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Technical Report

3rd Generation Partnership Project;

Technical Specification Group Services and System Aspects;

Study on Mission Critical services support over 5G System

(Release 16)

** 

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# Foreword

This Technical Report 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

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

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

z the third digit is incremented when editorial only changes have been incorporated in the document.

# Introduction

This clause is optional. If it exists, it is always the second unnumbered clause.

# 1 Scope

The present document describes the impacts on and the necessary changes in the Stage 2 Mission Critical specifications to ensure that the set of Mission Critical services is supported over the 5GS.

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

Editor's note: Further numbered references to be inserted here

# 3 Definitions and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP 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 3GPP TR 21.905 [1].

**example:** text used to clarify abstract rules by applying them literally.

Editor's note: Example line above to be deleted and replaced by definitions as needed.

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP 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 3GPP TR 21.905 [1].

<ACRONYM> <Explanation>

Editor's note: Example line above to be deleted and replaced by definitions as needed.

# 4 Subclauses in Mission Critical Specifications containing 4G specific terminology

## 4.1 Introduction

Editor's note: To be replaced by introductory text describing the approach.

## 4.2 TS 23.280

### 4.2.1 Proposed change to 1 Scope

This document specifies the common functional architecture, procedures and information flows needed to support mission critical services including the common services core architecture.

The corresponding service requirements are defined in 3GPP TS 22.179 [2], 3GPP TS 22.280 [3], 3GPP TS 22.281 [4] and 3GPP TS 22.282 [5].

The present document is applicable primarily to mission critical services using E-UTRAN access based on the EPC architecture defined in 3GPP TS 23.401 [17] and using 5GS access based on the 5G System architecture defined in 3GPP TS 23.501[X]. Certain MC service functions such as dispatch and administrative functions could also be supported via non-3GPP access networks but no additional functionality is specified to support non-3GPP access.

The common functional architecture to support mission critical services can be used for public safety applications and also for general commercial applications e.g. utility companies and railways.

### 4.2.2 Proposed change to 2 References

Add reference:

[X] 3GPP TS 23.501: "System Architecture for the 5G System".

### 4.2.3 Proposed change to 3.2 Abbreviations

Insert abbreviation:

5GC 5G Core Network

### 4.2.4 Proposed change to 4 Introduction

A common functional architecture to support MC services (i.e., MCPTT defined in 3GPP TS 23.379 [16], MCVideo defined in 3GPP TS 23.281 [12], MCData defined in 3GPP TS 23.282 [13]) including common application plane and signalling plane entities is specified in this document.

Each MC service supports several types of communications amongst the users (e.g. group call, private call). There are several common functions and entities (e.g. group, configuration, identity) which are used by the MC services.

The common functional architecture to support MC services utilises aspects of the IMS architecture defined in 3GPP TS 23.228 [9], the Proximity-based Services (ProSe) architecture defined in 3GPP TS 23.303 [14], the Group Communication System Enablers for LTE (GCSE\_LTE) architecture defined in 3GPP TS 23.468 [18] and the PS-PS access transfer procedures defined in 3GPP TS 23.237 [10].

The MC service UE primarily obtains access to a MC service via E-UTRAN, using the EPS architecture defined in 3GPP TS 23.401 [17] and using 5GS access based on the 5G System architecture defined in 3GPP TS 23.501[X]. Certain MC service functions such as dispatch and administrative functions can be supported using either MC service UEs in E-UTRAN, using MC service UEs in 5GS or using MC service UEs via non-3GPP access networks. External applications usage of MC services can be enabled via E-UTRAN, 5GS or non-3GPP access networks.

NOTE: Dispatch consoles and devices used by MC service administrators are considered MC service UEs in the common functional architecture to support MC services.

### 4.2.X Proposed change to <Y> <Title>

Editor's note: Proposed modification to cover both 4G and 5GS, using highlighting, hard-strikeout of removed text and hard-underlining for new text.

## 4.3 TS 23.281

### 4.3.X Proposed change to <Y> <Title>

Editor's note: Proposed modification to cover both 4G and 5GS, using highlighting, hard-strikeout of removed text and hard-underlining for new text.

## 4.4 TS 23.282

### 4.4.X Proposed change to <Y> <Title>

Editor's note: Proposed modification to cover both 4G and 5GS, using highlighting, hard-strikeout of removed text and hard-underlining for new text.

## 4.5 TS 23.283

### 4.5.X Proposed change to <Y> <Title>

Editor's note: Proposed modification to cover both 4G and 5GS, using highlighting, hard-strikeout of removed text and hard-underlining for new text.

## 4.6 TS 23.379

### 4.6.X Proposed change to <Y> <Title>

Editor's note: Proposed modification to cover both 4G and 5GS, using highlighting, hard-strikeout of removed text and hard-underlining for new text.

## 4.7 TS 23.479

### 4.7.X Proposed change to <Y> <Title>

Editor's note: Proposed modification to cover both 4G and 5GS, using highlighting, hard-strikeout of removed text and hard-underlining for new text.

# 5 5GS aspects to support Mission Critical architecture

## 5.X <Example>

### 5.X.1 General description

### 5.X.2 Impact

# 6 Key issues to ensure support of Mission Critical services over 5GS

## 6.1 Key issue 1: Service continuity between on-network MC services and UE-to-network relay MC service

### 6.1.1 Description

Service continuity between on-network MC services and UE-to-network relay MC services is currently not supported by 5GS.

This has impact to:

- TS 23.280 subclause 5.1.1, 5.2.3, 8.3.1, 9.2.1.5, 9.2.1.6, 10.5.1, 10.5.2, 10.7.3.7.3, Annex B.1

The search terms to create the above list are: UE-R and UE-to-network relay. Occurrences of these terms have been highlighted in a copy of the TS in annex A of this report.

### 6.1.2 Architectural requirements

Editor's Note: Capture agreements on architectural requirements for solving the key issue. This clause may be omitted if deemed unnecessary.

## 6.2 Key issue 2: 5GC level roaming

### 6.2.1 Description

5GC level roaming is FFS.

This has impact to:

- TS 23.280 subclause 5.2.2, 5.2.9.2, 9.4

Occurrences of the term EPC-level roaming have been highlighted in a copy of the TS in annex A of this report.

### 6.2.2 Architectural requirements

Editor's Note: Capture agreements on architectural requirements for solving the key issue. This clause may be omitted if deemed unnecessary.

## 6.3 Key issue 3: Use of multicast

### 6.3.1 Description

The use of multicast in 5GS is FFS.

This has impact to:

- TS 23.280 subclause 5.2.1, 5.2.6, 5.2.7.1, 7.2, 7.3.1, 7.4.2.3.2, 7.5.3.2, 7.5.3.3, all of 10.7, 10.9.3.1, 10.11.4;

- TS 23.379 subclause 5.7.4, 7.3.1, 7.4.2.3.2, 7.5.2.2, 7.5.2.7, 7.5.2.9, 7.5.2.10, 10.6.2.5.2.4, 10.9.1.6, all of 10.10;

- TS 23.281 subclause 5.5.4, 6.1.1, 6.2.2.3.2, 6.3.4B, 6.3.6, 6.3.7, all of 7.10; and

- TS 23.282 subclause 5.4, 5.8.4, 6.4.3.1.2, 6.4.4.1.4, 6.5.4.1.3, 6.6.4.1.3, 6.6.4.1.5, 6.7.4.1.3, all of 7.3, 7.5.2.7.2, 7.7.2.2.2.1, 7.7.2.3.2.1

The search terms to create the above list are: GCSE\_LTE, MBMS, BM-SC, MB2-U, MB2-C, GC1, TMGI, MBSFN, ECGI, SAI, TS 23.246, TS 23.468 and TS 29.468. Occurrences of these terms have been highlighted in copies of the TSs in annex A, annex B, annex C and annex D of this report.

### 6.3.2 Architectural requirements

Editor's Note: Capture agreements on architectural requirements for solving the key issue. This clause may be omitted if deemed unnecessary.

## 6.4 Key issue 4: ProSe

### 6.4.1 Description

A equivalent to ProSe in 5GS is FFS.

This has impact to:

- TS 23.280 subclause 5.1.1, 5.2.3, 8.1.3.2, 9.2.1.5, 9.2.1.6, 9.3.2, 10.5.1, 10.5.2, 10.7.2.1, 10.7.2.5, 10.7.3.7.3, 10.10.2.2.1, 10.10.2.2.2, A.4, B.1;

- TS 23.379 subclause 10.6.3.3, 10.6.3.9.1, 10.7.3.2, A.2, A.3, A.4, A.5;

- TS 23.281 subclause 7.1.3.3.2, 7.1.3.4.2, 7.1.3.5.2, 7.1.3.8.1, 7.1.3.8.2, 7.2.3.3, 7.2.3.4.2, 7.2.3.5.2, 7.2.3.5.3, 7.3.3.3.2, 7.4.3.3.2, 7.4.3.4.2, 7.5.3.3.2, 7.5.3.4.2, 7.5.3.4.3, 7.5.3.5.2, 7.5.3.5.3, 7.7.2.1, A.2, A.3, A.4, A.5; and

- TS 23.282 subclause 7.4.3.3.2, 7.4.3.4.2, 7.5.3.3.2, 7.5.3.4.2, 7.8.3.1.1, 7.8.3.2.1, 7.9.4.1.1, A.2, A.3, A.4, A.5;

The search terms to create the above list are: PC5, ProSe, TS 23.303. Occurrences of these terms have been highlighted in copies of the TSs in annex A, annex B, annex C and annex D of this report.

### 6.4.2 Architectural requirements

Editor's Note: Capture agreements on architectural requirements for solving the key issue. This clause may be omitted if deemed unnecessary.

## 6.5 Key issue 5: APN

### 6.5.1 Description

The impact of the APN alternative in 5GS is FFS.

This has impact to:

- TS 23.280 subclause 5.2.7.0, 5.2.7.2, 5.2.9.2, A.6;

- TS 23.379 subclause 5.7.1;

- TS 23.281 subclause 5.5.1; and

- TS 23.282 subclause 5.8.1;

The search terms to create the above list are: APN, APNs, PAP, CHAP. Occurrences of these terms have been highlighted in copies of the TSs in annex A, annex B, annex C and annex D of this report.

### 6.5.2 Architectural requirements

Editor's Note: Capture agreements on architectural requirements for solving the key issue. This clause may be omitted if deemed unnecessary.

## 6.6 Key issue 6: resource control

### 6.6.1 Description

The impact of different resource control (including 5QI) in 5GS is FFS.

This has impact to:

- TS 23.280 subclause 5.2.7.2, 7.2, 10.7.2.1, 10.7.2.4, 10.7.2.5, 10.7.2.6, 10.7.2.7, 10.11.2, 10.11.3, 10.11.5.2;

- TS 23.379 subclause 5.7.3, 7.5.2.6;

- TS 23.281 subclause 5.5.3, 6.3.4A; and

- TS 23.282 subclause 5.8.3, 6.4.4.1.3A;

The search term to create the above list is: QCI, TS 23.203. Occurrences of these terms have been highlighted in copies of the TSs in annex A, annex B, annex C and annex D of this report.

### 6.6.2 Architectural requirements

Editor's Note: Capture agreements on architectural requirements for solving the key issue. This clause may be omitted if deemed unnecessary.

## 6.x Key issue x: <Key issue title>

### 6.x.1 Description

Editor's Note: Describe the key issue (i.e. problem statement), including technical constraints and interpretations.

### 6.x.2 Architectural requirements

Editor's Note: Capture agreements on architectural requirements for solving the key issue. This clause may be omitted if deemed unnecessary.

# 7 Solutions to ensure support of Mission Critical services over 5GS

## 7.x Solution x: <Solution title>

### 7.x.1 Description

Editor's Note: Describe the solutions. Sub-clause(s) may be added to capture details, procedural flow etc.

### 7.x.2 Impacts on existing nodes and functionality

Editor's Note: Capture impacts on existing 3GPP nodes and functional elements.

### 7.x.3 Solution evaluation

Editor's Note: Use this section for evaluation at solution level.

# 8 Overall evaluation

Editor's Note: This clause will provide evaluation of different solutions.

# 9 Conclusions

Editor's Note: This clause is intended to list conclusions that have been agreed during the course of the study item activities.

Annex A:  
Copy of TS 23.280 with highlighted E-UTRAN/EPS specific terminology and references

Editor's note:   
 This copy of TS 23.280 has the following terminology highlighted, identified as E-UTRAN/EPS specific:  
UE-R, UE-to-network relay,   
EPC-level roaming,   
GCSE\_LTE, MBMS, BM-SC, MB2-U, MB2-C, GC1, TMGI, MBSFN, ECGI, SAI, TS 23.246, TS 23.468, TS‑29.468,   
PC5, ProSe, TS 23.303,   
APN, PAP, CHAP,   
QCI, TS 23.203,   
LTE, EPS, EPC, E-UTRAN, eNB, TS 23.401, TS 36.300, GSMA PRD IR.88, TS 36.331

Annex B:  
Copy of TS 23.379 with highlighted E-UTRAN/EPS specific terminology and references

Editor's note:   
 This copy of TS 23.379 has the following terminology highlighted, identified as E-UTRAN/EPS specific:  
UE-R, UE-to-network relay,   
EPC-level roaming,   
GCSE\_LTE, MBMS, BM-SC, MB2-U, MB2-C, GC1, TMGI, MBSFN, ECGI, SAI, TS 23.246, TS 23.468, TS‑29.468,   
PC5, ProSe, TS 23.303,   
APN, PAP, CHAP,   
QCI, TS 23.203,   
LTE, EPS, EPC, E-UTRAN, eNB, TS 23.401, TS 36.300, GSMA PRD IR.88, TS 36.331

Annex C:  
Copy of TS 23.281 with highlighted E-UTRAN/EPS specific terminology and references

Editor's note:   
This copy of TS 23.281 has the following terminology highlighted, identified as E-UTRAN/EPS specific:  
UE-R, UE-to-network relay,   
EPC-level roaming,   
GCSE\_LTE, MBMS, BM-SC, MB2-U, MB2-C, GC1, TMGI, MBSFN, ECGI, SAI, TS 23.246, TS 23.468, TS‑29.468,   
PC5, ProSe, TS 23.303,   
APN, PAP, CHAP,   
QCI, TS 23.203,   
LTE, EPS, EPC, E-UTRAN, eNB, TS 23.401, TS 36.300, GSMA PRD IR.88, TS 36.331

Annex D:  
Copy of TS 23.282 with highlighted E-UTRAN/EPS specific terminology and references

Editor's note:   
This copy of TS 23.282 has the following terminology highlighted, identified as E-UTRAN/EPS specific:  
UE-R, UE-to-network relay,   
EPC-level roaming,   
GCSE\_LTE, MBMS, BM-SC, MB2-U, MB2-C, GC1, TMGI, MBSFN, ECGI, SAI, TS 23.246, TS 23.468, TS‑29.468,   
PC5, ProSe, TS 23.303,   
APN, PAP, CHAP,   
QCI, TS 23.203,   
LTE, EPS, EPC, E-UTRAN, eNB, TS 23.401, TS 36.300, GSMA PRD IR.88, TS 36.331

Annex E:  
Copy of TS 23.283 with highlighted E-UTRAN/EPS specific terminology and references

Editor's note:   
This copy of TS 23.283 has the following terminology highlighted, identified as E-UTRAN/EPS specific:  
UE-R, UE-to-network relay,   
EPC-level roaming,   
GCSE\_LTE, MBMS, BM-SC, MB2-U, MB2-C, GC1, TMGI, MBSFN, ECGI, SAI, TS 23.246, TS 23.468, TS‑29.468,   
PC5, ProSe, TS 23.303,   
APN, PAP, CHAP,   
QCI, TS 23.203,   
LTE, EPS, EPC, E-UTRAN, eNB, TS 23.401, TS 36.300, GSMA PRD IR.88, TS 36.331

Annex F:  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2018-07 | SA6#25 |  |  |  |  | Implementation of the following p-CRs approved by SA6:  S6-181194, S6-181196, S6-181197, S6-18199, S6-181200, S6 18201, S6-181251, S6-181267 | 0.0.0 |
| 2018-07 | SA6#25 |  |  |  |  | Correction of the change history to include references to the implemented pCRs | 0.1.0 |
| 2018-10 | SA6#26 |  |  |  |  | Implementation of the following p-CRs approved by SA6:  S6-181516, S6-181517, S6-181518, S6-181519, S6-181566, S6-181567, S6-181568, S6-181569, S6-181570 | 0.2.0 |