If radio resources are not available, the session request is queued and the subscriber is informed of this action. The network will allocate the next available radio resource to the queued session request. Access to radio resources is determined by the user's priority level and the time of arrival in the queue. A MMPS session with a higher user priority level will get access to radio resources sooner than sessions with a user lower priority level. Access to radio resources for MMPS session requests with the same user priority level will be determined by the time of entry into the queue, that is first in first out. Once radio resources are available, the network will allocate the radio resources needed to transmit the streaming video.

**4.4 Use Case 4 – VoIP**

When a Service User initiates a MMPS session, the network recognizes the user as a MMPS subscriber requesting MMPS, and allocates network resources with priority over other non-MMPS subscribers attempting to initiate sessions, if congestion occurs.

If network resources (e.g., radio or other bearer access) are not immediately available, the network places the VoIP session request in a session (admission) request queue for the next available network resource.

The network provides feedback to the MMPS Service User on the status (either tones or short message) of the MMPS session request.

MMPS information (e.g., user's priority level, MMPS indicator) associated with the VoIP session is conveyed end-to-end to be used for the session establishment..