**SA WG2 Meeting SA2#143-e S2-2xxxxxx**

**24 February – 9 March, 2021, Electronic meeting (revision of S2-2009411)**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.401** | **CR** | **<CR#>** | **rev** | **<Rev#>** | **Current version:** | **<Version#>** |  |
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| *For* ***HE******LP*** *on using this form: comprehensive instructions can be found at  http://www.3gpp.org/Change-Requests.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Multimedia Priority Service (MPS) Phase 2 support for Data Transport Service | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Perspecta Labs, CISA ECD, AT&T, T-Mobile USA, Nokia, Nokia Shanghai-Bell, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | MPS2 | | | | |  | ***Date:*** | | | DD MM 2021 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP TR 21.900. | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)*  *Rel-17 (Release 17)* | |
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| ***Reason for change:*** | | MPS for DTS provides the Service User with priority for applications using the default bearer in the EPS, to one or more selected active Packet Data Networks (PDNs), in periods of severe network congestion during which normal commercial data service is degraded.  This CR supports stage 1 requirements, TS 22.153, clause 9.3.1:  The system shall support:   * MPS for DTS for an authorized Service User using a UE with a subscription for MPS, and * MPS for DTS for an authorized Service User using a UE that does not have an MPS subscription.   TS 23.401 currently does not support MPS for DTS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Added a new DTS abbreviation; 2. Added MPS for DTS material to a general clause and included a new clause on MPS for DTS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | No support for MPS for DTS in Release 17. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.2, 4.3.18.1, 4.3.18.3X (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | CR for TS 23.203 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | This CR updates endorsed Draft CR S2-2009411 from meeting SA2#142-e, November 16-20, 2020 based on additional discussion with stakeholders. | | | | | | | | |

*FIRST CHANGE*

## 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].

5GS 5G System

AF Application Function

ARP Allocation and Retention Priority

AMBR Aggregate Maximum Bit Rate

CBC Cell Broadcast Centre

CBE Cell Broadcast Entity

CIoT Cellular IoT

CSG Closed Subscriber Group

CSG ID Closed Subscriber Group Identity

C-SGN CIoT Serving Gateway Node

CSS CSG Subscriber Server

DCN Dedicated Core Network

DeNB Donor eNode B

DL TFT DownLink Traffic Flow Template

DRX Discontinuous Reception

DTS Data Transport Service

ECGI E-UTRAN Cell Global Identifier

ECM EPS Connection Management

ECN Explicit Congestion Notification

EMM EPS Mobility Management

eNB evolved Node B

EPC Evolved Packet Core

EPS Evolved Packet System

E-RAB E-UTRAN Radio Access Bearer

E-UTRAN Evolved Universal Terrestrial Radio Access Network

GBR Guaranteed Bit Rate

GUMMEI Globally Unique MME Identifier

GUTI Globally Unique Temporary Identity

GW Gateway

HeNB Home eNode B

HeNB GW Home eNode B Gateway

HFN Hyper Frame Number

IOPS Isolated E-UTRAN Operation for Public Safety

IoT Internet of Things

ISR Idle mode Signalling Reduction

LAA Licensed Assisted Access

LBI Linked EPS Bearer Id

L-GW Local GateWay

LIPA Local IP Access

LWA LTE/WLAN Aggregation

LWIP LTE/WLAN Radio Level Integration with IPsec Tunnel

MBR Maximum Bit Rate

MME Mobility Management Entity

MMEC MME Code

MTC Machine-Type Communications

M-TMSI M-Temporary Mobile Subscriber Identity

NB-IoT Narrowband IoT

NR New Radio

OCS Online Charging System

OFCS Offline Charging System

OMC-ID Operation and Maintenance Centre Identity

P‑GW PDN Gateway

PCC Policy and Charging Control

PCRF Policy and Charging Rules Function

PRA Presence Reporting Area

PDCP Packet Data Convergence Protocol

PMIP Proxy Mobile IP

PSAP Public Safety Answering Point

PSM Power Saving Mode

PTI Procedure Transaction Id

QCI QoS Class Identifier

RACS UE Radio Capability Signalling optimization

RCAF RAN Congestion Awareness Function

RFSP RAT/Frequency Selection Priority

RLOS Restricted Local Operator Services

RN Relay Node

RUCI RAN User Plane Congestion Information

S‑GW Serving Gateway

S-TMSI S-Temporary Mobile Subscriber Identity

SDF Service Data Flow

SIPTO Selected IP Traffic Offload

TAC Tracking Area Code

TAD Traffic Aggregate Description

TAI Tracking Area Identity

TAU Tracking Area Update

TI Transaction Identifier

TIN Temporary Identity used in Next update

UCMF UE radio Capability Management Function

URRP-MME UE Reachability Request Parameter for MME

UL TFT UpLink Traffic Flow Template

ULR-Flags Update Location Request Flags

*SECOND CHANGE*

#### 4.3.18.1 General

Multimedia Priority Service (MPS) allows certain subscribers (i.e. Service Users as per TS 22.153 [68]) priority access to system resources in situations such as during congestion, creating the ability to deliver or complete sessions of a high priority nature. Service Users are government-authorized personnel, emergency management officials and/or other authorized users. MPS supports priority sessions on an "end-to-end" priority basis.

MPS is based on the ability to invoke, modify, maintain and release sessions with priority, and deliver the priority media packets under network congestion conditions. MPS is supported in a roaming environment when roaming agreements are in place and where regulatory requirements apply.

NOTE 1: If a session terminates on a server in the Internet (e.g. web-based service), then the remote end and the Internet transport are out of scope for this specification.

A Service User obtains priority access to the Radio Access Network by using the Access Class Barring mechanism according to TS 36.331 [37] and TS 22.011 [67]. This mechanism provides preferential access to UEs based on its assigned Access Class. If a Service User belongs to one of the special access-classes as defined in TS 22.011 [67], the UE has preferential access to the network compared to ordinary users in periods of congestion.

MPS subscription allows users to receive priority services, if the network supports MPS. MPS subscription entitles a USIM with special Access Class(es). MPS subscription includes indication for support of Priority EPS Bearer Service including MPS for DTS, IMS priority service, and CS Fallback priority service support for the end user. Priority level regarding Priority EPS Bearer Service including MPS for DTS, and IMS are also part of the MPS subscription information. The usage of priority level is defined in TS 23.203 [6] and TS 23.228 [52].

An MPS Service User is treated as an On Demand MPS subscriber or not, based on regional/national regulatory requirements. On Demand service is based on Service User invocation/revocation explicitly and applied to the PDN connections for an APN. When not On Demand, MPS service does not require invocation, and provides priority treatment for all EPS bearers for a given Service User after attachment to the EPS network.

NOTE 2: According to regional/national regulatory requirements and operator policy, On-Demand MPS Service Users can be assigned the highest priority.

For this release of the specification, MPS is supported for E-UTRAN access only in case of 3GPP accesses.

Since the Service User has an access class within the range for priority services, the Establishment Cause in RRC connection request is set to highPriorityAccess. When the eNodeB receives mobile initiated signalling with establishment cause set to highPriorityAccess, the eNodeB handles the RRC connection request with priority. When the MME receives and verifies mobile initiated signalling with establishment cause set to highPriorityAccess, the MME establishes the S1 bearer with priority.

The terminating network identifies the priority of the MPS session and applies priority treatment, including paging with priority, to ensure that the MPS session can be established with priority to the terminating user (either a Service User or normal user).

Priority treatment for MPS includes priority message handling, including priority treatment during authentication, security, and location management procedures.

Priority treatment for MPS session requires appropriate ARP and QCI (where necessary for non-GBR bearers) setting for bearers according to the operator's policy.

When an MPS session is requested by a Service User, the following bearer management principles apply in the network:

- EPS bearers (including default bearer) employed in an MPS session shall be assigned ARP value settings appropriate for the priority level of the Service User.

- Setting ARP pre-emption capability and vulnerability for MPS bearers, subject to operator policies and depending on national/regional regulatory requirements.

- Pre-emption of non-Service Users over Service Users during network congestion situation, subject to operator policy and national/regional regulations.

Priority treatment is applicable to IMS based multimedia services, priority EPS bearer services (PS data without IMS interaction) including MPS for DTS, and CS Fallback.

For Multimedia Priority services any EPC functions, procedures and capabilities are provided according to this clause's specification except when specified differently in the following clauses.

*THIRD and LAST CHANGE*

#### 4.3.18.3 Priority EPS Bearer Services

The Service User receives on demand priority treatment according to its MPS profile, i.e. On-Demand. If the Service User is not authorized to use on-demand priority request, the Service User receives priority treatment (i.e. appropriate ARP and QCI ) at initial attach for all bearers, based on user profile data stored in the HSS/SPR and authorized by the PCRF (see TS 23.203 [6], clause 7.2).

An On-Demand Service User requires explicit invocation/revocation via SPR MPS user profile update (see TS 23.203 [6], clause 7.5). Since MPS user profile are part of inputs for PCC rules, the update will trigger PCC rules modification to achieve appropriate ARP and QCI settings for bearers (see TS 23.203 [6], clause 7.4.2).

When the eNodeB receives mobile initiated signalling with establishment cause set to highPriorityAccess, the eNodeB handles the RRC connection request with priority. When the MME receives and verifies mobile initiated signalling with establishment cause set to highPriorityAccess, the MME establishes the S1 bearer with priority. Based on MPS EPS priority subscription, MME can verify whether the UE is permitted to handle the request preferentially comparing to other UEs not prioritized.

An AF for MPS Priority Service is used to provide Priority EPS Bearer Services using network-initiated resource allocation procedures (via interaction with PCC) for originating accesses.

NOTE: Use of 3rd party AF for MPS services for Service Users is outside the scope of 3GPP specification.

#### 4.3.18.3X MPS for Data Transport Service

MPS for DTS is an on-demand service that may be invoked/revoked by an authorized MPS Service User using a UE with a subscription for MPS (i.e., according to its MPS profile), or using a UE that does not have a subscription for MPS (i.e., using authorization methods outside the scope of 3GPP).

MPS for DTS is the means for an AF to invoke/revoke Priority EPS Bearer Service for the default bearer of a specific APN supporting/enabling MPS for DTS traffic.

NOTE 1: MPS for DTS can be applied to any APN other than the well-known APN for IMS.

MPS for DTS requires explicit invocation. The Service User invokes the service by communicating with an AF that interacts with the PCRF over Rx to request QoS modifications in the EPS. The invocation is done for the default bearer to a specific APN and the QoS upgrade shall be specifically made to the existing default bearer. For MPS for DTS, the AF may create an SDF for signaling priority between the UE and the AF.

The MPS for DTS request is used to determine the appropriate ARP and QCI settings to modify the default bearer. In addition, the PCC rules for the SDFs associated with the default bearer shall be modified per TS 23.203 [6], clause 6.1.11.X.

NOTE 2: The network can hide its topology from the AF supporting MPS for DTS. At the same time, the UE needs to provide its locally known IP address to the AF supporting MPS for DTS to support Diameter routing to the applicable PCRF. Thus, there can be no NAT of the UE IP address between the PDN-GW and the AF supporting MPS for DTS.

*END OF CHANGES*