

**Phoenix, Arizona, USA, 14 - 15 September 2015**

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**Source:** MCC Work Plan Manager (Alain Sultan)

**Document for:** Information

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# 1 Scope

The present document contains a high-level description of the 3GPP Release 13 Features.

Its latest version is available at: [http://www.3gpp.org/ftp/Information/WORK\\_PLAN/Description\\_Releases/](http://www.3gpp.org/ftp/Information/WORK_PLAN/Description_Releases/)

3G Release 13 - See version 13 of TR [21.101](#)

GSM/EDGE, Phase 2+ Release 13 - See Version 13 of TR [41.101](#)

## Freeze Dates

Release	TS/TR version	Functional freeze date, indicative only (see note)
Rel-13	13.x.y	<b>Stage 1 freeze Sep 2014</b>
		<b>Stage 2 freeze Jun 2015</b>
		<b>Stage 3 freeze Dec 2015</b>

Note: After "freezing", a Release can have no further additional functions added. However, detailed protocol specifications (stage 3) may not yet be complete. In addition, test specs may lag by some considerable time. A "frozen" Technical Specification is one which can have no further category B or C (new or modified functionality) Change Requests, other than to align earlier stages with later stages; thus all TSs pertaining to a Release may not necessarily be frozen at the time the Release itself is functionally frozen. Indeed since Release 7, the trend has been to freeze each of the three stages independently.

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# 2 References

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 21.101: "Technical Specifications and Technical Reports for a UTRAN-based 3GPP system". Version 13.x.y
- [3] 3GPP TS 41.101: "Technical Specifications and Technical Reports for a GERAN-based 3GPP system". Version 13.x.y

## 2.1 Specifications

Global information on the Specifications (also called "specs") can be found at:

<http://www.3gpp.org/specs/specs.htm>

The latest versions of all 3GPP specifications, containing the most recent corrections and additions, are available at:

<http://www.3gpp.org/ftp/Specs/latest/>

For specific purposes, older versions might be needed. These versions are available at:

<http://www.3gpp.org/ftp/Specs/Archive/>

where the specifications are sorted by series and then by folders containing all the available versions of a given spec (one folder per spec), for all Releases.

## 2.2 Tdocs

The Temporary Documents (tdocs) are mainly the original papers written by the 3GPP Members, and are the inputs for elaborating the specs. They are available (sorted by 3GPP technical groups (Technical Specification Groups (TSGs) and Working Groups (WGs)) at:

<http://www.3gpp.org/ftp/>

starting with 'tsg....'.

## 2.3 Work Plan, Work Items and Study Items

Work Item Description (WID) / Study Item Description (SID) is a form which initial version provides the target to be reached before starting the work. Potential subsequent versions precise the target and foreseen completion dates according the actual work progress. WIDs / SIDs are stored in:

[http://www.3gpp.org/ftp/Information/WI\\_Sheet/](http://www.3gpp.org/ftp/Information/WI_Sheet/)

The 3GPP Work Plan is a living document, periodically updated, containing the full list of Work Items and Study Items, as well as summary information for each WI, as: the WG in charge of it, its starting date and (foreseen or actual) completion date, the actual progress, etc. The 3GPP Work Plan is available at:

[http://www.3gpp.org/ftp/Information/WORK\\_PLAN/](http://www.3gpp.org/ftp/Information/WORK_PLAN/)

## 2.4 Change Request database

A specification is originally drafted and maintained by a rapporteur, who compiles the contents from discussions in the WGs and TSGs. When it is considered to be 80% complete, it is brought under a so-called "change control" process. After this, changes to the specification can only be made using Change Requests (CRs) that are usually agreed by consensus in the WG responsible for the specification, and then formally approved by the relevant TSG.

The CR database contains information on CRs including a Work Item code, a CR number that is unique for a certain specification (different CR versions are possible, but only one can ever be approved), the status of each CR, references to the source Individual 3GPP Member(s) and relevant WG/TSG temporary documents numbers and meetings.

This database is available in:

[http://www.3gpp.org/ftp/Information/Databases/Change\\_Request/](http://www.3gpp.org/ftp/Information/Databases/Change_Request/)

Further information on CR is available at:

<http://www.3gpp.org/specifications/change-requests>

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## 3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply.



## Mission Critical Push To Talk over LTE

				S1, S2, S3, S6, S4				
620064	<a href="#">Mission Critical Push To Talk over LTE</a>	MCPTT	1		Jan-00	Dec-15	57%	SP-150356
640142	<a href="#">Study on Application Architecture to support Mission Critical Push To Talk over LTE (MCPTT) services</a>	MCPTT	2	S6	Jun-14	Sep-15	100%	SP-150356
670030	<a href="#">SA2 Study on Architecture Enhancements at the EPS and IMS Level to Support Mission Critical Push To Talk over LTE (MCPTT) Services</a>	MCPTT	2	S2	Mar-15	Jun-15	100%	SP-150356
670032	<a href="#">Study on Security Enhancements for Mission Critical Push To Talk over LTE</a>	MCPTT	2	S3	Mar-15	Dec-15	0%	SP-150356
670022	<a href="#">Study on media, codecs and MBMS enhancements for Mission Critical Push to Talk over LTE</a>	MCPTT	2	S4	Dec-14	Dec-15	40%	SP-150356
620164	<a href="#">Stage 1 for Mission Critical Push To Talk over LTE</a>	MCPTT	2	S1	Dec-13	Dec-14	100%	SP-150356
640143	<a href="#">Functional architecture and information flows to support mission critical communication services</a>	MCPTT	2	S6	Jun-15	Sep-15	85%	SP-150356
660053	<a href="#">Security of Mission Critical Push To Talk over LTE</a>	MCPTT	2	S3	Dec-14	Dec-15	15%	SP-150356
670023	<a href="#">MCPTT Codecs and media handling</a>	MCPTT	2	S4	Mar-15	Dec-15	40%	SP-150356
690011	<a href="#">Mission Critical Push To Talk over LTE protocol aspects</a>	MCPTT-CT	2	ct	Sep-15	Dec-15	3%	SP-150356
690017	<a href="#">CT1 aspects for Mission Critical Push To Talk over LTE protocol aspects</a>	MCPTT-CT	3	C1	Sep-15	Dec-15	10%	SP-150356
690028	<a href="#">CT3 aspects for Mission Critical Push To Talk over LTE protocol aspects</a>	MCPTT-CT	3	C1	Sep-15	Dec-15	0%	SP-150356
690018	<a href="#">CT4 aspects for Mission Critical Push To Talk over LTE protocol aspects</a>	MCPTT-CT	3	C4	Sep-15	Dec-15	0%	SP-150356
690019	<a href="#">CT1's MCPTT-Prof (check CT#69)</a>		2		Jan-00	Jan-00	0%	SP-150356
640062	<a href="#">Deleted: SA2 aspects for Mission Critical Push To Talk over LTE</a>	MCPTT	2	S2	Mar-15	Mar-15	100%	SP-150356
670031	<a href="#">Deleted (duplicated): Application Architecture to support Mission Critical Push To Talk over LTE (MCPTT) Services</a>	MCPTT	2	S6	Mar-15	Mar-15	100%	SP-150356
660054	<a href="#">Deleted (duplicated): SA6 aspects for Mission Critical Push To Talk over LTE</a>	MCPTT	2	S6	Dec-14	Dec-15	100%	SP-150356

## 3GPP TSG SA Meeting #68

TD SP-150356

Malmö, Sweden, 17-19 June 2015

revision of TD SP-150217

**Source:** SA6

**Title:** Update to the MCPTT WID

**Document for:** Approval

**Agenda Item:** 13.1

**Work Item / Release:** MCPTT / Rel-13

*Abstract of the contribution: This contribution to SA#68 provides an update to the MCPTT WID approved at TSG SA#67 (SP-150164). It is based on a merger of SP-150217 and SP-150269*

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

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Title: Mission Critical Push To Talk over LTE

Acronym: MCPTT

Unique identifier: 620064

1 3GPP Work Area

X	Radio Access
X	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
530044	Study on Proximity-based Services (FS_ProSe)	TR 22.803 Complementing Study
580059	Proximity-based Services (ProSe)	Complementing Feature Stage 1 in TS 22.115, TS 22.278; Stage 2 in TS 23.303
560020	Group Communication System Enablers for LTE (GCSE_LTE)	Complementary Feature Stage 1 in TS 22.468; Stage 2 in TS 23.468
640141	eProSe_ext	Complementary Feature Stage 1 in TS 22.115, TS 22.278; Stage 2 in TR 23.713, TS 23.303, TBD by SA2
660009	FS_MBMS_enh	Complementary Study

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

X	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any)</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>
FIRSTNET	Push to Talk over LTE requirements for United States public safety	
United Kingdom Home Office	Push to Talk over LTE requirements for United Kingdom public safety	
TCCA	Information about the system improvements requirements for the adoption of LTE for mission/business critical communications	
OMA	Push to talk over Cellular Requirements, Version 1.0 (09 Jun 2006) OMA-RD-PoC-V1_0-20060609-A; Push to talk over Cellular Requirements, Version 2.0 (02 Aug 2011) OMA-RD-PoC-V2_0-20110802-A; and Push to talk over Cellular 2.1 Requirements (02 Aug 2011) OMA-RD-PoC-V2_1-20110802-A	

Go to §3.

### 2.3.2 Stage 2

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>
620164	Mission Critical Push To Talk over LTE (MCPTT)	TS 22.179

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

<b>Corresponding stage 2 work item (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>
560020	Group Communication System Enablers for LTE (GCSE_LTE)	Complementary Feature TS 23.468
620064	Mission Critical Push To Talk over LTE (MCPTT)	TS 23.179

<b>Else, corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other justification</b>		
<b>TS or CR(s) or external document</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)		
Unique ID	Title	Nature of relationship
		TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Mission Critical Push To Talk is an essential functionality of public safety communication systems; for example, those systems widely deployed using Land Mobile Radio (LMR) technology such as TETRA, Project 25 (P25), TETRAPOL and GSM-R.

Agreement has been reached by 3GPP that LTE should support effective means for group communication services and proximity services, which are essential to position LTE as the future technology for critical communications users including public safety first responders as well as other users such as utility companies and railways.

Service requirements for Group Communication System Enablers for LTE (GCSE\_LTE, TS 22.468) and Proximity Services (ProSe, TS22.278, TS22.115) were approved in June 2013. While these service requirements provide essential LTE enablers for communications independent of any particular type of media, specific service/system/EPS/application requirements are needed for development of network and application architectures, security, RAN aspects, and network and application protocols to support Mission Critical Push To Talk over LTE (MCPTT).

Sources of input requirements for MCPTT include:

- The First Responder Network Authority (FirstNet) – the government network operator for the public safety community in the United States.
- The United Kingdom Home Office – the office responsible for the development of the next generation public safety communications system in the UK.
- The work of the National Public Safety Telecommunications Council (NPSTC) – an organization made up of all the major public safety organizations in the United States.
- The TETRA and Critical Communications Association (TCCA), which is considering LTE for Mission Critical Push to Talk.
- The Association of Public safety Communications Officials (APCO) Global Alliance, which has also endorsed LTE as the technology of choice for public safety communications worldwide.
- Telecommunications Industry Association (TIA) is considering LTE for critical communications involving LTE mission-critical voice service and interworking with P25 and is creating related requirements for PTT (TIA-4973.201, “Requirements for Mission Critical PTT and Related Supplementary Services”).

- Open Mobile Alliance (OMA) has defined Push to talk over Cellular (PoC) specifications with several components that could provide partial support for Mission Critical Push to Talk.
- European Telecommunications Standards Institute (ETSI) TC TETRA and Critical Communications Evolution (TCCE) has opened a work item: DTR/TETRA-01203, User Requirements Specification Mission Critical Broadband Communications Part 2 Critical Communications Application.
- Ministry of Public Safety and Security (MPSS) of Korea has defined the functional requirements which include MCPTT components such as “Compiling of Group Call”, “Listening Plural Talk Group” and “Network Interoperability” for Korean Public Safety Broadband Network (PSBN). Telecommunications Technology Association has opened the work items on LTE for Public Safety.

Other regional requirements not listed may also be reflected in the work.

While previous such standards have often been regional, there is a strong desire for the next generation of Mission Critical Push To Talk to be based on a single, widely adopted global standard.

There is no overlap foreseen with OMA work on PoC for Stage 1 requirements.

Both unicast and broadcast bearer are used by GCS AS for transferring application signalling and data. In Rel-13 MCPTT, only voice/audio media type is supported. In TS 22.179, AMR-WB is recommended for voice codec. Other voice codec and other media format supported by MTSI (TS 26.114) and MBMS (TS 26.346) are not mentioned. This WI proposes to clarify the media type and format used by MCPTT.

In order to support MCPTT service, GCS AS acting as media source delivers RTP payload to the UEs. In downlink direction, RTP based voice/audio delivery over EPS bearer is fully supported by MTSI specification already. In TS 23.468, it is decided that the data transferred via MBMS bearer(s) by the GCS AS is transparent to the BM-SC. The media processing behaviour of BM-SC in TS 26.346 is not specified yet (for example, in the case of RTP transport, RTP headers are assumed to be transparently delivered to MCPTT UE, but for other UEs, BM-SC is generating RTP headers).

In TS 26.346, hybrid streaming delivery is supported. Per alternativeAccessDelivery element in the USD, the UE receives streaming content from either PSS server or MBMS. In TS 23.468, for service continuity between unicast delivery and MBMS delivery, the UE communicates with GCS AS directly to maintain the service continuity. The discrepancy between those 2 specifications needs to be clarified.

Based on the analysis in TR 36.868, the E2E delay for media transport over MBMS bearer is beyond requirements. The E2E delay for media transport is different between EPS bearer path and MBMS bearer path. A MCPTT UE-A receiving RTP payload over EPS bearer will ahead of another MCPTT UE-B receiving the same RTP payload over MBMS bearer. This un-sync issue degrades the user experience and may impact the MCPTT UE-B requesting permission to transmit. This WI proposed to address this un-sync issue.

To better support MCPTT, the procedure, metadata element and value of element/attribute can be optimized considering the mechanisms defined in TS 23.468. At the same time, the guidance of MBMS for MCPTT will help the interoperability.

## 4 Objective

The SA1 objective is to specify the Stage 1 requirements for a Push To Talk functionality to support Mission Critical voice communication over LTE that can be used by public safety and commercial uses (e.g., utility companies and railways).

To accomplish this objective SA1 needs to specify the requirements that are relevant to improve the E-UTRAN, EPC and application-layer functionality, including applications supported by UEs and external network elements (e.g. Application Servers) supporting Mission Critical voice for LTE.

Requirements for MCPTT will include the following areas:

- Push To Talk (PTT) group and PTT individual communications involving the EPS and external networking and application interaction;

- Services, including talker identification, location, and emergency alerting for mission critical voice communication;
- Voice/audio quality;
- Special privilege handling (For console interaction - e.g, override, monitor, exception handling, etc);
- Service availability;
- Floor control, priority and pre-emption;
- Performance, including call establishment times and permission to talk request to permission granted times;
- Use of GCSE\_LTE;
- Use of Proximity Services (ProSe);
- Interconnection with voice systems, including cellular and the PSTN, as well as private/land mobile radio;
- Security, including confidentiality of mission-critical voice communications;
- Charging/billing and system management considerations;
- Management of Mission Critical PTT communications;
- Presence service, including interaction with other communication services.

MCPTT should aim at re-using existing, standardized functionality when possible and justified.

The SA2 objectives are as follows:

1. As part of the study:
  - a) Define the MCPTT architectural requirements at the EPS level (including IMS aspects) based on the service requirements specified by SA1 and based on needs determined by the application specified by SA6 in order to scope/guide the work in SA2 taking into account:
    - i) The need for GCSE\_LTE and ProSe architecture support of the Stage 1 MCPTT service requirements including the need for possible architectural enhancements to existing Stage 2 specifications (e.g., TS 23.468, TS 23.303); and,
    - ii) The need for MCPTT architecture support that reuses existing 3GPP capabilities, if appropriate to meet the needs.
  - b) Determine impact to normative specifications within SA2 scope.
2. Specify the selected Stage 2 (architecture) solutions at the EPS-level (including IMS aspects) in relevant specifications.

Existing, standardized functionality will be exploited where possible and justified.

Work on normative technical specification(s) in SA2 will be based on approved Stage 1 requirements.

The SA6 objectives are as follows:

1. As part of the TR phase:
  - a) Review MCPTT Stage 1 requirements and other user-related requirements to determine those aspects of the normative requirements that apply to the application level in order to scope the SA6 work.
  - b) Review inputs from other SDOs regarding proposed architectures, etc. to support MCPTT.
  - c) Define the MCPTT architectural requirements (based on the Stage 1 requirements) at the applications level (including the overall MCPTT architecture in cooperation with SA2) taking into account the need for MCPTT application layer architecture support to use existing 3GPP capabilities, as appropriate.

- d) Develop MCPTT solutions based on objective a).
  - e) Determine which solution(s) from the TR phase to document in normative specifications.
2. Specify the selected Stage 2 (architecture) solutions at the applications level (including the overall MCPTT architecture in cooperation with SA2) in relevant specifications.

Existing, standardized functionality will be exploited where possible and justified.

Work on normative technical specification(s) in SA6 will be based on approved Stage 1 requirements.

The SA3 objectives are to meet the requirements and to ensure security of use cases defined by SA1 within the architecture defined by SA2 and SA6. In particular:

1. As part of the TR phase:
  - a) Define the MCPTT security requirements (based on the Stage 1 normative requirements) in order to scope/guide the work in SA3 taking into account:
    - i) The need for security to support the GCSE\_LTE and ProSe use cases, which may require enhancements to existing Stage 2 security specifications and,
    - ii) The need to reuse existing 3GPP capabilities.
  - b) Develop MCPTT solutions based on objective a).
  - c) Determine which solution(s) from the TR phase to document in normative specifications.
2. Specify the selected Stage 2 (security) solutions in relevant specifications.

The SA4 objectives are to specify media codecs, media handling, and enhancements to enable delivery of MCPTT in accordance with the requirements defined by SA1 and the architecture defined by SA2 and SA6. In particular:

1. As part of the TR phase:
  - a) Identify codecs, media handling, and enhancements to enable delivery of MCPTT (based on the Stage 1 and 2 requirements) in order to scope/guide the work in SA4 taking into account:
    - i) The need to support the GCSE\_LTE and ProSe use cases, which may require enhancements to existing specifications and,
    - ii) The need to reuse existing 3GPP capabilities whenever possible, otherwise define missing enablers.
    - iii) Consider stage 1 requirements regarding speech and audio quality, including delay aspects.
  - b) Develop MCPTT solutions based on objective a), which will address:
    - i) Identify voice/audio codec profile of unicast and broadcast for MCPTT support
    - ii) Identify media processing behaviour for MCPTT support
    - iii) Clarify the metadata usage to support service continuity between unicast and MBMS delivery
    - iv) Provide guidelines for MBMS operation supporting MCPTT
    - v) Address un-sync issue (e.g. the service continuity between unicast and MBMS bearer) and reduce MBMS delivery latency towards the MCPTT latency requirements.
    - vi) Define MCPTT MBMS Operation on Demand
  - c) Determine which solution(s) from the TR phase to document in normative specifications.
2. As part of TS phase, specify what has been determined in step c) of the TR phase.

In all aspects, reuse of existing technology shall be considered.

During the work, SA4 will coordinate as needed with other relevant WGs (e.g. in CT).

## 5 Service Aspects

Service aspects will be identified.

## 6 MMI-Aspects

Not applicable.

## 7 Charging Aspects

Will be identified in this work item.

## 8 Security Aspects

Security aspects will be identified.

### 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No					
Don't know	X		X		X

## 10 Expected Output and Time scale

Spec No.	Title	New specifications [If Study Item, one TR is anticipated]		Presented for information at plenary#	Approved at plenary #	Comments
		1st rsp. WG	2nd rsp. WG(s)			
TS 22.179	Mission Critical PTT over LTE	SA1		SA#64 (06/2014)	SA#65 (09/2014)	
TR ???.???	Study on Architecture Enhancements at the EPS and IMS Level to Support Mission Critical Push To Talk over LTE (MCPTT) Services	SA2		SA#?? (??/?????)	SA#?? (??/?????)	It is to be determined by SA2 if TR is at all required for SA2.
TR 23.779	Study on Application Architecture to support Mission Critical Push To Talk over LTE (MCPTT) services	SA6		SA#68 (06/2015)	SA#69 (09/2015)	
TS 23.179	Functional architecture and information flows to support mission critical communication services	SA6		SA#69 (09/2015)	SA#69 (09/2015)	
TR 33.xxx	Study on Security Enhancements for Mission Critical Push To Talk over LTE	SA3		SA#69 (09/2015)	SA#70 (12/2015)	
TS 33.xxx	Security of Mission Critical Push To Talk over LTE	SA3		SA#70 (12/2015)	SA#70 (12/2015)	
TR 26.8xx	Study on media, codecs and MBMS enhancements for Mission Critical Push to Talk over LTE	SA4		SA#69 (09/2015)	SA#70 (12/2015)	
TS 26.xxx	MCPTT Codecs and media handling	SA4		SA#70 (12/2015)	SA#70 (12/2015)	

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR Subject of the CR	Approved at plenary	Comments
TS 23.468	Stage 2 GCSE_LTE		
TS 23.303	Stage 2 ProSe		
TS 26.346	MCPTT impacts to MBMS specs	SA#70 (12/2015)	

11

## Work item rapporteur(s)

SA1: David Cypher (david.cypher at nist.gov)  
SA2: Randy Bloomfield (randy at its.bldrdoc.gov)  
SA3: Peter Haigh (peter.haigh at cesg.gsi.gov.uk)  
SA4: Eric Turcotte (eric.turcotte@ericsson.com)  
SA4: Zhiming Li (lizhiming@huawei.com)  
SA6: Yannick Lair (yannick.lair@lge.com)

12

## Work item leadership

SA1, SA2, SA4, SA6

13

## Supporting Individual Members

Supporting IM name
US Department of Commerce
Home Office
AT&T
T-Mobile USA Inc.
Telefónica
Vodafone
Alcatel Lucent
Nokia Networks
Ericsson LM
KPN
BMW
Blackberry UK Ltd.
General Dynamics UK Limited
Deutsche Telekom
Expway
Fujitsu Limited
Qualcomm Inc.
Motorola Solutions
Harris Corp.
Intel
ETRI
Kodiak Networks
SouthernLINC Wireless
Huawei
TD Tech
ORANGE
CESG
Airbus Group SAS
LG Electronics
Samsung
Telecom Italia S p A
SK Telecom
Thales
Police of the Netherlands
KT Corp.
LG Uplus
ITL

# Service Requirements Maintenance for Machine-Type Communications (MTC)

620063	Service Requirements Maintenance for Machine-Type Communications (MTC)	SRMMTC	1	S1	Dec-13	Sep-14	100%	SP-130600
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**3GPP TSG SA Meeting #62**

**SP-130600**

**Busan, Korea, 09 – 11 December, 2013**

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**Source:** TSG SA WG1 (from S1-135304)

**Title:** New WID on Service Requirements Maintenance for Machine-Type Communications (SRMMTC)

**Document for:** APPROVAL

**Agenda Item:** 15

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Service Requirements Maintenance for Machine-Type Communications (MTC)

**Acronym:** SRMMTC

**Unique identifier:** 6200xy

## 1 3GPP Work Area

X	Radio Access
X	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

X	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
610030	Service Exposure and Enablement Support	May impact MTC requirements

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

X	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks
560021	Stage 1 for Support for Interworking with M2M Service Enablement (MTCe-SIMSE) Rel-12 Completed March 2013	22.368
570030	Stage 1 for Machine-Type and other mobile data applications Communications – Service Requirement Maintenance (MTCe-SRM) Rel-12 Completed March 2013	22.101, 22.368

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

A number of the MTC related service requirements in 3GPP TS 22.368 have not been implemented yet in Rel-12.

Some of these service requirements will be taken up in stage 2 activities within Rel-13. For these activities, Stage 1 need to support the Stage 2 work, e.g. with clarifications of the existing service requirements.

For the service requirements for which there will be no Stage 2 activities in Rel-13, Stage 1 needs to revisit whether these service requirements are still valid or whether they should be removed.

Furthermore, this work item will provide end-of-release alignment at the end of Rel-13, to ensure that the Stage 1 service specifications reflect what has been implemented in Stage 2.

This work item is not intended to introduce new MTC related service requirements.

## 4 Objective

- 1) to provide upon request clarifications for the service requirements that 3GPP Stage 2 Working Groups are working on in Rel-13.
- 2) to reconsider existing service requirements in 3GPP TS 22.368 that will not be listed in future Rel-13 Stage 2 WIDs. It will be decided which of these service requirements will be retained, restructured, or removed permanently from Rel-13 and future releases. Some of the requirements may be partially already implemented, or may be partially worked upon. This will have to be taken into account in a restructuring of the relevant requirements.
- 3) to provide the usual end-of-release maintenance to ensure that the frozen Rel-13 version of the service requirement specifications (Stage 1) reflect what has actually been implemented in Stage 2.
- 4) No new service requirements will be added under this WID.

The items listed below are existing requirements that are not yet implemented in Stage 2. These items are for consideration related under objectives 1 and 2 and hence may be clarified if worked on by 3GPP Stage 2 Working Groups or may be retained, restructured, or removed. Further updates e.g. as to which items in the list will be worked on (or not) by the 3GPP Stage 2 Working Groups will provided as Rel-13 Stage 2 work progresses.

- Activation of MTC features: requirements in 22.368 clause 7.1.1.
- Handle registration and interaction of UEs and applications on UEs with IMS efficiently: requirement in 22.368 clause 7.1.1
- MTC Device triggering when not attached: Remaining requirement in 22.368 clause 7.1.2.
- Charging related to (the use of) particular MTC Features: requirements in 22.368 clause 7.1.5.
- Create bulk CDRs to count chargeable events per group of MTC Devices: requirements in 22.368 clause 7.1.5
- Low mobility - optimize mobility management procedures per UE by e.g. changing frequency: requirements in 22.368 clause 7.2.1.
- Time controlled - allow/reject access requests based on a pre-defined time interval: requirements in 22.368 clause 7.2.2
- Infrequent mobile terminated - optimize mobility management procedures per UE by e.g. reducing frequency: requirements in 22.368 clause 7.2.7
- MTC Monitoring: requirements in 22.368 clause 7.2.8 Enforce a maximum bit rate for a group of MTC Devices: requirements in 22.368 clause 7.2.14.2
- Send a broadcast message within a particular geographic area, e.g. to wake up the MTC Devices that are members of a group: requirements in 22.368 clause 7.2.14.3

## 5 Service Aspects

Service aspects will be considered as needed.

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes					
No					
Don't know	X	X	X	X	X

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

Affected existing specifications [None in the case of Study Items]				
Spec Nd	CR	Subject of the CR	Approved at plenary#	Comments
22.368		Clean up of requirements that are no longer desired	SA#66 Dec 2014	CR may be generated as needed

## **11 Work item rapporteur(s)**

SA1 : KPN, Toon Norp (toon.norp@tno.nl)

## **12 Work item leadership**

SA1

## **13 Supporting Individual Members**

<b>Supporting IM name</b>
KPN
Intel
China Mobile
LG
NEC

2013-10-03 version 1.14.0

## Extended DRX cycle for Power Consumption

690005	<a href="#">Extended DRX cycle for Power Consumption</a>	eDRX	1	S2, R2, G2	Mar-15	Dec-15	37%	SP-150369
680052	<a href="#">Stage 2 for Extended DRX cycle for Power Consumption</a>	eDRX	2	S2	Jun-15	Dec-15	95%	SP-150369
690010	<a href="#">CT aspects of extended DRX cycle</a>	eDRX-CT	2	ct	Sep-15	Dec-15	22%	SP-150369
690020	<a href="#">CT1 aspects of extended DRX cycle</a>	eDRX-CT	3	ct	Sep-15	Dec-15	25%	SP-150369
690030	<a href="#">CT3 aspects of extended DRX cycle</a>	eDRX-CT	3	C3	Sep-15	Dec-15	0%	SP-150369
690021	<a href="#">CT4 aspects of extended DRX cycle</a>	eDRX-CT	3	C4	Sep-15	Dec-15	40%	SP-150369
670057	<a href="#">RAN enhancements for extended DRX in LTE</a>	LTE_extD RX	2	R2	Mar-15	Dec-15	15%	RP-150493
670157	<a href="#">Core part: RAN enhancements for extended DRX in LTE</a>	LTE_extD RX-Core	3	R2	Mar-15	Dec-15	15%	RP-150493
690001	<a href="#">Extended DRX (eDRX) for GSM</a>	eDRX_GS M	2	G2	Jun-15	Nov-15	40%	GPC150624

## 3GPP TSG SA Meeting #68

**TD SP-150369**

Malmö, Sweden, 17 - 19 June 2015

**Source:** SA WG2

**Title:** New Work Item on Extended DRX cycle for Power Consumption Optimization

**Document for:** Approval

**Agenda Item:** 15.2.34

**Work Item / Release:** eDRX / Rel-13

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SA WG2 Meeting #109

S2-151878

25 - 29 May 2014, Fukuoka, Japan

(revision of S2-151685)

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Extended DRX cycle for Power Consumption Optimization

**Acronym:** eDRX

**Unique identifier:**

## 1 3GPP Work Area

X	<b>Radio Access</b>
X	<b>Core Network</b>
	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
660008	Feasibility study on Extended DRX cycle for Power Consumption Optimization	Feasibility study focused on core network aspects that led to this work item
670057	RAN enhancements for extended DRX in LTE	RAN aspects of the feature for extending DRX cycle in E-UTRAN
670027	Optimizations to Support High Latency Communications	Defines the required handling of mobile terminated data for UEs using power saving techniques, including extended DRX.
560322	Machine-Type and other mobile data applications Communications enhancements-UE Power Consumptions Optimizations (MTCe-UEPCOP)	Rel-12 SA2 work item for UE power consumptions optimizations
680012	Study of Power Saving for MTC Devices (FS_uPOD)	GERAN study item for UE power saving for MTC Devices
650013	Study on Small Data Transmission Enhancements for UMTS (FS_UTRA_SDATA)	RAN study item for UTRAN device power enhancements

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Power consumption is important for UEs using battery and also for UEs using external power supply its importance increases with the continued growth of device populations and more demanding use cases. The importance can be illustrated by following scenarios, e.g.:

- For M2M use cases like sensors that run on battery it is a major cost to on site to exchange (or charge) the batteries for a large amount of devices and the battery lifetime may even determine the device's lifetime if it is not foreseen to charge or replace the battery;
- Even for scenarios where UEs may consume power from an external power supply it may be desirable to consume less power for energy efficiency purposes.

During Rel-13 a SA2 Feasibility Study on extending DRX cycle was performed, and solutions to all identified issues in the realm of SA WG2 were evaluated and captured in TR 23.770.

RAN and GERAN have also approved WIDs to standardise the extension of DRX for E-UTRAN/UTRAN and GERAN.

## 4 Objective

Objective is to specify the solutions to the identified issues as captured in the conclusions of TR 23.770 to extend the DRX cycle in idle for GERAN, UTRAN and E-UTRAN. The specified solutions will reflect the agreements performed in GERAN/RAN groups, including the maximum length of the DRX cycle for idle mode.

Solutions are to be specified for the following identified issues for extending idle mode DRX cycle up to and beyond 10.24 seconds:

- Support NAS-protocol extensions to enable extended DRX cycle. There needs to be coordination between UE and Core Network (SGSN/MME) for use of extended DRX.
- Paging strategy in CN that fits the needs of the extended DRX cycle and normal DRX cycle.
- Handling of MT SMS, e.g. avoiding retransmissions for long DRX cycles.
- Impact in S/P-GW retransmissions when handling Network originated control plane procedure.
- Interaction between eDRX and PSM (Power Saving Mode) in UE and MME/SGSN procedures.
- MT Location services support

Handling of Mobile Terminated Data for extended DRX in idle mode will be specified as part of HLCom WI.

Work in RAN and co-operation with RAN will be required for UTRAN and E-UTRAN aspects. Work in GERAN and co-operation with GERAN will be required for the GERAN aspects.

Feedback from CT groups will be requested if needed.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

Any necessary security analysis will be undertaken by SA3 with support from SA2.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X	X	
No	X				X

Don't know				
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## 10 Expected Output and Time scale

<b>New specifications</b> [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

<b>Affected existing specifications</b> [None in the case of Study Items]			
Spec No.	CR	Subject of the CR	Approved at plenary#
23.401	General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access	As per TR 23.770 conclusions	SA#69 (Sep 2015)
23.060	General Packet Radio Service (GPRS); Service description; Stage 2	As per TR 23.770 conclusions	SA#69 (Sep 2015)
23.682	Architecture enhancements to facilitate communications with packet data networks and applications	As per TR 23.770 conclusions	SA#69 (Sep 2015)
23.271	Support for MT Location services for UEs in extended DRX	As per TR 23.770 conclusions	SA#69 (Sep 2015)
23.272	Support for MT SMS for UE in extended DRX	As per TR 23.770 conclusions	SA#69 (Sep 2015)

## 11 Work item rapporteur(s)

Qualcomm Inc, Miguel Griot (mgriot@qti.qualcomm.com).

## 12 Work item leadership

SA2

## 13 Supporting Individual Members

Supporting IM name
Qualcomm Incorporated
Ericsson
ZTE Corporation
Sierra Wireless
Verizon
AT&T
InterDigital
Sony
Intel
MediaTek Inc.
Alcatel-Lucent
LG Electronics
KDDI
Huawei

2013-10-03 version 1.14.0

**3GPP TSG RAN Meeting #67**  
**Shanghai, China, 9 - 12 March 2015**

**RP-150493**

---

Source:	Qualcomm Incorporated
Title:	New WI Proposal: RAN enhancements for extended DRX in LTE
Document for:	Approval
Agenda Item:	13.1.2

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: RAN enhancements for extended DRX in LTE

Acronym:

Unique identifier:

NOTE: If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	

## 1 3GPP Work Area

X	<b>Radio Access</b>
	<b>Core Network</b>
	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any)</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

<b>Corresponding stage 2 work item (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Else, corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other justification</b>			
<b>TS or CR(s) or external document</b>	<b>Clause</b>	<b>Remarks</b>	

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

<b>Related Work Item(s)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

Go to §3.

### 2.3.5 Other

<b>Related Work Item(s)</b>			
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>	<b>TS / TR</b>

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Power consumption is important for UEs using battery or an external power supply and its importance increases with the continued growth of device populations and more demanding use cases. The importance can be illustrated by following scenarios, e.g.:

- For M2M use cases like sensors that run on battery it is a major cost to on site exchange (or charge) the batteries for a large amount of devices and the battery lifetime may even determine the device's lifetime if it is not foreseen to charge or replace the battery;
- Even for scenarios where UEs may consume power from an external power supply, it may be desirable to consume less power for energy efficiency purposes.

In Release 12, 3GPP adopted a NAS layer defined Power Saving Mode (PSM) solution for power consumption enhancement. PSM allows the UE to save battery by negotiating with the network periods for which the UE becomes unreachable, in which case the UE stops access stratum activities. The UE exits this mode when it has mobile originated data pending, or when the periodic TAU timer expires.

However, PSM has limited applicability for unscheduled Mobile Terminated data with some requirement on delay tolerance. In this case, the UE would need to negotiate Periodic TAU timer equal (or slightly shorter) than the maximum allowed delay tolerance for MT data. If the maximum allowed delay tolerance is not in the order of many hours, the PSM solution introduces an important increase in signalling due to more frequent periodic TAU procedures. It also suffers in terms of power consumption performance because the UE would be required to "wake up" very frequently in order to perform this signalling. Furthermore, for MT data that is infrequent, most of the wake up procedures would turn out to be entirely unnecessary and thus power inefficient.

A more flexible approach that addresses the scenarios not suitable for PSM such as the one described above is to enhance DRX operation. Unlike PSM, DRX makes the UE reachable during pre-defined occasions without resulting in unnecessary signalling.

As currently defined, however, DRX cycles in LTE can at most be 2.56s and thus would not allow for sufficient power savings for UEs that only need to wake-up infrequently (e.g. every few or tens of minutes) for MT data.

Hence, DRX cycle extension is required in order to enable significant battery savings for such UEs. Furthermore, the DRX cycle can be set depending on the data delay tolerance and power saving requirements, thus providing a flexible solution for achieving significant UE battery savings.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The general objective of this work item is to provide RAN specifications for extending the DRX cycle in scenarios where mobile terminated data has a delay tolerance in the order of minutes to an hour. The specific objectives are:

- Extend idle mode DRX cycles in order to provide at least an order of magnitude power savings for UEs in idle mode; and

- Extend connected mode DRX cycles in order to enable additional power savings beyond what is currently possible for UEs in connected mode

This work will continue the work started in Rel-12 in TR 23.887 and TR 37.869 for Extended DRX, by:

- Identifying the RAN impacts of extending the DRX cycle for both idle and connected mode [RAN2] :

- o beyond 2.56s and up to values to be determined in conjunction with SA2/CT.

NOTE: Values (if any) that are identified to have CN impact will not be actioned in RAN without the corresponding work in SA2/CT.

- Performing the specification work resulting from the identified impacts on

- o Layer 2/3 protocols [RAN2]
  - o RRM core requirements [RAN4]

No connected mode mobility enhancements are considered in this work, i.e., the current mobility, RRM/RLM procedures apply for UEs using extended DRX cycles in connected mode.

Work and cooperation with SA2 will be required.

RAN3 may be involved to work on specification of network protocol aspects, if deemed necessary.

## 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

## 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

Q2/2015																			RAN				
RAN #67		#68																		RAN			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75				
															1								

Q3/2015											RAN								RAN				
RAN #68		#69									RAN								RAN				
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U
82	82	91	91	91	91	76	76	76	76	76	76	76	76	76	76	76	76	76	76				
		1																					

Q4/2015																			RAN				
RAN #69		#70																	RAN				
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77				
		1													1								

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X	X	
No	X				X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.  
By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.300		E-UTRAN Overall description	RAN#70	
36.304		UE procedures in idle mode	RAN#70	
36.331		Radio Resource Control protocol specification	RAN#70	
36.133		Requirements for support of radio resource management	RAN#70	
36.321		Medium Access Control protocol specification	RAN#70	
36.413		S1 Application Protocol (S1AP)	RAN#70	

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.  
If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Vajapeyam, Madhavan

**Company:** Qualcomm Incorporated

**Email:** [msvajape@qti.qualcomm.com](mailto:msvajape@qti.qualcomm.com)

Johan Johansson

**Company:** Mediatek Inc  
**Email:** [Johan.Johansson@mediatek.com](mailto:Johan.Johansson@mediatek.com)

## 12 Work item leadership

Primary: RAN WG2  
Secondary: RAN WG4, RAN WG3

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Qualcomm Incorporated
Sierra Wireless
InterDigital
AT&T
Potenvio
ZTE
Coolpad
Kyocera
Sony
KDDI
Fujitsu
Softbank
Verizon
Microsoft
Intel Corporation
Orange
Telefonica
TeliaSonera
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Mediatek Inc
CHTTL
III
ITRI
Asus
Mstar
Acer
HTC
Sequans
Samsung
KPN
Ericsson

3GPP TSG GERAN FS\_IoT\_LC Adhoc#3  
Kista, Sweden, 29 June – 2 July 2015

GPC150624

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**Source:** Ericsson LM, Sierra Wireless S.A., Telit Communications S.p.A., MediaTek Inc., Gemalto N.V., Orange, **TeliaSonera**  
**Title:** New Work Item on Extended DRX (eDRX) for GSM  
**Document for:** Approval  
**Agenda Item:** 1.5, 1.6, 2.5.2, 2.6

---

3GPP™ Work Item Description

Title: New Work Item on Extended DRX (eDRX) for GSM

Acronym: eDRX\_GSM

Unique identifier: XXXXX

## 1 3GPP Work Area

X	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
620012	Study on Power saving for Machine-Type Communications (MTC) devices <span style="background-color: yellow;">in 3GPP TR 43.869.</span>	Study Item
680052	Extended DRX cycle for Power Consumption	Feature

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification			
TS or CR(s) or external document	Clause	Remarks	

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

There is a significant growth opportunity in the 3GPP ecosystem for Machine-Type Communication (MTC), where an extended battery lifetime is essential in several use cases. The FS\_uPoD Study Item was thus started at 3GPP GERAN#60 to evaluate how substantial power savings for Machine Type Communications can be realized. The objective of the study was to find solutions for reducing power consumed by devices used for MTC and to thereby realize substantially extended battery lifetimes.

In the study the use of extended eDRX, optimized idle mode behaviour and relaxed mobility requirements have been evaluated and demonstrate that significantly increased battery lifetimes can be realized for devices used for MTC compared to legacy device operation.

## 4 Objective

The objective of the work is to introduce support for an eDRX feature, including optimized idle mode behaviour and relaxed mobility requirements, wherein devices used for MTC that require paging based reachability can make use of paging cycles ranging from multiple seconds to multiple tens of minutes. It should be noted that there are core network impacts associated with eDRX and as such this GERAN feature will be subject to ongoing eDRX related investigations and decisions in SA2.

## 5 Service Aspects

None.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

None.

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X	X	
No	X				X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
TS 43.064			TSG GERAN #68 (Nov 2015)	
TS 44.018			TSG GERAN #68 (Nov 2015)	
TS 44.060			TSG GERAN #68 (Nov 2015)	
TS 45.008			TSG GERAN #68 (Nov 2015)	
TS 48.018			TSG GERAN #68 (Nov 2015)	
TS 43.022			TSG GERAN #68 (Nov 2015)	

## 11 Work item rapporteur(s)

John Diachina

## 12 Work item leadership

Primary responsible: 3GPP TSG GERAN WG2

Secondary responsible: 3GPP TSG GERAN WG1

## 13 Supporting Individual Members

Supporting IM name
Ericsson LM
Sierra Wireless S.A.
Telit Communications S.p.A.
MediaTek Inc.
Gemalto N.V.
Orange
TeliaSonera



## Optimizations to Support High Latency Communications

670027	<a href="#">Optimizations to Support High Latency Communications</a>	HLcom	1	S2	Sep-14	Dec-15	93%	SP-150030
650035	<a href="#">Study on Optimizations to support High Latency communications</a>	FS_HLcom	2	S2	Sep-14	Jun-15	100%	SP-140635
680005	<a href="#">Optimizations to Support High Latency Communications</a>	HLcom	2	S2	Mar-15	Jun-15	100%	SP-150252
680015	<a href="#">CT aspects of Optimizations to Support High Latency</a>	HLcom-CT	2	C4	Jun-15	Dec-15	80%	CP-150399

3GPP TSG SA Meeting #67

TD SP-150030

Shanghai, P. R. China, U.S.A, 11 - 13 March 2015

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Source: SA WG2

Title: New WID on Optimizations to Support High Latency Communications

Presented for: Approval

Agenda Item: 15

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3GPP TSG WG SA2 Meeting #107  
Sorrento, Italy, 26 - 30 January 2015

S2-150652

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: Optimizations to Support High Latency Communications

Acronym: HLcom

Unique identifier:

## 1 3GPP Work Area

	Radio Access
x	Core Network
x	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
x	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
560322	Study on Optimizations to Support High Latency Communications	Study

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

Stage 1 (go to 2.3.1)
Stage 2 (go to 2.3.2)
Stage 3 (go to 2.3.3)
Test spec (go to 2.3.4)
Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Due to potential high latency (e.g. power saving mode is used) when accessing 3GPP constrained devices using the 3GPP access, communicating with very large number of constrained devices may cause high packet losses, and large system load on the 3GPP system. Examples of constrained devices are sensors, meters and actuators that have specific low-cost, low-energy and low-bitrate requirements.

The Internet-of-Things (IoT) is a concept where many things (e.g., devices) can be uniquely identified and communicated with. One study forecasted that the number of devices representing the IoT will grow to 26 Billion units by 2020<sup>i</sup>. Many of these devices will be constrained in terms of low-cost, low-energy and low-bitrate. The very large number makes it especially important that the 3GPP access is efficient when accessing these constrained devices.

For the scope of this WI devices that are not reachable for a long period may be UEs using UE battery saving techniques, UE sleep functions making UEs unreachable for long periods of time, UEs using low throughput bearers, etc, hence resulting in e.g. in high latency for accessing the devices from network side.

## 4 Objective

The objective of this work item is to specify enhancements for applications that communicate with devices that are not reachable for a long period over the 3GPP IP connectivity and being able to support large number of such devices in the system without negatively affecting the system performance.

In addressing the above, the following problem will be addressed:

- Downlink access for devices that are not reachable for a long period and the problems associated with such devices (e.g. packet discard when the UE sleeps, frequent retransmissions, load on the CN network, waste of radio resources and UE power when the network unnecessarily conveys retransmit packets, etc). This work may propose and evaluate enhancements to the 3GPP system documented in the TR 23.709 or make normative updates to the 3GPP system as concluded in the TR 23.709. Depending on conclusions, the study may also propose 3GPP enablers to be used by the service layer e.g. defined by other SDOs for downlink access to devices that are not reachable for a long period.

NOTE: Different application layer protocols used within the M2M ecosystem have different requirements and characteristics with respect to acceptable end-to-end delay, round trip time, persistence in retransmissions, etc. The result of this work may include general recommendations for application layers how to use the 3GPP accesses for better application performance and optimal core and radio network efficiency thereof.

The normative work will be based on the agreed conclusions on specific scenarios from the study phase documented in the TR 23.709.

## 5 Service Aspects

Services aspects will be considered.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

Based on the agreements leading to normative work any necessary normative charging aspects will be undertaken by SA5 with support from SA2.

## 8 Security Aspects

Based on the agreements leading to normative work any necessary normative security aspects will be undertaken by SA3 with support from SA2.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				x	
No	x		x		
Don't know		x			x

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WC	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #Comments

Affected existing specifications [None in the case of Study Items]			
Spec No	CR	Subject of the CR	Approved at plenary# Comments
23.401		Conclusions from TR	SA#68 (June 2015)
23.060		Conclusions from TR	SA#68 (June 2015)
23.682		Conclusions from TR	SA#68 (June 2015)

## 11 Work item rapporteur(s)

SA2: Ericsson, Hans Rönneke, hans.ronneke(at)ericsson.com

## 12 Work item leadership

Stage 2: 3GPP SA2

## 13 Supporting Individual Members

Supporting IM name
Ericsson
Samsung
Orange
TeliaSonera
LG Electronics
Fujitsu
HTC
AT&T
InterDigital
Sierra Wireless
KPN
Intel
Alcatel-Lucent
Qualcomm

**3GPP TSG SA Meeting #65**  
**Edinburgh, Scotland, UK, 15 - 17 September 2014**

**SP-140635**

revision of SP-140437

---

**Source:** SA WG2 Chairman, SA WG2  
**Title:** New Study WID on Optimizations to Support High Latency Communications  
**Document for:** Approval  
**Agenda Item:** 16

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Study on Optimizations to Support High Latency Communications

**Acronym:** FS\_HLcom

**Unique identifier:**

## 1 3GPP Work Area

	Radio Access
x	Core Network
x	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

x	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship
560322	MTCe-UEPCOP (Machine-Type and other mobile data applications Communications enhancements-UE Power Consumptions Optimizations)	UEPCOP defined PSM feature

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
x	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

##### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Due to potential high latency (e.g. power saving mode is used) when accessing 3GPP constrained devices using the 3GPP access, communicating with very large number of constrained devices may cause high packet losses, and large system load on the 3GPP system. Examples of constrained devices are sensors, meters and actuators that have specific low-cost, low-energy and low-bitrate requirements.

The Internet-of-Things (IoT) is a concept where many things (e.g., devices) can be uniquely identified and communicated with. One study forecasted that the number of devices representing the IoT will grow to 26 Billion units by 2020<sup>ii</sup>. Many of these devices will be constrained in terms of low-cost, low-energy and low-bitrate. The very

large number makes it especially important that the 3GPP access is efficient when accessing these constrained devices.

For the scope of this WI devices that are not reachable for a long period may beUEs using UE battery saving techniques, UE sleep functions making UEs unreachable for long periods of time, UEs using low throughput bearers, etc, hence resulting in e.g. in high latency for accessing the devices from network side.

## 4 Objective

The objective of this study item is to study possible enhancements for applications that communicate with devices that are not reachable for a long period over the 3GPP IP connectivity and being able to support large number of such devices in the system without negatively affecting the system performance.

In addressing the above, the following problem will be studied:

- Downlink access for devices that are not reachable for a long period and the problems associated with such devices (e.g. packet discard when the UE sleeps, frequent retransmissions, load on the CN network, waste of radio resources and UE power when the network unnecessarily conveys retransmit packets, etc). This study may propose and evaluate enhancements to the 3GPP system. Depending on conclusions, the study may also propose 3GPP enablers to be used by the service layer e.g. defined by other SDOs for downlink access to devices that are not reachable for a long period.

NOTE: Different application layer protocols used within the M2M ecosystem have different requirements and characteristics with respect to acceptable end-to-end delay, round trip time, persistence in retransmissions, etc. The result of this study may include general recommendations for application layers how to use the 3GPP accesses for better application performance and optimal core and radio network efficiency thereof.

## 5 Service Aspects

Services aspects will be considered.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

Based on the conclusion leading to normative work any necessary normative charging aspects will be undertaken by SA5 with support from SA2.

## 8 Security Aspects

Based on the conclusion leading to normative work any necessary normative charging aspects will be undertaken by SA5 with support from SA2.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				x	
No			x		
Don't know	x	x			x

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #
TR 23.xxx	Study on Optimizations to Support High Latency Communications	SA2		SA#67 (March 2015)	SA#68 (June 2015)
					TR may be used for capturing solution alternatives and evaluations.

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR Subject of the CR	Approved at plenary#	Comments

## 11 Work item rapporteur(s)

SA2: Ericsson, Hans Rönneke, hans.ronneke(at)ericsson.com

## 12 Work item leadership

Stage 2: 3GPP SA2

## 13 Supporting Individual Members

Supporting IM name
Ericsson
Samsung
Orange
TeliaSonera
Deutsche Telekom
LG Electronics
Fujitsu
Silver Spring Networks
HTC
AT&T
InterDigital
Sierra Wireless
KPN
Intel

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Malmö, Sweden, 17 - 19 June 2015

Source: SA WG2

Title: New WID on Optimizations to Support High Latency Communications

Document for: Approval

Agenda Item: 15.2.34

Work Item / Release: HLcom / Rel-13

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SA WG2 Meeting #109

S2-152131

25 - 29 May 2015, Fukuoka, Japan

(e-mail revision 2 of S2-151874)

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: Optimizations to Support High Latency Communications

Acronym: HLcom

Unique identifier:

### 1 3GPP Work Area

	Radio Access
x	Core Network
x	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
x	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
560322	Study on Optimizations to Support High Latency Communications	Study

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

<a href="#">Stage 1 (go to 2.3.1)</a>
<a href="#">Stage 2 (go to 2.3.2)</a>
<a href="#">Stage 3 (go to 2.3.3)</a>
<a href="#">Test spec (go to 2.3.4)</a>
<a href="#">Other (go to 2.3.5)</a>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Due to potential high latency (e.g. power saving mode is used) when accessing 3GPP constrained devices using the 3GPP access, communicating with very large number of constrained devices may cause high packet losses, and large system load on the 3GPP system. Examples of constrained devices are sensors, meters and actuators that have specific low-cost, low-energy and low-bitrate requirements.

The Internet-of-Things (IoT) is a concept where many things (e.g., devices) can be uniquely identified and communicated with. One study forecasted that the number of devices representing the IoT will grow to 26 Billion units by 2020<sup>iii</sup>. Many of these devices will be constrained in terms of low-cost, low-energy and low-bitrate. The very large number makes it especially important that the 3GPP access is efficient when accessing these constrained devices.

For the scope of this WI devices that are not reachable for a long period may be UEs using UE battery saving techniques, UE sleep functions making UEs unreachable for long periods of time, UEs using low throughput bearers, etc, hence resulting in e.g. in high latency for accessing the devices from network side.

## 4 Objective

The objective of this work item is to specify enhancements for applications that communicate with devices that are not reachable for a long period over the 3GPP IP connectivity and being able to support large number of such devices in the system without negatively affecting the system performance.

In addressing the above, the following problem has been addressed in TR 23.709:

- Downlink access for devices that are not reachable for a long period and the problems associated with such devices (e.g. packet discard when the UE sleeps, frequent retransmissions, load on the CN network, waste of radio resources and UE power when the network unnecessarily conveys retransmit packets, etc). This work may propose and evaluate enhancements to the 3GPP system documented in the TR 23.709 or make normative updates to the 3GPP system as concluded in the TR 23.709. Depending on conclusions, the study may also propose 3GPP enablers to be used by the service layer e.g. defined by other SDOs for downlink access to devices that are not reachable for a long period.

NOTE: Different application layer protocols used within the M2M ecosystem have different requirements and characteristics with respect to acceptable end-to-end delay, round trip time, persistence in retransmissions, etc. The result of this work may include general recommendations for application layers how to use the 3GPP accesses for better application performance and optimal core and radio network efficiency thereof.

The study finished with the following conclusions:

- Extended buffering in the SGW based on solution 2 clause 5.2 is used to handle high latency communication to devices using power saving functions e.g. eDRX and PSM.
- MONTE event notifications to notify an AS/SCS when downlink data can be sent to a UE that uses power saving functions e.g. PSM or eDRX, based on:
  - solution 3 clause 5.3 using a 'UE Reachability' one-time event shall be specified; and
  - solution 4 clause 5.4 sending notifications triggered by DDN shall be specified.
- The Extended buffering in the SGW/SGSN and the MONTE based notifications shall apply to E-UTRAN, UTRAN and GERAN.
- Coordination of maximum latency between the application and the network is handled either by interaction between the application in the UE with the UE NAS layer according to solution 7 clause 5.7, or through the parameter on Maximum latency in monitoring event configuration from SCS/AS to SCEF according to TR 23.789, clause 5, describing specific parameters for the UE Reachability event.

The normative work will be based on these agreed conclusions from the study phase documented in the TR 23.709.

## 5 Service Aspects

Services aspects will be considered.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

Based on the agreements leading to normative work any necessary normative charging aspects will be undertaken by SA5 with support from SA2.

## 8 Security Aspects

Based on the agreements leading to normative work any necessary normative security aspects will be undertaken by SA3 with support from SA2.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				x	
No	x	x	x		
Don't know					x

The conclusion of the FS\_HLCOM has impact on the application in the UE, but not any impact on normative specifications with regard to the ME.

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary

Affected existing specifications [None in the case of Study Items]			
Spec Nd	C	Subject of the CR	Approved at plenary#
23.401		Conclusions from TR	SA#69 (September 2015)
23.060		Conclusions from TR	SA#69 (September 2015)
23.682		Conclusions from TR	SA#69 (September 2015)

## 11 Work item rapporteur(s)

SA2: Ericsson, Hans Ronneke, hans.ronneke(at)ericsson.com

## 12 Work item leadership

Stage 2: 3GPP SA2

## 13 Supporting Individual Members

Supporting IM name
Ericsson
Samsung
Orange
TeliaSonera
LG Electronics
Fujitsu
HTC
AT&T
InterDigital
Sierra Wireless
KPN
Intel
Alcatel-Lucent
Qualcomm

**3GPP TSG CT Meeting #68**  
**Malmö, SWEDEN; 15<sup>th</sup> – 16<sup>th</sup> June 2015**

**CP-150399**  
Revision of CP-150239

---

**Source:** TSG CT WG4  
**Title:** New WID on CT aspects of Optimizations to Support High Latency Communications  
**Document for:** Approval  
**Agenda Item:** 13.1

Title: CT aspects of Optimizations to Support High Latency Communications

Acronym: HLcom-CT

Unique identifier: 680015

## 1 3GPP Work Area

	Radio Access
x	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
x	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
	Optimizations to Support High Latency Communications	TS 23.682, 23.060, 23.401

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
x	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
	Optimizations to Support High Latency Communications	TS 23.682, 23.060, 23.401

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Due to potential high latency (e.g. power saving mode is used) when application servers communicate to 3GPP constrained devices, high packet losses and large system load on the 3GPP system may be an issue. Especially these problems can occur when communicating with very large number of constrained devices. Examples of constrained devices are sensors, meters and actuators that have specific low-cost, low-energy and low-bitrate requirements.

The Internet-of-Things (IoT) is a concept where many things (i.e. devices) can be uniquely identified and communicated with. One study forecasted that the number of devices representing the IoT will grow to 26 Billion units by 2020. Many of these devices will be constrained in terms of low-cost, low-energy and low-bitrate. The very large number makes it especially important that the 3GPP access is efficient when accessing these constrained devices.

For the scope of this WI, devices that are not reachable for a long period, e.g. UEs that are using UE battery saving techniques, UE sleep functions, low throughput bearers, etc., result in high latency for accessing the devices from network side.

## 4 Objective

The objective of this work item is to develop stage 3 specification to enable the optimizations to Support High Latency Communications according to the related stage 2 requirements.

The work will cover the following aspects:

For CT4 part:

- To specify new requirements on the protocols to support the optimizations to support High Latency Communications, e.g. enhancements in Downlink Data Notification (DDN) procedure and inter MME/SGSN TAU/RAU procedure to support Extended buffering in the SGW;
- To specify the new monitoring (MONTE) "availability notification after DDN Failure" event.

NOTE: The new monitoring (MONTE) "UE Reachability one-time" event will be specified as part of the MONTE\_CT Work Item.

## 5 Service Aspects

Covered by the Parent WID.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

None.

## 8 Security Aspects

None.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
29.274		EPC requirements for Optimizations to Support High Latency Communications	CT#70 (Dec. 2015)	CT4 responsibility
29.060		EPC requirements for Optimizations to Support High Latency Communications	CT#70 (Dec. 2015)	CT4 responsibility
29.281		EPC requirements for Optimizations to Support High Latency Communications	CT#70 (Dec. 2015)	CT4 responsibility
23.008		Storage requirements for the new parameters for Optimizations to Support High Latency Communications	CT#70 (Dec. 2015)	CT4 responsibility
29.272		New parameters for the MONTE "availability notification after DDN Failure" event, and new potential subscription parameter (e.g. number of packets to be buffered)	CT#70 (Dec. 2015)	CT4 responsibility
29.230		New AVPs for new parameters introduced in the diameter based specifications	CT#70 (Dec. 2015)	CT4 responsibility
29.002		New parameters for the MONTE "availability notification after DDN Failure" event, and new potential subscription parameter (e.g. number of packets to be buffered)	CT#70 (Dec. 2015)	CT4 responsibility
29.336		New requirements for the MONTE event notification "availability notification after DDN Failure" for the S6 reference point.	CT#70 (Dec. 2015)	CT4 responsibility
29.128		New requirements for the MONTE event notification "availability notification after DDN Failure" for the T6a/T6b reference points. TS29.xyz is a new TS created by the MONTE CT Work Item.	CT#70 (Dec. 2015)	CT4 responsibility

## 11 Work item rapporteur(s)

Ericsson, Yong Yang ([frank.yong.yang@ericsson.com](mailto:frank.yong.yang@ericsson.com))

## 12 Work item leadership

CT4

## 13 Supporting Individual Members

Supporting IM name
Ericsson
Verizon
Orange
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Intel
Qualcomm Incorporated

## Further LTE Physical Layer Enhancements for MTC

650033	<a href="#">Further LTE Physical Layer Enhancements for MTC</a>	LTE_MTC e2_L1	1	R1, R4, R2	Sep-14	Jun-16	19%	RP-141660
650133	<a href="#">Core part: Further LTE Physical Layer Enhancements for MTC</a>	LTE_MTC e2_L1- Core	2	R1, R2, R4	Sep-14	Dec-15	45%	RP-150492
650233	<a href="#">Perf. Part: Further LTE Physical Layer Enhancements for MTC</a>	LTE_MTC e2_L1- Perf	2	R4	Sep-14	Jun-16	0%	RP-150492

**3GPP TSG RAN Meeting #65** **RP-141660**  
**Edinburgh, Scotland, 9<sup>th</sup> – 12<sup>th</sup> September 2014**

---

<b>Source:</b>	Ericsson, Nokia Networks
<b>Title:</b>	New WI proposal: Further LTE Physical Layer Enhancements for MTC
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	14.1.1

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Further LTE Physical Layer Enhancements for MTC

**Acronym:** TBD

**Unique identifier:**

This WID includes a Core part	X
This WID includes a Performance part	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

X	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
FS_LC_M TC_LTE	Study on Provision of low-cost MTC UEs based on LTE	FS_LC_MTC_LTE is a study of the feasibility of an LTE UE for MTC with reduced UE complexity and up to 20 dB coverage enhancement. The results are documented in TR 36.888.
LC_MTC_UE	Work Item on Low cost & enhanced coverage MTC UE for LTE	LC_MTC_UE is a Rel-12 work item introducing a low complexity UE category. The initial work item scope also included up to 15 dB coverage enhancement.

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

<a href="#">Stage 1 (go to 2.3.1)</a>
<a href="#">Stage 2 (go to 2.3.2)</a>
<a href="#">Stage 3 (go to 2.3.3)</a>
<a href="#">Test spec (go to 2.3.4)</a>
<a href="#">Other (go to 2.3.5)</a>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The provision of Machine-Type Communications (MTC) via cellular networks is proving to be a significant opportunity for new revenue generation for mobile operators. The Rel-12 work item “Low cost & enhanced coverage MTC UE for LTE” specified a low complexity LTE device for MTC with Bill of Material cost approaching that of an EGPRS modem using a combination of complexity reduction techniques. However, results from the study item documented in TR 36.888 indicated that further complexity reduction of LTE devices for MTC can be achieved if additional complexity reduction techniques are supported.

In addition, the study report TR 36.888 concluded that a coverage improvement target of 15-20 dB for both FDD and TDD in comparison to normal LTE footprint could be achieved to support the use cases where MTC devices are deployed in challenging locations, e.g. deep inside buildings, and to compensate for gain loss caused by complexity reduction techniques. The Rel-12 work item “Low cost & enhanced coverage MTC UE for LTE” also made significant progress towards specifying solutions for enhanced coverage but due to time limitations this was removed from the Rel-12 scope. Instead, RAN#63 endorsed a way forward (RP-140512) to continue MTC Coverage enhancements in Rel-13.

Power consumption is another important aspect that deserves more attention. Power saving design is a cross-layer effort, but at the physical layer the known best practice is to reduce active transmit/receive duration to a minimum.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The general objective is to specify a new UE for MTC operation in LTE that also allows for enhanced coverage compared to existing LTE networks and low power consumption, with the following detailed objectives:

- Specify a new Rel-13 low complexity UE category/type for MTC operation in any LTE duplex mode (full duplex FDD, half duplex FDD, TDD) based on the Rel-12 low complexity UE category/type supporting the following additional capabilities:
  - Reduced UE bandwidth of 1.4 MHz in downlink and uplink.
    - Bandwidth reduced UEs should be able to operate within any system bandwidth.
    - Frequency multiplexing of bandwidth reduced UEs and non-MTC UEs should be supported.
    - The UE only needs to support 1.4 MHz RF bandwidth in downlink and uplink.
    - The allowed re-tuning time supported by specification (e.g. ~0 ms, 1 ms) should be determined by RAN4.
  - Reduced maximum transmit power.
    - The maximum transmit power of the new UE power class should be determined by RAN4 and should support an integrated PA implementation.
  - Reduced support for downlink transmission modes.
  - The following further UE processing relaxations can also be considered within this work item:
    - Reduced maximum transport block size for unicast and/or broadcast signalling.
    - Reduced support for simultaneous reception of multiple transmissions.
    - Relaxed transmit and/or receive EVM requirement including restricted modulation scheme. Reduced physical control channel processing (e.g. reduced number of blind decoding attempts).
    - Reduced physical data channel processing (e.g. relaxed downlink HARQ time line or reduced number of HARQ processes).
    - Reduced support for CQI/CSI reporting modes.
- Target a relative LTE coverage improvement – corresponding to 15 dB for FDD – for the UE category/type defined above and other UEs operating delay tolerant MTC applications with respect to their respective nominal coverage.
  - The following techniques (which shall be applicable for both FDD and TDD) can be considered to achieve this:
    - Subframe bundling techniques with HARQ for physical data channels (PDSCH, PUSCH)
    - Elimination of use of control channels (e.g. PCFICH, PDCCH)
    - Repetition techniques for control channels (e.g. PBCH, PRACH, (E)PDCCH)
    - Either elimination or repetition techniques (e.g. PBCH, PHICH, PUCCH)

- Uplink PSD boosting with smaller granularity than 1 PRB
- Resource allocation using EPDCCH with cross-subframe scheduling and repetition (EPDCCH-less operation can also be considered)
- New physical channel formats with repetition for SIB/RAR/Paging
- A new SIB for bandwidth reduced and/or coverage enhanced UEs
- Increased reference symbol density and frequency hopping techniques
- Relaxed “probability of missed detection” for PRACH and initial UE system acquisition time for PSS/SSS/PBCH/SIBs can be considered as long as the UE power consumption impact can be kept on a reasonable level.
- The amount of coverage enhancement should be configurable per cell and/or per UE and/or per channel and/or group of channels. Relevant UE measurements and reporting to support this functionality should be defined.
- When defining the detailed solutions for the above coverage enhancement techniques, the work should strive to minimize divergence of solutions between the new UE category/type and other UEs. One possible approach is to require a ‘normal complexity UE’ configured with the coverage enhancement techniques to mimic some of the behaviours of a Rel-13 low complexity UE configured with the coverage enhancement techniques.
- The work with the physical layer control signalling (e.g. EPDCCH) and higher layer control signalling (e.g. SIB, RAR and Paging messages) should aim for a high level of commonality between the solutions for the new Rel-13 low complexity UEs and the solutions for coverage enhanced UEs.
- Provide power consumption reduction for the UE category/type defined above, both in normal coverage and enhanced coverage, to target ultra-long battery life:
  - When defining the detailed solutions for the Rel-13 low complexity UEs and the solutions for coverage enhanced UEs, strive to reduce active transmit/receive time. (e.g., minimizing the required number of repetitions by minimizing sizes of control messages).
  - Modification, including redesign, addition or removal, of signals/channels can be considered if this can achieve significant power consumption reduction.
  - Reduction of measurement time, measurement reporting, feedback signalling, system information acquisition, and synchronization acquisition time etc., can be considered if this can achieve significant power consumption reduction.
- Half duplex FDD, full duplex FDD, and TDD should be supported but since half duplex operation is particularly beneficial from device complexity and power consumption point of view, the solutions specified within this work item should be optimized for half duplex FDD and TDD.
- Reduced mobility support can be considered if this is needed to fulfil the objectives.
- The agreements and working assumptions made during the initial work carried out during the corresponding Rel-12 work item should be used as a starting point when applicable.

The work plan for the work shall be the following:

- RAN1 work
  - Specify physical layer aspects, and initiate the design of the new UE category/type.
- RAN2 work

- Specification of Layer 2/3 protocol aspects.
- RAN3 work
  - Specification of network protocol aspects on request from RAN1/RAN2.
- RAN4 work
  - Determine the allowed re-tuning time for when the UE changes its Rx or Tx frequency.
  - Determine the maximum transmission power level for the new UE power class.
  - Specify UE, eNodeB and RRM core requirements.
  - Specify necessary performance requirements related to the above mentioned core requirements.

## 4.2 Objective of Performance part WI

Specify necessary performance requirements related to the above mentioned core requirements

## 4.3 RAN time budget proposal

RAN #65															Q4/2014					RAN				
#66		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf			
78bis	78bis	87bis	87bis	87bis	87bis	85bis	72bis	72bis	72bis	72bis	72bis	79	79	88	88	88	86	73	73	73	73			
2												3.5												

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

RAN #66															Q1/2015					RAN				
#67		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf													
80	80	89	89	89	89	89	87	74	74	74	74													
3		1						0.5	0.5															

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

RAN #67															Q2/2015					RAN				
#68		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf													
80bis	80bis	89bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	74bis													
3	1.5						0.5	0.5	3	1.5														

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

RAN #68															Q3/2015					RAN				
#69		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf													
82	82	91	91	91	91	89	76	76	76	76	76													
3		1.5					1	1																

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

RAN #69															Q4/2015					RAN				
#70		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf													
82bis	82bis	91bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	76bis													
2							0.5	0.5																

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X				X
Don't know				X	

## 10 Expected Output and Time scale

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.201			RAN#70	Core part
36.211			RAN#70	Core part
36.212			RAN#70	Core part
36.213			RAN#70	Core part
36.214			RAN#70	Core part
36.300			RAN#70	Core part
36.302			RAN#70	Core part
36.306			RAN#70	Core part
36.321			RAN#70	Core part
36.331			RAN#70	Core part
36.101			RAN#70	Core part
36.104			RAN#70	Core part
36.133			RAN#70	Core part
36.101			RAN#72	Performance part
36.104			RAN#72	Performance part
36.133			RAN#72	Performance part

## 11 Work item rapporteur(s)

Bergman, Johan

**Company:** Ericsson

**Email:** [johan.bergman@ericsson.com](mailto:johan.bergman@ericsson.com)

## 12 Work item leadership

Primary responsibility: RAN WG1

Secondary responsibility: RAN WG2 and RAN WG4

## 13 Supporting Individual Members

Supporting IM name
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
AT&T
CATT
CHTTL
Deutsche Telekom
Ericsson
Huawei
HiSilicon
HTC
III
Intel
InterDigital
ITRI
KPN
Panasonic
KDDI
MediaTek Inc.
Microsoft
NEC
Nokia Corporation
Nokia Networks
Orange
Qualcomm Incorporated
Samsung
Sequans
Sharp
Sierra Wireless
Silver Spring Networks
SoftBank Mobile
Sony
Telefónica
Verizon Wireless
ZTE



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Source: Ericsson  
Title: Revised WI: Further LTE Physical Layer Enhancements for MTC  
Document for: Approval  
Agenda Item: 11.3.2

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: Further LTE Physical Layer Enhancements for MTC

Acronym: LTE\_MTCe2\_L1

Unique identifier: 650033

This WID includes a Core part	X
This WID includes a Performance part	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

X	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
FS_LC_M TC_LTE	Study on Provision of low-cost MTC UEs based on LTE	FS_LC_MTC_LTE is a study of the feasibility of an LTE UE for MTC with reduced UE complexity and up to 20 dB coverage enhancement. The results are documented in TR 36.888.
LC_MTC_UE	Work Item on Low cost & enhanced coverage MTC UE for LTE	LC_MTC_UE is a Rel-12 work item introducing a low complexity UE category. The initial work item scope also included up to 15 dB coverage enhancement.

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

<b>Stage 1 (go to 2.3.1)</b>
<b>Stage 2 (go to 2.3.2)</b>
<b>Stage 3 (go to 2.3.3)</b>
<b>Test spec (go to 2.3.4)</b>
<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The provision of Machine-Type Communications (MTC) via cellular networks is proving to be a significant opportunity for new revenue generation for mobile operators. The Rel-12 work item “Low cost & enhanced coverage MTC UE for LTE” specified a low complexity LTE device for MTC with Bill of Material cost approaching that of an EGPRS modem using a combination of complexity reduction techniques. However, results from the study item documented in TR 36.888 indicated that further complexity reduction of LTE devices for MTC can be achieved if additional complexity reduction techniques are supported.

In addition, the study report TR 36.888 concluded that a coverage improvement target of 15-20 dB for both FDD and TDD in comparison to normal LTE footprint could be achieved to support the use cases where MTC devices are deployed in challenging locations, e.g. deep inside buildings, and to compensate for gain loss caused by complexity reduction techniques. The Rel-12 work item “Low cost & enhanced coverage MTC UE for LTE” also made significant progress towards specifying solutions for enhanced coverage but due to time limitations this was removed from the Rel-12 scope. Instead, RAN#63 endorsed a way forward (RP-140512) to continue MTC Coverage enhancements in Rel-13.

Power consumption is another important aspect that deserves more attention. Power saving design is a cross-layer effort, but at the physical layer the known best practice is to reduce active transmit/receive duration to a minimum.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The general objective is to specify a new UE for MTC operation in LTE that also allows for enhanced coverage compared to existing LTE networks and low power consumption, with the following detailed objectives:

- Specify a new Rel-13 low complexity UE category/type for MTC operation in any LTE duplex mode (full duplex FDD, half duplex FDD, TDD) based on the Rel-12 low complexity UE category/type supporting the following additional capabilities:
  - Reduced UE bandwidth of 1.4 MHz in downlink and uplink.
    - Bandwidth reduced UEs should be able to operate within any system bandwidth. The work should target high commonality between different system bandwidths.
    - Frequency multiplexing of bandwidth reduced UEs and non-MTC UEs should be supported.
    - The UE only needs to support 1.4 MHz RF bandwidth in downlink and uplink.
    - The allowed re-tuning time supported by specification (e.g. ~0 ms, 1 ms) should be determined by RAN4.
  - Reduced maximum transmit power.
    - The maximum transmit power of the new UE power class should be determined by RAN4 and should support an integrated PA implementation.
  - Reduced support for downlink transmission modes.
  - The following further UE processing relaxations can also be considered within this work item:
    - Reduced maximum transport block size for unicast and/or broadcast signalling.
    - Reduced support for simultaneous reception of multiple transmissions.
    - Relaxed transmit and/or receive EVM requirement including restricted modulation scheme. Reduced physical control channel processing (e.g. reduced number of blind decoding attempts).
    - Reduced physical data channel processing (e.g. relaxed downlink HARQ time line or reduced number of HARQ processes).
    - Reduced support for CQI/CSI reporting modes.
- Target a relative LTE coverage improvement – corresponding to 15 dB for FDD – for the UE category/type defined above and other UEs operating delay tolerant MTC applications with respect to their respective nominal coverage.
  - The following techniques (which shall be applicable for both FDD and TDD) can be considered to achieve this:
    - Subframe bundling techniques with HARQ for physical data channels (PDSCH, PUSCH)
    - Elimination of use of control channels (e.g. PCFICH, PDCCH)
    - Repetition techniques for control channels (e.g. PBCH, PRACH, (E)PDCCH)
    - Either elimination or repetition techniques (e.g. PBCH, PHICH, PUCCH)
    - Uplink PSD boosting with smaller granularity than 1 PRB
    - Resource allocation using EPDCCH with cross-subframe scheduling and repetition (EPDCCH-less operation can also be considered)
    - New physical channel formats with repetition for SIB/RAR/Paging
    - A new SIB for bandwidth reduced and/or coverage enhanced UEs
    - Increased reference symbol density and frequency hopping techniques

- Relaxed “probability of missed detection” for PRACH and initial UE system acquisition time for PSS/SSS/PBCH/SIBs can be considered as long as the UE power consumption impact can be kept on a reasonable level.
  - The amount of coverage enhancement should be configurable per cell and/or per UE and/or per channel and/or group of channels. Relevant UE measurements and reporting to support this functionality should be defined.
- When defining the detailed solutions for the above coverage enhancement techniques, the work should strive to minimize divergence of solutions between the new UE category/type and other UEs. Basically the coverage enhancement solutions should be the same for the new low complexity UE category/type and for other UEs, however if a divergence cannot be avoided, the specification work for the new low complexity UE category/type should be given higher priority. One possible approach is to require a ‘normal complexity UE’ configured with the coverage enhancement techniques to mimic some of the behaviours of a Rel-13 low complexity UE configured with the coverage enhancement techniques.
- The work with the physical layer control signalling (e.g. EPDCCH) and higher layer control signalling (e.g. SIB, RAR and Paging messages) should aim for a high level of commonality between the solutions for the new Rel-13 low complexity UEs and the solutions for coverage enhanced UEs.
- All legacy system bandwidths should be supported but if it is particularly challenging to fulfil the coverage enhancement target in system bandwidths below 5 MHz then the work should focus on fulfilment of the coverage enhancement target in system bandwidths 5 MHz and above.
- Provide power consumption reduction for the UE category/type defined above, both in normal coverage and enhanced coverage, to target ultra-long battery life:
  - When defining the detailed solutions for the Rel-13 low complexity UEs and the solutions for coverage enhanced UEs, strive to reduce active transmit/receive time. (e.g., minimizing the required number of repetitions by minimizing sizes of control messages).
  - Modification, including redesign, addition or removal, of signals/channels can be considered if this can achieve significant power consumption reduction.
  - Reduction of measurement time, measurement reporting, feedback signalling, system information acquisition, and synchronization acquisition time etc., can be considered if this can achieve significant power consumption reduction.
- Half duplex FDD, full duplex FDD, and TDD should be supported but since half duplex operation is particularly beneficial from device complexity and power consumption point of view, the solutions specified within this work item should be optimized for half duplex FDD and TDD.
- Reduced mobility support can be considered if this is needed to fulfil the objectives.
- The agreements and working assumptions made during the initial work carried out during the corresponding Rel-12 work item should be used as a starting point when applicable.

The work plan for the work shall be the following:

- RAN1 work
  - Specify physical layer aspects, and initiate the design of the new UE category/type.
- RAN2 work
  - Specification of Layer 2/3 protocol aspects.

- RAN3 work
  - Specification of network protocol aspects on request from RAN1/RAN2.
- RAN4 work
  - Determine the allowed re-tuning time for when the UE changes its Rx or Tx frequency.
  - Determine the maximum transmission power level for the new UE power class.
  - Specify UE, eNodeB and RRM core requirements.
  - Specify necessary performance requirements related to the above mentioned core requirements.

## 4.2 Objective of Performance part WI

Specify necessary performance requirements related to the above mentioned core requirements

## 4.3 RAN time budget proposal

RAN #67																Q2/2015								RAN							
#68																															
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf												
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75												
3		1.5				0.5	0.5			3		1.5					1	1													

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

RAN #68																Q3/2015								RAN							
#69																															
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf												
82	82	91	91	91	89bis	76bis	76bis	76bis	76bis	89		76		76	76	76	76	76	76												
3		1.5				0.5	0.5					1		1																	

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

RAN #69																Q4/2015								RAN							
#70																															
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf												
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77												
		2				0.5	0.5					2								0.5	0.5										

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

RAN #70																Q1/2016								RAN							
#71																															
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf												
84	84	93	93	93	91bis	78bis	78bis	78bis	78bis	91		78		78	78	78	78	78	78												
																				1	1										

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

RAN #71																Q2/2016								RAN							
#72																															
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf												
84bis	84bis	93bis	93bis	93bis	91bis	78bis	78bis	78bis	78bis	85	85	94	94	94	92	79	79	79	79												
																				1	1										

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X				X
Don't know				X	

## 10 Expected Output and Time scale

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.201			RAN#70	Core part
36.211			RAN#70	Core part
36.212			RAN#70	Core part
36.213			RAN#70	Core part
36.214			RAN#70	Core part
36.300			RAN#70	Core part
36.302			RAN#70	Core part
36.306			RAN#70	Core part
36.321			RAN#70	Core part
36.331			RAN#70	Core part
36.101			RAN#70	Core part
36.104			RAN#70	Core part
36.133			RAN#70	Core part
36.101			RAN#72	Performance part
36.104			RAN#72	Performance part
36.133			RAN#72	Performance part

## 11 Work item rapporteur(s)

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**Company:** Ericsson

Email: johan.bergman@ericsson.com

## 12 Work item leadership

Primary responsibility: RAN WG1

Secondary responsibility: RAN WG2 and RAN WG4

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
AT&T
CATT
CHTTL
Deutsche Telekom
Ericsson
ETRI
III
Intel
InterDigital
ITRI
Huawei
HiSilicon
KDDI
KPN
LG Electronics
MediaTek Inc.
Microsoft
NEC
Nokia Corporation
Nokia Networks
Orange
Panasonic
Qualcomm Incorporated
Samsung
Sequans
Sharp
Sierra Wireless
Silver Spring Networks
SoftBank Mobile
Sony
Telefónica
Verizon Wireless
ZTE



## MBMS Enhancements

660009	<b>MBMS Enhancements</b>	MBMS_e nh	1	S2	Dec-14	Sep-15	100%	SP-140883
660010	MBMS Enhancements TR Phase	MBMS_e nh_TR	2	S2	Dec-14	Sep-15	100%	SP-140883
660011	MBMS Enhancements - Stage 2	MBMS_e nh_TS	2	S2	Mar-15	Mar-15	100%	SP-140883

## 3GPP TSG SA Meeting #66

TD SP-140883

Maui, Hawaii, U.S.A, 10 - 12 December 2014

was SP-140880, SP-140713

Title: New WID on Study on MBMS Enhancements <FS\_MBMS\_enh>

Source: SA WG2

Agenda Item: 15

SA WG2 Meeting #105

Sapporo, Japan, 13-17 October 2014

S2-143785

revision of S2-143753

Source: Nokia Networks

Title: New WID on MBMS Enhancements

Document for: Approval

Agenda Item: 8.1

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

Title: Study on MBMS Enhancements

Acronym: FS\_MBMS\_enh

Unique identifier: 660009

## 1 3GPP Work Area

X	Radio Access
X	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

X	Study Item (go to 2.1)
	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship
560020	Rel-12 Group Communication System Enablers for LTE (GCSE_LTE)	GCSE basic feature in Rel-12.
640137	Group Call eMBMS congestion management for LTE (GCSE_LTE-MBMS_CM-Core)	RAN BB on MBMS congestion management for LTE.
620064	Rel-13 Mission Critical Push To Talk over LTE (MCPTT)	MCPTT application uses GCSE as MBMS delivery service.

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
X	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

To position LTE as technology for critical communications such as Public Safety, Group Communication System Enablers for LTE (GCSE\_LTE) were introduced in Rel-12.

In Rel-12, GCSE\_LTE offers basic support for delivering voice and other data in a resource efficient way to a group of users spread over a large geographical area. Most prominent use case is a Push-To-Talk (PTT) service using GCSE\_LTE to broadcast voice using MBMS Delivery to a group of users. Via the MB2 interface introduced in Rel-12 between GCS AS and BM-SC, the GCS AS is able to request establishment of MBMS bearers.

During the work on GCSE\_LTE in Rel-12 it became clear that, in order to support Mission Critical Push To Talk (MCPTT), further improvements to GCSE\_LTE and MBMS are required. This is e.g. to allow establishment of MBMS bearers using a list of cell identifiers for finer granularity of the service area. There is an ongoing Rel-12 work item in RAN3 on Group Call eMBMS congestion management for LTE (GCSE\_LTE-MBMS\_CM). SA2 needs to consider the outcome of this work.

In the current MBMS solution the MBMS service area is pre-configured, i.e. each eNB, based on local configuration, is aware of the service area(s) it belongs to. For MCPTT, it is not always possible to determine the area where a group call is applicable in a static fashion. It should be possible to determine group call areas in a dynamic fashion, i.e.

based on the where-about of an incident. In addition, it may be up to a functional entity outside the MBMS architecture, for example, an MCPTT Application Server to determine the group communication area. Furthermore, the MBMS service area was defined for a large areas (e.g. a whole country for TV broadcast) while public safety related broadcast may happen only in a limited area (e.g. one cell or a couple of cells). To accommodate this requirement, it needs to be studied how broadcasting can be achieved in a smaller area and in a backward compatible manner.

Within the study phase of this work item possible improvements to GCSE and MBMS, including the MB2 interface, will be investigated. Coordination with other working groups such as RAN2, RAN3, CT3 and CT4 is foreseen.

## 4 Objective

### 1. Objectives as part of the TR phase:

- a. Define the architectural requirements in order to scope the work in SA2.
- b. Study possible improvements to allow establishment of MBMS bearers using target area information (e.g. a list of cell identifiers), as distinct from using an MBMS Service Area.  
Note: The mentioned improvements have impact to RAN, thus work on this objective requires coordination with RAN working groups. Solutions for this objective are supposed to have no UE impacts and are backward compatible to existing MBMS in a way that they do not change the MBSFN area concept.
- c. Study possible improvements to MBMS congestion handling.  
Note: Work on this objective depends on the outcome of the corresponding RAN3 work item GCSE\_LTE-MBMS\_CM and may have UE impact.
- d. Study possible MBMS roaming scenarios and, if needed, study how to support these roaming scenarios.
- e. Study aspects identified from MCPTT application work.
- f. Develop solutions and determine which solution(s) to document in normative specifications.

## 5 Service Aspects

Not applicable.

## 6 MMI-Aspects

Not applicable.

## 7 Charging Aspects

Based on the conclusion leading to normative work any necessary normative charging aspects will be undertaken by SA5 with support from SA2.

## 8 Security Aspects

Based on the conclusion leading to normative work any necessary normative security aspects will be undertaken by SA3 with support from SA2.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X				
Don't know		X			X

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
TR 23.8xy	Study on Enhancements to MBMS for LTE (MBMS_enh)	SA2		SA#68 (June 2015)	SA#69 (September 2015)	

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments

## 11 Work item rapporteur(s)

Nokia Networks, Rainer Liebhart

## 12 Work item leadership

SA2

## 13 Supporting Individual Members

Supporting IM name
Nokia Networks
Alcatel-Lucent
US Department of Commerce
AT&T
KPN
General Dynamics
Harris Corporation
Motorola Solutions
Vodafone
Ericsson
ZTE
Huawei
LG Electronics
Telefonica
UK Home Office
China Mobile
BMWi
Telecom Italia
Fujitsu
Samsung
SouthernLINC Wireless

2013-10-03 version 1.14.0

## MBMS Extensions and Profiling

670024	<a href="#">MBMS Extensions and Profiling</a>	MEPRO	1	S4	Mar-15	Dec-15	40%	SP-150099
670090	<a href="#">TR on Profiling and Extensions of MBMS</a>	MEPRO	2	S4	Mar-15	Dec-15	40%	SP-150099
670091	<a href="#">Specification of MBMS Extensions and Profiling</a>	MEPRO	2	S4	Mar-15	Dec-15	40%	SP-150099

3GPP TSG SA Meeting #67  
Shanghai, P. R. China, 11 – 13 March, 2015

▪ SP-150099  
Agenda Item: 15

3GPP TSG SA WG-4 Meeting #82  
Dubrovnik, CROATIA, Jan 26 – 30, 2015

▪ S4-150157  
revision of S4-150153

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

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Title \* : MBMS Extensions and Profiling

Acronym \* : MEPRE

Unique identifier \*

### 1 3GPP Work Area \*

	Radio Access
	Core Network
X	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

*This work item is a ... \**

	<a href="#">Study Item (go to 2.1)</a>
X	<a href="#">Feature (go to 2.2)</a>
	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

*Go to §3.*

#### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

*Go to §3.*

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

### 3.1 Introduction

The work in this work item is in four areas; for some of these, there is an initial study phase, and specification work will only commence on satisfactory conclusion of the study and consensus on the value and scope of the specification work.

### 3.2 Service Announcement Profile for live DASH and non-real time File Delivery

The MBMS User Services as defined in 3GPP TS 26.346 offer a broad set of media delivery services such as for Live Video distribution over MBMS and evolved MBMS systems. Devices follow the MBMS User Service Discovery and Announcement procedure in order to discover MBMS User Services of interest. The high number of different service announcement features makes the usability of service announcement difficult in particular in multi-vendor environments. Implementation effort for device side support is increased unnecessarily.

The work item aims to collect the essential service announcement features (from the set of already defined and used features) needed to specify a service announcement channel over an MBMS bearer service and define the usage within a profile.

A unicast bootstrapping of the service announcement channel over an MBMS bearer service should be defined clearly to allow devices (in particular newly deployed devices) to acquire the service announcement channel. The unicast framework used for bootstrapping may also be leveraged to deliver service announcement information via unicast bearer service when the UE is not in the MBMS coverage area.

### 3.3 Profile for Download Delivery Method (excluding Service Announcement profile)

In order to better support the existing services over MBMS, an identification of the set of useful tools for file delivery services is needed. The resulting set of tools makes a download delivery profile that is restricted to the relevant use cases which are to be identified. In addition, this profile should enable seamless delivery of content over unicast and broadcast channels, always allowing the service provider to make use of the most suitable delivery channel, without impacting the service consumption.

### **3.4 Usage of MBMS as a transport protocol including a URL form**

In some circumstances it is desirable to enable applications that use network resources that could be delivered over HTTP, to access those resources over MBMS rather than over a unicast protocol. The MBMS protocol handler will be identified by a URL form, and handler will act (from the application's point of view) in a similar way as a unicast resolution handler.

An application encountering such a URL would use this handler and the handler will use the information in the URL to bootstrap, access the service and return the identified resource to the application if possible.

The access details, including the bootstrap procedure, caching, and resolution of the location of the resources, are hidden in the protocol handler, thus allowing the application and the content authors to exploit MBMS without exposing these details to the application, and also ideally without requiring the application to be specific to the MBMS protocol.

In this area, we will study the details of such URL form(s), the bootstrapping process, and the behaviour of the protocol handler, both from the point of view of the network and the application.

### **3.5 MBMS API Set**

Currently, no standardized APIs are available between the MBMS UE middleware and an application that wants to use the services provided by the MBMS User Service delivery platforms.

Such an API set for MBMS is relevant as it could be used by developers for developing applications on top of MBMS User Services. Such a documented API set offers a more consistent mobile user experience and enables a wider selection of applications that may utilize the capabilities of MBMS.

In particular, an application/user agent supporting this API would be allowed to manage reception of content delivered over MBMS User Services. Examples of such functionalities include the provisioning of the available user services, the management of user service content reception, the initiation and termination of content reception, content reception status information, etc.

By defining an API set that abstract the details and complexity of the underlying middleware and the MBMS operations, but at the same time expose the service capabilities with the necessary details, applications/user agent could leverage the benefits of an MBMS User Service delivery platform.

Certain questions remain open on the exact functionalities that need to be exposed through such APIs, the abstraction level of the API, as well as the appropriate documentation and support for such API definitions.

A proper study of these questions is necessary.

## **4 Objective**

### **4.1 Common**

In all areas, reuse of existing technology and backwards compatibility shall be considered.

### **4.2 Service Announcement Profile for live DASH and non-real time File Delivery**

The objective is to specify a service announcement profile for MBMS User Services. Service announcement for live services delivered over DASH and none real time file delivery have priority, since these services for managed content (including managed 3rd Party Content) are currently deployed in the market place. Other services are for study

- Specification of a service announcement profile for MBMS User Services, which utilizes an MBMS Bearer Service for announcement, including updating of service announcement information, bootstrapping of the service announcement channel and unicast fall-back, when not in the MBMS coverage
- Provide additional guiding example for the usage of the service announcement profile in an informative annex.

## **4.3 Profile for Download Delivery Method (excluding Service Announcement profile)**

The objective is

- Define the relevant profile for file delivery services based on existing deployments and relevance of the tools

## **4.4 Usage of MBMS as a transport protocol including a URL form**

The objective is to study and consider specifying:

- The interface and behaviour of the protocol handler enabling the handler to bootstrap, access the service and return the identified resource to the application if possible; both interface and behaviour considered both from the point of view of the network and the application, including possibly signalling a redirection into another protocol;
- The details of the URL form(s);
- The methods and messages to communicate between the MBMS protocol handler and the applications.

Note: the redirection from other protocols into MBMS would be handled by the redirection mechanism of those other protocols.

In all cases solutions should be considered such that the application need not be specific to the MBMS protocol.

## **4.5 MBMS API Set**

The objective is to study the benefits of the specification of a common MBMS API set between UE middleware and the application that wants to use the services provided by the delivery platforms. The objective of the study includes

- Collection of relevant use cases that would justify the definition of an MBMS API set
- Documentation of a reference architecture in order to identify the level of the MBMS API set, e.g. MBMS service layer, MBMS application, etc.
- Collection of the functionalities and services of MBMS User services that would benefit from an API including the high-level description of the API including the APIs considered in the context of the objectives in section 4.4.
- Considerations on the appropriate documentation of the API Set in 3GPP or elsewhere
- Additional aspects to support the introduction of such an API set for deployments including maintenance, tooling support, testing, etc.
- Relation to other relevant organizations with more experience on definition of APIs
- Decision whether to specify the API as part of 3GPP SA4 specifications

## **5 Service Aspects**

None.

## **6 MMI-Aspects**

None.

## **7 Charging Aspects**

None.

## **8 Security Aspects**

None.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X		X
Don't know				X	

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp2ndary rsp. WG	Presented for information at plenary#	Approved at plenary#	Comments
26.8xx	Profiling and Extensions of MBMS	S4	SA#69	SA#70	
Affected existing specifications * [None in the case of Study Items]					
Spec No.	CR	Subject	Approved at plenary#	Comments	
26.346			SA#70		

## 11 Work item rapporteur(s) \*

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## 12 Work item leadership \*

Leadership: SA4

## 13 Supporting Individual Members \*

Supporting IM name
Apple (UK) Limited
Ericsson LM
Expway
Intel
HuaWei Technologies Co., Ltd
one2many B.V.
ORANGE
Qualcomm Incorporated
Samsung Electronics Co., Ltd
Sony Europe Limited

## Service Exposure and Enablement Support

610030	Service Exposure and Enablement Support	SEES	1	S1	Sep-13	Sep-14	100%	SP-130505
610130	TR on Stage 1 for Service Exposure and Enablement Support	SEES	2	S1	Sep-13	Jun-14	100%	SP-130505
610230	Stage 1 for Service Exposure and Enablement Support	SEES	2	S1	Sep-13	Sep-14	100%	SP-130505

### 3GPP TSG SA Meeting #61

**SP-130505**

**Porto, Portugal, 9 - 11 September 2013**

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**Source:** TSG SA WG1

**Title:** WID for Service Exposure and Enablement Support (SEES)

**Document for:** APPROVAL

**Agenda Item:** 15

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MCC comment: From S1-134174, agreed at SA1#63.

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

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**Title \* : Service Exposure and Enablement Support**

**Acronym \* : SEES**

**Unique identifier \***

### 1 3GPP Work Area \*

	Radio Access
X	Core Network
X	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		Nature of relationship
Unique ID	Title	
480130	System Improvements for Machine Type Communications (SIMTC)	Rel-11 WI on MTC
560022	Machine-Type and other mobile data applications Communications enhancements (MTCe)	Rel-12 WI on MTC
480032	Study on enhancements for Machine-Type Communications (FS_MTCe)	TR 22.888, Rel-12 SI on MTC
500031	Interworking between Mobile Operators using the Evolved Packet System and Data Application Providers (MOSAP)	Rel-12 WI, possible overlapping aspects

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

X	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks
oneM2M	Technical Report TR 0001- oneM2M Use Case collection	
oneM2M	Technical Specification TS 0002 - M2M Requirements	

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

#### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

### 3 Justification \*

This work item allows 3<sup>rd</sup> parties to interact with the 3GPP System to use 3GPP functions to provide 3<sup>rd</sup> party services to their customers. Since M2M services and other Application services often have the same or similar requirements on the 3GPP System these are addressed jointly in this work item.

The following service scenarios are considered in this work item:

M2M services:

Standardization work related to M2M service enablement is on-going in standardization organisations outside 3GPP (e.g. ETSI TC M2M and the oneM2M Global Initiative). These SDOs work under the assumption that M2M service enablement can be offered by a network operator but can also be provided by third parties that have business agreements with operators. In addition, these SDOs want to use 3GPP capabilities beyond pure IP based data transmission that can be offered by 3GPP networks.

On the other hand, 3GPP architecture work on MTC has started in Rel-10 and in Rel-12 SA2 is working on Small Data Transmissions and Low Power Consumption UEs. Some information (e.g. on transmission scheduling or indications for small data, device triggering...) may need to be provided by M2M service enablement.

In Rel-11, 3GPP defined an interface (Tsp) between the 3GPP Core Network and M2M service enablement platforms.. Additionally, 3GPP has defined other interfaces (Le, Rx, Mo, Mf, and Mh) between the 3GPP Core

Network and application platforms; these interfaces may also be used by M2M service enablement platforms. This work item extends the scope for this interworking.

### Application services:

With the high penetration of smart phones with a variety of applications, it is a challenge for operators to develop a new business model to increase the Quality of Experience for diversity of service type and potentially monetize the network asset. Interworking with the service providers and exposing network services can help the operators to take on the challenge.

Some private deployments have allowed operators to provide to application providers some services (e.g. statistics, location). However in multi-vendor environments, this requires time consuming and costly adaptations, therefore standardized exposure of selected 3GPP functions to application providers is needed.

## 4 Objective \*

### Stage 1 objectives:

Study and specify service requirements for the support of exposing selected 3GPP functions to

- M2M service enablement layers (e.g. ETSI TC M2M and oneM2M).

Use cases of oneM2M are contained in oneM2M TR 0001- oneM2M Use Case collection.

Functions that may require such interworking have been identified by oneM2M should e.g. allow for:

- o An M2M Service provider may request QoS and Prioritization for M2M communications to/from individual devices or groups of devices. A device may request QoS and Prioritization for M2M communications to/from the M2M Service Provider.

Note: For M2M communications initiated by the device QoS may be covered by existing call setup procedures.

- o An M2M Service provider and a Network Operator may exchange information related to individual M2M Devices or Gateways, such as transmission scheduling or indications for small data, device triggering, etc.
- o A Network Operator may request the M2M Service Provider to schedule traffic via the Operator Network (e.g. to delay specific M2M traffic when the 3GPP Network experiences high traffic load).
- o Provide mechanisms to correlate the oneM2M Service Enablement Framework identifier of M2M Devices with the External Identifier used by the 3GPP network for the same MTC client.
- o Upon request by the one M2M Service enablement Framework provide the oneM2M Service Enablement Framework with information regarding whether a M2M Device is authorized to access the 3GPP Operator Network.
- o An M2M Service provider and a Network Operator may need to exchange information on charging and subscriptions to support interworking with M2M Service providers.
- o Provide 3GPP security capabilities such as GBA for the benefit of oneM2M Services and Applications. Conversely provide mechanisms to leverage oneM2M security capabilities for the benefit of the 3GPP Operator Network security.
- o An M2M Service provider and a Network Operator may exchange information related to location information of M2M Devices or M2M Gateways.

In order to avoid overlapping specifications, close cooperation with ETSI TC M2M and oneM2M is envisaged.

- Application services:

Study use cases and identify requirements to support exposure of 3GPP network's information and capabilities which include the following aspects:

- o to allow MNO provide network policy information to the application (e.g. for video service or non-time critical service) thus the application could adapt the service accordingly
- o allow network consider the QoS/charging model expectation from application
- o users movement information

The exposed network information should not compromise private user information, i.e. no link with UE identity.

For both M2M service enablement layer support and application services aspects, to perform a gap analysis with existing related features e.g. MOSAP.

When the study is completed, an assessment to progress to normative work in 3GPP will be determined based on planned normative work in the external SDOs (e.g. ETSI TC M2M and oneM2M).

The work shall ensure no overlap of specification with OMA.

## 5 Service Aspects

Specification of M2M service enablement or M2M applications are outside the scope of this WID.

## 6 MMI-Aspects

None

## 7 Charging Aspects

While 3GPP charging mechanisms may not be affected it is expected that correlation of charging on M2M service enablement level with 3GPP charging is needed.

## 8 Security Aspects

Any necessary security analysis will be undertaken by SA3.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No					
Don't know	X	X	X		X

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]						
Spec Nd	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR 22.xxx	Service Exposure and enablement support	SA1		SA#63 (Mar 2014)	SA#64 (June 2014)	
Affected existing specifications * [None in the case of Study Items]						
Spec Nd	CR	Subject	Approved at plenary#		Comments	
22.368		Stage 1 CRs related to interworking with M2M service enablement layer	SA#64 (June 2014)			
22.xxx		Stage 1 CRs related to application services	SA#64 (June 2014)		Specification TBD depending on results of the TR	

## 11 Work item rapporteur(s) \*

Stage 1: SA1, KPN, Toon Norp (toon.norp@tno.nl)

## 12 Work item leadership \*

Stage 1: SA1

## 13 Supporting Individual Members \*

Supporting IM name
AT&T
CATT
China Mobile
Chunghwa Telecom Laboratories (CHTTL)
Deutsche Telekom
Huawei
Institute for Information Industry (III)
Intel
InterDigital Communications
ITRI
KDDI
KPN
LG Electronics
NTC
NEC
NTT DOCOMO
Orange
Sierra Wireless
Sprint
SoftBank Mobile
Telecom Italia
ZTE
Silver Spring Networks

## Isolated E-UTRAN Operation for Public Safety

630015	<a href="#">Isolated E-UTRAN Operation for Public Safety</a>	IOPS	1	S1	Mar-14	Dec-15	99%	SP 150358
680047	<a href="#">Stage 1 fo Isolated E-UTRAN Operation for Public Safety</a>	IOPS	2	S1	Mar-14	Sep-14	100%	SP 150358
680048	<a href="#">Stage 2 for Isolated E-UTRAN Operation for Public Safety</a>	IOPS	2	S2	Jun-15	Dec-15	100%	SP 150358

# Service Requirements Maintenance for Group Communication System Enablers for LTE

640042	Service Requirements Maintenance for Group Communication System Enablers for LTE	SRM_GCSE_LTE	1	S1	Jun-14	Sep-14	100%	SP-140228
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**3GPP TSG SA Meeting #64**

**TD SP-140228**

**Sophia-Antipolis, France, 16 – 18 June 2014**

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**Source:** TSG SA WG1

**Title:** New WID on Service Requirements Maintenance for Group Communication System Enablers for LTE (SRM\_GCSE\_LTE) (from S1-141571)

**Document for:** APPROVAL

**Agenda Item:** 15

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

**Title \* : Service Requirements Maintenance for Group Communication System Enablers for LTE**

**Acronym \* : SRM\_GCSE\_LTE**

**Unique identifier \*: 6400xy**

### 1 3GPP Work Area \*

X	Radio Access
X	Core Network
X	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

X	Study Item (go to 2.1)
X	Feature (go to 2.2)
X	Building Block (go to 2.3)
X	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
530044	Rel-12 Study on Proximity-based Services (FS_ProSe)	TR 22.803
580059	Rel-12 Proximity-based Services (ProSe)	Complementing feature
560020	Rel-12 Group Communication System Enablers for LTE (GCSE_LTE)	Predecessor feature

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

X	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

#### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

### 3 Justification \*

To position LTE as technology for critical communications such as public safety, Group Communication System Enablers for LTE were introduced in Rel-12. Group Communication System Enablers for LTE complements its sibling communication feature of proximity-based services (ProSe, UID 580059).

Group communication is a key functionality of LMR/PMR and public safety systems. Such functionality exists for voice calls in existing systems such as TETRA, P25 and GSM-R. Such functionality consists of a group delivery of calls to users as well as considerations about set up and management of groups.

### 4 Objective \*

This is a maintenance work item to support and, if needed, provide necessary clarifications for the introduction of requirements not implemented in Rel-12.

No new functions will be introduced by this work item.

Using the 'Feature Components' defined in the SA prioritization document (SP-130506) and the final contents from stage 2 TS 23.468, some functions requested by stage 1 TS 22.468 were not handled in Rel-12. Hence, those features were moved to Rel-13, i.e. the feature components to be worked on will be the additional aspect of Geographic Scope not covered in Rel-12, Floor Control, User Interaction, UE to Network Relay, Interworking (with non-3GPP networks) and UE-AS Open Interface.

## 5 Service Aspects

Will be clarified, if needed

## 6 MMI-Aspects

Not applicable

## 7 Charging Aspects

Will be clarified, if needed

## 8 Security Aspects

Will be clarified, if needed

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X	X	
No					
Don't know	X				X

## 10 Expected Output and Time scale \*

New specifications *					
[If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp WG(s)	Presented for information at plenary#	Approved at plenary#
Affected existing specifications *					
[None in the case of Study Items]					
Spec No.	CR	Subject	Approved at plenary#		Comments
22.468		<if needed>	SA#65 09/2014		

## 11 Work item rapporteur(s) \*

Juergen Merkel, NSN

## 12 Work item leadership \*

SA1

## 13 Supporting Individual Members \*

Supporting IM name
NSN
US Department of Commerce
AT&T
KPN
BMW
Blackberry UK Ltd.
Home Office

## Application specific Congestion control for Data Communication

640052	<a href="#">Application specific Congestion control for Data Communication</a>	ACDC	1	S1, C1	Jun-14	Dec-15	38%	SP-140234
660013	Stage 1 for Application specific Congestion control for Data Communication	ACDC-ST1	2	S1	Jun-14	Sep-14	100%	SP-140234
660039	Stage 3 for Application specific Congestion control for Data Communication	ACDC-CT	2	C1	Dec-14	Dec-15	35%	CP-150282
660139	CT1 part of Stage 3 for Application specific Congestion control for Data Communication	ACDC-CT	3	C1	Dec-14	Dec-15	70%	CP-150282
660239	CT6 part of Stage 3 for Application specific Congestion control for Data Communication	ACDC-CT	3	C6	Dec-14	Dec-15	0%	CP-150282
670059	RAN aspects of Application specific Congestion control for Data Communication	ACDC-RAN	2	R2	Mar-15	Dec-15	25%	RP-150512
670159	Core part: RAN aspects of Application specific Congestion control for Data Communication	ACDC-RAN-Core	3	R2	Mar-15	Dec-15	25%	RP-150662

**3GPP TSG SA Meeting #64**

**TD SP-140234**

**Sophia-Antipolis, France, 16 – 18 June 2014**

**Source:** [TSG SA WG1](#)

**Title:** [New WID on Application specific Congestion control for Data Communication \(ACDC\) \(from S1-141523\)](#)

**Document for:** APPROVAL

**Agenda Item:** 15

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

**Title \* : Application specific Congestion control for Data Communication**

**Acronym \* : ACDC**

**Unique identifier \***

### 1 3GPP Work Area \*

X	Radio Access
	Core Network
X	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any) *</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>
570034	Study on Application specific Congestion control for Data Communication, FS_ACDC	This WI stems from this SI.
630131	Core part: Smart Congestion Mitigation in E-UTRAN, SCM_LTE-Core	SCM_LTE-Core focuses on the preferred handling of MMTEL. When overlapping between ACDC and SCM_LTE-Core is found, the overlapped part is to be removed from ACDC.
	CT aspects of Smart Congestion Mitigation in E-UTRAN	This Building Block addresses CT aspects of SCM_LTE-Core.

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

This work item is ... \*

X	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any) *</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2 \*

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

**If no identified source of stage 1 information, justify: \***

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

**If no identified source of stage 2 information, justify: \***

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

There are services, such as the disaster message board service or the disaster voice messaging service, that are used to confirm the safety status of families, relatives, or community members in situations of disaster. Those services have been already used in several occasions and recognized as essential to support general public. Highly congested situation may be caused by natural disaster or public events or triggered by any of a number of reasons. In order to free up network resources based on operator-defined situation, e.g. in RAN/CN that is congested or about to be congested, it would be useful to have a mechanism (subject to regional regulations) that is able to allow/prohibit communication initiation of operator-defined particular applications in the UE. Currently there is no such mechanism.

## 4 Objective \*

The objective is to specify service requirements for system that shall be able to allow/prohibit communication initiation of particular applications defined by operator, subject to regional regulations. The requirements are intended to prevent/mitigate high overload of the access network and/or the core network before/under situation defined by operators.

The followings will be considered:

- Granularity of the control; ACDC category, barring rates.
- Activation by the network and action in UE.
- Related roaming scheme and network sharing scheme.
- Interaction with existing other access barring mechanisms.

## 5 Service Aspects

Service aspects will be specified. They are applied for UTRAN and E-UTRAN.

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale \*

New specifications *					
[If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
Affected existing specifications *					
[None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments
22.011	XX	Service accessibility		SA#65, Sept 2014	

## 11 Work item rapporteur(s) \*

Atsushi Minokuchi <minokuchi (at) nttdocomo (dot) co (dot) jp>

## 12 Work item leadership \*

SA WG1

## 13 Supporting Individual Members \*

Supporting IM name
NTT DOCOMO
Qualcomm Incorporated
Sony Mobile Communication
Intel
Huawei
KDDI
NEC
TeliaSonera
LG Electronics
NTC
Hitachi
SHARP
MediaTek
NTT

**3GPP TSG CT Meeting #68**  
Malmö, SWEDEN; 15<sup>th</sup> - 16<sup>th</sup> June 2015

**CP-150282**

**3GPP TSG CT Meeting #66**  
Maui, US; 8<sup>th</sup> - 9<sup>th</sup> December 2014

**CP-140999**

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

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Title: CT aspects of Application specific Congestion control for Data Communication (ACDC)

Acronym: ACDC-CT

Unique identifier: 660039

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
640052	Application specific Congestion control for Data Communication	TS 22.011

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS
640052	Application specific Congestion control for Data Communication	TS 22.011

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

There is no stage 2 requirement because it is only UE internal requirement.

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block					
Unique ID	Title	TS			

## 3 Justification

There are essential services to support the communication in disaster situations. To alleviate the highly congested situations of the network in these environments, it is beneficial to have a mechanism to allow/prevent new access attempts from particular operator-defined applications in the UE, subject to regional regulations.

SA1 agreed requirements on Application specific Congestion control for Data Communication (ACDC) in Release 13.

Highlighted requirements for ACDC include:

- This feature shall be applicable to UTRAN and E-UTRAN.
- The home network shall be able to configure a UE with at least four ACDC categories to each of which particular, operator-identified applications are associated.
- The serving network shall be able to broadcast, in one or more areas of the RAN, control information per each ACDC category, indicating e.g. barring rates, and whether a roaming UE shall be subject to ACDC control.
- The UE shall be able to control whether or not access attempt for certain application is allowed, based on this broadcast control information and the configuration of categories in the UE.

## 4 Objective

The objective of this work item is to specify the necessary changes in the stage-3 specifications based on the ACDC requirements in SA1 in order to control the access attempts for the particular, operator-identified applications, based on the information and configuration of categories.

The stage 3 specification work aims at investigating interaction with existing the access barring mechanism and specifying a new access control mechanism for prioritization of mobile originating access attempts depending on the particular categories in the UE.

## 5 Service Aspects

Covered by parent work item.

## 6 MMI-Aspects

Covered by parent work item.

## 7 Charging Aspects

Covered by parent work item.

## 8 Security Aspects

Covered by parent work item.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes	X	X			
No			X	X	X

<b>Don't know</b>				
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## 10 Expected Output and Time scale

<b>New specifications</b> [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
24.105	Application Specific Access Control Management Object (MO)	CT1		CT#69 (September 2015)	CT#70 (December 2015)	New Management Object for Application Specific Access Control

<b>Affected existing specifications</b> [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
24.301		Possible updates of UE procedure related to controlling the access attempts for the particular, operator-identified applications, based on the information and configuration of categories.	CT#70 (December 2015)	CT1 responsibility
24.008		Possible updates of MS procedure related to controlling the access attempts for the particular, operator-identified applications, based on the information and configuration of categories.	CT#70 (December 2015)	CT1 responsibility
27.007		Possible AT command for passing of the information related to controlling the access attempts for the particular, operator-identified applications.	CT#70 (December 2015)	CT1 responsibility
23.122		Possible updates of access control	CT#70 (December 2015)	CT1 responsibility
31.102		Possible addition of new functionalities for the configuration and operation of categories.	CT#70 (December 2015)	CT6 responsibility

## 11 Work item rapporteur(s)

Kim, Jaehyun (jaehyun7.kim@lge.com)

## 12 Work item leadership

CT1

## 13 Supporting Individual Members

<b>Supporting IM name</b>
LG Electronics
LG Uplus
KT Corp.
Qualcomm Incorporated
Verizon
Huawei
HiSilicon
NTT DOCOMO
InterDigital
MediaTek Inc.
Nokia Networks
SK Telecom
Intel
CATT
Samsung

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<b>Source:</b>	<b>LG Electronics</b>
<b>Title:</b>	<b>New Work Item Proposal on RAN aspects of Application specific Congestion control for Data Communication (ACDC)</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>13.1.2</b>

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** RAN aspects of Application specific Congestion control for Data Communication (ACDC)

**Acronym:** ACDC-RAN

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	<input type="checkbox"/>
<b>This WID includes a Performance part</b>	<input type="checkbox"/>

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
640052	Application specific Congestion control for Data Communication	TS 22.011

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS
640052	Application specific Congestion control for Data Communication	TS 22.011

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR
660039	CT aspects of Application specific Congestion control for Data Communication (ACDC)	Related CT work item	

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

There are essential services to support the communication in disaster situations. To alleviate the highly congested situations of the network in these environments, it is beneficial to have a mechanism to allow/prevent new access attempts from particular operator-defined applications in the UE, subject to regional regulations.

SA1 agreed requirements on Application specific Congestion control for Data Communication (ACDC) in Release 13.

Highlighted requirements for ACDC include:

- This feature shall be applicable to UTRAN and E-UTRAN.
- The home network shall be able to configure a UE with at least four ACDC categories to each of which particular, operator-identified applications are associated.
- The serving network shall be able to broadcast, in one or more areas of the RAN, control information per each ACDC category, indicating e.g. barring rates, and whether a roaming UE shall be subject to ACDC control.
- The UE shall be able to control whether or not access attempt for certain application is allowed, based on this broadcast control information and the configuration of categories in the UE.

Meanwhile, CT#66 approved a new work item for CT aspects of ACDC. The objective of this CT work item is to specify the necessary changes in the stage-3 specifications based on the ACDC requirements in SA1 in order to control the access attempts for the particular, operator-identified applications, based on the information and configuration of categories. CT1 work is planned to be completed in June 2015.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of this work item is to specify the necessary changes in the stage-3 specifications based on the ACDC requirements in SA1 in order to control the access attempts for the particular, operator-identified applications, based on the information and configuration of categories.

The stage 3 specification work for UTRAN and E-UTRAN is expected to enhance at least the followings to support ACDC requirements:

- System Information; and
- RRC Connection Establishment.

The work should take into account outcome of the related CT work item.

### 4.2 Objective of Performance part WI

### 4.3 RAN time budget proposal

RAN #67										Q2/2015										RAN									
#68																													
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf										
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75										
															0.25														

RAN										Q3/2015										RAN #69									
#68																													
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf										
82	82	91	91	91	89	76	76	76	76	82	82	91	91	91	89	76	76	76	76										
					0.25	0.25																							

RAN #69										Q4/2015										RAN									
#70																													
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf										
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77										
					0.25	0.25																							

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

## 5 Service Aspects

Covered by parent work item.

## 6 MMI-Aspects

Covered by parent work item.

## 7 Charging Aspects

Covered by parent work item.

## 8 Security Aspects

Covered by parent work item.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X	X	
No					X
Don't know	X				

## 10 Expected Output and Time scale

Spec No.	Title	New specifications [If Study Item, one TR is anticipated]				Comments
		1 <sup>st</sup> rsp. WG	2 <sup>nd</sup> rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	

NOTE: If this is a RAN WID including Core and Perf. Part, then all new Core part specs have to be listed first and then all new Perf. Part specs. Indicate "Core part" or "Perf. Part" under Comments for each spec.  
By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.331			RAN#70 (Dec. 2015)	
25.331			RAN#70 (Dec. 2015)	

NOTE: If this is a RAN WID including Core and Perf. Part, then all new Core part specs have to be listed first and then all new Perf. Part specs. Indicate "Core part" or "Perf. Part" under Comments for each spec.  
If an existing spec is affected by both (Core part and Perf. Part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Youngdae LEE

Company: LG Electronics Inc.

Email: youngdae.lee@lge.com

Nianshan Shi (for UMTS)

Company: Ericsson

Email: nianshan.shi@ericsson.com

## 12 Work item leadership

RAN2

## 13 Supporting Individual Members

Supporting IM name
LG Electronics Inc.
Samsung
Verizon
SK Telecom
LG Uplus
ETRI
ITL
Huawei
HiSilicon
MediaTek Inc.
TeliaSonera
NTT DOCOMO, INC.
KT Corp.
Qualcomm
Intel
Ericsson
InterDigital

3GPP TSG RAN Meeting #68

RP-150662

Malmo, Sweden, 15 – 18 June, 2015

Source:	LG Electronics
Title:	New Work Item Proposal on RAN aspects of Application specific Congestion control for Data Communication (ACDC)
Document for:	Approval
Agenda Item:	11.2.5

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

**Title:** RAN aspects of Application specific Congestion control for Data Communication (ACDC)

**Acronym:** ACDC-RAN

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>
640052	Application specific Congestion control for Data Communication	TS 22.011

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any)</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS
640052	Application specific Congestion control for Data Communication	TS 22.011

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR
660039	CT aspects of Application specific Congestion control for Data Communication (ACDC)	Related CT work item	

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

There are essential services to support the communication in disaster situations. To alleviate the highly congested situations of the network in these environments, it is beneficial to have a mechanism to allow/prevent new access attempts from particular operator-defined applications in the UE, subject to regional regulations.

SA1 agreed requirements on Application specific Congestion control for Data Communication (ACDC) in Release 13.

Highlighted requirements for ACDC include:

- This feature shall be applicable to UTRAN and E-UTRAN.
- The home network shall be able to configure a UE with at least four ACDC categories to each of which particular, operator-identified applications are associated.
- The serving network shall be able to broadcast, in one or more areas of the RAN, control information per each ACDC category, indicating e.g. barring rates, and whether a roaming UE shall be subject to ACDC control.
- The UE shall be able to control whether or not access attempt for certain application is allowed, based on this broadcast control information and the configuration of categories in the UE.

Meanwhile, CT#66 approved a new work item for CT aspects of ACDC. The objective of this CT work item is to specify the necessary changes in the stage-3 specifications based on the ACDC requirements in SA1 in order to control the access attempts for the particular, operator-identified applications, based on the information and configuration of categories. CT1 work is planned to be completed in June 2015.

## 4 Objective

#### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of this work item is to specify the necessary changes in the stage-3 specifications based on the ACDC requirements in SA1 in order to control the access attempts for the particular, operator-identified applications, based on the information and configuration of categories.

The stage 3 specification work for UTRAN and E-UTRAN is expected to enhance at least the followings to support ACDC requirements:

- System Information; and
  - RRC Connection Establishment.

The work should take into account outcome of the related CT work item.

#### 4.2 Objective of Performance part WI

## 4.3 RAN time budget proposal

RAN #68		Q3/2015					RAN #69				
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RD Perf	R4RF Perf	R4RD Perf	
82	82	91	91	91	89	76	76	76	76	76	
			0.25	0.25							

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

5 Service Aspects

Covered by parent work item.

## 6 MMI-Aspects

Covered by parent work item.

## 7 Charging Aspects

Covered by parent work item.

## 8 Security Aspects

Covered by parent work item.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X	X	
No					X
Don't know	X				

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1 <sup>st</sup> rsp. WG	2 <sup>nd</sup> rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. Part, then all new Core part specs have to be listed first and then all new Perf. Part specs. Indicate "Core part" or "Perf. Part" under Comments for each spec.  
By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.331			RAN#70 (Dec. 2015)	
25.331			RAN#70 (Dec. 2015)	

NOTE: If this is a RAN WID including Core and Perf. Part, then all new Core part specs have to be listed first and then all new Perf. Part specs. Indicate "Core part" or "Perf. Part" under Comments for each spec.  
If an existing spec is affected by both (Core part and Perf. Part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Youngdae LEE

Company: LG Electronics Inc.

Email: youngdae.lee@lge.com

Nianshan Shi (for UMTS)

Company: Ericsson

Email: nianshan.shi@ericsson.com

## 12 Work item leadership

RAN2

## 13 Supporting Individual Members

<b>Supporting IM name</b>
LG Electronics Inc.
Samsung
Verizon
SK Telecom
LG Uplus
ETRI
ITL
Huawei
HiSilicon
MediaTek Inc.
TeliaSonera
NTT DOCOMO, INC.
KT Corp.
Qualcomm
Intel
Ericsson
InterDigital

650018	<a href="#">Enhanced Calling Information Presentation</a>	ECIP	1	S1	Sep-14	Dec-15	100%	SP-140513
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**3GPP TSG SA Meeting #65****TD SP-140513****Edinburgh, GB, 15 – 17 September 2014****Source:** TSG SA WG1**Title:** New WID on Enhanced Calling Information Presentation (ECIP)**Document for:** APPROVAL**Agenda Item:** 15**3GPP™ Work Item Description**For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>**Title:** Enhanced Call Information Presentation (ECIP)**Acronym:** ECIP**Unique identifier:****1 3GPP Work Area**

	Radio Access
	Core Network
X	Services

**2 Classification of WI and linked work items****2.0 Primary classification**

This work item is a work task.

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

**2.1 Study Item**

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
620070	Study on Enhanced Call Information Presentation, FS_ECIP	This WI is based on TR 22.810 (FS_ECIP)
7038	Multimedia Telephony Service for IMS	TS 22.173, Stage 1 Supplementary services are defined, including OIP(Originating Identification Presentation) / TIP(Terminating Identification Presentation)/ etc.
370028	Stage 1 for Customized Alerting Tone (CAT)	TS 22.182, Stage 1 Customized Alerting Tones is played to the calling party.
380067	Customized Ringing Signal (CRS)	TS 22.183, Stage 1 Customized Ringing Signal is played to the called party.

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

x	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Supplementary services such as CLIP, CNAP and OIP provide the calling party's number/name to the called party. With the uptake of smart phones and IP communications, supplementary services are expected to provide the calling/called party Enhanced Call Information (ECI) such as portrait, video, signature, etc. TS 22.182 addresses the service requirements of Customized Alerting Tone (CAT) which provides multimedia call information to the calling party, and TS 22.183 addresses the service requirements of Customized Ringing Signal (CRS) which provides multimedia call information to the called party.

The study done in TR 22.810 introduces some new use cases for Enhanced Call Information Presentation (ECIP) which brings additional or enhanced service requirements for CAT and CRS respectively.

## 4 Objective

The objective of this work item is to update the stage 1 CAT and CRS specifications (TS 22.182 and TS 22.183 respectively) with the enhancements introduced in TR 22.810, which include:

- Support of additional media types for CAT/CRS contents.
- Ability to verify that the party is authorised to store and update CAT/CRS contents.
- For CRS service allow the calling party to select from the pre-stored CRS content, or use content, on a per call basis.
- Ability to charge on event, volume or media type basis.

## 5 Service Aspects

Enhanced service requirements for CAT and CRS will be specified.

## 6 MMI-Aspects

None

## 7 Charging Aspects

Enhanced charging requirements for CAT and CRS will be specified.

## 8 Security Aspects

Access to the stored call information should be secure.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

Affected existing specifications [None in the case of Study Items]			
Spec No	CR	Subject of the CR	Approved at plenary#
22.182	0023	Enhanced call information presentation to the calling party	SA#65, Sept 2014
22.183	0002	Enhanced call information presentation to the called party	SA#65, Sept 2014

## 11 Work item rapporteur(s)

Zheng, Jianping (China Mobile, zhengjianping@chinamobile.com)

## 12 Work item leadership

SA WG1

## 13 Supporting Individual Members

Supporting IM name
China Mobile
Orange
Huawei
ZTE
CHTTL



	650019
	650055
	660002
	660003
	690024
	650020

**3GPP TSG SA Meeting #65**

**TD SP-140638**

**Edinburgh, GB, 15 – 17 September 2014**

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**Source:** TSG SA WG1

**Title:** New WID on Flexible Mobile Service Steering (FMSS)

**Document for:** APPROVAL

**Agenda Item:** 15

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

**Title \* : Flexible Mobile Service Steering**

**Acronym \* : FMSS**

**Unique identifier \***

### 1 3GPP Work Area \*

	Radio Access
X	Core Network
X	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
620069	Study on Flexible Mobile Service Steering (FS_FMSS)	SA1 TR 22.808

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

X	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

#### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

### 3 Justification \*

The operator can deploy a mobile service network (e.g., (S)Gi-LAN network) to improve the user's QoE, reduce the bandwidth pressure and provide valued added services. Current chain models have some drawbacks, such as rigidity and complexity, for example:

- Traffic is routed sequentially via all service enablers in the chain, even though not all service enablers are needed in all cases. Because of this:
  - Unused service enablers add an unnecessary transfer delay;
  - Each service enabler has to support the maximum traffic capacity, even though it may only be needed for part of the traffic;

In order to overcome the drawbacks, new mechanisms are proposed. The "Service Function Chain (SFC)" BOF is currently developed in IETF. In contrast to the traditional IP routing mechanism, the service function chain defined in the IETF is working to bring a new "On demand" routing mechanism, which allows specific service enablers to be selected for traffic routing and this could be used for realizing efficient and flexible routing. Besides IETF, there are other SDOs (e.g. ETSI NFV, ITU) working on the service chain mechanisms. The work of 3GPP will not duplicate the work of the other SDOs.

Such a routing mechanism could be used in the (S)Gi-LAN network. The mobile network can leverage these newly

defined service routing mechanisms for (S)Gi-LAN traffic steering with 3GPP network function enhancements enabling the traffic classification and service chain selection mechanisms.

## 4 Objective \*

The objective is to define service requirements to enable the 3GPP Core Network to define and modify traffic steering policies that will be used to select required service enablers of the operator deployed (S)Gi-LAN. The aim is to realize efficient and flexible mobile service steering in the (S)Gi-LAN. SA1 will develop requirements for steering policy generation.

Requirements that will be considered include:

- The 3GPP Core Network traffic steering policies are generated based on one or a combination of several pieces of information, such as network operator's policies, application characteristics, and user's subscription;

## 5 Service Aspects

Service aspects will be covered.

## 6 MMI Aspects

N/A

## 7 Charging Aspects

The work may impact charging, e.g. charging based on the steering policy or services.

## 8 Security Aspects

N/A

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		
Don't know					X

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
Affected existing specifications * [None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments
22.101		Define requirement of flexible mobile service steering		SA#65 (Sept 2014)	

## 11 Work item rapporteur(s) \*

Stage 1: SA1, China Mobile, Lu Lu (lulu@chinamobile.com)

## 12 Work item leadership \*

Primary: SA1

## 13 Supporting Individual Members \*

Supporting IM name
China Mobile Com. Corporation
Huawei Technologies Co., Ltd
ZTE Corporation
Allot Communications Ltd
Alcatel-Lucent
CATT
CATR
Deutsche Telekom AG
Orange
Openet
Nokia Networks
Oracle
US Cellular
BT Group Plc
China Telecom
NTT DoCoMo
KDDI
Comverse
Intel
Telecom Italia
Juniper Networks
China Unicom
SoftBank Mobile
Sprint
NEC

**3GPP TSG SA Meeting #66**

**TD SP-140703**

**Maui, Hawaii, U.S.A, 10 - 12 December 2014**

**Title:** Updated WID for Flexible Mobile Service Steering (FMSS)

**Source:** SA WG2

**Agenda Item:** 13.14

**SA WG2 Meeting #105**

**S2-143749**

**13 - 17 October 2014, Sapporo, Japan**

**(revision of S2-143526)**

**Title:** Updated WID for Flexible Mobile Service Steering (FMSS)

**Source:** China Mobile, Alcatel-Lucent, Alcatel-Lucent ShangHai Bell, China Telecom, Orange, China Unicom, Allot Communications

**Agenda Item:** 8.1

**Document for:** Discussion and Approval

**Work Item / release:** Rel-13 Flexible Mobile Service Steering (FMSS)

# 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Title \* : Flexible Mobile Service Steering

Acronym \* : FMSS

Unique identifier \*

## 1 3GPP Work Area \*

	Radio Access
X	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
620069	Study on Flexible Mobile Service Steering (FS_FMSS)	SA1 TR 22.808

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

X	Stage 1 (go to 2.3.1)
X	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS
650019	Flexible Mobile Service Steering	22.101

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 4 Justification \*

The operator can deploy a mobile service network (e.g., (S)Gi-LAN network) to improve the user's QoE, reduce the bandwidth pressure and provide valued added services. Current chain models have some drawbacks, such as rigidity and complexity, for example:

- Traffic is routed sequentially via all service enablers in the chain, even though not all service enablers are needed in all cases. Because of this:
  - Unused service enablers add an unnecessary transfer delay;
  - Each service enabler has to support the maximum traffic capacity, even though it may only be needed for part of the traffic;

In order to overcome the drawbacks, new mechanisms are proposed. The "Service Function Chaining (SFC)" is a working group currently developed in IETF. In contrast to the traditional IP routing mechanism, the service function chain defined in the IETF is working to bring a new "On demand" routing mechanism, which allows specific service enablers to be selected for traffic routing and this could be used for realizing efficient and flexible routing. Besides IETF, there are other SDOs (e.g. ETSI NFV, ITU) working on the service chain mechanisms. The work of 3GPP will not duplicate the work of the other SDOs.

Such a routing mechanism could be used in the (S)Gi-LAN network. The mobile network can leverage these newly defined service routing mechanisms for (S)Gi-LAN traffic steering with 3GPP network function enhancements enabling the traffic classification and service chain selection mechanisms.

## 4 Objective \*

The objective in Stage 1 is to define service requirements to enable the 3GPP Core Network to define and modify traffic steering policies that will be used to select required service enablers of the operator deployed (S)Gi-LAN. The aim is to realize efficient and flexible mobile service steering in the (S)Gi-LAN. SA1 will develop requirements for steering policy generation.

Requirements that will be considered include:

- The 3GPP Core Network traffic steering policies are generated based on one or a combination of several pieces of information, such as network operator's policies, application characteristics, and user's subscription;

The objective in Stage 2 is to meet the service requirements defined in Stage 1, i.e., specify how the 3GPP core network provides policies for mobile service steering in the (S)Gi-LAN.

NOTE: Service enablers supported within the (S)Gi-LAN and the routing of traffic between those service enablers are out of this work item scope. The work item scope is restricted to providing policies through interfaces defined by 3GPP.

## 5 Service Aspects

Service aspects will be covered.

## 6 MMI Aspects

N/A

## 7 Charging Aspects

The work may impact charging, e.g. charging based on the steering policy or services.

## 8 Security Aspects

N/A

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		
Don't know					X

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp WG(s)	Presented for information at plenary#	Approved at plenary#
23.xyz	Architecture Enhancement for Flexible Mobile Service Steering	SA2		SA#67 (March 2015)	SA#68 (June 2015) TR will be used for capturing solution alternatives and evaluations.
Affected existing specifications * [None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments
22.101		Define requirement of flexible mobile service steering		SA#65 (Sept 2014)	
TBD				SA#68 (June 2015)	The list of affected specifications will become available once TR is concluded.

## 11 Work item rapporteur(s) \*

Stage 1: SA1, China Mobile, Lu Lu ([lulu@chinamobile.com](mailto:lulu@chinamobile.com))

Stage 2: SA2, China Mobile, Sun Tao ([suntao@chinamobile.com](mailto:suntao@chinamobile.com))

## 12 Work item leadership \*

Primary: SA1

Secondary: SA2

## 13 Supporting Individual Members \*

Supporting IM name
China Mobile Com. Corporation
Huawei Technologies Co., Ltd
ZTE Corporation
Allot Communications Ltd
Alcatel-Lucent
CATT
CATR
Deutsche Telekom AG
Orange
Openet
Nokia Networks
Oracle
US Cellular
BT Group Plc
China Telecom
KDDI
Comverse
Intel
Telecom Italia
Juniper Networks
China Unicom
SoftBank Mobile
Sprint
NEC
AT&T
Broadcom Corporation
Cisco
Sandvine
Hitachi
LG Electronics

650020	<b>GERAN UTRAN Sharing Enhancements</b>	GUSH	1	S1	Sep-14	Dec-14	100%	SP-140637
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**3GPP TSG SA Meeting #65****TD SP-140637****Edinburgh, GB, 15 – 17 September 2014****Source:** TSG SA WG1**Title:** New WID on GERAN UTRAN Sharing Enhancements (GUSH)**Document for:** APPROVAL**Agenda Item:** 15**3GPP™ Work Item Description**For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>**Title:** GERAN UTRAN Sharing Enhancements**Acronym:** GUSH**Unique identifier:****1 3GPP Work Area**

X	Radio Access
X	Core Network
	Services

**2 Classification of WI and linked work items****2.0 Primary classification**

This work item is a ...

X	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

**2.1 Study Item**

Related Work Item(s) (if any)		
Unique ID:	Title	Nature of relationship

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
540028	TR 22.852 - Study on Radio Access Network (RAN) sharing enhancements (FS_RSE)	This version of the Study was written for E-UTRAN.
	TR 22.852 - Study on RAN Sharing Enhancements on GERAN and UTRAN (FS_GUSH)	This is the updated version of TR 22.852 that includes GERAN and UTRAN as well as E-UTRAN from the previous version. This version of TR 22.852 will be used as the basis for normative work on GERAN & UTRAN Sharing Enhancements.

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

X	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CRIS	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	IS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Description of relationship	IS/AIR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	IS

## 3 Justification

RAN Sharing is common practice and allows operators to share resources and hence reduce costs. There has already been work done to enhance RAN Sharing capability for E-UTRAN (4G) based networks. This work is to enhance RAN sharing capability on GERAN and UTRAN (2G and 3G) networks. This will make it easier for operators to share RANs on and across all radio access technologies.

It is considered necessary to enhance RAN Sharing on 2G and 3G to cater for the following scenarios:

- Common network shared by multiple operators – This is the case where the traffic on the older networks (e.g. 2G) of all operators in a particular country has reduced significantly. It is, however, still necessary to keep the 2G network as there are still many devices that use it, for example, older UEs, low-traffic M2M devices and roaming UEs from other countries. In order to save costs, it is agreed amongst the operators to jointly share a single 2G radio network to support these devices. Some of the operators have MVNO agreements that also use this network.
- Consolidation Situation: when any of the 2G, 3G or 4G networks, which have already built out by each of the sharing operators, needs to be consolidated into one joint network. This type of network sharing usually holds significant cost advantages, but it also presents substantial design challenges.

In a preceding study on RAN Sharing Enhancements (TR 22.852), use cases have been collected and the effects of enhanced RAN Sharing scenarios have been studied for 2G, 3G and 4G based RAN technologies.

## 4 Objective

The objective of this work item is to standardise means that complement existing system capabilities for sharing common 2G and 3G RAN resources. The work will take into account the following topics:

- Allocation of Shared RAN resources based on the proportion of assigned RAN usage for each Participating Operator.
- On-demand capacity negotiation.
- Selective OAM access to Participating Operators.
- Load balancing while respecting the agreed shares of RAN resources.
- Generation and retrieval of usage and accounting information on a per Participating Operator basis.
- PWS in shared RAN.
- RAN Allocation in a common radio network shared by multiple operators.

## 5 Service Aspects

Impact on service experience of individual subscribers should be kept at a minimum.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

These will include generation and retrieval of usage and accounting information

## 8 Security Aspects

RAN Sharing Enhancements shall not negatively affect security or privacy of sharing networks or subscribers.

For the case of multiple operators sharing radio network resources the work item needs take care of requirements and scenarios for:

- maintaining end-to-end security for each operator
- providing and allowing appropriate levels of visibility of the shared radio network resources to the sharing network operators according to each operator's role in the sharing arrangement.

Involvement of SA3 for evaluation of potential scenarios is envisaged.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

<b>Affected existing specifications</b> [None in the case of Study Items]			
Spec No	CR Subject of the CR	Approved at plenary	Comments
22.101	CR on Requirements to support enhanced GERAN & UTRAN Sharing.	SA#66 Dec 2014	

## 11 Work item rapporteur(s)

SA1 : Telefónica, Chris Friel (chris.friel@telefonica.com)

## 12 Work item leadership

SA1

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Telefónica
Orange
Interdigital
Vodafone
China Unicom
Qualcomm
NEC

## User Plane Congestion management

				S1, S2, C3, C4				
570029	<a href="#">User Plane Congestion management</a>	UPCON	1	S1, S2, C3, C4	Sep-12	Mar-15	99%	SP-140631
570129	<a href="#">Stage 1 for User Plane Congestion management</a>	UPCON-ST1	2	S1	Sep-12	Mar-13	100%	SP-140631
580057	<a href="#">TR on Stage 2 for User Plane Congestion management</a>	UPCON-SA2TR	2	S2	Dec-12	Mar-15	100%	SP-140631
580058	<a href="#">Deleted - Stage 2 for User Plane Congestion management</a>	UPCON-SA2Del	2	S2	Dec-12	Dec-13	100%	SP-140631
630019	<a href="#">BB1: RAN Downlink Traffic Differentiation, Congestion Detection and Reporting</a>	UPCON-DOTCON	2	S2	Mar-14	Mar-15	99%	SP-140631
630119	Stage 2 for RAN Downlink Traffic Differentiation, Congestion Detection and Reporting	UPCON-DOTCON-SA2	3	S2	Mar-14	Dec-14	100%	SP-140434
650007	CT aspects of User Plane Congestion Management for BB1	UPCON-DOTCON-CT	3	C3	Mar-14	Mar-15	100%	CP-150365
650107	CT3 part of CT aspects of User Plane Congestion Management for BB1	UPCON-DOTCON-CT	4	C3	Mar-14	Mar-15	100%	CP-150365
650207	CT4 part of CT aspects of User Plane Congestion Management for BB1	UPCON-DOTCON-CT	4	C4	Mar-14	Mar-15	100%	CP-150365
630020	<a href="#">Deleted - BB2: Application and Content Prioritization</a>	UPCON-CONDEL	2	S2	Mar-14	Sep-14	100%	SP-140631
630021	<a href="#">Deleted - BB3: Uplink traffic and attended/unattended traffic</a>	UPCON-TRAFDEL	2	S2	Mar-14	Sep-14	100%	SP-140631

## 3GPP TSG SA Meeting #65

TD SP-140631

Edinburgh, Scotland, UK, 15 - 17 September 2014 [\(revision of SP-140153, SP-140625\)](#)

Source: SA WG2

Title: Updated WID: Revised User Plane Congestion management WID

Document for: Approval

Agenda Item: 13.7

SA WG2 Meeting #104

S2-142850

7 - 11 July 2014, Dublin, Ireland

[\(revision of S2-142323\)](#)

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Title \* : User Plane Congestion management

Acronym \* : UPCON

Unique identifier \* 570029

## 1 3GPP Work Area \*

X	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
540027	Rel-12 TR 22.805 Study on User Plane Congestion management (FS_UPCON): User plane congestion management use cases and requirements	Study to identify use cases and associated requirements as a basis for normative work

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

X	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

#### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 5 Justification \*

Mobile operators are seeing significant increases in user data traffic. For some operators, user data traffic has more than doubled annually for several years. Although the data capacity of networks has increased significantly, the

observed increase in user traffic continues to outpace the growth in capacity. This is resulting in increased network congestion and in degraded user service experience. Reasons for this growth in traffic are the rapidly increasing use of smart phones and tablet like devices, and the proliferation of data applications that they support, as well as the use of USB modem dongles for laptops to provide mobile Internet access using 3GPP networks. As the penetration of these terminals increases worldwide and the interest in content-rich multi-media services (e.g. OTT video streaming services) rises, this trend of rapidly increasing data traffic is expected to continue and accelerate.

3GPP SA2 has studied some aspects of the above in UPCON Work Item in Release 12 (TR-23.705). The current work item is being proposed to complete the study aspects of UPCON in Rel-12 and to progress selected solutions towards normative specification. The feature components defined in SP-130337 have been used for focussed objectives.

## 4 Objective \*

The SA1 objective is to specify normative stage 1 enhancements based on the requirements derived from the scenarios and use cases developed in FS\_UPCON. These use cases addressed situations where high usage levels lead to user plane traffic congestion in the RAN. The aim is to make efficient use of available resources to support the optimal mix of high priority services and applications, and users with premium subscriptions, while maintaining the user experience, and supporting as many active users as possible.

The normative stage 1 requirements are anticipated to be based on the categorization in the TR:

- General;
- Prioritizing traffic;
- Optimizing traffic; and
- Limiting traffic.

The SA2 objectives are as follows:

2. As part of the TR phase, define the architectural requirements (based on the SA1 normative requirements) in order to scope/guide the work;
3. Develop solutions for user plane congestion mitigation based on objective 1; and
4. Determine which solution(s) from the TR phase to document in normative specifications, and specify them accordingly.

The objective of this work is to continue the work started in Rel-12 in TR 23.705. Based on the TR, it will be identified which solution can handle which use cases and requirements with more detailed analyses and evaluations in cooperation with RAN WG2 and RAN WG3 as needed.

The following Building blocks are identified for this work:

Building Block I: RAN Downlink Traffic Differentiation, Congestion Detection and Reporting (UPCON-DOTCON). This Building Block includes the following features:

- RAN Congestion Detection: Determine if the RAN is congested. This includes considerations of 'what' congestion is, 'when' (to distinguish between transient and sufficiently long periods to take action, e.g. to report congestion).
- RAN Traffic Differentiation: This includes traffic differentiation enhancements (e.g. marking, priority, etc.) and considerations for shared networks.
- RAN Congestion Reporting: Determines how (which method) and what will be reported from the RAN to the Core Network.
- CN Congestion Mitigation mechanisms.
- Dynamic Policy Control: Provide policies for RAN Traffic Differentiation and CN Congestion Mitigation, per subscriber policies, including Application/Rx handling.

## 5 Service Aspects

The proposed work will not impact specific services but is anticipated to have positive impact on service delivery.

## 6 MMI Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

N/A

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			
Don't know	-				X

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp WG(s)	Presented for information at plenary#	Approved at plenary#
23.705	System Enhancements for User Plane Congestion Management	SA2		SA#65 (September 2014)	SA#67 (March 2015)
Affected existing specifications * [None in the case of Study Items]					
Spec No.	CR	Subject	Approved at plenary#		Comments
22.101		Service aspects; Service principles	SA #58 (Dec 2012)		
23.203		Policy and charging control architecture	SA #66 (Dec 2014)		Core Network based off path solution normative specification; PCC aspects
23.401		Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access	SA #66 (Dec 2014)		Core Network based off path solution normative specification; EPC aspects
23.060		General Packet Radio Service (GPRS); Service description; Stage 2	SA #66 (Dec 2014)		Core Network based off path solution normative specification; EPC aspects

## 11 Work item rapporteur(s) \*

SA1: Eriko Yoshida, KDDI ( [er-yoshida@kddi.com](mailto:er-yoshida@kddi.com) )

SA2: Alla Goldner, Allot Communications ( [agoldner@allot.com](mailto:agoldner@allot.com) )

## 12 Work item leadership \*

SA1

## 13 Supporting Individual Members \*

Supporting IM name
KDDI
Movik Networks
Allot Communications
NTT DOCOMO
AT&T
Samsung Electronics
Verizon
ZTE
SoftBank Mobile
China Telecom
Cisco
Huawei
Ericsson
NEC
Alcatel-Lucent
China Mobile
Hitachi
Intel
Orange
LG Electronics
CATT
Telecom Italia
Broadcom Corporation
Sprint
III
TeliaSonera

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### 3GPP TSG SA Meeting #65

TD SP-140412

Edinburgh, Scotland, UK, 15 - 17 September 2014

(revision of SP-140153)

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Source: SA WG2

Title: Updated WID: Revised User Plane Congestion management WID

Document for: Approval

Agenda Item: 13.7

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### SA WG2 Meeting #104

S2-142850

7 - 11 July 2014, Dublin, Ireland

(revision of S2-142323)

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

Title \* : User Plane Congestion management

Acronym \* : UPCON

Unique identifier \* 570029

## 1 3GPP Work Area \*

X	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
540027	Rel-12 TR 22.805 Study on User Plane Congestion management (FS_UPCON): User plane congestion management use cases and requirements	Study to identify use cases and associated requirements as a basis for normative work

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

X	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 6 Justification \*

Mobile operators are seeing significant increases in user data traffic. For some operators, user data traffic has more than doubled annually for several years. Although the data capacity of networks has increased significantly, the observed increase in user traffic continues to outpace the growth in capacity. This is resulting in increased network congestion and in degraded user service experience. Reasons for this growth in traffic are the rapidly increasing use of smart phones and tablet like devices, and the proliferation of data applications that they support, as well as the use of USB modem dongles for laptops to provide mobile Internet access using 3GPP networks. As the penetration of these terminals increases worldwide and the interest in content-rich multi-media services (e.g. OTT video streaming services) rises, this trend of rapidly increasing data traffic is expected to continue and accelerate.

3GPP SA2 has studied some aspects of the above in UPCON Work Item in Release 12 (TR-23.705). The current work item is being proposed to complete the study aspects of UPCON in Rel-12 and to progress selected solutions towards normative specification. The feature components defined in SP-130337 have been used for focussed objectives.

## 4 Objective \*

The SA1 objective is to specify normative stage 1 enhancements based on the requirements derived from the scenarios and use cases developed in FS\_UPCON. These use cases addressed situations where high usage levels lead to user plane traffic congestion in the RAN. The aim is to make efficient use of available resources to support the optimal mix of high priority services and applications, and users with premium subscriptions, while maintaining the user experience, and supporting as many active users as possible.

The normative stage 1 requirements are anticipated to be based on the categorization in the TR:

- General;
- Prioritizing traffic;
- Optimizing traffic; and
- Limiting traffic.

The SA2 objectives are as follows:

5. As part of the TR phase, define the architectural requirements (based on the SA1 normative requirements) in order to scope/guide the work;
6. Develop solutions for user plane congestion mitigation based on objective 1; and
7. Determine which solution(s) from the TR phase to document in normative specifications, and specify them accordingly.

The objective of this work is to continue the work started in Rel-12 in TR 23.705. Based on the TR, it will be identified which solution can handle which use cases and requirements with more detailed analyses and evaluations in cooperation with RAN WG2 and RAN WG3 as needed.

The following Building blocks are identified for this work:

Building Block I: RAN Downlink Traffic Differentiation, Congestion Detection and Reporting (UPCON-DOTCON). This Building Block includes the following features:

- RAN Congestion Detection: Determine if the RAN is congested. This includes considerations of 'what' congestion is, 'when' (to distinguish between transient and sufficiently long periods to take action, e.g. to report congestion).
- RAN Traffic Differentiation: This includes traffic differentiation enhancements (e.g. marking, priority, etc.) and considerations for shared networks.
- RAN Congestion Reporting: Determines how (which method) and what will be reported from the RAN to the Core Network.
- CN Congestion Mitigation mechanisms.
- Dynamic Policy Control: Provide policies for RAN Traffic Differentiation and CN Congestion Mitigation, per subscriber policies, including Application/Rx handling.

## 5 Service Aspects

The proposed work will not impact specific services but is anticipated to have positive impact on service delivery.

## 6 MMI Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

N/A

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			
Don't know	-				X

## 10 Expected Output and Time scale \*

New specifications *					
[If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
23.705	System Enhancements for User Plane Congestion Management	SA2		SA#65 (September 2014)	SA#67 (March 2015)
Affected existing specifications *					
[None in the case of Study Items]					
Spec No.	CR	Subject	Approved at plenary#		Comments
22.101		Service aspects; Service principles	SA #58 (Dec 2012)		
23.203		Policy and charging control architecture	SA #66 (Dec 2014)		Core Network based off path solution normative specification; PCC aspects
23.401		Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access	SA #66 (Dec 2014)		Core Network based off path solution normative specification; EPC aspects
23.060		General Packet Radio Service (GPRS); Service description; Stage 2	SA #66 (Dec 2014)		Core Network based off path solution normative specification; EPC aspects

## 11 Work item rapporteur(s) \*

SA1: John Visser, KDDI ( [xjo-visser@kddi.com](mailto:xjo-visser@kddi.com) )

SA2: Alla Goldner, Allot Communications ( [agoldner@allot.com](mailto:agoldner@allot.com) )

## 12 Work item leadership \*

SA1

## 13 Supporting Individual Members \*

Supporting IM name
KDDI
Movik Networks
Allot Communications
NTT DOCOMO
AT&T
Samsung Electronics
Verizon
ZTE
SoftBank Mobile
China Telecom
Cisco
Huawei
Ericsson
NEC
Alcatel-Lucent
China Mobile
Hitachi
Intel
Orange
LG Electronics
CATT
Telecom Italia
Broadcom Corporation
Sprint
III
TeliaSonera

**3GPP TSG CT Meeting #68**  
**Malmo, Sweden; 15th – 16th June2015**

**CP-150365**

**Source:** CT3  
**Agenda item :** 13.1  
**Title:** Revised WID on CT aspects of User Plane Congestion Management (UPCON) for Building Block I (from C3-151115)  
**Document for:** APPROVAL

---

This is a revision of CP-140929 to reflect the change of title of TS 29.217.

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: CT aspects of User Plane Congestion Management for Building Block I

Acronym: UPCON-DOTCON-CT

Unique identifier: 650007

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
570029	User Plane Congestion management	23.203, 23.401, 23.060

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

### **3 Justification**

User data traffic has been rapidly increasing in mobile operators' network. And this trend is expected to be accelerated with the rapid growth of smart phones and tablet like devices, the proliferation of data applications that they support, and the use of USB modem dongles for laptops to provide mobile Internet access using 3GPP networks. This is resulting in increased network congestion and degraded user service experience. The study of user plane congestion management (UPCON) started from Rel-12 has attracted many operators and vendors to determine the appropriate solutions to relieve the network congestion.

The current stage 2 work item on user plane congestion management (UID 570029) focuses on completing the study of Building Block I as below and progresses the selected solutions towards normative specifications:

Building Block I: RAN Downlink Traffic Differentiation, Congestion Detection and Reporting (UPCON-DOTCON).

During the SA2 #103 meeting in May 2014, conclusions are made for stage 2 UPCON BBI that:

"It is concluded that the solutions 1.5.5 Off-path based and 1.6.1: Policy-based congestion mitigation are to be added into normative specifications."

Therefore, stage 3 normative work on the new Np reference point between the PCRF and the RCAF (RAN Congestion Awareness Function) and corresponding enhancement to the existing PCC functions are needed to fulfil the UPCON off-path solution and policy-based congestion mitigation as specified in 3GPP TS 23.203. It's also necessary to specify the stage 3 Nq/Nq' reference point between the RCAF and the MME/ SGSN according to 3GPP TS 23.401 and 3GPP TS 23.060.

### **4 Objective**

The objective of this work item is to specify the stage 3 functionality of user plane congestion management for stage 2 Building Block I: RAN Downlink Traffic Differentiation, Congestion Detection and Reporting (UPCON-DOTCON). The work is based on the output from 3GPP TR 23.705 and corresponding stage 2 specifications on user plane congestion management (3GPP TS 23.203, 3GPP TS 23.401 and 3GPP TS 23.060).

CT3 aspects:

- New functional entity of RAN Congestion Awareness Function (RCAF) and the Np reference point between the RCAF and the PCRF is to be specified;
- Enhancement to the Rx functionality to support UPCON as specified by SA2 ;

CT4 aspects:

- The Nq reference point between the RCAF and the MME, the Nq' reference point between the RCAF and the S4-SGSN, or between the RCAF and the Gn/Gp-SGSN is to be specified;
- MME/ SGSN selection using DNS SNAPTR by the RCAF.

### **5 Service Aspects**

None.

### **6 MMI-Aspects**

N/A

### **7 Charging Aspects**

None.

## 8 Security Aspects

N/A

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary	Comments
29.217	Policy and Charging Control: Congestion Reporting over Np reference point	CT3		CT#66(Dec, 2014)	CT#68(June, 2015)	CT3 responsibility Proposed rapporteur: Zhou Xiaoyun
29.405	Nq and Nq' Application Protocol (Nq-AP); Stage 3	CT4		CT#67(Mar, 2015)	CT#68(June, 2015)	CT4 responsibility Proposed rapporteur: Shi Xiaoyan

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
29.212		Adapt PCC architecture diagrams to include Np reference point.	CT#67 (Mar, 2015)	CT3 responsibility
29.213		Enhance the PCC call flows to support user plane congestion management. Enhance DRA procedures to support PCRF selection for Np reference point.	CT#67 (Mar, 2015)	CT3 responsibility
29.214		Enhance Rx functionality to support the subscription and transfer of related parameters for congestion mitigation. Adapt PCC architecture diagrams to include Np reference point.	CT#67 (Mar, 2015)	CT3 responsibility
29.215		Adapt PCC architecture diagrams to include Np reference point.	CT#67 (Mar, 2015)	CT3 responsibility
29.219		Adapt PCC architecture diagrams to include Np reference point.	CT#67 (Mar, 2015)	CT3 responsibility
29.201		Enhance Restful Rx functionality to support the subscription and transfer of related parameters for congestion mitigation. Adapt PCC architecture diagrams to include Np reference point.	CT#67 (Mar, 2015)	CT3 responsibility
29.303		Specify MME/ SGSN selection using DNS SNAPTR by the RCAF.	CT#67 (Mar, 2015)	CT4 responsibility
23.003		Specify the app-service and app-protocol names to be used for MME/SGSN discovery using DNS SNAPTR.	CT#67 (Mar, 2015)	CT4 responsibility

## 11 Work item rapporteur(s)

Huawei, Xia Haitao (xiahaitao@huawei.com)

## 12 Work item leadership

CT3

## 13 Supporting Individual Members

Supporting IM name
China Telecom
Allot Communications
Huawei
AT&T
ZTE
Alcatel Lucent
Alcatel-Lucent Shanghai Bell
Ericsson
Oracle
CATR
China Mobile
Cisco
NEC
Verizon

2013-10-03 version 1.14.0

3GPP TSG SA Meeting #65

TD SP-140631

Edinburgh, Scotland, UK, 15 - 17 September 2014 (revision of SP-140153, SP-140625)

**Source:** SA WG2  
**Title:** Updated WID: Revised User Plane Congestion management WID  
**Document for:** Approval  
**Agenda Item:** 13.7

**SA WG2 Meeting #104** **S2-142850**

7 - 11 July 2014, Dublin, Ireland (revision of S2-142323)

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

## Title \* : User Plane Congestion management

Acronym \* : UPCON

Unique identifier \* 570029

1 3GPP Work Area \*

X	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

## 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
540027	Rel-12 TR 22.805 Study on User Plane Congestion management (FS_UPCON): User plane congestion management use cases and requirements	Study to identify use cases and associated requirements as a basis for normative work

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

X	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 7 Justification \*

Mobile operators are seeing significant increases in user data traffic. For some operators, user data traffic has more than doubled annually for several years. Although the data capacity of networks has increased significantly, the observed increase in user traffic continues to outpace the growth in capacity. This is resulting in increased network congestion and in degraded user service experience. Reasons for this growth in traffic are the rapidly increasing use of smart phones and tablet like devices, and the proliferation of data applications that they support, as well as the use of USB modem dongles for laptops to provide mobile Internet access using 3GPP networks. As the penetration of these terminals increases worldwide and the interest in content-rich multi-media services (e.g. OTT video streaming services) rises, this trend of rapidly increasing data traffic is expected to continue and accelerate.

3GPP SA2 has studied some aspects of the above in UPCON Work Item in Release 12 (TR-23.705). The current work item is being proposed to complete the study aspects of UPCON in Rel-12 and to progress selected solutions towards normative specification. The feature components defined in SP-130337 have been used for focussed objectives.

## 4 Objective \*

The SA1 objective is to specify normative stage 1 enhancements based on the requirements derived from the scenarios and use cases developed in FS\_UPCON. These use cases addressed situations where high usage levels lead to user plane traffic congestion in the RAN. The aim is to make efficient use of available resources to support the optimal mix of high priority services and applications, and users with premium subscriptions, while maintaining the user experience, and supporting as many active users as possible.

The normative stage 1 requirements are anticipated to be based on the categorization in the TR:

- General;
- Prioritizing traffic;
- Optimizing traffic; and
- Limiting traffic.

The SA2 objectives are as follows:

8. As part of the TR phase, define the architectural requirements (based on the SA1 normative requirements) in order to scope/guide the work;
9. Develop solutions for user plane congestion mitigation based on objective 1; and
10. Determine which solution(s) from the TR phase to document in normative specifications, and specify them accordingly.

The objective of this work is to continue the work started in Rel-12 in TR 23.705. Based on the TR, it will be identified which solution can handle which use cases and requirements with more detailed analyses and evaluations in cooperation with RAN WG2 and RAN WG3 as needed.

The following Building blocks are identified for this work:

Building Block I: RAN Downlink Traffic Differentiation, Congestion Detection and Reporting (UPCON-DOTCON). This Building Block includes the following features:

- RAN Congestion Detection: Determine if the RAN is congested. This includes considerations of 'what' congestion is, 'when' (to distinguish between transient and sufficiently long periods to take action, e.g. to report congestion).
- RAN Traffic Differentiation: This includes traffic differentiation enhancements (e.g. marking, priority, etc.) and considerations for shared networks.
- RAN Congestion Reporting: Determines how (which method) and what will be reported from the RAN to the Core Network.
- CN Congestion Mitigation mechanisms.
- Dynamic Policy Control: Provide policies for RAN Traffic Differentiation and CN Congestion Mitigation, per subscriber policies, including Application/Rx handling.

## 5 Service Aspects

The proposed work will not impact specific services but is anticipated to have positive impact on service delivery.

## 6 MMI Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

N/A

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			
Don't know	-				X

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
23.705	System Enhancements for User Plane Congestion Management	SA2		SA#65 (September 2014)	SA#67 (March 2015)
Affected existing specifications * [None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments
22.101		Service aspects; Service principles		SA #58 (Dec 2012)	
23.203		Policy and charging control architecture		SA #66 (Dec 2014)	Core Network based off path solution normative specification; PCC aspects
23.401		Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access		SA #66 (Dec 2014)	Core Network based off path solution normative specification; EPC aspects
23.060		General Packet Radio Service (GPRS); Service description; Stage 2		SA #66 (Dec 2014)	Core Network based off path solution normative specification; EPC aspects

## 11 Work item rapporteur(s) \*

SA1: Eriko Yoshida, KDDI ( [er-yoshida@kddi.com](mailto:er-yoshida@kddi.com) )

SA2: Alla Goldner, Allot Communications ( [agoldner@allot.com](mailto:agoldner@allot.com) )

## 12 Work item leadership \*

SA1

## 13 Supporting Individual Members \*

Supporting IM name
KDDI
Movik Networks
Allot Communications
NTT DOCOMO
AT&T
Samsung Electronics
Verizon
ZTE
SoftBank Mobile
China Telecom
Cisco
Huawei
Ericsson
NEC
Alcatel-Lucent
China Mobile
Hitachi
Intel
Orange
LG Electronics
CATT
Telecom Italia
Broadcom Corporation
Sprint
III
TeliaSonera

## Media Handling Aspects of IMS-based Telepresence

650028	<b>Media Handling Aspects of IMS-based Telepresence</b>	IMS_TELE P_S4	1	S4	Sep-14	Dec-15	60%	SP-140483
650128	<b>TR on Media Handling Aspects of IMS-based Telepresence</b>	IMS_TELE P_S4-SA4TR	2	S4	Sep-14	Sep-15	60%	SP-140483
650228	<b>Specification on Media Handling Aspects of IMS-based Telepresence</b>	IMS_TELE P_S4-SA4	2	S4	Sep-14	Dec-15	60%	SP-140483

**3GPP TSG SA WG4 Meeting #80**  
**San Francisco, CA, U.S.A., 4 - 8 August 2014**

**I S4-140989**  
**revision of S4-140962**

---

<b>Source:</b>	<b>TSG SA WG4 Codec</b>
<b>Title:</b>	<b>New Work Item on "Media Handling Aspects of IMS-based Telepresence"</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>15</b>

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

**Title \*: Media Handling Aspects of IMS-based Telepresence**

**Acronym \* : IMS\_TELEP\_S4**

**Unique identifier \***

### 1 3GPP Work Area \*

	Radio Access
	Core Network
X	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
530142	Stage 1 for IMS-based Telepresence (Release 12)	Use cases and requirements on IMS-based telepresence specified by SA1 in TS 22.228
580001	CT part of IMS-based Telepresence - Stage 3 (Release 12)	Normative work by CT1, CT3 and CT4 on core network aspects of IMS-based telepresence

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	

This work item is ... \*

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

During Release 12, use cases and requirements on IMS-based telepresence were introduced by SA1 into TS 22.228 to enable telepresence support in IMS applications. In TS 22.228, telepresence is defined as a conference with interactive audio-visual communications experience between remote locations, where the users enjoy a strong sense of realism and presence between all participants (i.e., as if they are in same location) by optimizing a variety of attributes such as audio and video quality, eye contact, body language, spatial audio, coordinated environments and natural image size. A telepresence system is defined as a set of functions, devices and network elements which are able to capture, deliver, manage and render multiple high quality interactive audio and video signals in a telepresence conference. An appropriate number of devices (e.g. cameras, screens, loudspeakers, microphones, codecs) and environmental characteristics are used to establish telepresence.

The core network aspects of IMS-based telepresence have been addressed by the CT groups (CT1, CT3, CT4), including incorporation of new tools into IMS as defined by IETF's Controlling mUltiple streams for tElepresence (CLUE) WG (see more from: <https://datatracker.ietf.org/wg/clue/charter/>) that achieves media advertisement and configuration to facilitate controlling and negotiating multiple spatially related media streams in an IMS conference supporting telepresence, taking into account capability information, e.g., screen size, number of screens and cameras, codecs, etc., so that sending system, receiving system, or intermediate system can make decisions about transmitting, selecting, and rendering media streams.

This work item aims to specify the media handling aspects of IMS-based telepresence in 3GPP services. This includes specification of codec requirements for a telepresence UE (TP UE), which is expected to not only support MTSI UE media handling capabilities, but also more advanced media handling capabilities. Other SA4-level media handling aspects such as media configuration and session control, data transport, media adaptation, QoS handling and interworking with MTSI are also within scope of this work item.

No impact is expected in service requirements or architecture.

## 4 Objective \*

The objective of this Work Item is to specify the media handling aspects of IMS-based telepresence in 3GPP services.

The study phase of the work item will investigate the following:

- Media codecs (speech, video, real-time text) for IMS-based telepresence
- Media configuration including session setup and control procedures for IMS-based telepresence, and media provisioning aspects of capability negotiation based on SDP and CLUE protocols, etc.
- Set-up and control of the individual media streams between clients including interactivity, such as adding and dropping of media components, as well as end-to-end QoS handling, etc. for IMS-based telepresence
- Data transport including usage of RTP / RTCP protocols, RTP profiles, RTP payload formats, RTP mapping, media synchronization, etc. for IMS-based telepresence, e.g., in relation to negotiation and establishment of the CLUE data channel, and exchange of CLUE ADVERTISEMENT and CONFIGURE messages
- Requirements and guidelines for media adaptation in IMS-based telepresence, for example in response to changes of network bandwidth
- Media handling requirements and guidelines for fixed-mobile interworking as well as interworking with MTSI and with GSMA's IMS profile on High-Definition Video Conference (HDVC) service in IR.39

The gap analysis and conclusions for the proposed improvements will be documented in a Technical Report. Study and evaluation of end-to-end quality of experience (QoE) for IMS-based telepresence use cases for various codec, media handling and QoS configurations will be conducted and related findings will also be documented in the technical report.

Upon completion of the study phase, normative work will be produced based on the relevant conclusions in the Technical Report. At a minimum, it is expected that the normative work will result in specification of codec requirements for IMS-based telepresence services which is currently lacking.

Coordination with CT groups is expected in order to address any potential core network impacts of the proposed enhancements.

## 5 Service Aspects

Media handling aspects are defined for IMS-based telepresence.

## 6 MMI-Aspects

No impact.

## 7 Charging Aspects

No impact.

## 8 Security Aspects

No impact.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	

No	X		X		X
Don't know					

## 10 Expected Output and Time scale \*

New specifications *					
[If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp WG(s)	Presented for information at plenary#	Approved at plenary#
TR 26.9xy	Study on Media Handling Aspects of IMS-based Telepresence	SA4		SA#68	SA#69
TS 26.1xy	Telepresence using the IP Multimedia Subsystem (IMS); Media Handling and Interaction	SA4		SA#69	SA#70
Affected existing specifications *					
[None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments

## 11 Work item rapporteur(s) \*

Ozgur Oyman, Intel, Email: ozgur.oyman@intel.com

## 12 Work item leadership \*

3GPP SA4

## 13 Supporting Individual Members \*

Supporting IM name
Intel
Huawei Technologies Co. Ltd.
HiSilicon Technologies Co. Ltd
Telecom Italia S.p.A.
ORANGE
Ericsson

## RAN Sharing Enhancements

600045	<b>RAN Sharing Enhancements</b>	RSE	1	S1, R3	Jun-13	Sep-15	83%	SP-130330
600145	Stage 1 for RAN Sharing Enhancements	RSE-SA1	2	S1	Jun-13	Dec-13	100%	SP-130330
650021	RAN aspects of RAN Sharing Enhancements for LTE	RSE- RAN_LTE	2	R3	Sep-14	Sep-15	75%	RP-141671
650121	Core part: RAN aspects of RAN Sharing Enhancements for LTE	RSE- RAN_LTE- Core	3	R3	Sep-14	Sep-15	75%	RP-141671

**3GPP TSG SA Meeting #60**  
**Oranjestad, Aruba, 17 - 19 June 2013**

**TD SP-130330**

---

Title: Proposed update to New WID on RAN Sharing Enhancements (RSE)  
Source: NEC, MCC  
Agenda Item: 14

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

**Title \* : RAN Sharing Enhancements**

**Acronym \* : RSE**

**Unique identifier \***

## 1 3GPP Work Area \*

X	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
540028	Study on RAN Sharing Enhancements (TR 22.852)	In TR 22.852 "Study on RAN Sharing Enhancements" (FS_RSE) use cases and potential requirements for a more dynamic co-operation among operators on RAN sharing have been analyzed. TR 22.852 builds upon and extends the Rel-6 work item on Network Sharing (UID_31018) TR 22.852 is the basis for normative work on RSE

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

X	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

#### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

### 3 Justification \*

RAN Sharing is not simply be a method of reducing costs – it ushers in a new paradigm in network roll-out strategy. Basically three situations can be envisaged in which enhanced RAN sharing are highly beneficial:

1. A Greenfield deployment – two operators jointly agree to build out a new technology (typically 4G). At the outset, the new shared network infrastructure and operations can be based on capacity and coverage requirements of both operators. The operator can fund built-on 50:50 or according to their expected needs.
2. Buy-in – when one of the sharing operators has already built (4G for example) and looking for another operator to share this network. In this case, the second operator would either pay a capacity usage fee or up-front fee to acquire in the network.
3. Consolidation Situation: when either 2G, 3G or 4G networks, which have already built out by each of the sharing operators, needs to be consolidated into one joint network. This type of network sharing usually holds significant cost advantages, but it also presents substantial design challenges.

In a preceding study on RAN Sharing Enhancements (TR 22.852) use cases have been collected and the effects of enhanced RAN Sharing scenarios have been studied.

### 4 Objective \*

The objective of this work item is to standardize means that complement existing system capabilities for sharing common RAN resources. The work will take into account the following topics

- Allocation of Shared RAN resources based on the proportion of assigned RAN usage for each Participating Operator
- On-demand capacity negotiation

- Selective OAM access to Participating Operators
- Load balancing while respecting the agreed shares of RAN resources
- Generation and retrieval of usage and accounting information on a per Participating Operator basis.
- Handover functionality due to RAN Sharing Agreements
- Public Warning System (PWS) in shared RAN

Coordination with SA5 is envisaged, in particular on SA5's Study on OAM aspects of Network Sharing, FS\_OAM\_SHARE (UID 540032) in TR 32.851.

## 5 Service Aspects

Impact on service experience of individual subscribers should be kept at a minimum.

## 6 MMI-Aspects

none

## 7 Charging Aspects

These will include generation and retrieval of usage and accounting information

## 8 Security Aspects

RAN Sharing Enhancements shall not negatively affect security or privacy of sharing networks or subscribers.

For the case of multiple operators sharing radio network resources the work item needs take care of requirements and scenarios for:

- maintaining end-to-end security for each operator
- providing and allowing appropriate levels of visibility of the shared radio network resources to the sharing network operators according to each operator's role in the sharing arrangement.

Involvement of SA3 for evaluation of potential scenarios is envisaged.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No					
Don't know	X	X			

## 10 Expected Output and Time scale \*

New specifications *					
[If Study Item, one TR is anticipated]					
Spec No	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
					Comments
Affected existing specifications *					
[None in the case of Study Items]					
Spec No	CR	Subject		Approved at plenary#	Comments
22.101	CR on Requirements to support enhanced RAN Sharing		SA#61 (Sep 2013)		

## 11 Work item rapporteur(s) \*

NEC, Joerg Swetina (joerg.swetina@neclab.eu)

## 12 Work item leadership \*

SA1

## 13 Supporting Individual Members \*

Supporting IM name
NEC
Sprint
Qualcomm
Telefonica Europe
Huawei
Intel
SoftBank Mobile
InterDigital Communications
TeliaSonera

3GPP TSG RAN Meeting #65  
Edinburgh, Scotland, 9 - 12 September 2014

**RP-141671**

revision of RP-141659

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**Source:** NEC  
**Title:** New WI proposal: RAN Aspects of RAN Sharing Enhancements for LTE  
**Document for:** Approval  
**Agenda Item:** 14.1.3

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** RAN Aspects of RAN Sharing Enhancements for LTE

**Acronym:** RSE-RAN\_LTE

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>
600145	RAN Sharing Enhancements	Stage 1 requirements TS22.101

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any)</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>
600145	RAN Sharing Enhancements	Stage 1 requirements TS22.101

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS
600145	RAN Sharing Enhancements	Stage 1 requirements TS22.101

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS
620044	Study of RAN aspects of RAN Sharing Enhancements for LTE - Core Part	TR 36.856

## 3 Justification

During the SI phase, the following areas were identified as in need for possible enhancements:

- In case of GateWay Core Network (GWCN), CN overload can result in a situation where an overloaded PLMN starves another PLMN, thus leading to unfairness. The existing Overload Start/Stop mechanisms are the most suitable baseline to support RAN and CN sharing scenarios. The procedures may need to be enhanced to fully support the reuse of GUMMEI List.
- Sharing is normally based on agreed quota or share ratio. However, the legacy Mobility Load Balancing (MLB) does not take such quota into consideration and may lead to a problem as highlighted during the RSE SI phase.
- Current mechanisms do not allow a hosting provider to calculate DL and UL data volumes used by a participating operator. Hence, new functions need to be introduced to enable Aggregated DL and UL data volume collection per PLMN and per QoS profile parameters. Depending on Sharing Operators agreement, QoS profile may be limited to a subset of standard parameters (e.g. QCI). This requires further evaluation and interaction with other groups, e.g. SA5/RAN2.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of this work item is to make appropriate changes according to the study item conclusion as follows:

- Enhance relevant S1 overload procedure(s),
- Enhance X2 Resource Status reporting procedure,
- Introduce means to quantify and monitor data volume per PLMN and per QoS profile parameters (e.g. QCI).

Co-operation with other groups may be required in case some of the requirements would impact parts of the overall system which are out of scope of RAN3.

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #65																Q4/2014								RAN			
#66																											
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf								
78bis	78bis	87bis	87bis	87bis	85bis	72bis	72bis	72bis	72bis	79	79	88	88	88	86	73	73	73	73								
					0.5										1.0												

RAN #66																Q1/2015								RAN			
#67																											
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf								
80	80	89	89	89	89					74	74	74	74	74	1.0												

RAN #67																Q2/2015								RAN			
#68																											
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf								
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75								
					1.0																						

RAN #68																Q3/2015								RAN			
#69																											
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf								
82	82	91	91	91	91					76	76	76	76	76													

RAN #69																Q4/2015								RAN			
#70																											

R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

#### additional comments to the time budget proposal:

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.  
By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2	RAN#67 March 2015	
36.413		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)	RAN#68 June 2015	
36.423		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 Application Protocol (X2AP)	RAN#68 June 2015	

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.  
If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Siva Vakeesar

**Company:** NEC

**Email:** Siva.Vakeesar@emea.nec.com

## 12 Work item leadership

RAN WG3

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
NEC
Alcatel-Lucent
China Telecom
CMCC
DT
Fujitsu
InterDigital
ip.access
LGE
Orange
Qualcomm
Softbank Mobile
Telefonica
Telenor
TeliaSonera
ZTE

## Enhancements to WEBRTC interoperability

630014	<a href="#">Enhancements to WEBRTC interoperability</a>	eWebRTC i	1	S1, S2, S3	Mar-14	Dec-15	64%	SP-140630
630114	<a href="#">Stage 1 for Enhancements to WEBRTC interoperability</a>	eWebRTC i	2	S1	Mar-14	Sep-14	100%	SP-140630
640138	<a href="#">TR on Stage 2 for Enhancements to WEBRTC interoperability</a>	eWebRTC i	2	S2	Jun-14	Mar-15	100%	SP-140630
640038	<a href="#">Stage 2 for Enhancements to WEBRTC interoperability</a>	eWebRTC i	2	S2	Jun-14	Jun-15	100%	SP-140630
650122	<a href="#">TR on Security for Enhancements to WEBRTC interoperability</a>	eWebRTC i	2	S3	Sep-14	Jun-15	75%	SP-140630
650022	<a href="#">Security for Enhancements to WEBRTC interoperability</a>	eWebRTC i	2	S3	Sep-14	Jun-15	20%	SP-140630
690012	<a href="#">Stage 3 for Enhancements to WebRTC interoperability</a>	eWebRTC i-CT	2	ct	Sep-15	Dec-15	0%	SP-140630
690015	<a href="#">CT1 aspects 3 for Enhancements to WebRTC interoperability</a>	eWebRTC i-CT	3	C1	Sep-15	Dec-15	0%	SP-140630
690029	<a href="#">CT3 aspects for Enhancements to WebRTC interoperability</a>	eWebRTC i-CT	3	C3	Sep-15	Dec-15	0%	SP-140630
690016	<a href="#">CT4 aspects for Enhancements to WebRTC interoperability</a>	eWebRTC i-CT	3	C4	Sep-15	Dec-15	0%	SP-140630

### 3GPP TSG SA Meeting #65

**TD SP-140630**

Edinburgh, Scotland, 15-17 September, 2014

Agenda item: 13.9

### 3GPP TSG SAWG3 Meeting #76

**TD S3-142282**

**Sophia Antipolis, France, 25 - 29 August, 2014**

[\(Update to S3-142141\)](#)

**Source:** Ericsson

**Title:** Updated WID: Enhancements to WEBRTC interoperability {eWebRTCi}

**Presented for:** Approval

**Agenda Item:** 7.1.2

### 3GPP TSG SA Meeting #64

**TD SP-140286**

**Sophia Antipolis, France, 16 - 18 June, 2014**

[\(Update to SP-140166\)](#)

**Source:** SA WG2

**Title:** Updated WID: Enhancements to WEBRTC interoperability {eWebRTCi}

**Presented for:** Approval

**Agenda Item:** 12.2

### SA WG2 Meeting #103

**S2-142266**

**19 - 23 May 2014, Phoenix, Arizona, USA**

[\(revision of S2-142227\)](#)

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: enhancements to WEBRTC interoperability

Acronym: eWebRTCi

Unique identifier: 630000

## 1 3GPP Work Area

	Radio Access
	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
580062	Web Real Time Communication (WebRTC) Access to IMS	This work item adds enhanced interoperability support for WebRTC.

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

X	Stage 1 (go to 2.3.1)
X	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

### 3 Justification

An initial set of requirements supporting IMS access via a WebRTC IMS client was established in Rel-12. SA2 has determined that they are not able to implement the Stage 2 for a subset of the SA1 requirements. These are carried forward to Rel-13 under the feature defined by this WID.

Several useful functions supporting WebRTC IMS client interoperability with 3GPP systems were not included in the Rel-12 requirements. Consideration was given only to interoperability between IMS and a WebRTC IMS client. Requirements to provide end-to-end support for specific WebRTC capabilities at the bearer level (e.g., WebRTC IMS client to WebRTC IMS client communication) will reduce the need for protocol conversions between WebRTC and IMS protocols on the data channel. Requirements are also needed to provide end-to-end security which is currently not available due to the need for interworking between WebRTC and IMS security mechanisms.

Additionally, other new IMS features were introduced in Rel-12 which can now be considered for interoperability in Rel-13. Requirements for these and other functions may be needed to expand the capabilities accessible via a WebRTC IMS client. Since WebRTC is part of Rel-12, it should be able to interwork with other Rel-12 or earlier features, e.g., Presence, MMTEL, Telepresence.

This work item is intended to address any carried forward requirements as well as introduce requirements for additional functionality related to interoperability with WebRTC IMS clients.

### 4 Objective

#### **SA1 objectives:**

The objective of this work item is to specify service requirements to enhance interoperability with WebRTC IMS clients in the following areas:

1. Requirements and use cases originally included for Rel-12 for which the stage 2/3 work has been deferred to Rel-13.
  - a. third-party WebRTC access in the case where the 3<sup>rd</sup> party allocates IMS identities from a block where the associated subscription corresponds to a class of users supported by the WebRTC environment (e.g., enterprise associates) rather than a single end user.
  - b. third-party realization of communication services (e.g., enterprise) either instead or in addition to those provided by the IMS operator.
2. Minimize the need for bearer level protocol conversion when supporting WebRTC media capabilities between WebRTC IMS clients without the need to convert to/from IMS protocols
3. Support for end to end WebRTC security, subject to regulatory constraints, that avoids conversion between WebRTC and IMS security protocols
4. Address any gaps identified to ensure interworking of Rel-12 or earlier IMS services (e.g., Telepresence, presence) with webRTC.

#### **SA2 objectives:**

The SA2 objectives are to enhance the IMS architecture and stage 2 procedures defined as part of IMS\_WebRTC as required to support the requirements defined by SA1 as part of the work on eWebRTCI

The output of this work will not require changes to existing webRTC enabled web browsers.

#### **SA3 objectives:**

The SA3 objectives are to meet the requirements and to ensure security of use cases defined by SA1 within the architecture defined by SA2. In particular, point 1a and point 3 of SA1 objectives are considered important from a security perspective and will require further study, including the feasibility of end to end security aspects.

## 5 Service Aspects

Service aspects will be specified.

## 6 MMI-Aspects

MMI aspects will be defined in later specification stages. Any potential service impacts will be identified.

## 7 Charging Aspects

Charging mechanisms will be defined in later specification stages. Any potential service impacts will be identified.

## 8 Security Aspects

Security aspects are defined in the SA3 objectives. Any potential service impacts will be identified. A study of the feasibility of end to end security aspects may be needed in SA3 LI.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No			X		
Don't know	X				X

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
23.8xx	TR on Architectural enhancements to support webRTC interworking	SA2		SA#66 (December 2014)	SA#67 (March 2015)	
33.8xx	TR on Security enhancements to support webRTC interworking	SA3		SA#67 (March 2015)	SA#68 (June 2015)	

Affected existing specifications [None in the case of Study Items]			
Spec No	CR	Subject of the CR	Approved at plenary#
22.228	CRs to support WebRTC client interoperability	SA#65 (September 2014)	
23.228	CRs to Annex U	SA#68 (June 2015)	
33.203	CRs to support security enhancements for webRTC interworking	SA#68 (June 2015)	
33.328	CRs to support security enhancements for webRTC interworking	SA#68 (June 2015)	

## 11 Work item rapporteur(s)

SA1: Betsy Covell ([betsy.covell@alcatel-lucent.com](mailto:betsy.covell@alcatel-lucent.com))

SA2: Yu Qing ([yuqing@chinamobile.com](mailto:yuqing@chinamobile.com))

SA3: Vesa Lehtovirta ([vesa.lehtovirta@ericsson.com](mailto:vesa.lehtovirta@ericsson.com))

## 12 Work item leadership

SA1

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Alcatel-Lucent
Broadcom Corporation
Office of Emergency Communications
Sprint
Huawei
Telecom Italia
AT&T
Orange
T-Mobile USA
China Mobile
Motorola Mobility
Intel
Verizon
NTT DoCoMo
NTT
ZTE
Ericsson

## Improvements to CS/PS coordination in UTRAN/GERAN Shared Networks

630016	<a href="#">Improvements to CS/PS coordination in UTRAN/GERAN Shared Networks</a>	CSPS_Co ord	1	S2	Mar-14	Nov-15	83%	SP-140168
630116	TR on Stage 2 for Improvements to CS/PS coordination in UTRAN/GERAN Shared Networks	CSPS_Co ord-SA2TR	2	S2	Mar-14	Sep-14	100%	SP-140168
630216	Stage 2 for Improvements to CS/PS coordination in UTRAN/GERAN Shared Networks	CSPS_Co ord-SA2	2	S2	Mar-14	Dec-14	100%	SP-140168
650100	RAN aspects for improvements to CS/PS coordination in GERAN Shared Networks	CSPS_Co ord_GER AN	2	G2	Mar-15	Nov-15	50%	GP-150225

## 3GPP TSG SA Meeting #63

TD SP-140115

Fukuoka, Japan, 05 - 07 March, 2014

3GPP WG-SA2 Meeting #101

S2-140528

Taipei, Taiwan, 20 - 24 January 2014

# 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

**Title:** New WID on improvements to CS/PS coordination in UTRAN/GERAN Shared Networks

**Acronym:** CSPS\_Coord

**Unique identifier:**

## 1 3GPP Work Area

	<b>Radio Access</b>
X	<b>Core Network</b>
	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

### 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

**If no identified source of stage 2 information, justify:**

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

There is support of Network Sharing in UTRAN/GERAN specifications where radio access and core network can be shared between operators without this being known to the UEs. One challenge in the context of this functionality is to ensure that the registration of a given UE to the CS and PS domain is coordinated, i.e. a subscriber is registered to the same PLMN in both domains.

Initial analysis has shown that there are issues with CS/PS coordination in least in the case of network-controlled mobility into UTRAN/GERAN shared networks i.e. CS/PS coordination failure resulting in UE ending up registered to different operators in the CS and PS domains.

## 4 Objective

The objective is to investigate all use cases for CS/PS coordination for non-supporting UEs. This includes also shared networks not having support for supporting UEs i.e. networks not broadcasting multiple PLMN IDs. The use cases that need to be handled will at least include:

- CS handover to UTRAN/GERAN (DTM/non-DTM for GERAN)
- PS Handover to UTRAN/GERAN
- Redirection
- Cell reselection
- CSFB
- (r)SRVCC, and SRVCC

The objective is to provide improvements to the solutions for CS/PS coordination in TS23.251 to ensure that CS/PS coordination can be achieved for all mobility scenarios.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
23.704	Analysis of CS/PS Coordination	SA2		SA#64 (June 2014)	SA#64 (June 2014)

Affected existing specifications [None in the case of Study Items]				
Spec No	CR	Subject of the CR	Approved at plenary#	Comments
23.216		Introduction of general solution for CS/PS Coordination	SA#65 (September 2014)	
23.251		Introduction of general solution for CS/PS Coordination	SA#65 (September 2014)	
23.272		Introduction of general solution for CS/PS Coordination	SA#65 (September 2014)	

## 11 Work item rapporteur(s)

SA2: roland.gustafsson@ericsson.com

## 12 Work item leadership

SA2

## 13 Supporting Individual Members

Supporting IM name
Ericsson
TeliaSonera
Telenor
Vodafone
Orange

2013-10-03 version 1.14.0

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Source:	Ericsson LM, TeliaSonera, Orange, Nokia Networks
Title:	New WID on RAN aspects for improvements to CS/PS coordination in GERAN Shared Networks
Document for:	Approval
Agenda Item:	6.2, 7.2.5.3.6

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

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**Title:** New WID on RAN aspects for improvements to CS/PS coordination in GERAN Shared Networks

**Acronym:** CSPS\_Coord\_GERAN

**Unique identifier:**

## 1 3GPP Work Area

X	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
630016	Improvements to CS/PS coordination in UTRAN/GERAN Shared Networks	

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
630216	Stage 2 for Improvements to CS/PS coordination in UTRAN/GERAN Shared Networks	23.251

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Network Sharing is supported in GERAN specifications from Release-10. For a mobile station not supporting Network Sharing (i.e. a MS that ignores the additional broadcast system information that is specific for Network Sharing) the radio access and core network can be shared between operators without this being known to the mobile station. One challenge in the context of this functionality is to ensure that the registration of a given MS to the CS and PS domain is coordinated, i.e. a subscriber is registered to the same operator in both domains.

TSG SA WG2 have identified issues with CS/PS coordination in the case of network-controlled mobility into GERAN shared networks i.e. CS/PS coordination may fail resulting in MS ending up registered to different operators in the CS and PS domains.

Enhancements to prevent CS/PS coordination failure have been specified in stage 2 TS 23.251 Release-13 by SA WG2.

## 4 Objective

The objective is to enhance GERAN specifications according to the CS/PS coordination solutions as specified in TS 23.251 to ensure that CS/PS coordination can be achieved for all mobility scenarios into GERAN shared networks.

To achieve this, the A- and Gb-interfaces have to be updated with the following functionality:

- A-Interface:
  - In the REROUTE COMMAND message, add the possibility to transfer old LAI/CS-NRI and an indication whether the MS is attaching.
  - In case a registration attempt is made in the PS domain, the BSS may query the MSC(s) whether the mobile station is served by any of the sharing operators in the CS domain.
- Gb-Interface:
  - In the DL-UNITDATA message, add the possibility to transfer old RAI/PS-NRI and an indication whether the MS is attaching.
  - In case a registration attempt is made in the CS domain, the BSS may query the SGSN(s) whether the mobile station is served by any of the sharing operators in the PS domain.

Based on the information received from the CN in the same or from the opposite domain, the BSS selects an operator and the registration message is forwarded to a CN node of this operator.

## 5 Service Aspects

None.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

None.

## 8 Security Aspects

None.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
TS 48.008			TSG GERAN #67	
TS 48.018			TSG GERAN #67	

## 11 Work item rapporteur(s)

Nicklas Johansson, Ericsson LM

## 12 Work item leadership

Primary responsible: 3GPP TSG GERAN WG2

Secondary responsible: none

## 13 Supporting Individual Members

Supporting IM name
Ericsson LM
TeliaSonera
Orange
Nokia Networks



## Enhancements to Proximity-based Services

640040	<b>Enhancements to Proximity-based Services</b>	eProSe	1	S1, S2, S3	Jun-14	Dec-15	51%	SP-140386
640140	<b>Stage 1 for Enhancements to Proximity-based Services</b>	eProSe-SA1	2	S1	Jun-14	Sep-14	100%	SP-140386
640041	<b>Stage 2 for Enhancements to Proximity-based Services - Extensions</b>	eProSe-Ext-SA2	2	S2	Jun-14	Sep-15	90%	SP-150028
640141	<b>TR on Stage 2 for Enhancements to Proximity-based Services - Extensions</b>	eProSe-Ext-SA2TR	2	S2	Jun-14	Mar-15	100%	SP-150028
650023	<b>Security for Enhancements to Proximity-based Services - Extensions</b>	eProSe-Ext-SA3	2	S3	Sep-14	Sep-15	0%	SP-150028
680006	<b>CT aspects of enhancements to Proximity-based</b>	eProSe-Ext-CT	2	C1	Jun-15	Dec-15	27%	CP-150370
680007	CT1 aspects of enhancements to Proximity-based	eProSe-Ext-CT	3	C1	Jun-15	Dec-15	40%	CP-150370
680008	CT3 aspects of enhancements to Proximity-based	eProSe-Ext-CT	3	C3	Jun-15	Dec-15	60%	CP-150370
680009	CT4 aspects of enhancements to Proximity-based	eProSe-Ext-CT	3	C4	Jun-15	Dec-15	10%	CP-150370
680010	CT6 aspects of enhancements to Proximity-based	eProSe-Ext-CT	3	C6	Jun-15	Dec-15	0%	CP-150370

**3GPP TSG SA Meeting #64**  
**Sophia Antipolis, France, 16-18 June 2014**

**SP-140386**  
**revision of SP-140353**

**Source:** Qualcomm Incorporated (rapporteur)

**Title:** Editorial update of SA1 ProSe phase 2 WID

**Document for:** Approval

**Agenda Item:** 15

**Work Item / Release:** New WID/Rel.13

*Abstract of the contribution: This contribution proposes some editorial changes to the SA1 approved ProSe WID for rel.13 (S1-141569).*

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

**Title:** Enhancements to Proximity-based Services

**Acronym:** eProSe

**Unique identifier:** 6400xy

## 1 3GPP Work Area

X	<b>Radio Access</b>
X	<b>Core Network</b>
X	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
580059	Proximity-based Services	Work item predecessor
6400xy	Enhancements to Proximity-based Services – Extensions (eProSe-Ext)	Rel-13 new building block (initiated by SA2)

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

##### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The work item on Proximity-based Services (ProSe) generated a large number of service requirements for 3GPP TS 22.278 and TS 22.115. These requirements have been taken up by other groups within 3GPP to generate Stage 2 and Stage 3 ProSe specifications.

A number of the ProSe service requirements in 3GPP have not been implemented yet in Rel-12.

Some or all of these service requirements will be taken up in stage 2 activities within Rel-13. For these activities, Stage 1 needs to support the Stage 2 work with appropriate requirements.

This work item is not intended to introduce new service requirements.

## 4 Objective

To support stage 2/3 development during Release 13.

To support end-of-release 12 maintenance to review and ensure that Release 13 TS 22.278 and TS 22.115 contain all agreed ProSe Stage 1 requirements. These service requirements are to be copied from Release 12 TS 22.278 and TS 22.115 prior to removal of unfulfilled service requirements from Release 12 as per process for handling WIDs across releases.

The topics likely to be addressed in this process are:

- ProSe E-UTRA Communication between two ProSe-enabled UEs
- Restricted discovery
- Public safety out of coverage discovery
- UE-to-Network & UE-to-UE Relays
- Requesting Discovery Range Class
- Service continuity
- Moving of a user traffic session path
- WLAN QoS consideration
- Some WLAN roaming requirements
- Some third-party application interaction requirements

No new service requirements will be added under this WID.

## 5 Service Aspects

Service aspects will be specified.

## 6 MMI-Aspects

Any potential service impacts will be identified. MMI aspects will be defined in later specification stages.

## 7 Charging Aspects

Any potential service impacts will be identified. Requirements for flexible charging models (e.g. volume-based charging) will be developed. Charging mechanisms will be defined in later specification stages.

## 8 Security Aspects

Security aspects will be specified.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X	X	
No					
Don't know	X				X

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary

Affected existing specifications [None in the case of Study Items]					
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments	
TS 22.278	Service requirements for the Evolved Packet System (EPS)		SA#65, Sep 2014	Retain normative requirements from Release 12 prior to handling of WIDs across releases	
TS 22.115	Charging requirements for Prose		SA#65, Sep 2014	Retain normative requirements from Release 12 prior to handling of WIDs across releases	

## 11 Work item rapporteur(s)

Eddy Hall  
Qualcomm Incorporated  
[edhall@qti.qualcomm.com](mailto:edhall@qti.qualcomm.com)

## 12 Work item leadership

SA1

## 13 Supporting Individual Members

Supporting IM name
Qualcomm Incorporated
AT&T
Deutsche Telekom
U.S. Department of Commerce
BlackBerry UK Limited
Alcatel-Lucent
NSN
KPN N.V.
T-Mobile USA Inc.
Sony
UK Home Office
Fujitsu

3GPP TSG SA Meeting #67

TD SP-150028

Shanghai, P. R. China, U.S.A, 11 - 13 March 2015

(Update of SP-140573)

Source: SA WG2

Title: Updated WID: Enhancements to Proximity-based Services extensions (eProSe-Ext-SA2)

Presented for: Approval

Agenda Item: 13.6

Abstract of the contribution: Updates the expected output and timescales section in eProSe-EXT WI.

# 3GPP™ Work Item Description

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Title \*: Enhancements to Proximity-based Services - Extensions

Acronym \* : eProSe-Ext

Unique identifier \*640041

## 1 3GPP Work Area \*

X	Radio Access
X	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
580059	Proximity-based Services (ProSe)	Rel-12 Work item predecessor
640040	Enhancements to Proximity-based Services (eProSe)	Rel-13 new Work item (initiated by SA1)

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any) *</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2 \*

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>
580159	Stage-1 for Proximity Services	TS 22.278

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

<b>Corresponding stage 2 work item (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Else, corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other justification</b>		
<b>TS or CR(s) Or external document</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 2 information, justify: \*

Go to §3

### 2.3.4 Test spec \*

<b>Related Work Item(s)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

Go to §3.

### 2.3.5 Other \*

<b>Related Work Item(s)</b>			
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>	<b>TS / TR</b>

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

ProSe Rel.12 has standardised in TS 23.303 Rel.12 a subset of the stage-1 requirements defined in TS 22.278. Namely, from stage-2 perspective, support for the following features was standardised in Rel.12:

- Open ProSe Direct Discovery
- EPC-level Discovery
- EPC-assisted interworking with WLAN direct
- ProSe Direct Communication 1-many

The following features based on existing (Rel.12 defined) stage-1 requirements that were not completed in Rel-12:

- Restricted ProSe Direct Discovery for non-Public Safety use.
- ProSe Direct Discovery for Public Safety use.
- ProSe UE-Network relays for Public Safety use
- ProSe UE-UE relays for Public Safety use
- ProSe Direct Communication one-to-one for Public Safety use

Additional requirements for service continuity and QoS priority/pre-emption of ProSe Direct Communication sessions as defined in TS 22.278 will also need to be considered.

During SA2 meetings, some further improvements to the Open ProSe Direct Discovery procedures were discussed .

For Public Safety use the UE Location, and Presence in ProSe mode is required.

The identified services provide support for Public Safety and non-Public Safety services that would be of interest to operators and users. For Public Safety use, ProSe Direct Discovery and ProSe Direct Communication scenarios are expected to be supported, regardless of whether the UE are served by E-UTRAN.

ProSe normative specifications are also requested to enable economy of scale advantages, i.e. the requirements should ensure that the resulting system can be used for both Public Safety and non-Public Safety services, whenever possible.

## 4 Objective \*

The SA2 objectives are as follows:

1. As part of the TR phase
  - a. Study architecture enhancements in order to support:
    - i. Restricted ProSe Direct Discovery for non-Public Safety use;
    - ii. ProSe Direct Discovery for Public Safety use;
    - iii. Support for model B ProSe Direct Discovery for all use cases (i.e. open and restricted);

- iv. Enhancements to the procedures for Open ProSe Direct Discovery such as management of ProSe Application IDs and metadata at the ProSe Function from application server over PC2 and revocation of ProSe App. Code from the ProSe Function. Any other Enhancements to the procedures for Open ProSe Direct Discovery, if need is identified in the scope of this work item;
- v. Status determination and reporting, including location status, Presence status, Group status, and UE Network Coverage status in ProSe for Public Safety use, if it is identified to be exchanged (as part of PC5 information exchanges) in scope of 3GPP standardization for Public Safety use. However, if it is identified that it is preferable that some of this status information is exchanged only as application layer signalling then this will not be in the scope of this WID.
- vi. ProSe UE-Network relays for Public Safety use;
- vii. ProSe UE-UE relays for Public Safety use;
- viii. ProSe Direct Communication one-to-one for Public Safety use;
- ix. Requirements for service continuity and QoS/priority/pre-emption of ProSe Direct Communication sessions as defined in TS 22.278 for the aforementioned communication scenarios.
- x. Study architecture enhancements in order to support proximity estimation e.g. how near or how far a discovered UE is from the discovering UE. Based on that additional ProSe discovery range classes could be introduced, if deemed necessary.

#### 11. Specify selected solutions in relevant specifications.

The SA3 objective is to specify security solutions in the relevant SA3 specifications for the SA2 specified features. The specified solution should be based on the outcome of the Rel-12 SA3 study in TR 33.833 UID\_590035 "TR on Security for Proximity-based Services" WID in SP-140300.

Other stage-1 requirements (defined in Rel-12) that are not captured in the above objectives are considered out of scope of this WID.

## 5 Service Aspects

Service aspects will be considered.

## 6 MMI-Aspects

None

## 7 Charging Aspects

The related charging aspects need to be specified by SA5.

## 8 Security Aspects

Security aspects specified by SA3.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes	X	X	X	X	
No					
Don't know					X

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR 23.713	Study on extended architecture support for proximity services	SA2		SA#67 (Mar 2015)	SA#68 (Jun 2015)	
Affected existing specifications * [None in the case of Study Items]						
Spec No.	CR	Subject		Approved at plenary#	Comments	
TS 23.303	XX	XX		SA#69, Sep. 2015	Possible SA2 normative specifications derived from the TR phase	
TBD					Other possible SA2 normative specifications derived from the TR phase	
TS 33.303				SA#69, Sep 2015	Adding security for the Rel-13 ProSe features into the ProSe security TS	

## 11 Work item rapporteur(s) \*

SA2: Haris Zisimopoulos ([harisz@qti.qualcomm.com](mailto:harisz@qti.qualcomm.com))

SA3: Adrian Escott ([aescott@qti.qualcomm.com](mailto:aescott@qti.qualcomm.com))

## 12 Work item leadership \*

SA2

## 13 Supporting Individual Members \*

Supporting IM name
Qualcomm Incorporated
Deutsche Telekom
ZTE
UK Home Office
CATT
US Department of Commerce
AT&T
HTC
General Dynamics UK Ltd
Telefonica
Motorola Mobility
KDDI
ITRI
LG Electronics
Interdigital
Intel
Nokia Corporation
Nokia Networks
Ericsson
Huawei
Alcatel-Lucent
Sony
NEC
Fujitsu

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<b>Source:</b>	Qualcomm Incorporated
<b>Title:</b>	New WID on CT aspects of enhancements to Proximity-based Services extensions
<b>Document for:</b>	Agreement
<b>Agenda Item:</b>	13.1

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** CT aspects of enhancements to Proximity-based Services extensions

**Acronym:** eProSe-Ext-CT

**Unique identifier:** TBD

### 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
640041	Stage 2 for enhancements to Proximity-based Services extensions	23.303

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
640041	Stage 2 for enhancements to Proximity-based Services extensions	23.303

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

ProSe Rel-12 has standardised a subset of the stage-1 requirements defined in TS 22.278. Namely, support for the following features was standardised in Rel-12:

- Open ProSe direct discovery
- EPC-level ProSe discovery
- EPC-assisted interworking with WLAN direct
- One-to-many ProSe direct communication

Several features based on existing (Rel-12 defined) stage-1 requirements were not completed in Rel-12.

Additional requirements for QoS/priority of ProSe direct communication sessions as defined in TS 22.278 also need to be considered. Moreover, during SA2 meetings, some further improvements to the open ProSe direct discovery procedures were discussed.. For Public Safety use, ProSe direct discovery and ProSe direct communication scenarios are expected to be supported, regardless of whether the UE are served by E-UTRAN.

ProSe normative specifications are also requested to enable economy of scale advantages, i.e. the requirements should ensure that the resulting system can be used for both Public Safety and non-Public Safety services, whenever possible.

To develop the stage 2 for several Rel-12 stage-1 requirements that were not completed in Rel-12, as well as for the additional requirements mentioned above, SA2 has agreed a Work Item at SA#64. The work in SA2 is now close to entering normative phase and there is a need to have a corresponding stage-3 Work Item. The stage-3 work for each area shall be started only after the applicable normative stage-2 specification is available.

## 4 Objective

The objective of this work item is to develop the stage 3 specifications for the stage 2 solutions agreed under the eProSe-Ext stage-2 work item. Specific areas of work in the CT WGs will include the items listed below. Stage-3 work for each area shall be started only after the applicable normative stage-2 specification is available:

- Restricted ProSe direct discovery for non-Public Safety use
- ProSe direct discovery for Public Safety use
- Support for model B ProSe direct discovery (open and restricted)

- Enhancements to the procedures for open ProSe direct discovery
- ProSe UE-Network relays for Public Safety use
- One-to-one ProSe direct communication for Public Safety use
- QoS/priority of ProSe direct communication sessions
- Proximity estimation, including enabling authorised applications to request and to use a certain range class when the ProSe-enabled UE is being discovered by other ProSe-enabled UEs

This work item will not cover miscellaneous non-essential corrections or enhancements to the Rel-12 ProSe features.

## 5 Service Aspects

Covered by the parent feature.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

Covered by the parent feature.

## 8 Security Aspects

Covered by the parent feature.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes	X	X		X	
No			X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

Affected existing specifications			[None in the case of Study Items]
Spec No.	CR	Subject of the CR	Approved at plenary#
23.122		Possible updates to cover interactions between ProSe and NAS functions related to MS in idle mode	CT#70 (December 2015)
24.301		Possible updates to cover interactions between ProSe and EMM/ESM procedures	CT#70 (December 2015)
24.333		Updates to the ProSe Management Objects	CT#70 (December 2015)
24.334		Addition of procedure, message and data formats for new ProSe Rel-13 features. Updates to support enhancements to open ProSe direct discovery.	CT#70 (December 2015)
29.343		Addition of procedure, message and data formats for restricted ProSe direct discovery for non-Public Safety use	CT#70 (December 2015)
23.003		Possible updates to format for ProSe Identities	CT#70 (December 2015)
23.008		Possible updates to ProSe parameters in subscription data in HSS, in MME and in ProSe function	CT#70 (December 2015)
29.272		Possible updates of S6a to enable inclusion of ProSe parameters in subscription data	CT#70 (December 2015)
29.344		Addition of procedure, message and data formats for new ProSe Rel-13 features. Updates to support enhancements to open ProSe direct discovery.	CT#70 (December 2015)
29.345		Addition of procedure, message and data formats for new ProSe Rel-13 features. Updates to support enhancements to open ProSe direct discovery.	CT#70 (December 2015)
31.102		Possible addition of new functionalities for ProSe configuration and operation	CT#70 (December 2015)
31.111		Possible addition of new functionalities for new ProSe Rel-13 features	CT#70 (December 2015)

## 11 Work item rapporteur(s)

Lena Chaponnier ([lguelllec@qti.qualcomm.com](mailto:lguelllec@qti.qualcomm.com))

## 12 Work item leadership

CT1

## 13 Supporting Individual Members

Supporting IM name
Qualcomm Incorporated
ZTE
AT&T
CATT
HTC
Huawei
Orange
InterDigital
LG Electronics
NEC
US Department of Commerce
Intel
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Nokia Networks
Deutsche Telekom
Ericsson
Samsung

voice over E-UTRAN Paging Policy Differentiation

				S1, S2, C4, C1, C3				
640045	<a href="#">voice over E-UTRAN Paging Policy Differentiation</a>	voE_UTR_AN_PPD	1		Jun-14	Dec-14	90%	SP-140394
640145	<a href="#">Stage 1 for voice over E-UTRAN Paging Policy Differentiation</a>	voE_UTR_A_N_PPD-SA1	2	S1	Jun-14	Jun-14	100%	SP-140394
640245	<a href="#">Stage 2 for voice over E-UTRAN Paging Policy Differentiation</a>	voE_UTR_AN_PPD-SA2	2	S2	Jun-14	Dec-14	100%	SP-140394
650003	<a href="#">CT aspects of voice over E-UTRAN Paging Policy Differentiation</a>	voE_UTR_AN_PPD-CT	2	C4, C1, C3	Sep-14	Dec-14	83%	CP-140491
650103	CT4 part of CT aspects of voice over E-UTRAN Paging Policy Differentiation	voE_UTR_AN_PPD-CT	3	C4	Sep-14	Dec-14	100%	CP-140491
650203	CT1 part of CT aspects of voice over E-UTRAN Paging Policy Differentiation	voE_UTR_AN_PPD-CT	3	C1	Sep-14	Dec-14	50%	CP-140491
650303	CT3 part of CT aspects of voice over E-UTRAN Paging Policy Differentiation	voE_UTR_AN_PPD-CT	3	C3	Sep-14	Dec-14	100%	CP-140491

**3GPP TSG SA Meeting #64**

**TD SP-140394**

**Sophia Antipolis, France, 16 - 18 June, 2014**

**was SP-140287**

**Source:** **SA WG2**

**Title:** **New WID: voice over E-UTRAN Paging Policy Differentiation {voE-UTRAN\_PPD}**

**Presented for:** **Approval**

**Agenda Item:** **15**

**MCC Note:** **This is an update to the new WID proposed by SA WG1 in SP-140136.**

**SA WG2 Meeting #103**

**S2-142267**

**Phoenix, AZ, USA, 19-23 May, 2014**

**(revision of S2-142230)**

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

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**Title:** **voice over E-UTRAN Paging Policy Differentiation**

**Acronym:** **voE-UTRAN\_PPD**

**Unique identifier:**

# 1 3GPP Work Area

	<b>Radio Access</b>
x	<b>Core Network</b>
	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
x	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

x	<b>Stage 1 (go to 2.3.1)</b>
x	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

##### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Operators can apply different paging policies (e.g., paging area, paging retransmission strategy, paging priority) for services carried over different EPS bearers. But voice over E-UTRAN and the other services (e.g. SMS and other non-voice over E-UTRAN services) share the same paging policy as they are using the same signalling bearer.

Voice over E-UTRAN calls typically require a more aggressive paging profile (e.g., due to user awareness of the call setup time) than other non-voice over E-UTRAN services. The current constraint of differentiating paging policy based on bearer type results in applying the same aggressive paging policy for all services using the IMS signalling bearer, regardless of whether these services correspond to voice over E-UTRAN or not and thus contributes to an

undesirable increase of the paging load for non-voice over E-UTRAN services. When termination attempts for non-voice over E-UTRAN services occurs at a rate of 2 to 3 times that of termination attempts for voice over E-UTRAN services, a significant savings of radio resources can be achieved by using a less aggressive paging strategy for the non-voice over E-UTRAN services.

Because a more aggressive paging profile is needed for voice over E-UTRAN services but not for other services using the IMS signalling bearer, a distinction should be made between voice over E-UTRAN and non-voice over E-UTRAN traffic. Providing this distinction will allow the use of a more aggressive voice over E-UTRAN paging profile to page devices for voice over E-UTRAN mobile terminating calls and less aggressive paging profile for non-voice over E-UTRAN applications. No impacts are expected to the RAN as paging priority mechanisms already exist.

## 4 Objective

### SA1 Objective

The objective of this work item is to specify service requirements to allow a more aggressive paging policy for voice over E-UTRAN termination attempts than for non-voice over E-UTRAN termination attempts.

### SA2 Objective

As part of the stage 2 work, the “voice over E-UTRAN” service described in the SA1 objective of this WID is understood to mean the “IMS Voice” service (as described by current 3GPP specifications) when running over E-UTRAN

The SA2 objective is to specify architectural enhancements to allow over E-UTRAN a differentiated paging policy for IMS Voice calls.

The solution shall be developed in a way that it can be extended in the future to UTRAN or other services than Voice over IMS.

The solution shall be developed to avoid differences between S4 and S11 interfaces.

## 5 Service Aspects

Service aspects will be specified.

## 6 MMI-Aspects

MMI aspects will be defined in later specification stages.

## 7 Charging Aspects

No Charging impact is expected.

## 8 Security Aspects

No Security impact is expected.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary	Comments

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR Subject of the CR	Approved at plenary#	Comments	
22.228	Use of differentiated paging for incoming voice over E-UTRAN services	SA#64 (June 2014)	SA1 ownership	
22.278	Differential paging for voice over E-UTRAN vs. other services using the IMS signalling bearer	SA#64 (June 2014)	SA1 ownership	
23.401	Paging Policy Differentiation for IMS Voice over E-UTRAN	SA#66 (Dec 2014)	SA2 ownership	
23.228	Paging Policy Differentiation for IMS Voice over E-UTRAN	SA#66 (Dec 2014)	SA2 ownership	

## 11 Work item rapporteur(s)

SA1: Betsy Covell ([betsy.covell@alcatel-lucent.com](mailto:betsy.covell@alcatel-lucent.com))

SA2: Laurent Thiébaut ([laurent.thiebaut@alcatel-lucent.com](mailto:laurent.thiebaut@alcatel-lucent.com))

## 12 Work item leadership

SA1

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Alcatel-Lucent
Verizon
Oracle
LG Electronics
Samsung
Telefonica
NSN
Ericsson
Deutsche Telekom
Intel
T-Mobile USA

# **3GPP TSG CT Meeting #65**

## **Edinburgh, GB; 10<sup>th</sup> – 11<sup>th</sup> September 2014**

CP-140491

**Source:** 3GPP TSG CT WG4  
**Title:** New WID on CT aspects of voice over E-UTRAN Paging Policy Differentiation  
**Document for:** Approval  
**Agenda Item:** 12.1

Title: CT aspects of voice over E-UTRAN Paging Policy Differentiation

Acronym: voE-UTRAN\_PPD-CT

Unique identifier: 6500ab

## 1 3GPP Work Area

	Radio Access
x	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
x	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
	Voice over E-UTRAN Paging Policy Differentiation	TS 22.228, 22.278, 23.228, 23.401

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
x	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
	Voice over E-UTRAN Paging Policy Differentiation	TS 23.228, 23.401

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Operators can apply different paging policies (e.g., paging area, paging retransmission strategy, paging priority) for services carried over different EPS bearers. But voice over E-UTRAN and the other services (e.g. SMS and other non-voice over E-UTRAN services) share the same paging policy as they are using the same signalling bearer.

Voice over E-UTRAN calls typically require a more aggressive paging profile (e.g., due to user awareness of the call setup time) than other non-voice over E-UTRAN services. The current constraint of differentiating paging policy based on bearer type results in applying the same aggressive paging policy for all services using the IMS signalling bearer, regardless of whether these services correspond to voice over E-UTRAN or not and thus contributes to an undesirable increase of the paging load for non-voice over E-UTRAN services. When termination attempts for non-voice over E-UTRAN services occurs at a rate of 2 to 3 times that of termination attempts for voice over E-UTRAN services, a significant savings of radio resources can be achieved by using a less aggressive paging strategy for the non-voice over E-UTRAN services.

Because a more aggressive paging profile is needed for voice over E-UTRAN services than for other services using the IMS signalling bearer, a distinction should be made between voice over E-UTRAN and non-voice over E-UTRAN signalling. Providing this distinction will allow the use of a more aggressive voice over E-UTRAN paging profile to page devices for voice over E-UTRAN mobile terminating calls and less aggressive paging profile for non-voice over E-UTRAN applications. No impacts are expected to the RAN as paging priority mechanisms already exist.

## 4 Objective

This work item will specify the stage 3 impacts to allow a differentiated paging policy over E-UTRAN for IMS Voice calls according to the stage 2 requirements.

This will cover the following aspects in particular:

- o P-CSCF requirements for differentiated paging policy for IMS voice over E-UTRAN, i.e. identification and marking of voice over E-UTRAN calls;
- o Potential interworking requirements at the PGW between IMS and EPC networks to carry the IMS voice call indication from IMS to EPC;
- o EPC requirements for differentiated paging policy for IMS voice over E-UTRAN, i.e. enhancements for signalling that a downlink packet on the IMS signalling bearer is associated to an IMS voice session and for conveying that information in the Downlink Data Notification message sent to the MME.

## 5 Service Aspects

Covered by the Parent WID.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

None.

## 8 Security Aspects

None.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

Affected existing specifications [None in the case of Study Items]			
Spec No	CR	Subject of the CR	Approved at plenary#
24.229		P-CSCF requirements for Paging Policy Differentiation for IMS Voice over E-UTRAN (Annex L)	CT#66 (Dec. 2014)
29.061		Potential interworking requirements at the PGW between IMS and EPC	CT#66 (Dec. 2014)
29.281		Potential EPC requirements for Paging Policy Differentiation for IMS Voice over E-UTRAN	CT#66 (Dec. 2014)
29.274		EPC requirements for Paging Policy Differentiation for IMS Voice over E-UTRAN	CT#66 (Dec. 2014)

## 11 Work item rapporteur(s)

Alcatel-Lucent, Bruno Landais ([bruno.landais@alcatel-lucent.com](mailto:bruno.landais@alcatel-lucent.com))

## 12 Work item leadership

CT4

## 13 Supporting Individual Members

Supporting IM name
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Verizon
LG Electronics
Ericsson
Telefonica
Nokia Networks
Samsung

## Dedicated Core Networks

640046	<b>Dedicated Core Networks</b>	DECOR	1	S2	Jun-14	Dec-15	62%	SP-150249
640146	<b>TR for Dedicated Core Networks</b>	DECOR	2	S2	Jun-14	Dec-14	100%	SP-150249
640246	<b>Stage 2 for Dedicated Core Networks</b>	DECOR	2	S2	Jun-14	Mar-15	100%	SP-150249
690004	<b>Dedicated Core Networks CT aspects</b>	DÉCOR-CT	2	ct	Jun-15	Dec-15	35%	CP-150423
690014	CT1 aspects for Dedicated Core Networks CT aspects	DÉCOR-CT	3	C1	Sep-15	Dec-15	0%	CP-150423
690013	CT4 aspects for Dedicated Core Networks CT aspects	DÉCOR-CT	3	C4	Jun-15	Dec-15	70%	CP-150423
680066	<b>Dedicated Core Networks RAN Aspects</b>	DECOR-UTRA_LT E	2	R3	Jun-15	Dec-15	0%	RP-151048
680166	Core part: Dedicated Core Networks	DECOR-UTRA_LT E-Core	3	R3	Jun-15	Dec-15	0%	RP-151048

## 3GPP TSG SA Meeting #68

**TD SP-150249**

**Malmö, Sweden, 17 - 19 June 2015**

(revision of **SP-140707**)

**Source:** SA WG2

**Title:** Updated WID: Dedicated Core Networks (DECOR)

**Document for:** Approval

**Agenda Item:** 13.18

**Work Item / Release:** DECOR / Rel-13

**3GPP TSG SA2 Meeting #109**

**S2-151791**

**25 – 29 May 2015, Fukuoka, Japan**

update of **SP-140707**

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

**Title:** Dedicated Core Networks

**Acronym:** DECOR

**Unique identifier:** 640046

## 1 3GPP Work Area

x	Radio Access
x	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any)</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

**If no identified source of stage 1 information, justify:**

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

3GPP networks are beginning to support devices and customers with very different characteristics, such as machine type devices, MVNO, data usage, etc. These classes of devices and customers may have different requirements from the core-network in terms of optional feature support, traffic characteristic support, availability, congestion management, ratio of signalling to user plane traffic, etc. As we move forward the classes of devices/customers will continue to increase. One cost effective mechanism for operators to support these different classes of devices and customers is to create separate dedicated core networks consisting of specialized core network elements that are designed and deployed to meet the requirements of these different devices and customers. It is cost-effective as the network availability or redundancy requirements may be easier met with different hardware and software than the existing core network. Also, creating separate core networks enables independent scaling or specific feature provisioning for specific user or traffic types and isolating specific users and traffic from each other.

Such dedicated core networks need to support both future and previous device releases and it is not always possible to expect devices to provide specific indication of the above requirements in their initial signalling to the network. The overall model is comparable to MOCN network sharing with non-supporting UEs.

Existing specifications for MTC devices, specifically the use of the low priority indication (LAPI), provides a partial solution for dedicated core networks for such types of devices, but (i) is not able to handle UEs that do not provide

the LAPI indication, (ii) nor is the reselection of MME/SGSN supported. This WID will try to solve the problem when devices do not provide indication to the network and will not be restricted just to low priority class of devices.

## 4 Objective

The objective of this work item is to enable the deployment of dedicated core networks where each dedicated core network is dedicated to UEs sharing the same characteristics. The specific dedicated core network that serves a UE is selected based on subscription information and operator configuration, without requiring the UEs to be modified.

A dedicated core network consists of a set of MMEs, S4-SGSNs, SGWs and PGWs. The objective of the WID includes studying and creating solutions for the following:

- Defining the subscription information and configuration used to determine the selection of the specific dedicated core network that shall serve the UE.
- Enable the initial allocation of serving MMEs or SGSNs from the dedicated network selected for the UE and maintaining the UE's association with the selected dedicated network during MME/SGSN change. - Enable the allocation/reallocation of serving SGW and PGW from the dedicated network selected for serving the UE.
- Whether other network elements, eg. PCRF, also need to included as part of the dedicated network and if additional functionality is needed for selection of such network elements.
- Whether dedicated core network may also consist of Gn/Gp SGSNs and GGSNs is to be determined during the study.
- Handling of possible relocation of UEs from one dedicated network to another.
- Handling of dedicated core networks in roaming scenarios and GWCN/MOCN shared networks.

Interactions with intra and inter-RAT handover, Gs interface, CSFB, and SRVCC will also be considered.

A TR will be created to capture the study phase of the WID. Normative changes to specifications will be based on conclusions of the TR.

## 5 Service Aspects

Service aspects will be considered.

## 6 MMI-Aspects

None

## 7 Charging Aspects

If any charging aspects arise, they will be handled by SA5.

## 8 Security Aspects

If any security aspects arise, they will be handled by SA3.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X			
Don't know			X		X

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1 <sup>st</sup> rsp. WG	2 <sup>nd</sup> rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
23.707	Architecture Enhancements for Dedicated Networks	SA2	-	SA#66 (Dec 2014)	SA#66 (Dec 2014)	The TR captures solution alternatives and evaluations.

Affected existing specifications [None in the case of Study Items]				
Spec No	CR	Subject of the CR	Approved at plenary#	Comments
23.401		Architecture Enhancements for Dedicated Networks	SA2#68(June 2015)	Details of DECOR functionality
23.060		Architecture Enhancements for Dedicated Networks	SA2#68(June 2015)	Details of DECOR functionality
23.236		Intra-domain connection of Radio Access Network (RAN) nodes to multiple Core Network (CN) nodes	SA2#68(June 2015)	NNSF enhancements for DECOR

## 11 Work item rapporteur(s)

SA WG2: NTT DOCOMO, Daisuke FUJISHIMA, fujishimad (at) nttdocomo (dot) com

## 12 Work item leadership

SA WG2

## 13 Supporting Individual Members

Supporting IM name
NTT DOCOMO
Vodafone
AT&T
Telecom Italia
Telenor
Huawei
NSN
Cisco
Ericsson
NEC
ZTE
Silver Spring Networks
Hitachi
Intel
Fujitsu
CATT
Alcatel-Lucent
TeliaSonera

2013-10-03 version 1.14.0

**3GPP TSG RAN Meeting #68**  
**Malmö, Sweden, June 15 - 18, 2015**

**RP-151048**  
**Revision of RP-151007**

---

**Source:** NTT DOCOMO, INC., Ericsson  
**Title:** New Work Item on Dedicated Core Networks  
**Document for:** Approval

# 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

Title: Work Item on Dedicated Core Networks

Acronym: DECOR-UTRA\_LTE

Unique identifier:

NOTE: If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	

## 1 3GPP Work Area

X	<b>Radio Access</b>
X	<b>Core Network</b>
	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

### 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

### 2.2 Feature

<b>Related Study Item or Feature (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TR
640046	Dedicated Core Networks	23.707

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
640046	Dedicated Core Networks	23.401

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

To cope with market demand for providing various services over mobile networks, network operators need to accommodate devices and customers of different characteristics, such as machine type applications/devices, best effort packet applications, smartphones, MVNO, etc. These different groups of customers and devices may have different requirements towards the operator's network in terms of necessary optional features, traffic characteristic support, availability, congestion management, signalling and user plane data usage, etc. Operators foresee that the variety of devices/customers will continue to increase. Under specific conditions, one cost effective mechanism for operators is to create separate dedicated core networks consisting of specialized core network elements/resources that are designed and deployed to meet the requirements of a certain group of devices/customers. By doing this way, the network availability and/or redundancy requirements can be met easily. Also, creating separate core networks enables independent scaling or specific feature provisioning for specific user or traffic types and isolating specific users and traffic from each other.

To ensure broad application of markets and customers, such dedicated core networks need to support both future and previous device releases. Although the existing specification allows for a UE to indicate a specific indication (such as LAPI (low priority indication)) for the network to understand the type of device/application, it is assumed that not all devices support such kind of indication, so that the network cannot always rely on it. SA2 has been discussing the necessary solution in the related WID [1]. In the LS [2] SA2 indicated that they have completed the specification work to support dedicated core network feature. SA2 has also agreed stage 2 solutions and relevant specifications [3, 4, 5, 6, 7, 8].

### References:

- [1] S2-151791, "Updated WID: Dedicated Core Networks {Decor}", NTT DOCOMO, INC.
- [2] S2-151997, "Request for specification of Dedicated Core Network (DECOR) feature", LS from SA2, to: RAN3, CT4, cc: RAN, Contact person: NTT DOCOMO, INC.
- [3] TR 23.707, "Architecture Enhancements for Dedicated Core Networks", Stage 2 (Release 13)
- [4] S2-152107, "Introduce the Dedicated Core Network (DECOR) feature", CR to 23.401, NTT DOCOMO, INC., et al.
- [5] S2-151818, "Introduce the Dedicated Core Network (DECOR) feature", CR to 23.060, NTT DOCOMO, INC., et al.
- [6] S2-152108, "Adding support for load re-balancing within DCN", CR to 23.401, Ericsson, et al.
- [7] S2-151820, "Load rebalancing for SGSNs with Dedicated Core Networks", CR to 23.236, NTT DOCOMO, INC., et al.
- [8] S2-151322, "Update of MME load balancing for Dedicated Core Networks", CR to 23.236, Huawei, et al.

## 4 Objective

### 4.1 Objective of WI

The objective of this work item is to specify the necessary changes in stage-2 and stage-3 RAN specifications based on the SA2 agreements [1-8].

The work will consider/assess the following possible changes:

- NAS Node Selection Function description and behavior
- S1AP/RANAP signaling to support MME/SGSN (re)selection function

### 4.2 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #68 #69		Q3/2015										RAN	
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82	82	91	91	91	89	76	76	76	76				
					1								

RAN #69 #70														Q4/2015								RAN			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf						
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77						
					1										0.5										

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

Covered by parent work item.

## 6 MMI-Aspects

Covered by parent work item.

## 7 Charging Aspects

Covered by parent work item.

## 8 Security Aspects

Covered by parent work item.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.  
By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2	RAN#69	
36.401		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Architecture description	RAN#70	
36.410		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 general aspects and principles	RAN3#70	if necessary
36.413		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)	RAN#70	
25.401		Technical Specification Group Radio Access Network; UTRAN overall description	RAN#70	if necessary
25.413		UTRAN Iu interface Radio Access Network Application Part (RANAP) signalling	RAN#70	

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.  
If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Martin Israelsson  
Ericsson  
martin.israelsson@ericsson.com

## 12 Work item leadership

Primary: RAN WG3

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Ericsson
NTT DOCOMO, INC.
Nokia Networks
NEC
Fujitsu
CATT
Intel Corporation
AT&T
KDDI
Alcatel-Lucent
TeliaSonera
Vodafone
Orange
Telecom Italia
InterDigital
Samsung
Deutsche Telekom
SK Telecom



## IP Flow Mobility support for S2a and S2b Interfaces

640047	<a href="#">IP Flow Mobility support for S2a and S2b Interfaces</a>	NBIFOM	1	S2	Jun-14	Dec-15	67%	SP-150250
640147	<a href="#">TR for IP Flow Mobility support for S2a and S2b Interfaces</a>	NBIFOM-SA2TR	2	S2	Jun-14	Mar-15	90%	SP-140279
640247	<a href="#">Stage 2 for IP Flow Mobility support for S2a and S2b Interfaces</a>	NBIFOM-SA2	2	S2	Jun-14	Sep-15	100%	SP-150250
680019	<a href="#">CT aspects of IP Flow Mobility support for S2a and S2b Interfaces</a>	NBIFOM-CT	2	C1	Jun-15	Dec-15	28%	CP-150285
680020	CT1 aspects of IP Flow Mobility support for S2a and S2b Interfaces	NBIFOM-CT	3	C1	Jun-15	Dec-15	25%	CP-150285
680021	CT3 aspects of IP Flow Mobility support for S2a and S2b Interfaces	NBIFOM-CT	3	C3	Jun-15	Dec-15	40%	CP-150285
680022	CT4 aspects of IP Flow Mobility support for S2a and S2b Interfaces	NBIFOM-CT	3	C4	Jun-15	Dec-15	20%	CP-150285

### 3GPP TSG SA Meeting #68

TD SP-150250

Malmö, Sweden, 17 - 19 June 2015

(revision of SP-140279)

**Source:** SA WG2

**Title:** Revised WID: IP Flow Mobility support for S2a and S2b Interfaces (NBIFOM)

**Document for:** Approval

**Agenda Item:** 13.19

**Work Item / Release:** NBIFOM / Rel-13

---

### 3GPP TSG SA2 Meeting #109

TD S2-152089

25 – 29, May, 2015, Fukuoka, Japan,

(revision of S2-151879)

*Abstract of the contribution: Revised NBIFOM WID to request for dedicated TS assignment to capture the normative procedures and also to update the conclusion date for the normative phase.*

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

**Title \*** : IP Flow Mobility support for S2a and S2b Interfaces (NBIFOM)

**Acronym \*** : NBIFOM

**Unique identifier \*** :

### 1 3GPP Work Area \*

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	Stage 1 (go to 2.3.1)
X	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

#### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

#### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

Dual radio devices (e.g. 3GPP/LTE & WiFi) are becoming commonly available and the set of applications running in the mobile devices is diversifying. While some applications are very well suited to use as transport 3GPP access systems, some other applications may be also well suited use as transport some other - complementary - access systems (e.g. APP software update via WiFi in parallel to VoIP over LTE). Also, in some environments (e.g. home, office, and campus) it would be beneficial for operators to offload certain type of traffic from 3GPP radio to WLAN.

Up to Rel. 12, mechanisms have been defined for simultaneous connectivity over 3GPP and WLAN for different PDN connections and for NSWO.

In Rel-10, 3GPP defined the capability for DSMIPv6 capable UEs to allow seamless offload of individual IP flows corresponding to a PDN connection to WLAN by introducing IP flow mobility (IFOM) support to the EPC. The IFOM features allows MNOs to dynamically direct individual IP flows generated by different applications and belonging to the same PDN connection to specific access system via the DSMIP mobility solution.

Many operators have deployed network-based mobility protocols (e.g. GTP and PMIP). The proposed work item will study and define solutions for IP Flow Mobility using network-based mobility protocols.

## 4 Objective \*

The objective of this work item is to define the IFOM functionality for GTP-based S2a and S2b over WLAN based on the use-cases, the service requirements and the NBIFOM Rel-13 conclusions as captured in TR 23.861.

It is assumed that

- the UE supports dual radio for 3GPP and WLAN access simultaneously

## 5 Service Aspects

N/A

## 6 MMI-Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

N/A

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR 23.861	Network based IP flow mobility	SA WG2		#66 (Dec., 2014)	# 68 (June., 2015)	
TS 23.xxx	Network based IP flow mobility	SA WG2			#69 (Sept., 2015)	
Affected existing specifications * [None in the case of Study Items]						
Spec No.	CR	Subject		Approved at plenary#	Comments	

## 11 Work item rapporteur(s) \*

ZTE, Tricci So ([tso@zte.com.cn](mailto:tso@zte.com.cn))

## 12 Work item leadership \*

Primary Responsibility: **SA WG2**

## 13 Supporting Individual Members \*

Supporting IM name
China Telecom
ZTE
China Mobile
Orange
CATT
China Unicom
KDDI
Verizon
Broadcom Corporation
AT&T
Alcatel Lucent
Alcatel Lucent Shanghai Bell
Intel
Oracle
Samsung
LG Electronics
NEC
Ericsson
Interdigital
Sharp Corporation
Huawei

**Title:** New WID: IP Flow Mobility support for S2a and S2b Interfaces (NB-IFOM)  
{NBIFOM}

**Presented for:** Approval

**Agenda Item:** 15

*Abstract of the contribution: WID based on study item in SP-120270 and SA WG2 agreed updates in SP-120740 and SP-120741.*

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3GPP TSG SA2#102

TD S2-141502

24 - 28 March 2014, St. Julian's, Malta

(Revision of S2-141475)

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

**Title \*** : IP Flow Mobility support for S2a and S2b Interfaces (NB-IFOM)

**Acronym \*** : NBIFOM

**Unique identifier \*** :

### 1 3GPP Work Area \*

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<a href="#">Study Item (go to 2.1)</a>
X	<a href="#">Feature (go to 2.2)</a>
	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

#### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

### 3 Justification \*

Dual radio devices (e.g. 3GPP/LTE & WiFi) are becoming commonly available and the set of applications running in the mobile devices is diversifying. While some applications are very well suited to use as transport 3GPP access systems, some other applications may be also well suited use as transport some other - complementary - access systems (e.g. APP software update via WiFi in parallel to VoIP over LTE). Also, in some environments (e.g. home, office, and campus) it would be beneficial for operators to offload certain type of traffic from 3GPP radio to WLAN.

Up to Rel. 12, mechanisms have been defined for simultaneous connectivity over 3GPP and WLAN for different PDN connections and for NSWO.

In Rel-10, 3GPP defined the capability for DSMIPv6 capable UEs to allow seamless offload of individual IP flows corresponding to a PDN connection to WLAN by introducing IP flow mobility (IFOM) support to the EPC. The IFOM features allows MNOs to dynamically direct individual IP flows generated by different applications and belonging to the same PDN connection to specific access system via the DSMIP mobility solution.

Many operators have deployed network-based mobility protocols (e.g. GTP and PMIP). The proposed work item will study and define solutions for IP Flow Mobility using network-based mobility protocols.

### 4 Objective \*

The objective of this work item is to define the IFOM functionality for PMIP and GTP-based S2a and S2b over WLAN. The scope of the work is based on the use-cases and service requirements defined in TR 23.861.

It is assumed that

- the UE supports dual radio for 3GPP and WLAN access simultaneously

The following procedures related to seamless offload and flow mobility using network-based protocol, PMIP and GTP based S2a and S2b over WLAN, are to be studied:

- The support of a PDN Connection active over multiple accesses simultaneously
- The association of one or multiple IP flows belonging to a PDN connection to an access system
- The movement of one or multiple IP flows belonging to a PDN connection between different access systems
- The triggers for IP flow mobility in the UE and the network
- UE-initiated and network-initiated NBIFOM.
- The impact and the relationship to 3GPP related policies (e.g. PCC, ANDSF, ISRP, ISMP, RAN policy with no ANDSF etc.), if any, to support NBIFOM

Based on the outcome of study, the intention is to develop the normative specification.

## 5 Service Aspects

N/A

## 6 MMI-Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

N/A

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		
Don't know					X

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR 23.861	Network based IP flow mobility	SA WG2		#66 (Dec., 2014)	# 67 (Mar., 2015)	
Affected existing specifications * [None in the case of Study Items]						
Spec No.	CR	Subject			Approved at plenary#	Comments
TS 23.402		Network based IP flow mobility			#68 (Jun., 2015)	
TBD		TBD			Other existing specifications that are affected would be identified during the development of TR	

## 11 Work item rapporteur(s) \*

ZTE, Tricci So ([tso@zteusa.com](mailto:tso@zteusa.com))

## 12 Work item leadership \*

Primary Responsibility: **SA WG2**

## 13 Supporting Individual Members \*

Supporting IM name
China Telecom
ZTE
China Mobile
Orange
CATT
China Unicom
KDDI
Verizon
Broadcom Corporation
AT&T
Alcatel Lucent
Alcatel Lucent Shanghai Bell
Intel
Oracle
Samsung
LG Electronics
NEC
DoCoMo
Ericsson
Interdigital
Sharp Corporation
Huawei
Motorola Mobility

**Source:** SA WG2

**Title:** Revised WID: IP Flow Mobility support for S2a and S2b Interfaces (NBIFOM)

**Document for:** Approval

**Agenda Item:** 13.19

**Work Item / Release:** NBIFOM / Rel-13

3GPP TSG SA2 Meeting #109

TD S2-152089

25 – 29, May, 2015, Fukuoka, Japan,

(revision of S2-151879)

*Abstract of the contribution: Revised NBIFOM WID to request for dedicated TS assignment to capture the normative procedures and also to update the conclusion date for the normative phase.*

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

**Title \*** : IP Flow Mobility support for S2a and S2b Interfaces (NBIFOM)

**Acronym \*** : NBIFOM

**Unique identifier \*** :

### 1 3GPP Work Area \*

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	Stage 1 (go to 2.3.1)
X	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

Dual radio devices (e.g. 3GPP/LTE & WiFi) are becoming commonly available and the set of applications running in the mobile devices is diversifying. While some applications are very well suited to use as transport 3GPP access systems, some other applications may be also well suited use as transport some other - complementary - access systems (e.g. APP software update via WiFi in parallel to VoIP over LTE). Also, in some environments (e.g. home, office, and campus) it would be beneficial for operators to offload certain type of traffic from 3GPP radio to WLAN.

Up to Rel. 12, mechanisms have been defined for simultaneous connectivity over 3GPP and WLAN for different PDN connections and for NSWO.

In Rel-10, 3GPP defined the capability for DSMIPv6 capable UEs to allow seamless offload of individual IP flows corresponding to a PDN connection to WLAN by introducing IP flow mobility (IFOM) support to the EPC. The IFOM features allows MNOs to dynamically direct individual IP flows generated by different applications and belonging to the same PDN connection to specific access system via the DSMIP mobility solution.

Many operators have deployed network-based mobility protocols (e.g. GTP and PMIP). The proposed work item will study and define solutions for IP Flow Mobility using network-based mobility protocols.

## 4 Objective \*

The objective of this work item is to define the IFOM functionality for GTP-based S2a and S2b over WLAN based on the use-cases, the service requirements and the NBIFOM Rel-13 conclusions as captured in TR 23.861.

It is assumed that

- the UE supports dual radio for 3GPP and WLAN access simultaneously

## 5 Service Aspects

N/A

## 6 MMI-Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

N/A

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR 23.861	Network based IP flow mobility	SA WG2		#66 (Dec., 2014)	# 68 (June., 2015)	
TS 23.xxx	Network based IP flow mobility	SA WG2			#69 (Sept., 2015)	
Affected existing specifications * [None in the case of Study Items]						
Spec No.	CR	Subject		Approved at plenary#	Comments	

## 11 Work item rapporteur(s) \*

ZTE, Tricci So ([tso@zte.com.cn](mailto:tso@zte.com.cn))

## 12 Work item leadership \*

Primary Responsibility: **SA WG2**

## 13 Supporting Individual Members \*

Supporting IM name
China Telecom
ZTE
China Mobile
Orange
CATT
China Unicom
KDDI
Verizon
Broadcom Corporation
AT&T
Alcatel Lucent
Alcatel Lucent Shanghai Bell
Intel
Oracle
Samsung
LG Electronics
NEC
Ericsson
Interdigital
Sharp Corporation
Huawei

Title: CT aspects of IP Flow Mobility support for S2a and S2b Interfaces (NBIFOM)

Acronym: NBIFOM-CT

Unique identifier: **TBD**

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
640247	IP Flow Mobility support for S2a and S2b Interfaces (NB-IFOM)	<b>23.xxx Network based IP flow mobility</b>

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
640247	IP Flow Mobility support for S2a and S2b Interfaces (NB-IFOM)	23.xxx Network based IP flow mobility

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

[Go to §3.](#)

## 2.4 Work task

Parent Building Block		TS
Unique ID	Title	TS

## 3 Justification

Up to Rel-12, mechanisms have been defined for simultaneous connectivity over 3GPP access and non-3GPP access for different PDN connections and for the mobility of a PDN connection between 3GPP and non-3GPP access.

However, in case of Network based mobility based on GTP, no mechanisms have been defined to:

- Allow a PDN connection to be simultaneously supported over 3GPP and non-3GPP access and to
- Support UE decided or network decided mobility of IP flows belonging to the same PDN connection between 3GPP and non-3GPP access.

## 4 Objective

The objective of this work item is to provide the stage 3 solutions for the functionality defined in stage 2 requirements under the NBIFOM (network-based IFOM) WID in the TSG SAs working groups to allow the UE or the network to dynamically direct individual IP flows belonging to the same PDN connection between 3GPP and non-3GPP access when using GTP.

NOTE: PMIP-based IP flow mobility between 3GPP and non-3GPP access is not supported in Release 13, as this is not specified in the stage 2.

The stage 3 specifications shall be started only after the applicable normative stage 2 specification is available.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

Covered by the parent feature

## 8 Security Aspects

Covered by the parent feature

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		
Don't know					X

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

Affected existing specifications [None in the case of Study Items]			
Spec No	CR Subject of the CR	Approved at plenary	Comments
24.301	Update of NAS signalling to support NBIFOM	CT#70(Dec 2015)	CT1
24.302	Updates to support NBIFOM over S2a/S2b	CT#70(Dec 2015)	CT1
24.244	Update of WLCP signalling to support NBIFOM	CT#70(Dec 2015)	CT1
24.008	Extensions to PCO to support NBIFOM	CT#70(Dec 2015)	CT1
29.274	Update of GTP over S2a/S2b/S5/S8 to support NBIFOM	CT#70(Dec 2015)	CT4
23.008	Potential NBIFOM impacts on subscriber data	CT#70(Dec 2015)	CT4
29.212	Enhance the PCC rules and support multiple accesses for the same IP-CAN session and negotiation of NBIFOM	CT#70(Dec 2015)	CT3
29.213	Update the call flow to support NBIFOM	CT#70(Dec 2015)	CT3
29.214	Potential NBIFOM impacts on the signalling to the AF	CT#70(Dec 2015)	CT3
29.215	Enhance the S9 to support NBIFOM	CT#70(Dec 2015)	CT3

## 11 Work item rapporteur(s)

<ZTE Corporation, Xingyue(Joy) Zhou>  
[zhou.xingyue@zte.com.cn](mailto:zhou.xingyue@zte.com.cn)

## 12 Work item leadership

CT1

## 13 Supporting Individual Members

Supporting IM name
ZTE
ZTE Mobile
Huawei
HiSilicon
LG Electronics
CATT
Oracle
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Intel Corporation
Orange
Ericsson
Verizon

2013-10-03 version 1.14.0

## Architecture Enhancements for Service capability Exposure

640048	<b>Architecture Enhancements for Service capability Exposure</b>	AESE	1	S2, S3	Jun-14	Dec-15	54%	SP-140704
640148	<b>TR for Architecture Enhancements for Service capability Exposure</b>	AESE	2	S2	Jun-14	Mar-15	100%	SP-140704
640248	<b>Stage 2 for Architecture Enhancements for Service capability Exposure</b>	AESE	2	S2	Jun-14	Jun-15	100%	SP-140704
640348	<b>TR on Security for Architecture Enhancements for Service capability Exposure</b>	AESE	2	S3	Jun-14	Jun-15	60%	SP-140704
640448	<b>Security for Architecture Enhancements for Service capability Exposure</b>	AESE	2	S3	Jun-14	Sep-15	0%	SP-140704
680001	<b>CT aspects of Architecture Enhancements for Service capability Exposure</b>	AESE-CT	2	C3	Jun-15	Dec-15	37%	CP-150402
680023	<b>CT3 aspects of Architecture Enhancements for Service capability Exposure</b>	AESE-CT	3	C3	Jun-15	Dec-15	35%	CP-150402
680024	<b>CT4 aspects of Architecture Enhancements for Service capability Exposure</b>	AESE-CT	3	C4	Jun-15	Dec-15	40%	CP-150402

## 3GPP TSG SA Meeting #66

**TD SP-140704**

**Maui, Hawaii, U.S.A, 10 - 12 December 2014**

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**Title:** Correction to AESE WID's expected output and timelines (AESE)

**Source:** SA WG2

**Agenda Item:** 13.19

**SA WG2 Meeting #106**

**S2-144161**

**17-21 November 2014, San Francisco, USA**

---

**Source:** Intel

**Title:** Correction to AESE WID's expected output and timelines

**Document for:** Approval

**Agenda Item:** 8.1

*Abstract of the contribution: This proposal provides correction to AESE WID's expected output and timelines in clause 10. It also updates Unique ID for corresponding stage-1 SEES work item in clause 2.3.2.*

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

**Title \* : Architecture Enhancements for Service Capability Exposure**

**Acronym \* : AESE**

**Unique identifier \* :**

# 1 3GPP Work Area \*

	Radio Access
X	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS
480130	Stage 1 for System Improvements to Machine Type Communications (SIMTC)	TS 22.368
610230	Stage 1 for Service Exposure and enablement Support (SEES)	TS 22.101, TS 22.115

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

### **3 Justification \***

The 3GPP system owns operational information on device and services status and also on subscription that may be valuable for 3<sup>rd</sup> parties to base applications on or to enhance trouble shooting or customer care for 3<sup>rd</sup> party applications.

Such 3GPP system internal information or services, denoted as 3GPP service capabilities, are today already offered for external, i.e. Application provider, usage to some extent. This WID intends to define architecture enhancements to expose more service capabilities that are valuable for application providers and thereby contribute to monetize the PLMN's assets. Application providers could be M2M service providers, 3<sup>rd</sup> party application providers, or MNO's internal application platforms.

The Service Capability Exposure includes the identification and definition of the Service Capabilities on the one hand and the exposure of the capabilities on the other hand. Service capability exposure provides authorised and secure access to 3GPP system service capabilities and execution of services. The 3GPP system offers some support functions like mapping between internal and external identities. A range of 3GPP system capabilities is already accessible via OMA-APIs, like SMS or MMS. In order not to fragment the capability exposure, any capabilities exposed under this WID should likely be exposed e.g. via OMA-API(s) and therefore, the actual API is not in the scope of this WID.

### **4 Objective \***

Objective of this work item is to define stage 2 architecture enhancements wherein 3GPP system provided service capabilities are exposed to application providers, e.g. via OMA-API(s).

As part of this work it will be identified how the API and the 3GPP system act together to expose 3GPP service capabilities.

The definition of APIs is out of scope of this work item.

The work item should reuse existing 3GPP specifications and external specifications as far as possible.

**NOTE:** As part of the work it would be determined whether there is one single capability exposure function for all service capabilities, a variety of capability exposure functions that fit the needs of specific market segments and industries, or one capability exposure function for each service capability.

Once stage 1 normative requirements for SEES are available from SA1 then SA2 will:

12. Define the architectural requirements for new service capabilities and services (based on the Stage 1 normative requirements) that are exposed to application providers;
13. Develop solutions based on objective 1);
14. Determine which solution(s) from the TR phase to document in normative specifications; and
15. Specify selected solutions in relevant specifications.

Also objective of this work item is to study and provide stage 2 security and privacy related specification for the requirements identified in Stage 1 and Stage 2 specifications for Service Capability Exposure. Further, SA3 shall have responsibility for this feature, as an assessor of the security implications and resulting required changes to technical specifications, if any.

### **5 Service Aspects**

Services aspects will be considered.

### **6 MMI-Aspects**

None.

## 7 Charging Aspects

Any necessary charging aspects will be undertaken by SA5 with support from SA2.

## 8 Security Aspects

Any necessary security analysis will be undertaken by SA3 with support from SA2.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No					
Don't know	X	X	X		X

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
TR 23.708	Architecture Enhancements for Service Capability Exposure	SA2		SA#66 (Dec 2014)	SA#67 (Mar 2015)
TR 33.889	Study on Security Aspects of Machine-Type Communications architecture and feature enhancements	SA3		SA#67 (Mar 2015)	SA#68 (June 2015)
Affected existing specifications * [None in the case of Study Items]					
Spec No.	CR	Subject	Approved at plenary#		Comments
TS 23.682			SA#68 (June 2015)		Based on the outcome of the Stage 2 TR 23.708, any new normative text will be incorporated in TS 23.682 and/or suitable existing TS.
TS 33.187			SA#69 (Sep 2015)		Based on the outcome of the SA3 TR, any new normative text will be incorporated in TS 33.187 and/or suitable existing TS.

## 11 Work item rapporteur(s) \*

SA2: Intel, Puneet Jain ([puneet.jain@intel.com](mailto:puneet.jain@intel.com))

SA3: Samsung, Rajavelsamy R ([rajvel@samsung.com](mailto:rajvel@samsung.com))

## 12 Work item leadership \*

Stage 2: 3GPP SA2

Stage 2 security and privacy aspects: 3GPP SA3

## 13 Supporting Individual Members \*

Supporting IM name
Intel
Huawei
InterDigital
LG Electronics
KPN
ZTE
NTT DOCOMO
Silver Springs Network
CATT
HTC
NEC
KDDI
AT&T
Cisco
Acision
Fujitsu
China Mobile
Alcatel-Lucent
Orange
Samsung

**3GPP TSG CT Meeting #68**  
**Malmo, Sweden; 15th – 16th June2015**

**CP-150402**

**Source:** CT3  
**Agenda item :** 13.1  
**Title:** New WID on CT aspects of Architecture Enhancements for Service Capability Exposure (from C3-151235)  
**Document for:** APPROVAL

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** CT aspects of Architecture Enhancements for Service Capability Exposure

**Acronym:** AESE-CT

**Unique identifier:** 680001

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
640048	Architecture Enhancements for Service Capability Exposure	TS 23.682, TS 23.203

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

#### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

#### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

**If no identified source of stage 1 information, justify:**

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
640248	Stage 2 for Architecture Enhancements for Service Capability Exposure	TS 23.682, TS 23.203

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

**If no identified source of stage 2 information, justify:**

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

SA2 has worked on the 3GPP architecture enhancements for the exposure of the 3GPP service capabilities to external 3<sup>rd</sup> party application providers as part of the AESE work item. The service exposure is based on one or more standardized APIs defined by other standards bodies, e.g. the OMA-API(s). The definition of APIs is out of scope of 3GPP. As part of this work SA2 has identified how the external APIs and the 3GPP system functionality act together to expose 3GPP service capabilities. The following service capabilities are identified to be supported: setting up an AS session with required QoS, change the chargeable party at the session set-up or during the session, support of 3rd party interaction on information for predictable communication patterns, informing the 3rd party about potential network issues; 3GPP resource management for background data transfer.

The work in SA2 is now close to entering normative phase and there is a need to have a corresponding stage-3 Work Item.

## 4 Objective

The objectives of this WI are to:

- Cover the stage 3 aspects of the Architecture Enhancements for Service Capability Exposure work
- Introduce enhancements for providing the capabilities exposure service to external 3rd party application providers.

NOTE: APIs between SCEF and SCS/AS for Service Capability Exposure is expected to be supported by other SDOs (e.g. OMA, oneM2M, etc.)

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

Covered by the parent feature.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]							
Spec No.	Title			1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary Comments #
TS 29.153	Service exposure functionality between SCEF and RCAF reference point			CT3	-	CT#69 Sept 2015	CT#70 Dec 2015

Affected existing specifications [None in the case of Study Items]			
Spec No	CR	Subject of the CR	Approved at plenary
29.213		Add new procedures/parameters based on the impacts on Rx interface	CT#70 Dec 2015 CT3 responsibility
29.214		Possibly add new procedures/parameters based on the impacts on Rx interface	CT#70 Dec 2015 CT3 responsibility
29.201		Possibly add new procedures/parameters based on the impacts on Restful Rx interface	CT#70 Dec 2015 CT3 responsibility
29.336		Introduce new mechanism to provide communication pattern from the SCEF to the HSS	CT#70 Dec 2015 CT4 responsibility
29.230		Add new AVPs and possibly new commands in 3GPP TS 29.230.	CT#70 Dec 2015 CT4 responsibility
29.272		Provide new parameters from HSS to the MME	CT#70 Dec 2015 CT4 responsibility
23.008		Store new parameters in HSS and possibly MME	CT#70 Dec 2015 CT4 responsibility

## 11 Work item rapporteur(s)

Huawei, Yizhuang Wu (wuyizhuang@huawei.com)

## 12 Work item leadership

CT3

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Huawei
China Telecom
AT&T
Verizon
Ericsson
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
NEC
Cisco
China Mobile Com. Corporation
ZTE

2013-10-03 version 1.14.0

## Monitoring Enhancements

640049	<b>Monitoring Enhancements</b>	MONTE	1	S2, S3	Jun-14	Dec-15	58%	SP-140705
640149	<b>TR for Monitoring Enhancements</b>	MONTE	2	S2	Sep-14	Jun-15	100%	SP-140705
640249	<b>Stage 2 for Monitoring Enhancements</b>	MONTE	2	S2	Jun-14	Jun-15	100%	SP-140705
640349	<b>TR on Security for Monitoring Enhancements</b>	MONTE	2	S3	Jun-14	Jun-15	15%	SP-140705
640449	<b>Security for Monitoring Enhancements</b>	MONTE	2	S3	Jun-14	Sep-15	0%	SP-140705
680011	<b>Monitoring Enhancements CT aspects</b>	MONTE- CT	2	C4	Jun-15	Dec-15	82%	CP-150396
680025	CT1 aspects of Monitoring Enhancements	MONTE- CT	3	C1	Jun-15	Dec-15	95%	CP-150396
680026	CT3 aspects of Monitoring Enhancements	MONTE- CT	3	C3	Jun-15	Dec-15	100%	CP-150396
680027	CT4 aspects of Monitoring Enhancements	MONTE- CT	3	C4	Jun-15	Dec-15	50%	CP-150396

## 3GPP TSG SA Meeting #66

**TD SP-140705**

### Maui, Hawaii, U.S.A, 10 - 12 December 2014

**Title:** Correction to MONTE WID's expected output and timelines (MONTE)  
**Source:** SA WG2  
**Agenda Item:** 13.20

**SA WG2 Meeting #106** **S2-144162**

### 17-21 November 2014, San Francisco, USA

**Source:** Intel  
**Title:** Correction to MONTE WID's expected output and timelines  
**Document for:** Approval  
**Agenda Item:** 8.1

*Abstract of the contribution: This proposal provides correction to the MONTE WID's expected output and timelines in clause 10. It also updates Unique ID for corresponding stage-1 SEES work item in clause 2.3.2.*

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

**Title \* : Monitoring Enhancements**

**Acronym \* : MONTE**

**Unique identifier \* :**

## 1 3GPP Work Area \*

	Radio Access
X	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
xxxx	Architecture Enhancements for Service Exposure	

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

##### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS
480130	Stage 1 for System Improvements to Machine Type Communications	TS 22.368
610230	Stage 1 for Service Exposure and enablement Support (SEES)	TS 22.101, TS 22.115

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

The Monitoring feature is intended for monitoring of MTC Device, UE and user/subscription related events. This comprises of means that allow for activating monitoring of specific events, the event detection and the reporting to authorised users, e.g. for use by applications or logging. Some examples of monitoring events are - monitoring the association of the Device and UICC, change in the point of attachment, loss of connectivity etc. It is desired that the network is able to detect such events and report them to service capability server or application server for desired and/or pre-defined actions.

This new Work item is being proposed to address support for Monitoring as per service requirement defined in the clause 7.2.8 of TS 22.368.

It should be noted that although the service requirements are motivated by MTC the solution may apply to normal UEs as well.

## 4 Objective \*

Objective of this work item is to study and provide stage-2 specification for the following items -

- Monitoring as per the service requirements defined in the clause 7.2.8 of TS 22.368

This work item will define monitoring as value added service (service enabler) for Mobile Network Operators. This includes monitoring of events that are related to 3GPP procedures and operations and reporting of events to M2M service provider or 3<sup>rd</sup> party application providers. Application layer reporting of monitoring events is outside the scope of this work Item.

This work should make use of applicable architecture enhancements determined as part of AESE work item.

Also objective of this work item is to study and provide stage 2 security and privacy related specification for the requirements identified in Stage 1 and Stage 2 specifications for Monitoring feature. Further, SA3 shall have responsibility for this feature, as an assessor of the security implications and resulting required changes to technical specifications, if any.

## 5 Service Aspects

Services aspects will be considered.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

Any necessary charging aspects will be undertaken by SA5 with support from SA2.

## 8 Security Aspects

Any necessary security analysis will be undertaken by SA3 with support from SA2.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No					
Don't know	X	X	X		X

## 10 Expected Output and Time scale \*

New specifications *						
[If Study Item, one TR is anticipated]						
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR 23.789	Monitoring Enhancements	SA2		SA#66 (Dec 2014)	SA#67 (March 2015)	TR 23.789 will be used for capturing solution alternatives and evaluations.
TR 33.889	Study on Security Aspects of Machine-Type Communications architecture and feature enhancements	SA3		SA#67 (March 2015)	SA#68 (June 2015)	TR 33.889 will be used for capturing requirements, solution alternatives, evaluations and conclusions for AESE, MONTE and GROUPE WIDS.

Affected existing specifications *					
[None in the case of Study Items]					
Spec No.	CR	Subject	Approved at plenary#	Comments	
TS 23.682		Architecture Enhancements to facilitate communications with Packet Data Networks and Applications	SA#68 (June 2015)		
TBD			SA#68 (June 2015)	Depends on the outcome of the Stage 2 TR	
TS 33.187		Security Aspects of Machine-Type and other Mobile Data Applications Communications Enhancements	SA#69 (Sep 2015)	Based on the outcome of the SA3 TR, any new normative text will be incorporated in TS 33.187 and/or suitable existing TS.	

## 11 Work item rapporteur(s) \*

SA2: Intel, Puneet Jain ([puneet.jain@intel.com](mailto:puneet.jain@intel.com))

SA3: Samsung, Rajavelsamy R ([rajvel@samsung.com](mailto:rajvel@samsung.com))

## 12 Work item leadership \*

Stage 2: 3GPP SA2

Stage 2 security and privacy aspects: 3GPP SA3

## 13 Supporting Individual Members \*

Supporting IM name
Intel
Huawei
InterDigital
LG Electronics
KPN
Alcatel-Lucent
ZTE
NTT DOCOMO
Silver Spring Networks
CATT
HTC
China Mobile
Cisco
Acision
China Unicom
Orange
Samsung

**Source:** TSG CT WG4  
**Title:** WID on Monitoring Enhancements CT aspects.  
**Document for:** Approval  
**Agenda Item:** 13.1

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

**Title:** Monitoring Enhancements CT aspects

**Acronym:** MONTE-CT

**Unique identifier:** 680011

### 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
640049	Monitoring Enhancements	23.682, 33.187

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
640249	Stage 2 for Monitoring Enhancements	TS 23.682
640449	Security for Monitoring enhancements	TS 33.187

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)					
Unique ID	Title	Nature of relationship	TS / TR		

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The Monitoring feature is intended for monitoring of devices supporting MTC, UE and user/subscription related events. This comprises of means that allow for activating monitoring of specific events, the event detection and the reporting to authorised users, e.g. for use by applications or logging. Some examples of monitoring events are - monitoring the association of the device and UICC, change in the point of attachment, loss of connectivity etc. It is desired that the network is able to detect such events and report them to service capability server or application server for desired and/or pre-defined actions.

This new Work item is being proposed to address support for Monitoring as per service requirement defined in the clause 7.2.8 of TS 22.368 and its stage 2 realisation described in TS 23.682, 33.187.

## 4 Objective

The objectives of this WI are to cover the stage 3 aspects of the MONTE work.

The objective is to introduce enhancements for allowing configuration and reporting of monitoring events.

The mechanisms for the configuration and reporting of the monitoring events specified in TS 23.682 shall be supported.

The functionality to change the configured monitoring events shall be supported according to TS 23.682.

NOTE: APIs between SCEF and SCS/AS for monitoring feature is expected to be supported by other SDOs (e.g. OMA, oneM2M, etc.)

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

Covered by the parent feature.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	

No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
29.128	Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) interfaces for interworking with packet data networks and applications  Describe the new procedures, messages and parameters for monitoring needed for interfaces between SCEF – MME and SCEF - SGSN	CT4	-	CT#69 Sept 2015	CT#70 Dec 2015	

Affected existing specifications [None in the case of Study Items]						
Spec No.	CR Subject of the CR				Approved at plenary#	Comments
29.272	add configuration parameters to subscription data to support monitoring				CT#70 Dec 2015	CT4 responsibility
29.002	Possibly affected, depending on Stage 2 decision if monitoring is also supported by Gn-SGSN. If so add configuration parameters to subscription data to support monitoring.				CT#70 Dec 2015	CT4 responsibility
29.336	Introduce new procedures, messages and parameters for monitoring, reporting, recall and replace for the interface between the SCEF and HSS				CT#70 Dec 2015	CT4 responsibility
29.230	Add new AVP(s) and possibly new command(s) for new applicationID				CT#70 Dec 2015	CT4 responsibility
23.008	Add the new parameters to be stored in MME, SGSN, HSS for Monitoring.				CT#70 Dec 2015	CT4 responsibility
24.301	Adapt T3324 timer and reachability timer handling,				CT#70 Dec 2015	CT1 responsibility
24.008	Adapt T3324 timer and reachability timer handling,				CT#70 Dec 2015	CT1 responsibility
29.214	Indicate the events that are applicable when using PCC architecture to support monitoring				CT#70 Dec 2015	CT3 responsibility
29.213	Introduce the procedures for monitoring when using the PCC architecture				CT#70 Dec 2015	CT3 responsibility
29.201	Possibly affected, Introduce the procedures for monitoring when using the PCC architecture				CT#70 Dec 2015	CT3 responsibility

## 11 Work item rapporteur(s)

Huawei, Peter Schmitt (peter.schmitt@huawei.com)

## 12 Work item leadership

CT4

## 13 Supporting Individual Members

Supporting IM name
Huawei
Intel
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
China Mobile
Cisco
Ericsson
LG Electronics
Verizon
ZTE
InterDigital

## Group based Enhancements

640050	<b>Group based Enhancements</b>	GROUPE	1	S2, S3	Jun-14	Dec-15	51%	SP-140706
640150	TR for Group based Enhancements	GROUPE	2	S2	Jun-14	Mar-15	100%	SP-140706
640250	Stage 2 for Group based Enhancements	GROUPE	2	S2	Jun-14	Jun-15	100%	SP-140706
640350	TR on Security for Group based Enhancements	GROUPE	2	S3	Jun-14	Jun-15	60%	SP-140706
640450	Security for Group based Enhancements	GROUPE	2	S3	Jun-14	Sep-15	0%	SP-140706
680016	CT aspects of Group based Enhancements	GROUPE- CT	2	C4	Jun-15	Dec-15	32%	CP-150240
680028	CT1 aspects of Group based Enhancements	GROUPE- CT	3	C1	Jun-15	Dec-15	15%	CP-150240
680029	CT3 aspects of Group based Enhancements	GROUPE- CT	3	C3	Jun-15	Dec-15	0%	CP-150240
680030	CT4 aspects of Group based Enhancements	GROUPE- CT	3	C4	Jun-15	Dec-15	80%	CP-150240

## 3GPP TSG SA Meeting #66

**TD SP-140706**

**Maui, Hawaii, U.S.A, 10 - 12 December 2014**

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**Title:** Update GROUPE WID

**Source:** SA WG2

**Agenda Item:** 13.21

**SA WG2 Meeting #106**

**S2-144199**

**17 - 21 November 2014, San Francisco, California, USA**

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**Source:** Huawei, Hisilicon

**Title:** Update GROUPE WID

**Document for:** Approval

**Agenda Item:** 8.1

*Abstract of the contribution: Update work item proposal on Group based enhancements.*

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

**Title \* : Group based Enhancements**

**Acronym \* : GROUPE**

**Unique identifier \***

## 1 3GPP Work Area \*

	Radio Access
X	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
xxxx	Architecture Enhancements for Service Exposure	

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

#### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

#### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS
480130	Stage 1 for System Improvements to Machine Type Communications	TS 22.368

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

MTC applications generally involve a group of devices. Typically applications today involve more than 1000 subscriptions for a single customer.

From both customer and operator points of view, there is benefit in optimised handling of groups of MTC devices/subscriptions. This can be, e.g., the ability to trigger a group of devices with one trigger message, the ability to enforce a QoS policy for a group of devices.

Group based policing can be used to enforce a QoS policy for a group of MTC devices/subscriptions. This allows greater flexibility to the MTC application / MTC application owner compared to individual policies for each of the devices/subscriptions, while at the same time ensuring the operator that the particular group of MTC devices/subscriptions does not unduly load the network.

Group based triggering can be used by the Service Capability Server to trigger a group of devices within a particular geographical area, e.g. to wake up the MTC Devices that are members of that MTC Group.

Requirements for group based MTC are identified in 3GPP TS 22.368, clauses 7.2.14.1 (general group based requirements), 7.2.14.2 (group based policing) and 7.2.14.3 (group based addressing/triggering/messaging).

It should be noted that although the service requirements are motivated by MTC the solutions may apply to normal UEs as well.

## 4 Objective \*

The objectives of this work item are to study the concept of groups and to study and specify solutions to:

- Fulfil the general group based requirements (22.368 clause 7.2.14.1)
- Fulfil the group based policing requirements (22.368 clause 7.2.14.2)
- Fulfil the group based addressing requirements (22.368 clause 7.2.14.3)

This work should make use of applicable architecture enhancements determined as part of AESE work item.

Also objective of this work item is to study and provide stage 2 security and privacy related specification for the requirements identified in Stage 1 and Stage 2 specifications for Group based Enhancements. Further, SA3 shall have responsibility for this feature, as an assessor of the security implications and resulting required changes to technical specifications, if any.

## 5 Service Aspects

Service aspects will be considered.

## 6 MMI-Aspects

None

## 7 Charging Aspects

The related charging aspects need to be specified by SA5.

## 8 Security Aspects

Any security aspects will be handled by SA3.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No					
Don't know	X	X	X		X

## 10 Expected Output and Time scale \*

New specifications *						
[If Study Item, one TR is anticipated]						
Spec No.	Title	Prime WG	2ndary WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR 23.xyz	Group based Enhancements	SA2		SA#65 (Sep 2014)	SA#67 (Mar 2015)	TR may be used for capturing solution alternatives and evaluations.
TR 33.8xx	Feasibility Study on Security Aspects of Machine-Type Communications Enhancements to facilitate communications with Packet Data Networks and Applications	SA3		SA#67 (March 2015)	SA#68 (June 2015)	TR 33.8xx will be used for capturing requirements, solution alternatives, evaluations and conclusions for AESE, MONTE and GROUPE WIDs.
Affected existing specifications *						
[None in the case of Study Items]						
Spec No.	CR	Subject		Approved at plenary#	Comments	
TS 23.682		Architecture Enhancements to facilitate communications with Packet Data Networks and Applications		SA#68 (June 2015)		
TBD		Stage 2 CRs		SA#68 (June 2015)	Depends on the outcome of the Stage 2 TR	
TS 33.187		Security Aspects of Machine-Type and other Mobile Data Applications Communications Enhancements		SA#69 (Sep 2015)	Based on the outcome of the SA3 TR, any new normative text will be incorporated in TS 33.187 and/or suitable existing TS.	

## 11 Work item rapporteur(s) \*

SA2: Huawei, Wanqiang Zhang ([zhangwanqiang@huawei.com](mailto:zhangwanqiang@huawei.com))

SA3: Samsung, Rajavelsamy R ([rajvel@samsung.com](mailto:rajvel@samsung.com))

## 12 Work item leadership \*

Stage 2: 3GPP SA2

Stage 2 security and privacy aspects: 3GPP SA3

## 13 Supporting Individual Members \*

Supporting IM name
Intel
Huawei
InterDigital
LG Electronics
KPN
Alcatel-Lucent
ZTE
NTT DOCOMO
Silver Spring Networks
CATT
HTC
NEC
KDDI
Cisco
China Mobile
Qualcomm
Samsung
Fujitsu
Acision
China Unicom

**3GPP TSG CT Meeting #68**  
**Malmö, SWEDEN; 15<sup>th</sup> – 16<sup>th</sup> June 2015**

**CP-150240**

---

**Source:** TSG CT WG4  
**Title:** New WID on CT aspects of Group based Enhancements  
**Document for:** Approval  
**Agenda Item:** 13.1

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### 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** CT aspects of Group based Enhancements

**Acronym:** GROUPE-CT

**Unique identifier:**

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
640050	Group based Enhancements	TS23.682, TS23.401, TS23.060

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

##### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS
640050	Group based Enhancements	TS23.682, TS23.401, TS23.060

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

**If no identified source of stage 1 information, justify:**

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
640050	Group based Enhancements	TS23.682, TS23.401, TS23.060

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

**If no identified source of stage 2 information, justify:**

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Stage 2 has studied and evaluated architecture enhancements for group based enhancements. Conclusions are reached for the following three key issues identified in 3GPP TR 23.769 which include:

- Message delivery to a group of devices
- Group-specific NAS Level Congestion Control
- Group based addressing and identifiers

For Group messages delivery, MBMS mechanism has been adopted as the basis for normative work.

For NAS level congestion control, criteria of how to detect and control NAS signalling congestion associated to group specific or APN and Group specific has been adopted.

For group based addressing and identifiers, mapping between external group ID and internal group ID is needed, but the entity responsible for the identifiers mapping is not specified.

The normative work on GROUPE in stage 2 is almost completed and there is a need to have a corresponding stage 3 Work Item.

## 4 Objective

The objectives of this work item are to implement the necessary changes in stage-3 specifications based on the normative work of GROUPE in stage 2:

- Enhancement of NAS level congestion control for group specific control, and APN and group specific control (CT1)
- Potential enhancement of active MBMS bearer procedure on MB-2 reference point with group based message (CT3)
- Extending the messaging over S6a/S6d reference point with the group-ID list and adding the storage information (CT4)

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

Covered by the parent feature.

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR Subject of the CR	Approved at plenary#	Comments
24.008	Add the handling of group based congestion control at the MME/SGSN	CT#70 Dec 2015	CT1 responsibility
24.301	Add the handling of group based congestion control at the MME/SGSN	CT#70 Dec 2015	CT1 responsibility
29.468	Potential enhancements of MB2 procedure with group based message	CT#70 Dec 2015	CT3 responsibility
29.272	Enhance S6a/S6d procedure with group ID list	CT#70 Dec 2015	CT4 responsibility
23.008	Add storage information regarding group ID list in HSS , MME and SGSN	CT#70 Dec 2015	CT4 responsibility
29.336	Possible enhancements for authorization	CT#70 Dec 2015	CT4 responsibility
29.303	Potential DNS procedure impacts on how to select the BM-SC. SCEF selection is out of scope of 3GPP.	CT#70 Dec 2015	CT4 responsibility
29.002	Enhance Gr procedures with group ID list	CT#70 Dec 2015	CT4 responsibility
29.230	Add new AVPs	CT#70 Dec 2015	CT4 responsibility
29.305	Potential mapping related to group ID list	CT#70 Dec 2015	CT4 responsibility
23.003	Potential definition of group ID format	CT#70 Dec 2015	CT4 responsibility

## 11 Work item rapporteur(s)

Huawei, Peter Schmitt (Peter.Schmitt@huawei.com)

## 12 Work item leadership

3GPP CT4

## 13 Supporting Individual Members

Supporting IM name
Huawei
China Telecom
HiSilicon
China Mobile
NTT DOCOMO
Nokia Networks
ZTE
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
InterDigital
LG Electronics
Verizon

2013-10-03 version 1.14.0

## Double Resource Reuse for Multiple Media Sessions

640053	<b>Double Resource Reuse for Multiple Media Sessions</b>	DRuMS	1	S2	Mar-14	Mar-15	100%	SP-140393
640153	<b>Stage 2 for Double Resource Reuse for Multiple Media Sessions</b>	DRuMS-SA2	2	S2	Mar-14	Mar-15	100%	SP-140393
660019	<b>CT aspects of Double Resource Reuse for Multiple Media Sessions</b>	DRuMS-CT	2	C3	Dec-14	Mar-15	100%	CP-140926
660047	CT1 aspects of Double Resource Reuse for Multiple Media Sessions	DRuMS-CT	3	C1	Dec-14	Mar-15	100%	CP-140926
660048	CT3 aspects of Double Resource Reuse for Multiple Media Sessions	DRuMS-CT	3	C3	Dec-14	Mar-15	100%	CP-140926

## 3GPP TSG SA Meeting #64

**TD SP-140393**

### **Sophia Antipolis, France, 16 - 18 June, 2014**

**Source:** SA WG2

**Title:** New WID: Double Resource Reuse for Multiple Media Sessions {DRuMS}

**Presented for:** Approval

**Agenda Item:** 15

3GPP TSG SA2 Meeting #102  
24 - 28 March 2014, St. Julian's, Malta

**SA2-141500**

revision of S2-141473

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

## **Title: Double Resource Reuse for Multiple Media Sessions**

**Acronym:** DRuMS

**Unique identifier:**

## 1 3GPP Work Area

	<b>Radio Access</b>
X	<b>Core Network</b>
	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Today Call waiting, Call hold with Conferencing will lead to at least double the amount of resources in the system for the users subject to these services than really are necessary.

For these call cases, the user will only have one active session at a time, while the other session will be inactive; still dedicated resources are allocated for sessions where media is not sent or received.

Thus, if not considering these services when allocating resources in the network it will lead to unnecessary resources being reserved leading to less session to be served for a given system.

This may become a problem for populated areas and in particular in areas with a large concentration of business users, where an over-dimensioning will then be required.

Example: If a user starts a voice and video call, resources will be reserved in the system, e.g., one QCI-1 bearer with 23kps and a QCI-2 bearer with 700kps (HD voice and video). The user puts the call on hold, which means that the gates will be closed, but the resources will still be reserved in the system (to avoid that the call will be lost). The user places a call to another user. This will generate a new resource request, where additional resources on top of what is already reserved will be allocated. So, if this new call is also a voice /video, the allocated resources in the network will be: 46kps for QCI-1 and 1400kps for QCI-2 bearer. But since one of the calls is on hold, no media will be used for the held call, i.e., at any point in time, only 23kps for voice and 700kps for video will be used. Hence, it would not been required to reserve the additional resources.

A similar situation occurs at SIP forking, where today, additional resources on originating side are not allocated for each forking leg, but only the maximum resources required for the session. In the case of SIP forking the situation is known to be transient and concerns a single Rx session, while the case of Call waiting and Call hold normally extend over a longer time and the calls are handled with separate Rx sessions. Providing a similar mechanism for calls on

hold / conference, still with the functionally independent handling of the calls, would reduce the resources required significant in the network.

## 4 Objective

To optimize the PS access resources so that two or more parallel sessions for a user can share resources reserved per media type given that only one media stream per media type will be used at one time. The optimization shall not affect the service quality for any of the media types.

## 5 Service Aspects

none

## 6 MMI-Aspects

none

## 7 Charging Aspects

Any charging impacts will be undertaken by SA5.

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #Comments

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR	Subject of the CR	Approved at plenary#Comments
TS 23.228		SA#65	SA2 responsibility
TS 23.203		SA#65	SA2 responsibility

## 11 Work item rapporteur(s)

Foti George ([George.Foti@ericsson.com](mailto:George.Foti@ericsson.com))

## 12 Work item leadership

SA2

## 13 Supporting Individual Members

Supporting IM name
Ericsson
ATT
Alcatel-Lucent
KDDI
China Mobile

**3GPP TSG CT Meeting #66**  
**Maui, US; 8<sup>th</sup> – 9<sup>th</sup> December 2014**

**CP-140926**

**3GPP TSG CT WG3 Meeting #79**  
San Francisco, CA (USA), 17-21 November 2014

**C3-145084**

**3GPP TSG CT WG1 Meeting #89**  
San Francisco, CA (USA), 17-21 November 2014

**C1-144404**

**Source:** CT3  
**Title:** New WID on CT aspects of Double Resource Reuse for Multiple Media Sessions  
**Agenda Item:** 13.1  
**Document for:** Approval

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### 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

## Title: CT aspects Double Resource Reuse for Multiple Media Sessions

Acronym: DRuMS-CT

Unique identifier:

### 1 3GPP Work Area

	Radio Access
x	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
x	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
XXXXXX	Double Resource Reuse for Multiple Media Sessions	TS 23.228, TS 23.203

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
x	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
640153	Double Resource Reuse for Multiple Media Sessions	TS 23.228, TS 23.203

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Today Call waiting, Call hold with Conferencing will lead to the allocation of at least the double amount of resources in the system for the users that are subject to these services than really are necessary.

For these call cases, the user will only have one active session at a time, while the other session will be inactive; still dedicated resources are allocated for sessions where media is not sent or received.

Thus, if not considering these services when allocating resources in the network it will lead to unnecessary resources being reserved leading to fewer sessions to be served for a given system.

This may become a problem for populated areas and in particular in areas with a large concentration of business users, where an over-dimensioning will then be required.

Example: If a user starts a voice and video call, resources will be reserved in the system, e.g., one QCI-1 bearer with 23kps and a QCI-2 bearer with 700kps (HD voice and video). The user puts the call on hold, which means that the gates will be closed, but the resources will still be reserved in the system (to avoid that the call will be lost). The user places a call to another user. This will generate a new resource request, where additional resources on top of what is already reserved will be allocated. So, if this new call is also a voice /video, the allocated resources in the network will be: 46kps for QCI-1 and 1400kps for QCI-2 bearer. But since one of the calls is on hold, no media will be used for the held call, i.e., at any point in time, only 23kps for voice and 700kps for video will be used. Hence, it would not been required to reserve the additional resources.

A similar situation occurs at SIP forking, where today, additional resources on originating side are not allocated for each forking leg, but only the maximum resources required for the session. In the case of SIP forking the situation is

known to be transient and concerns a single Rx session, while the case of Call waiting and Call hold normally extend over a longer time and the calls are handled with separate Rx sessions. Providing a similar mechanism for calls on hold / conference, still with the functionally independent handling of the calls, would reduce the resources required significant in the network.

Stage 2 work on Double Resource Reuse for Multiple Media Sessions has been accomplished, so the corresponding stage 3 functionality needs to be specified.

## 4 Objective

The CT wide WID will cover the following aspects:

- Detection of the sessions and media that can share resources
- Notification over Rx that resource sharing is possible for the applicable Rx sessions.
- Authorization in PCRF for the affected Rx sessions.
- Provisioning of the related PCC/QoS rules indicating whether resource sharing is required for that set of PCC/QoS rules.
- Taking the highest GBR (and optionally MBR) to be shared for the set of PCC/QoS rules bound to the same bearer as input for the calculation of the GBR (and optionally MBR) of that bearer.
- Removal of PCC/QoS rules when the related flows are deleted over Rx and re-calculation of GBR (and optionally MBR) of the bearer.
- The roaming scenario where the PCEF is located in the VPLMN.

## 5 Service Aspects

None.

## 6 MMI-Aspects

Not Applicable.

## 7 Charging Aspects

Any charging impacts will be undertaken by SA5.

## 8 Security Aspects

Any security impacts will be undertaken by SA3.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

<b>Affected existing specifications</b> [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary	Comments
TS 24.229		Update the TS to support resource sharing.	CT#70 (December 2015)	CT1
TS 24.615		Informative text explaining that the held call may share resources with the active call.	CT#70 (December 2015)	CT1
TS 24.610		Possible indication from MTAS for call being held.	CT#70 (December 2015)	CT1
TS 24.605		Informative text explaining that the held call may share resources with the active call.	CT#70 (December 2015)	CT1
TS 29.212		Support of resource sharing for a set of PCC/QoS Rules. Using the maximum GBR and possibly MBR to be shared for the set of PCC/QoS rules bound to the same bearer as input for the GBR/MBR of the bearer.	CT#70 (December 2015)	CT3
TS 29.213		Updating the message flows to support resource sharing.	CT#70 (December 2015)	CT3
TS 29.214		Support of resource sharing over Rx, including a new indicator of the affected Rx sessions and authorization in the PCRF.	CT#70 (December 2015)	CT3
TS 29.215		Possible support of resource sharing over S9, including a new indicator of the affected PCC/QoS rules.	CT#70 (December 2015)	CT3

## 11 Work item rapporteur(s)

Ericsson, Jan Holm (jan.holm@ericsson.com)

## 12 Work item leadership

CT3

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Ericsson
ZTE
TeliaSonera
KDDI

2013-10-03 version 1.14.0

## Security Assurance Specification for 3GPP network products

620062	<a href="#">Security Assurance Specification for 3GPP network products</a>	SCAS	1	S3	Dec-13	Mar-15	54%	SP-150292
620162	TR on Pilot development of Security Assurance Specification for MME network product class	SCAS-SA3Pil_TR	2	S3	Dec-13	Dec-14	80%	SP-130718
620262	<a href="#">Security Assurance Specification for 3GPP network product classes</a>	SCAS-SA3	2	S3	Dec-13	Mar-15	5%	SP-130718
620362	TR on Security Assurance scheme for 3GPP network products	SCAS-SA3TR	2	S3	Dec-13	Dec-14	90%	SP-130718

### 3GPP TSG SA Meeting #68

**SP-150292**

Malmö, Sweden, 17-19 June 2015

**Source:** **TSG SA WG3**

**Title:** **Revised WID on Security Assurance Specification for 3GPP Network Products**

**Document for:** **Approval**

**Agenda Item:** **13.24**

### 3GPP TSG SA WG3 (Security) Meeting #79

20-24 April 2015, Nanjing (China)

**S3-151532**

*revision of SP-130718 and S3-151351 and S3-151439*

**Source:** **Nokia Networks, Ericsson, NTT DOCOMO**

**Title:** **Update of WID on Security Assurance Specification for 3GPP Network Products**

**Document for:** **Discussion and Decision**

**Agenda Item:** **7.11**

**Work Item / Release:** **Rel-13**

#### *Abstract of the contribution:*

*The present contribution proposes updating the approved WID to implement the proposal in section S3-151141 "Discussion of way forward for SCAS" about including requirements that are expected to apply to more than one network product class in a "SECAM Catalogue" TS.*

*It is further suggested to not include the threats description in any of these TSs and delete corresponding text from the objectives section of the present WID. The major specifications do not contain threats descriptions. E.g. threats for EPS / LTE are contained in TR 33.821. It is therefore suggested to leave threats and risks in TR 33.806.*

*Furthermore, the names of the relevant GSMA groups have changed and are corrected here.*

*Finally, the WID update adjusts the completion dates and deletes the name of the co-rapporteur that no longer attends SA3.*

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

Title \* : Security Assurance Specification for 3GPP Network Products

Acronym \* : SCAS

Unique identifier \* 620062

## 1 3GPP Work Area \*

X	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
570035	Study on Security Assurance Methodology for 3GPP Network Elements	Feasibility study

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4

## Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

While an operator's core network can be assumed to be physically inaccessible, it may not be as secure as one would like it to be. Such core network may be vulnerable due to its proximity to the Internet, due to the vulnerabilities of all-IP networking, due to its utilization of common-type operating systems (Unix/Linux etc.), due to human errors in network and firewall operations, due to inter-operators trust model, due to an inadequate operator (and vendor) commitment to NDS/IP protection, etc. Mobile networks have become part of society's critical infrastructure, and that reason alone calls for strong security assurance for mobile network products.

The present mode of Request for Information/Proposal fulfilment may be inefficient for the following reasons:

Operator's requirements are usually not identical. As a result, vendors may face difficulties to satisfy all the operators' different security requirements, in spite of the best of their efforts, while perhaps operators may be dissatisfied with fulfilment level of their requirements. Therefore, in addition to the needs due to being critical society infrastructure, there is a need of determining the most suitable asset-protection security level in a cooperative effort among vendors and operators.

The work area of 3GPP network security assurance is large and entirely new. It is currently understood that the following possible work tasks are to be included: security assurance specifications including threat and risk assessments and derived relevant test cases (for compliance and basic vulnerability testing), network product development and life cycle management requirements, and accreditation rules for all testers as well as for vendors regarding lifecycle management and organization setups. This appears to be a formidable task, bearing in mind the complexity of the whole 3GPP product portfolio and also when comparing with simpler, more isolated functions that have been subject to security assurance in the past, such as the UICCs. We recognize that there is a risk of challenge-drowning.

For this reason, we narrow the focus of this particular WID to the development of a Security Assurance Specification (SCAS) for one pilot network product class. This SCAS shall be written essentially as prescribed by the conclusions of the preceded SECAM study, as contained in TR 33.805. The first network product classe(s) to be considered by SA3 shall be the MME network product class. It has been recognised that several network product classes will share very similar if not identical security requirements for some aspects. It is therefore suggested collecting them in a single "catalogue" document. In addition to this catalogue, it will, however, still be useful to capture requirements specific to a product class in a separate document.

The GSMA Fraud and Security Group (FASG) is a natural partner for this work and would be able to mobilize a new subgroup named Security Assurance Group (SECAG) if necessary. This group would be well suited to study the Vendor network product development and network product lifecycle management process aspects of the TR 33.805 study and to further specify related requirements on SECAM –accreditation for vendors. We propose to leave this task to GSMA FASG as this task is complementary to the SCASs development. Moreover GSMA already holds expertise in the matter with the UICC supplier Security Accreditation Scheme (SAS).

The accreditation aspects of compliance and vulnerability testers as well as the conflict resolution process would also be dealt with by the GSMA SECAG. As the way to accredit testers is likely to be dependant of the kind of tests proposed by SA3, there will be high dependencies between the progress of SA3 and this aspect.

An exchange of liaison statement between GSMA FASG and 3GPP SA3 is under way, which is to establish the cooperation between these two groups regarding SECAM. It should be noted, however, that the two objectives described in section 4 of the WID undisputedly fall within the remit of 3GPP so that the work described by this WID can be performed independently of the exchange with GSMA

Since any security assurance presents a potentially large investment for equipment vendors, SCAS complexity and length of the security evaluation time will be taken into consideration.

## 4 Objective \*

There are two separate objectives of this WID.

The primary objective is to develop a Security Assurance Specification(s) (SCAS) for the MME network product class, starting from the development of a pilot SCAS in a dry-run. The content and the development of the SCAS shall follow the description of the SECAM scheme from the second objective, based on the prescription concluded in TR 33.805, and Methodology 2. Potential regulatory requirements can be considered. This means that the MME SCAS shall describe:

- high-level requirements needed to cover these threats and risks,
- detailed security requirements (including hardening requirements) and the associated test cases
- Basic Vulnerability Testing activities

This WID and the corresponding output documents (TS, TR) might be updated to add other network product classes once the SCAS for the MME product class has been finalized.

Details on the procedure to develop SCAS content may be found in the description of the SECAM scheme from the second objective below, based on TR 33.805. The resulting SCAS will consist of two documents to allow for a modular approach. One document will capture the security requirements that are expected to be beneficial for writing the SCASs for other network product classes ("catalogue"), the other document will capture the aspects specific to the selected product class. Following conclusions from TR 33.805, regarding testing and vulnerability analysis, only security compliance testing and basic vulnerability testing will be considered first.

The second objective of the WID is to describe in a 900 series TR the general SECAM scheme (constituted by amongst others actors, types of tests, type and content of documentation, accreditation ...) to provide an overview of the entire scheme and how to use the SCASs. For this, there is no need to go (much) beyond the level of detail of the current TR 33.805. Further details on the SECAM scheme, for example related for example to duration of the accreditation process in days or to the contractual aspect would have to be defined by the chosen accreditation body (e.g. GSMA NESAG group) in a separate document that will complement the 900 series TR.

## 5 Service Aspects

N/A

## 6 MMI-Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

This is a security work item.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	

No	X	X			X
Don't know					

## 10 Expected Output and Time scale \*

New specifications *						
[If Study Item, one TR is anticipated]						
Spec No.	Title	Prime rsp WG	2ndary rsp WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR 33.806	Pilot development of Security Assurance Specification for MME Network Product class	SA3		SA#69	SA#69 (Sept 2015)	This TR is used to collect input for TS 33.116 and 33.sas
TS 33.116	Security Assurance Specification for the MME network product class	SA3		SA#69	SA#70	This TS contains results of the first objective that are specific to the selected product class.
TS 33.sas	Catalogue of General Security Assurance Requirements	SA3		SA#69	SA#70	This TS contains results of the first objective that are expected to be beneficial for writing the SCASs for other network product classes.
TR 33.916	Security Assurance scheme for 3GPP Network Products	SA3		SA#68	SA#69	This TR contains results of the second objective
Affected existing specifications *						
[None in the case of Study Items]						
Spec No.	CR	Subject		Approved at plenary#	Comments	

## 11 Work item rapporteur(s) \*

Alf Zugenmaier (NTT DOCOMO)

## 12 Work item leadership \*

SA3

## 13 Supporting Individual Members \*

Supporting IM name
Alcatel-Lucent
BT
China Mobile
China Unicom
Deutsche Telekom
Ericsson
Huawei
Juniper Networks
NEC
Nokia Networks
NTT DOCOMO
ORANGE
Telecom Italia
TeliaSonera
Vodafone

Source: SA WG3

Title: New WID Security Assurance Specification for 3GPP Network Products

Document for: Approval

Agenda Item: 14.14

Source: Orange, NTT DOCOMO, Deutsche Telekom, Telecom Italia, BT, China Mobile, China Unicom, TeliaSonera, Vodafone, NSN, Juniper Networks, NEC, Huawei, Ericsson, Alcatel-Lucent

Title: Work Item on Security Assurance Specification for 3GPP Network Products

Document for: Approval

Agenda Item: 8.3

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

**Title \* : Security Assurance Specification for 3GPP Network Products**

**Acronym \* : SCAS**

**Unique identifier \* 620062**

### 1 3GPP Work Area \*

X	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any) *</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>
570035	Study on Security Assurance Methodology for 3GPP Network Elements	Feasibility study

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any) *</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2 \*

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

While an operator's core network can be assumed to be physically inaccessible, it may not be as secure as one would like it to be. Such core network may be vulnerable due to its proximity to the Internet, due to the vulnerabilities of all-IP networking, due to its utilization of common-type operating systems (Unix/Linux etc.), due to human errors in network and firewall operations, due to inter-operators trust model, due to an inadequate operator (and vendor) commitment to NDS/IP protection, etc. Mobile networks have become part of society's critical infrastructure, and that reason alone calls for strong security assurance for mobile network products.

The present mode of Request for Information/Proposal fulfilment may be inefficient for the following reasons:

Operator's requirements are usually not identical. As a result, vendors may face difficulties to satisfy all the operators' different security requirements, in spite of the best of their efforts, while perhaps operators may be dissatisfied with fulfilment level of their requirements. Therefore, in addition to the needs due to being critical society infrastructure, there is a need of determining the most suitable asset-protection security level in a cooperative effort among vendors and operators.

The work area of 3GPP network security assurance is large and entirely new. It is currently understood that the following possible work tasks are to be included: security assurance specifications including threat and risk assessments and derived relevant test cases (for compliance and basic vulnerability testing), network product development and life cycle management requirements, and accreditation rules for all testers as well as for vendors regarding lifecycle management and organization setups. This appears to be a formidable task, bearing in mind the complexity of the whole 3GPP product portfolio and also when comparing with simpler, more isolated functions that have been subject to security assurance in the past, such as the UICCs. We recognize that there is a risk of challenge-drowning.

For this reason, we narrow the focus of this particular WID to the development of a Security Assurance Specification (SCAS) for one pilot network product class. This SCAS shall be written essentially as prescribed by the conclusions of the preceded SECAM study, as contained in TR 33.805. The first network product classe(s) to be considered by SA3 shall be the MME network product class.

The GSMA Security Group is a natural partner for this work and would be able to mobilize a new subgroup named Network Equipment Security Assurance Group (NESAG) if necessary. This group would be well suited to study the Vendor network product development and network product lifecycle management process aspects of the TR 33.805 study and to further specify related requirements on SECAM –accreditation for vendors. We propose to leave this task to GSMA SG as this task is complementary to the SCASs development. Moreover GSMA already holds expertise in the matter with the UICC supplier Security Accreditation Scheme.

The accreditation aspects of compliance and vulnerability testers as well as the conflict resolution process would also be dealt with by the GSMA NESAG. As the way to accredit testers is likely to be dependant of the kind of tests proposed by SA3, there will be high dependencies between the progress of SA3 and this aspect.

An exchange of liaison statement between GSMA SG and 3GPP SA3 is under way, which is to establish the cooperation between these two groups regarding SECAM. It should be noted, however, that the two objectives described in section 4 of the WID undisputedly fall within the remit of 3GPP so that the work described by this WID can be performed independently of the exchange with GSMA

Since any security assurance presents a potentially large investment for equipment vendors, SCAS complexity and length of the security evaluation time will be taken into consideration.

## 4 Objective \*

There are two separate objectives of this WID.

The primary objective is to develop a Security Assurance Specification(s) (SCAS) for the MME network product class, starting from the development of a pilot SCAS in a dry-run. The content and the development of the SCAS shall follow the description of the SECAM scheme from the second objective, based on the prescription concluded in TR 33.805, and Methodology 2. Potential regulatory requirements can be considered. This means that the MME SCAS shall describe:

- the threats and risks related to the network product
- high-level requirements needed to cover these threats and risks,
- detailed security requirements (including hardening requirements) and the associated test cases
- Basic Vulnerability Testing activities

This WID and the corresponding output documents (TS, TR) might be updated to add other network product classes once the SCAS for the MME product class has been finalized.

Details on the procedure to develop SCAS content may be found in the description of the SECAM scheme from the second objective below, based on TR 33.805. The resulting SCAS may consist of one or several documents to allow for a modular approach that would be beneficial for writing the SCASs for other network product classes. Following

conclusions from TR 33.805, regarding testing and vulnerability analysis, only security compliance testing and basic vulnerability testing will be considered first.

The second objective of the WID is to describe in a 900 series TR the general SECAM scheme (constituted by amongst others actors, types of tests, type and content of documentation, accreditation ...) to provide an overview of the entire scheme and how to use the SCASs. For this, there is no need to go (much) beyond the level of detail of the current TR 33.805. Further details on the SECAM scheme, for example related for example to duration of the accreditation process in days or to the contractual aspect would have to be defined by the chosen accreditation body (e.g. GSMA NESAG group) in a separate document that will complement the 900 series TR.

## 5 Service Aspects

N/A

## 6 MMI-Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

This is a security work item.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			X
Don't know					

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
TR 33.806	Pilot development of Security Assurance Specification for MME Network Product class	SA3		SA#65	SA#66
TS 33.116	Security Assurance Specification for 3GPP network product classes	SA3		SA#66	SA#67
TR 33.916	Security Assurance scheme for 3GPP Network Products	SA3		SA#65	SA#66
Affected existing specifications * [None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments

## 11 Work item rapporteur(s) \*

Alf Zugenmaier (NTT DOCOMO) (for the TR phase)

Judy Zhu (China Mobile)

## 12 Work item leadership \*

SA3

## 13 Supporting Individual Members \*

Supporting IM name
Alcatel-Lucent
BT
China Mobile
China Unicom
Deutsche Telekom
Ericsson
Huawei
Juniper Networks
NEC
Nokia Solutions and Networks
NTT DOCOMO
Orange
Telecom Italia
TeliaSonera
Vodafone



640056	<a href="#">Lawful Interception in the 3GPP Rel-13</a>	LI13	1	S3	Jun-14	Dec-15	10%	SP-150290
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**3GPP TSG SA Meeting #68****SP-150290****Malmö, Sweden, 17-19 June 2015****Source:** TSG SA WG3**Title:** Revised WID: Lawful Interception Rel-13**Document for:** Approval**Agenda Item:** 13.41**3GPP TSG-SA WG3 LI Meeting #57****S3i150128**

Nashville, TN, USA, 28 - 30 April 2015.

**Source:** Sprint**Title:** Revised WID: Lawful Interception Rel-13**Presented for:** Approval**3GPP™ Work Item Description****Title:** Lawful Interception Rel-13**Acronym:** LI13**Unique identifier:** 640056**1 3GPP Work Area**

X	Radio Access
X	Core Network
X	Services

**2 Classification of WI and linked work items****2.0 Primary classification**

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship
600046	Study on Isolated E-UTRAN Operation for Public Safety (FS_IOPS)	Outcome may result in LI feature changes or additions being required
620070	Study on Enhanced Calling Information Presentation (FS_ECIP)	Outcome may result in LI feature changes or additions being required
620069	Study on Flexible Mobile Service Steering (FS_FMSS)	Outcome may result in LI feature changes or additions being required
610033	Study on Co-ordinated packet data network gateway change for SIPTO (FS_CSIPTO)	Outcome may result in LI feature changes or additions being required
610031	Study on enhancements for Infrastructure based data Communication Between Devices (FS_eICBD)	Outcome may result in LI feature changes or additions being required
650036	Study on IMS Enhanced Spoofed Call Prevention and Detection (FS_ESCAPADES)	Outcome may result in LI feature changes or additions being required
640001	Study on Cellular system support for ultra Low Complexity and low throughput Internet of Things (FS_IoT_LC)	Outcome may result in LI feature changes or additions being required
660058	Study on Interactivity Support for 3GPP-based Streaming and Download Services (FS_IS3)	Outcome may result in LI feature changes or additions being required
660057	Study on Video Enhancements in 3GPP Multimedia Services (FS_VE_3MS)	Outcome may result in LI feature changes or additions being required
660059	Study on architecture enhancements for Public Safety (FS_IOPS_St2)	Outcome may result in LI feature changes or additions being required
670029	Study on architecture enhancements of cellular systems for ultra low complexity and low throughput Internet of Things (Fs_AE_CIoT)	Outcome may result in LI feature changes or additions being required
670093	Study on EGPRS Access Security Enhancements with relation to cellular IOT (FS_EASE_IoT)	Outcome may result in LI feature changes or additions being required
670095	Study on Security Aspects of Isolated E-UTRAN Operation for Public Safety (FS_IOPS_Sec)	Outcome may result in LI feature changes or additions being required

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
610030	Service Exposure and Enablement Support (SEES)	Outcome may result in LI feature changes or additions being required
630015	Isolated E-UTRAN Operation for Public Safety (IOPS)	Outcome may result in LI feature changes or additions being required
630014	Enhancements to WebRTC interoperability (eWebRTCi)	Outcome may result in LI feature changes or additions being required
620064	Mission Critical Push To Talk over LTE (MCPTT)	Outcome may result in LI feature changes or additions being required
620062	Security Assurance Specification for 3GPP network products (SCAS)	Outcome may result in LI feature changes or additions being required
640058	Video enhancements by Region-Of-Interest information signaling (ROI)	Outcome may result in LI feature changes or additions being required
640051	Enhanced CS Fallback (eCSFB)	Outcome may result in LI feature changes or additions being required
640048	Architecture Enhancements for Service capability Exposure (AESE)	Outcome may result in LI feature changes or additions being required
640047	IP Flow Mobility support for S2a and S2b Interfaces (NBIFOM)	Outcome may result in LI feature changes or additions being required
640046	Dedicated Core Networks (DÉCOR)	Outcome may result in LI feature changes or additions being required
640053	Double Resource Reuse for Multiple Media Sessions (DRuMS)	Outcome may result in LI feature changes or additions being required
640044	Co-ordinated packet data network gateway change for SIPTO (CSIPTO)	Outcome may result in LI feature changes or additions being required
640040	Enhancements to Proximity based Services (eProSe)	Outcome may result in LI feature changes or additions being required
650031	Enhanced DASH (eDASH)	Outcome may result in LI feature changes or additions being required
650030	Support of EVS in 3G Circuit—Switched networks (EVSoCS)	Outcome may result in LI feature changes or additions being required
650029	HTML5 Presentation Layer (HTML5)	Outcome may result in LI feature changes or additions being required
650028	Media Handing Aspects of IMS-based Telepresence (IMS_TELEP_S4)	Outcome may result in LI feature changes or additions being required
650026	TV video Profile (TVPROF)	Outcome may result in LI feature changes or additions being required
650025	SRVCC Enhancements for Transcoding Avoidance (SETA)	Outcome may result in LI feature changes or additions being required
650019	Flexible Mobile Service Steering (FMSS)	Outcome may result in LI feature changes or additions being required
650018	Enhanced Calling Information Presentation (ECIP)	Outcome may result in LI feature changes or additions being required
660004	Service Domain Centralization (SeDoC)	Outcome may result in LI feature changes or additions being required
660034	Interworking solution for Called IN number and original called IN number ISUP parameters (INNB_IW)	Outcome may result in LI feature changes or additions being required
660030	Enhanced P-CSCF discovery using signaling for access to EPC via WLAN (ePSCF_WLAN)	Outcome may result in LI feature changes or additions being required
660050	MTSI Extension on Multi-stream Multiparty (MMCMH)	Outcome may result in LI feature changes or additions being required
660009	MBMS Enhancements (MBMS_enh)	Outcome may result in LI feature changes or additions being required
650019	Flexible Mobile Service Steering (FMSS)	Outcome may result in LI feature changes or additions being required
670020	H.248 Aspects of WebRTC Data Channel on IMS Access Gateway (WebRTCH248DC)	Outcome may result in LI feature changes or additions being required
650030	Support of EVS in 3G Circuit-Switched networks (EVSoCS)	Outcome may result in LI feature changes or additions being required
670058	LTE-WLAN Radio Level Integration and Interworking Enhancements (LTE_WLAN_radio)	Outcome may result in LI feature changes or additions being required

Go to §3.

## 2.3 Building Block

Not Applicable

## 2.4 Work task

Not Applicable

## 3 Justification

3GPP Release 13 adds functionality and capabilities to Release 12. National LI requirements will apply to a portion of these Release 13 enhancements and the 3GPP LI service needs to be extended to accommodate these enhancements. LI Considerations are necessary at least for following topics:

- o IMS Media security,
- o MTC
- o ProSe
- o MCPTT
- o IMS VOIP
- o Other IMS Release 13 Enhancements
- o Release 13 EPS Enhancements
- o Enhanced Location Reporting
- o Local IP Access and Selected IP Traffic Offload
- o Network Assurance of LI functions
- o eWebRTCi
- o Enhancing the LI service IMSI triggering capabilities
- o Further Enhancements to support GSMA VoLTE & RCS profiles

In addition services from prior releases which have not been addressed by the LI service may be considered Release 13 as needed by service deployments and national requirements.

## 4 Objective

The objective of this work item is to enhance the 3GPP LI service to accommodate Release 13 service enhancements and extensions.

Enhancements to specifications TS 33.106, TS 33.107 and TS 33.108 will address LI Service Requirements, LI Architecture, LI functions and the HI2 (Intercepted Related Information) and the HI3 (Content) interfaces for delivery to the Law Enforcement Monitoring Facilities.

## 5 Service Aspects

The 3GPP LI service will be extended as needed to accommodate Release 13 service, functionality and capability enhancements to meet National LI requirements.

## 6 MMI-Aspects

No Impact.

## 7 Charging Aspects

No Impact.

## 8 Security Aspects

SA WG3-LI may require normative standardisation in SA WG3 security standards (eg IMS media security) to provide underlying security features to support LI capabilities specified by SA WG3-LI.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X				
Don't know		X			X

## 10 Expected Output and Time scale

New specifications *					
[If Study Item, one TR is anticipated]					
Spec No	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#

Affected existing specifications *					
[None in the case of Study Items]					
Spec No	CR	Subject	Approved at plenary#	Comments	
33.106			SA#70 Dec 2015	Lawful Interception Requirements	
33.107			SA#70 Dec 2015	Lawful Interception Architecture and Functions	
33.108			SA#70 Dec 2015	Handover Interface for Lawful Interception	

## 11 Work item rapporteur(s)

TS 33.106 Lawful interception requirements	JASPERS, Koen	PIDS
TS 33.107 3G security; Lawful interception architecture and functions	JASPERS, Koen	PIDS
TS 33.108 3G security; Handover interface for Lawful Interception (LI)	Nag Rao	Nokia Networks

## 12 Work

Supporting IM name	
BT Group Plc	
Telefon AB LM Ericsson	
Ministry of Economics and Technology (DE)	
Rogers	
National Technical Assistance Centre (UK)	
Ministère de l'Economie du Redressement Productif et du Numérique (FR)	
PIDS (NL)	
AT&T	
Alcatel-Lucent	
VODAFONE Group Plc	
BfV	
OTD	
Nokia Networks	
BlackBerry UK Ltd	
Public Safety Canada	
Aqsacom	
Sprint	
Interdigital	
Orange	

## 13

item leadership

Supporting Individual Members



## Video enhancements by Region-Of-Interest information signalling

640058	<b>Video enhancements by Region-Of-Interest information signalling</b>	ROI	1	S4	Jun-14	Dec-15	57%	SP-140219
680031	SA4 aspects of Video enhancements by Region-Of-Interest information signalling	ROI	2	S4	Jun-14	Sep-15	100%	SP-140219
680017	CT Aspects of Video Enhancements by Region-Of-Interest information signalling	ROI-CT	2	C4	Jun-15	Dec-15	22%	CP-150241
680032	CT1 Aspects of Video Enhancements by Region-Of-Interest information signalling	ROI-CT	3	C1	Jun-15	Dec-15	50%	CP-150241
680033	CT3 Aspects of Video Enhancements by Region-Of-Interest information signalling	ROI-CT	3	C3	Jun-15	Dec-15	10%	CP-150241
680034	CT4 Aspects of Video Enhancements by Region-Of-Interest information signalling	ROI-CT	3	C4	Jun-15	Dec-15	5%	CP-150241

3GPP TSG SA WG4 Meeting #78  
Kista, Sweden, 7 - 11 April 2014

↳ **S4-140468**  
revision of S4-140457

---

<b>Source:</b>	<b>TSG SA WG4</b>
<b>Title:</b>	<b>New Work Item on "Video Enhancements by Region-of-Interest Information Signalling"</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>15</b>

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

### Title \*: Video Enhancements by Region-of-Interest Information Signalling

Acronym \* : ROI

Unique identifier \*

### 1 3GPP Work Area \*

	Radio Access
	Core Network
X	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	

This work item is ... \*

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

#### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

### 4 Justification \*

With the availability of mobile devices with advanced camera capabilities, new usages in conversational services are possible, such as interactive zooming during a multimedia telephony session. In conversational video services such as MTSI, dynamic adaptation of video is currently enabled in terms of bandwidth, spatial resolution, orientation, etc., but not in terms of enabling the remote user to zoom to a selected area in the video being transmitted, and having the source optimize encoding for this purpose. This limits the achievable video quality during the usage of interactive zoom in video calls. A receiver application may always zoom in to the user's desired region-of-interest (ROI) and crop out the unwanted parts of the video (e.g., in response to the commands from the user interface), but the sending terminal in this case would still encode and transmit the entirety of the video in the absence of any ROI knowledge. Therefore, signalling of the ROI information from an MTSI receiver to an MTSI sender might enable an MTSI sender to deliver a higher quality stream, by using the negotiated bitrate entirely or preponderantly on the encoding of the ROI part of the video.

To enable this, signalling in both directions may be needed: from sender to receiver to express capability, and from receiver to sender to express the desired ROI. This work item aims to standardize such ROI signalling and associated capability negotiation mechanisms for MTSI in TS 26.114.

No impact is expected in service requirements or architecture.

## 4 Objective \*

The objective of this work is to standardize the signalling of region-of-interest (ROI) information and associated capability negotiation mechanisms for MTSI in TS 26.114. More specifically, standardization goals are:

- Define suitable formats for real-time signalling of ROI information capability from an MTSI sender to an MTSI receiver during multimedia telephony session setup
- Define suitable formats for real-time signalling of ROI information from an MTSI receiver to an MTSI sender during a multimedia telephony session
- Define SDP-based mechanisms for the negotiation of ROI signalling capability across MTSI senders and receivers during both call setup and mid-call

Useful solutions, that are generally applicable and not only to 3GPP, should be offered to the IETF for specification. Therefore in the course of this work TSG SA WG4 should communicate with IETF to get guidance on the preferred direction for dynamically signalling ROI information.

Parallel work in CT is also expected in order to address the potential core network impacts of the ROI signalling.

## 5 Service Aspects

MTSI is impacted.

## 6 MMI-Aspects

No impact.

## 7 Charging Aspects

No impact.

## 8 Security Aspects

No impact.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X		X
Don't know				X	

## 10 Expected Output and Time scale \*

New specifications *					
[If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
Affected existing specifications *					
[None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments
26.114		ROI Feature for MTSI	SA#68		

## 11 Work item rapporteur(s) \*

Ozgur Oyman, Intel, Email: ozgur.oyman@intel.com

## 12 Work item leadership \*

3GPP SA4

## 13 Supporting Individual Members \*

Supporting IM name
Intel
TELECOM ITALIA S.p.A.
HuaWei Technologies Co., Ltd
HiSilicon Technologies Co., Lt
Cisco Systems Belgium
Sony Mobile Communications

**3GPP TSG CT Meeting #68**  
**Malmö, SWEDEN; 15<sup>th</sup> – 16<sup>th</sup> June 2015**

**CP-150241**

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<b>Source:</b>	TSG CT WG4
<b>Title:</b>	New WID on CT Aspects of Video Enhancements by Region-of-Interest Information Signalling
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	13.1

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** CT Aspects of Video Enhancements by Region-of-Interest Information Signalling

**Acronym:** ROI-CT

**Unique identifier:**

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>
640058	Video Enhancements by Region-of-Interest Information Signalling	

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any)</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
640058	Video Enhancements by Region-of-Interest Information Signalling	26.114

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks
TS 26.114, CR 0318		SA4 CR on Video Region-of-Interest Signalling agreed at SA4 #83

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

With the availability of mobile devices with advanced camera capabilities, new usages in conversational services are possible, such as interactive zooming during a multimedia telephony session. In conversational video services such as MTSI, dynamic adaptation of video is currently enabled in terms of bandwidth, spatial resolution, orientation, etc., but not in terms of enabling the remote user to zoom to a selected area in the video being transmitted, and having the source optimize encoding for this purpose. This limits the achievable video quality during the usage of interactive zoom in video calls. A receiver application may always zoom in to the user's desired region-of-interest (ROI) and crop out the unwanted parts of the video (e.g., in response to the commands from the user interface), but the sending terminal in this case would still encode and transmit the entirety of the video in the absence of any ROI knowledge. Therefore, signalling of the ROI information from an MTSI receiver to an MTSI sender might enable an MTSI sender to deliver a higher quality stream, by using the negotiated bitrate entirely or preponderantly on the encoding of the ROI part of the video.

To enable this, signalling in both directions may be needed: from sender to receiver to express capability, and from receiver to sender to express the desired ROI. This work item aims to standardize such ROI signalling and associated capability negotiation mechanisms for MTSI.

## 4 Objective

The objective of this building block is to provide support for the ROI (Region-of-Interest) video enhancements, as defined in 3GPP TS 26.114, within the core network IMS nodes. The following related capabilities will be provided;

- Support the end-to-end SDP negotiation of ROI between MTSI terminals through the IMS.
- Support the transparent end-to-end exchange of the following signalling related to ROI in the media plane between MTSI terminals through the IMS:
  - The far end camera control (FECC) protocol as defined in ITU-T and IETF.
  - RTCP feedback types 'Arbitrary ROI' and 'Pre-defined ROI'
  - RTP header extension for 'Sent ROI' information
- Interactions between the IBCF and the TrGW, and between the IMS-ALG and IMS-AGW, to configure the TrGW and IMS-AGW to transparently pass signalling related to ROI in the media plane triggered by the results of the SDP negotiation of ROI.
- Procedures of the IBCF and IMS-ALG to negotiate not using ROI when performing video transcoding.

**NOTE:** It is assumed that ROI will not be used when video transcoding, conferencing, or interworking towards CS networks is performed by core network entities, and therefore no updates of the MRFC/MRFP and MGCF/IM-MGW are required. It is also assumed that the ROI SDP negotiation procedures are designed in such a manner that they will result in ROI not being used if one peer does not understand ROI related SDP information.

## 5 Service Aspects

None under this WID

## 6 MMI-Aspects

None under this WID

## 7 Charging Aspects

None under this WID

## 8 Security Aspects

None under this WID

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

<b>Affected existing specifications</b> [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
24.229		Inclusion of SDP media attributes for 'FECC', 'Arbitrary ROI', 'Pre-defined ROI' and for RTP header extension in case of 'Sent ROI' in SDP negotiation at each IMS node and the UE	CT#70 (December 2015)	CT1 responsibility
23.334		Inclusion of procedures for the support of ROI: passing on the SDP negotiation for 'FECC', 'Arbitrary ROI', 'Pre-defined ROI' and 'Sent ROI' modes and configuring the IMS-AGW to transparently forward ROI related information in the user plane	CT#70 (December 2015)	CT4 responsibility
29.334		Inclusion of stage 3 procedures for configuring the IMS-AGW to the transparently forward ROI related information in the user plane.	CT#70 (December 2015)	CT4 responsibility
29.162		Inclusion of procedures for the support of ROI: passing on the SDP negotiation for 'FECC', 'Arbitrary ROI', 'Pre-defined ROI' and 'Sent ROI' modes and configuring the TrGW to the transparently forward ROI related information in the user plane	CT#70 (December 2015)	CT3 responsibility
29.238		Inclusion of stage 3 procedures for configuring the TrGW to the transparently forward ROI related information in the user plane.	CT#70 (December 2015)	CT4 responsibility

## 11 Work item rapporteur(s)

Vivek Gupta ([vivek.g.gupta@intel.com](mailto:vivek.g.gupta@intel.com))

## 12 Work item leadership

CT4

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Intel
Huawei
HiSilicon
Sony
Telecom Italia

## TV video profile

650026	<a href="#">TV video profile</a>	TVProf	1	S4	Sep-14	Dec-15	70%	SP-140481
650126	<a href="#">TR on TV video profile</a>	TVProf-SA4TR	2	S4	Sep-14	Dec-15	70%	SP-140481
650226	<a href="#">Specification on TV video profile</a>	TVProf-SA4	2	S4	Sep-14	Dec-15	70%	SP-140481

3GPP WG-SA4 Meeting #80  
San Francisco, USA, 4<sup>th</sup>-8<sup>th</sup> August 2014

*Tdoc S4-141018*

---

**Source:** TSG SA WG4 Codec  
**Title:** New Work Item on 'TV video profile' (TVProf)  
**Document for:** Approval  
**Agenda Item:** 15

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

**Title \* :** TV video profile

**Acronym \* :** TVProf

**Unique identifier \***

### 1 3GPP Work Area \*

	Radio Access
	Core Network
x	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<a href="#">Study Item (go to 2.1)</a>
x	<a href="#">Feature (go to 2.2)</a>
	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

Linear TV services can be made available on 3GPP services based on MBMS and PSS user services (over RTP or 3GP-DASH).

- 3GP-DASH aims at offering the best quality of experience as possible by adapting to the UE capabilities and dynamically to the network conditions. Linear TV and on-demand services are already identified as major use cases for 3GP-DASH delivery format.
- (e)MBMS user services offer the possibility to offload the network when the same content is consumed simultaneously by many UEs. This typically happens when a large audience accesses the same content concurrently, such as a popular football match, the Olympic Games, a political debate, breaking news, etc. For this reason, the access to live broadcast TV services is a major use case for eMBMS.

For traditional linear TV distribution, TV services accessed through Satellite, Digital Terrestrial TV (DTT), cable or IPTV obey to requirements on the video profiles to ensure a consistent quality of experience while accessing different channels within a TV bouquet.

On-demand video services, via streaming or downloading, generally obey to the same requirements.

3GPP specifications are missing detailed definitions of distribution formats (such as spatial and temporal resolutions, aspect ratios, random access points, etc.) for which operators can provide such guarantees in terms of quality of experience. Typically, 3GPP service specifications only define profiles and levels of video codecs.

Therefore, additional requirements/guidelines on video formats (frame rate, resolution, aspect ratio, colorimetry, bit depth...) and codecs (random access point period, SEI messages...) for linear TV and video-on-demand services should be documented. A limited set of operation points (e.g. SDTV, HDTV...) should be defined to provide confidence to content providers/broadcasters on the quality of experience offered by 3GPP services when used for TV-like distribution.

In addition, in the context of DASH operations, not only the main distribution format is of relevance, but at least also a subset of spatial and temporal resolutions. In order to minimize testing for seamless switching experience, suitable lower resolutions of distribution formats are important for consistent service offerings. Furthermore, to compensate congestion situations, a minimum service quality should be defined in order to provide service continuity.

Note that a TV service typically not only includes video components, but also other audio and supplementary components, such as subtitles. These aspects should also be considered and communication with experts in 3GPP and outside 3GPP should be considered to address these requirements.

Such consolidated operation points are particularly useful for second screen applications as well as hybrid broadcast broadband services. Traditional broadcasters and service providers are keen to provide a unified service offering to mobile devices without requiring adapting content encoding to a multitude of different device capabilities. Input from such organizations on main distribution formats for traditional distribution is relevant.

In order to address different device classes and distribution formats, a limited set of operation points for a TV profile definition should be defined.

No impact is expected in service requirements or architecture.

## 4 Objective \*

The objective of this Work Item is to produce a technical specification which defines a limited set of operation points for TV services in order to enable a consistent service offering within 3GPP, but also across different access networks including traditional distribution systems.

The relevant service specifications will be amended to recommend appropriate operation points.

In particular the following aspects are addressed:

In the initial phase

- Collect relevant established and emerging traditional distribution formats among others by communication with other organizations, such as DVB, ATSC, SMPTE, etc.
- Identify and define relevant parameters assigned to an operation point including but not limited to: spatial and temporal resolutions, bit depth, color space, etc.
- Define a small subset of relevant distribution formats independent of the service
- Define the operation points from a video codec point of view (signaling of SEI messages...)
- Identify the enablers in different 3GPP services (MBMS, PSS, DASH) to map such parameters to 3GPP services, including service specific requirements, e.g. adaptive resolution switching in DASH. etc.
- Identify non-video relevant aspects and document those
- Collect and document these findings in a technical report

In the second phase based on the above results

- Produce a technical specification that defines the operation points
- Amend the relevant service specifications to recommend appropriate operation points.

Continuous exchange with relevant standardization organizations is encouraged.

## 5 Service Aspects

The updates of the 3GPP specifications will contain TV video profiles in selected 3GPP multimedia services (MBMS, PSS, 3GP-DASH).

## 6 MMI-Aspects

None.

## 7 Charging Aspects

None.

## 8 Security Aspects

None.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		x		x	
No	x		x		x
Don't know					

## 10 Expected Output and Time scale \*

New specifications *					
[If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp WG(s)	Presented for information at plenary#	Approved at plenary#
26.9YZ Evaluation of MBMS FEC Enhancements SA#55	Video formats for 3GPP services	SA4		SA#68	SA#70
26.XYZ Evaluation of MBMS FEC Enhancements SA#55	TV video profiles over 3GPP services	SA4		SA#69	SA#70
Affected existing specifications *					
[None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments
26.234		TV profile for PSS		SA#70	
26.244		TV profile for 3GP		SA#70	
26.346		TV profile for MBMS		SA#70	
26.247		TV profile for DASH		SA#70	

## 11 Work item rapporteur(s) \*

Gilles TENIOU, gilles.teniou@orange.com

## 12 Work item leadership \*

3GPP

SA4

## 13 Supporting

Supporting IM name
ORANGE
Qualcomm Incorporated
TELECOM ITALIA S.p.A.
Sony Mobile Communications
HUAWEI TECHNOLOGIES Co. Ltd.
Ericsson
Deutsche Telekom AG
Intel

Individual Members \*

## Enhanced LTE UE Delay test methods and requirements

650027	Enhanced LTE UE Delay test methods and requirements	E_LTE_UE D	1	S4	Sep-14	Dec-15	50%	SP-140482
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3GPP TSG SA Meeting #65

TD SP-140482

Edinburgh, Scotland, 15-17 September, 2014

Agenda item: 15

3GPP TSG-SA4#80 meeting  
4-8 August, 2014, San Francisco, CA, USA

Tdoc S4 (14)1019  
Revision of S4-140980

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**Source:** TSG SA WG4 Codec  
**Title:** New Work Item on Enhanced LTE UE delay test methods and requirements  
**Document for:** Approval  
**Agenda Item:** 15

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Enhanced LTE UE Delay test methods and requirements

**Acronym:** E\_LTE\_UED

**Unique identifier:**

## 1 3GPP Work Area

	Radio Access
	Core Network
x	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
x	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Mouth to ear delay has a significant impact to the conversational experience as it has been described in e.g. ITU-T G.114. The audio test specifications in TS 26.131 and TS 26.132 were updated in Rel-12 to introduce delay specifications for UEs operating in an MTSI-based speech over LTE call scenario. This Rel-12 work was conducted in the scope of the ART\_LTE WI (specifically the UED building block) and several open issues were left for further study, such as:

- Limitations of existing test equipment (e.g. no support of DTX, SPS, DRX)
- Lack of specification for clock related test cases (e.g. clock accuracy of UEs, behavior of UEs in presence of clock drift)
- Artificial jitter/loss profiles that do not represent live operation in MTSI-based speech services over LTE.

Furthermore, the EVS codec was not considered in the ART\_LTE work.

No impact is expected in service requirements or architecture.

## 4 Objective

The objective of this work item is to enhance the LTE UE delay test cases and requirements to cover at least the following issues:

- Support of DTX in test equipment
- Support of LTE radio optimizations (e.g. SPS and DRX) if these features are implemented
- Specification of clock accuracy and behavior of UEs in presence of clock drift
- Introduction of at least one jitter/loss profile condition to represent well live operation in MTSI-based speech services over LTE and associated requirement in terms of delay and quality

- Enhancements to the existing LTE UE delay test cases, for instance in the area of test signals, delay estimation methods, etc. Testing under handover conditions will be considered.
- Specification of UE delay testing for MTSI-based services over LTE with EVS codec

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X	X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1 <sup>st</sup> rsp. WG	2 <sup>nd</sup> rsp. WG(s)	Presented for information at plenary#	Approved at plenary

Affected existing specifications [None in the case of Study Items]			
Spec No	CR	Subject of the CR	Approved at plenary
26.131		Terminal acoustic characteristics for telephony; Requirements	SA#70
26.132		Speech and video telephony terminal acoustic test specification	SA#70

## 11 Work item rapporteur(s)

Stéphane Ragot, ORANGE, [stephane.ragot@orange.com](mailto:stephane.ragot@orange.com)

## 12 Work item leadership

3GPP SA4

## 13 Supporting Individual Members

<b>Supporting IM name</b>
ORANGE
Sony Mobile Communications
Qualcomm Incorporated
AT&T
Ericsson
SPRINT Corporation

650029	<a href="#">HTML5 Presentation Layer</a>	HTML5	1	S4	Sep-14	Dec-15	70%	SP-140484
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**3GPP TSG SA-WG4 Meeting #80**  
**San Francisco, US, 4<sup>th</sup>-8<sup>th</sup> August 2014**

**S4-141024**

revision of tg-yynnnn

---

<b>Source:</b>	TSG SA WG4 Codec
<b>Title:</b>	Work Item on HTML5 Presentation Layer
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	15

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** HTML5 Presentation Layer

**Acronym:** HTML5

**Unique identifier:** HTML5

## 1 3GPP Work Area

	Radio Access
	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
TR 26.907	HTML5 for a New Presentation Layer in 3GPP Services	Related study item

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

**If no identified source of stage 2 information, justify:**

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

In Release 12, a study on HTML5 for a new Presentation Layer in 3GPP Services was performed. The purpose of the study was to come up with a unique presentation layer for all 3GPP services and avoid the current situation of having several solutions. The study item has shown that HTML5 is able to provide equivalent functionality to the existing solutions: XHTML, DIMS, and SMIL. A set of APIs has also been identified to fulfil at least the functionality of the currently defined scene description solutions.

The TR was concluded with the following recommendations.

- Adopt HTML5 with the identified features and APIs as the only scene description solution.
- Recommend the supported media codecs in the 3GPP services as the set of media codecs to be supported by user agents and the HTML5 media elements.
- Define the necessary procedures to identify and deliver scene updates for both unicast and broadcast distribution of dynamic scene updates in a fully compatible way with HTML5.

A new specification is to be generated to define the common presentation layer for all 3GPP services.

## 4 Objective

The objectives of this work item have been derived from TR 26.907. The following aspects need to be addressed:

- Define a common scene description solution using HTML5
- Specify the features and APIs that are to be supported by the new scene description solution, in order to fulfil at least the functionalities of existing presentation layers in 3GPP services
- Specify that the media codecs defined in the 3GPP services are to be supported by the HTML5 user agent with the same recommendation level
- Define the delivery of the presentation layer data in different 3GPP services, including static delivery as well as procedures to deliver scene updates.

## 5 Service Aspects

This work item will replace the scene description solutions in the 3GPP services: MBMS, PSS, MMS, and DASH. It will have no impact on requirements or architecture.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

None.

## 8 Security Aspects

None.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #
TS 26.xyz	SA4			Presentation Layer for 3GPP Services	SA #70

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR	Subject of the CR	Approved at plenary #
TS 26.346		Update Scene Description	SA #70
TS 26.234		Update Scene Description	SA #70
TS 26.140		Update Scene Description	SA #70
TS 26.247		Add Scene Description Reference	SA #70

## 11 Work item rapporteur(s)

Bouazizi, Imed, Samsung Electronics Ltd., i.bouazizi@samsung.com

## 12 Work item leadership

3GPP SA4

## 13 Supporting Individual Members

Supporting IM name
Samsung Electronics Co. Ltd.
Huawei Technologies Co. Ltd
Intel
Blackberry UK Limited
Qualcomm Incorporated
Orange
Nomor Research GmbH

## Support of EVS in 3G Circuit-Switched networks

				S4, C4, C1, C3, R1, R2,				
650030	<a href="#">Support of EVS in 3G Circuit-Switched networks</a>	EVSoCS	1	R3	Sep-14	Dec-15	55%	SP-140485
670016	<a href="#">SA4 aspects of EVS in 3G Circuit-Switched networks</a>	EVSoCS-S4	2	S4	Sep-14	Dec-15	40%	SP-140485
670002	<a href="#">CT aspects of EVS in 3G Circuit-Switched Networks</a>	EVSoCS-CT	2	C4, C1, C3	Mar-15	Dec-15	67%	CP-150200
670017	CT1 aspects of EVS in 3G Circuit-Switched Networks	EVSoCS-CT	3	C1	Mar-15	Dec-15	90%	CP-150200
670018	CT3 aspects of EVS in 3G Circuit-Switched Networks	EVSoCS-CT	3	C3	Mar-15	Dec-15	15%	CP-150200
670019	CT4 aspects of EVS in 3G Circuit-Switched Networks	EVSoCS-CT	3	C4	Mar-15	Dec-15	95%	CP-150200
660073	<a href="#">Support of EVS over UTRAN CS</a>	EVSoCS_UTRAN	2	R2, R1, R3	Jun-15	Sep-15	25%	RP-142282
660173	Core part: Support of EVS over UTRAN CS	EVSoCS_UTRAN-Core	3	R3	Jun-15	Sep-15	25%	RP-142282

Source:

**TSG SA WG4 Codec**

Title:

**New WID on Support of EVS in 3G Circuit-Switched Networks**

Document for:

**Approval**

Agenda Item:

**15**

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

## Title: Support of EVS in 3G Circuit-Switched Networks

Acronym: EVSoCS

Unique identifier:

## 1 3GPP Work Area

	<b>Radio Access</b>
	<b>Core Network</b>
X	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
x	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>
470030	Codec for Enhanced Voice Services	EVS codec developed in the WI

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any)</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The objectives set in the Work Item Description for the Enhanced Voice Services (EVS WID) in Rel-12 focus on quality improvement, especially in terms of an extended audio bandwidth (superwideband), enhanced narrowband and wideband performance, improved mixed content and music quality, interoperability to legacy through dedicated interop-modes, and better robustness against transmission errors. These targets serve the purpose of achieving a significantly enhanced user experience.

The objective to include interoperability to legacy coder or its improved version targets interoperability and quality improvements at the same time. Interoperability aims at avoiding the need for transcoding hence this aspect is a quality aspect too.

The EVS WID primarily targets Enhanced Packet Service (EPS) and also mentions that it is further desirable that the codec fulfills needs for enhanced voice services in other 3GPP systems, such as CS. The main objective of this Work Item is to enable users of 3G services to benefit from the enhanced user

experience and system capacity provided by EVS. We find that the quality improvements offered by EVS should be available in as many networks and voice services as possible.

In this context we would like to highlight that UMTS circuit-switched (CS) networks are widely used today. Besides service quality, system capacity is a further important aspect in mobile telephony. Since EVS is able to provide good quality at lower bit rates as compared to legacy 3GPP coders, using EVS helps in increasing system capacity.

## 4 Objective

On the service side, we propose 3GPP to start working on CS support of EVS over UTRAN (3G WCDMA).

The objective of this Work Item is to enable users of 3G services to benefit from the enhanced user experience and system capacity and interoperability provided by EVS.

As part of the work in 3GPP SA4, further relevant 3GPP WGs are planned to be liaised. Such WGs may include e.g. CT1, CT3, CT4, RAN2, RAN3, and RAN5. Some specifications in the responsibility of these WGs may need an update to include EVS. Expected spec changes are minor.

## 5 Service Aspects

This work item will enhance voice quality in CS services over UTRAN (3G WCDMA).

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		x	x	x	
No	x				

<b>Don't know</b>				x
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## 10 Expected Output and Time scale

<b>New specifications</b> [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
TS 26.xyz	EVS; Speech Codec Frame Structure	SA4		SA#69	SA#70	
TS 26.xyz	EVS; Interface to Iu, Uu and Nb	SA4		SA#69	SA#70	

<b>Affected existing specifications</b> [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
TS 26.103		Addition of EVS to Speech codec list	SA#70	
TS 28.062		Addition of EVS to Tandem Free Operation	SA#70	

## 11 Work item rapporteur(s)

Qualcomm Incorporated

Varga, Imre

## 12 Work item leadership

Primary responsibility: 3GPP SA4

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Qualcomm Incorporated
China Unicom
Huawei Technologies Co., Ltd.
Fraunhofer IIS

**Title:** New WID on CT aspects of EVS in 3G Circuit-Switched Networks  
**Document for:** Agreement  
**Agenda Item:** 13.1

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** CT aspects of EVS in 3G Circuit-Switched Networks

**Acronym:** EVSoCS-CT

**Unique identifier:** 670002

### 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
650030	Support of EVS in 3G Circuit-Switched networks	

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
650030	Stage 2/3 for support of EVS in 3G Circuit-Switched networks	

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The Enhanced Voice Services (EVS) codec is known to provide significant quality improvements, e.g. in terms of extended audio bandwidth (super wideband), enhanced narrowband and wideband performance, and better robustness against transmission errors. It also supports interoperability with legacy codecs through dedicated interop-modes.

From a network capacity perspective, since EVS is able to provide similar quality at lower bit rates, as compared to legacy 3GPP codecs, it may as well increase system capacity.

After the introduction in Rel-12 of EVS support in MTSI, SA#65 has approved and started a Rel-13 Work Item (led by SA4) to support EVS over UMTS CS networks (focusing on the service/codec aspects). Extending the support of EVS over UMTS CS networks will improve user quality and/or capacity also for CS users, plus an overall seamless user/voice experience (across CS and VoIP networks). Furthermore, RAN#66 has approved a Rel-13 Work Item (led by RAN2) to introduce the support for the EVS codec over UMTS CS networks in the relevant UTRAN protocols and specifications.

To complete the support of EVS over UMTS CS networks, some updates are also needed in CT specifications.

## 4 Objective

The objective of this Work Item is to update the relevant specifications under CT WGs responsibility to enable support of EVS over UMTS CS networks.

This includes:

1. Ensuring the EVS\_UMTS code point(s) can be carried over all relevant interfaces under CT WGs' remit
2. Adding support for codec parameter translation between CS networks and the IM CN subsystem for EVS.
3. Adding support for EVS over Iu.
4. Adding support for TrFO and TFO with EVS over UMTS CS.
5. Update H.248 profile specifications to support EVS over UMTS CS.

## 5 Service Aspects

Covered by the parent feature.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

Covered by the parent feature.

## 8 Security Aspects

None.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
24.008	Possible updates to Supported Codec List IE		CT#70 (Dec 2015)	CT1 responsibility
29.163	Addition of support for codec parameter translation between BICC CS network and the IM CN subsystem for EVS		CT#70 (Dec 2015)	CT3 responsibility
29.414	Addition of support for EVS in Transcoder-less Interworking with the Iu Framing Protocol		CT#70 (Dec 2015)	CT3 responsibility
29.415	Possible updates to support EVS over UMTS CS		CT#70 (Dec 2015)	CT3 responsibility
23.153	Addition of support for TrFO with EVS		CT#70 (Dec 2015)	CT4 responsibility
23.334	Possible updates to support access transfer with EVS over UMTS CS		CT#70 (Dec 2015)	CT4 responsibility
29.002	Possible updates to support EVS over UMTS CS		CT#70 (Dec 2015)	CT4 responsibility
29.231	Possible updates to support EVS over UMTS CS in SIP-I based networks		CT#70 (Dec 2015)	CT4 responsibility
29.232	Possible addition of examples for encoding of EVS in the Mc Single Codec IE and the TFO Codec List IE. Possible updates to SDP Media Parameters for RTP Terminations		CT#70 (Dec 2015)	CT4 responsibility
29.332	Possible updates to Codec Parameters for EVS		CT#70 (Dec 2015)	CT4 responsibility
29.334	Possible updates to support access transfer with EVS over UMTS CS		CT#70 (Dec 2015)	CT4 responsibility

## 11 Work item rapporteur(s)

Chaponniere, Lena (lguelllec@qti.qualcomm.com)

## 12 Work item leadership

CT4

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Qualcomm Incorporated
China Unicom
Ooredoo (Qtel)
ZTE
Fraunhofer IIS
Huawei

---

**Source:** Qualcomm Incorporated  
**Title:** New WI proposal: Support of EVS over UTRAN CS  
**Document for:** Approval  
**Agenda Item:** 14.1.2

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Support of EVS over UTRAN CS

**Acronym:** EVSoCS

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	x
<b>This WID includes a Performance part</b>	

## 1 3GPP Work Area

x	<b>Radio Access</b>
	<b>Core Network</b>
	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

x	<b>Study Item (go to 2.1)</b>
x	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

### 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
	Support of EVS in 3G Circuit-Switched Networks	SA4 Work Item

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

EVS is known to provide significant quality improvements, e.g. in terms of extended audio bandwidth (super wideband), enhanced narrowband and wideband performance, and better robustness against transmission errors. It also supports interoperability with legacy codecs through dedicated interop-modes.

From a network capacity perspective, since EVS is able to provide similar quality at lower bit rates, as compared to legacy 3GPP codecs, it may as well increase system capacity, especially relevant on the radio network/interface side.

After the introduction in Rel-12 of EVS support for MMTEL (VoIP), SA (#65) has approved and started a Rel-13 Work Item (led by SA4) to support EVS over UMTS CS networks (focusing on the service/codec aspects). Extending the support of EVS over UMTS CS networks will improve user quality and/or capacity also for CS users, plus an overall seamless user/voice experience (across CS and VoIP networks).

To complete the support of EVS over UMTS CS, some updates are needed to UTRAN protocols and specifications, which is what is proposed in this RAN related Work Item.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The Work Item objective is to introduce the support of the new EVS codec family in relevant UTRAN protocols and specifications, e.g. update the following:

- RABs and RRC signaling (RAN2, RAN1)
  - RAN2: Define new RABs and L1/2/3 parameters (in coord. with SA4 and RAN1), plus minor RRC updates;  
NOTE: RAN2 should focus on CS RAB over DCH (impacts to CS RAB over HSPA may be considered later, if time allows).
  - RAN1: no spec impacts; only input/consultancy on specific RAB L1/L2 parameters is expected.
- UTRAN network signalling (RAN3)
  - Small/minor updates in Iu specs.

RAN5 is expected to update, later on, UE conf. test specs (new RABs) and signalling test cases.

## 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

## 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). Changes can be proposed in the status report of the WI/SI.

RAN #66										Q1/2015					RAN		
#67		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf						
80	80	89	89	89	89	87	74	74	74	74	74						
				1		0.5											

RAN #67										Q2/2015					RAN		
#68		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf						
80bis	80bis	89bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75
		0.5		1		0.5				0.5		1		0.5			

RAN #68										Q3/2015					RAN		
#69		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf						
82	82	91	91	91	91	89	76	76	76	76	76						
				1													

RAN #69										Q4/2015					RAN		
#70		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf						
82bis	82bis	91bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

Additional comments to the time budget proposal:

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X	X	
No	X				
Don't know					X

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.  
By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
25.331		Radio Resource Control (RRC); Protocol specification	RAN #69 (Sept '15)	Core
25.413		UTRAN Iu interface Radio Access Network Application Part (RANAP) signalling	RAN #69 (Sept '15)	Core
25.993		Typical examples of Radio Access Bearers (RABs) and Radio Bearers (RBs) in UTRA	RAN #69 (Sept '15)	Core

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.  
If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Francesco Pica

**Company:** Qualcomm Incorporated

**Email:** fpica@qti.qualcomm.com

## 12 Work item leadership

RAN WG2, primary

RAN WG1, RAN WG3, secondary

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Qualcomm Incorporated
China Unicom
Huawei
HiSilicon
Ooredoo (Qtel)
Fraunhofer IIS
Nokia Networks
Deutsche Telekom

650031	<a href="#">Enhanced DASH (Dynamic Adaptive Streaming over HTTP in 3GPP)</a>	eDASH	1	S4	Sep-14	Dec-15	60%	SP-150211
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**Technical Specification Group Services and System Aspects****TSGS#68(15)0211****3GPP TSG SA Meeting #68****Agenda Item: 13.30****Malmö, Sweden, 17-19 June 2015****3GPP TSG-SA4 Meeting #83****S4-150587****Bratislava, Slovakia, Apr 13 – 17, 2015****revision of SP-140486**

**Source:** Huawei Technologies Co., Ltd  
**Title:** eDASH WID update for mosaic services  
**Document for:** Approval  
**Agenda Item:** 7  
**Work Item / Release:** eDASH / Release-13  
Abstract of the contribution:  
eDASH WID to add work for mosaic services.

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

**Title:** Enhanced DASH**Acronym:** eDASH**Unique identifier:**

## 1 3GPP Work Area

	<b>Radio Access</b>
	<b>Core Network</b>
X	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
540033	Study on Improved Support for Dynamic Adaptive Streaming over HTTP in 3GPP	The study item collected relevant information and conclusions that are referenced in the justification and objectives for this work item.

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

3GPP TSG SA4 conducted a study on Improved Support for DASH that is documented in TR26.938. Among others, this document provides deployment guidelines for content authoring, client operation as well as operational guidelines. In addition the document addresses advanced use cases for improved support for DASH. Based on the conclusions of the use cases documented in TR26.938, certain gaps and optimization potentials are identified for improved DASH operation in 3GPP services.

3GPP TSG SA4 conducted a study on mosaic service as part of the MI-EMO work item for release 12 that is documented in TR26.848. The document provides use cases and identifies certain gaps for mosaic services based on DASH over MBMS.

In order to harmonize DASH-based video distribution, close coordination with technologies defined in MPEG, IETF, DASH-IF and other relevant standardization organizations is highly desirable.

## 4 Objective

The objective of the work item is to address relevant enhancements for DASH-based services in 3GPP services and networks. The work item addresses normative aspects and operational guidelines to address the relevant gaps identified in the conclusions of TR26.938.

Specifically, the work item addresses the following objectives:

- For Live Services (see clause 6.2 of TR26.938), TS26.247 supports all basic aspects to offer a live service. Additional tools may be considered to optimize efficiency and robustness. MPEG-DASH second edition defines certain tools for this purpose that may be considered to improve latency. In addition, the use of certain HTTP delivery modes may be considered.
- For Content Protection (see clause 6.3 of TR26.938), TS 26.247 is agnostic to the DRM that is used. However, neither in TS 26.247 nor in 3GPP file format TS 26.244 there is explicit support for common encryption nor key rotation. Consider adding support for common encryption.
- For Content and Device Interoperability (see clause 6.6 of TR26.938), it was identified that 3GP-DASH as defined TS26.247 lacks a profile that is aligned with existing industry practices. Consider defining profile(s) aligned with industry practice.
- For DASH as download format (see clause 6.9 of TR26.938), the DASH formats may also be used in the progressive download context using a restricted subset of DASH. Consider documenting this usage.
- For Multiple Spectator Views offered with DASH (see clause 6.11 of TR26.938), TS26.247 provides certain tools to support the use case. Consider adding location/orientation information in the MPD and in timed metadata tracks in the 3GPP File Format as well as providing MPD indication of highlights and capturing parameters.
- For Operator control of video streaming services additional optimizations may be considered. In case 3GPP SA WG 2 WG decides to provide UPCON related signalling that is made available to Application Functions/PSS server, we may revisit the details of the signalling and analyse if this information may be useful for the PSS server or the DASH client to improve DASH operation. The benefit of signalling events of MPD updates will be investigated in this context. Also, if the operator decides to send DASH content over a non-GBR bearer initially, it may be useful to initiate QoS update procedure with GBR QoS parameter once the network gets more loaded. The feasibility of this option requires further clarification with 3GPP SA WG2.
- Support of methods to address optimized DASH Operation with network proxy caches as well as services for caching of DASH content at UE functions. Solutions provided by ISO/MPEG as part of their Core Experiment on SAND (Server And Network assisted DASH) will be considered in this context.
- Support for consistent playout behaviour of specific content with metadata support and dedicated client behaviour including authentication, authorization and session control.
- Signalling of quality-related information about the content (via the DASH MPD or other means) to the DASH client can be desirable. Solutions provided by ISO/MPEG in ISO/IEC 23001-10 will be considered.
- For Ad Insertion, Rel-12 TS 26.247 supports Ad-insertion and we will consider further optimizations provided in ISO/IEC 23009-1 second edition to enable more comprehensive and more feature rich use cases.
- Define deployment guidelines for content authoring, client operation as well as operational guidelines based upon TR 26.938 Clause 5, usage of the 3GPP PCC architecture for consistent QoE/QoS support as described in TR 26.938 Clause 6.8.3, hybrid broadcast/unicast services, content encoding guidelines, operator control of video streaming services, and other above enhancements.
- Support mosaic service based on DASH for signalling the association among the component video and audio streams within the mosaic services and signalling the association between the mosaic services and original streaming services based upon the mosaic service of TR 26.848 Clause 4.2.5.
- If refinements to use cases, gaps and requirements are identified, TR26.938 is extended in order to address newly gathered information.

For all developed solutions and optimizations, it is strongly recommended to re-use as much as possible of existing standards defined by MPEG (e.g. in ISO/IEC 23009-1 second edition) or other organizations such as IETF and DASH-IF.

Communication with other 3GPP WGs such as TSG SA WG2 is expected.

No impacts to the architecture or service requirements are foreseen.

## 5 Service Aspects

Improvements to PSS and 3GP-DASH services.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

None.

## 8 Security Aspects

None.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No			X		X
Don't know	X			X	

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
TS 26.233		Enhancements to DASH	SA#70	
TS 26.234		Enhancements to DASH	SA#70	
TS 26.244		Enhancements to DASH	SA#70	
TS 26.247		Enhancements to DASH	SA#70	
TR 26.938		Enhancements to DASH	SA#70	

## 11 Work item rapporteur(s)

Stockhammer, Thomas (tsto@qti.qualcomm.com)

Li, Zhiming (lizhiming@huawei.com)

NOTE: The rapporteurs split the work for coordinating the work with external standardization organizations and 3GPP internal working groups.

## 12 Work item leadership

Leadership: SA4

## 13 Supporting Individual Members

<b>Supporting IM name</b>
BlackBerry UK Limited
China Mobile Com. Corporation
China Telecom
Cisco Systems Belgium
Deutsche Telekom AG
Ericsson
Expway
HiSilicon Technologies Co. Ltd
Huawei Technologies Co. Ltd
Intel
INTERDIGITAL COMMUNICATIONS
Nomor Research GmbH
NTT DoCoMo Inc
Qualcomm Incorporated
Samsung Electronics Co., Ltd
Sony Europe Limited
TELECOM ITALIA S.p.A.

## QoS End-to-end Multimedia Telephony Service for IMS (MTSI) extensions (Stage 3)

650032	<b>QoS End-to-end Multimedia Telephony Service for IMS (MTSI) extensions (Stage 3)</b>	QOSE2E MTSI	1	S4, C3, C1, C4	Mar-13	Dec-15	44%	SP-140601
620068	<b>TR on improved end-to-end QoS handling for MTSI</b>	QOSE2E MTSI	2	S4	Dec-13	Jun-15	60%	SP-140601
650132	<b>SA4 part of QoS End-to-end Multimedia Telephony Service for IMS (MTSI) extensions (Stage 3)</b>	QOSE2E MTSI	2	S4	Mar-13	Dec-15	75%	SP-140601
660043	<b>CT Aspects of QoS End-to-End MTSI Extensions</b>	QOSE2E MTSI-CT	2	C3, C1,				
660044	CT3 Aspects of QoS End-to-End MTSI Extensions	QOSE2E MTSI-CT	3	C3	Nov-14	Sep-15	0%	CP-140925
660045	CT1 Aspects of QoS End-to-End MTSI Extensions	QOSE2E MTSI-CT	3	C1	Nov-14	Sep-15	0%	CP-140925
660046	CT4 Aspects of QoS End-to-End MTSI Extensions	QOSE2E MTSI-CT	3	C4	Nov-14	Sep-15	0%	CP-140925

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

### Title \* : QoS End-to-end Multimedia Telephony Service for IMS (MTSI) extensions

Acronym \* : QOSE2EMTSI

Unique identifier \*TBD

### 1 3GPP Work Area \*

	Radio Access
	Core Network
X	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

### End-to-end QoS handling (introducing an enhanced bandwidth negotiation mechanism for MTSI sessions)

Current end-to-end media QoS handling is based on identification of SDP media type (m=audio/video) and maximum bandwidth (b=). However, there are several bandwidth characteristics in terms of UE bandwidth usage and 3GPP systems bandwidth availability that cannot be expressed with the current bandwidth attribute since it is only a single value, the usage is vaguely defined, mainly applies to the receive direction, and is only an “application specific” maximum value. UEs and intermediate nodes relying on SDP information thus cannot take those characteristics into account in their media handling, unless they are exactly the same for all implementations and thus dependent on a much more thorough and precise specification than today. This is especially important for high bitrate and potentially highly variable bitrate media such as video. Such bandwidth characteristics include, but are not limited to:

- Bearers having Maximum Bitrate (MBR) different from Guaranteed Bitrate (GBR).
- Bearers using GBR, as compared to non-GBR with the same bitrate value.
- Although there are currently no such services defined, it is conceivable that a multimedia communication client has a desire to use bi-directional media of the same type (and thus applicable to the same b-line) but with significantly different media bitrates in the two directions. As an example, consider a mobile sender with limited uplink bandwidth but good downlink bandwidth participating in a rich multimedia conference with both fixed and mobile participants. This is already possible to express in SDP by using separate m-lines for send (a=sendonly) and receive (a=recvonly), but that solution may be undesirable since it has interoperability implications.
- Some end-user services benefit from using media with a dynamically varying bitrate, such as for example high quality video that is inherently variable bitrate, and imposing a strict constant bitrate restriction will impact the perceived media quality negatively. On the other hand, network services may have limited capability to handle varying bitrate, may want to optimize resource usage, or protect the network from too much variation (bandwidth policing). These opposing preferences introduce a need to communicate and agree on the wanted

and permissible bandwidth *variation* between end-users and potentially multiple network services. If the bandwidth variation is not agreed between media sender and network, media may risk to unnecessarily overloading the network and network may risk to unnecessarily and severely impairing media, without either part knowing that those negative implications could in fact have been avoided.

It is proposed to amend SDP bandwidth signalling to cover the wanted aspects, while keeping the existing bandwidth attribute (b=) for backward compatibility.

During LS exchange with the CT WGs and SA WG2 to coordinate the work on improved end-to-end QoS handling it was noted that introducing a new enhanced bandwidth negotiation mechanism, e.g. using a new SDP attribute could potentially require changes in several network nodes. Such potential impacts are investigated as part of a study phase.

No impact is expected in service requirements.

## 4 Objective \*

The objective of this New Work Item is to extend TS 26.114 to cover for end-to-end media improvements. In particular:

### Improve end-to-end QoS handling by:

Before starting normative work on QoS handling, a Study Phase will take place with the objective of:

- Identifying the high level functional and technical requirements
- Identifying potential solutions, including consideration of new QoS related SDP parameters or attributes
- Identifying any impacts of the potential solutions on network nodes

During the Study Phase, the CT WGs and SA WG2 are consulted to contribute to the Study Phase. The Study Phase output is given in a TR.

The objective of the normative work will be based on the conclusion of the Study Phase and may include:

- Introducing an enhanced bandwidth negotiation mechanism for MTSI sessions
- Introducing guidelines in Policy function interpretations of SDP parameters

This work requires coordination with 3GPP CT WGs, 3GPP SA WG2 and IETF MMUSIC.

## 5 Service Aspects

The updates of the 3GPP specifications will enable better efficiency, capacity and quality of MTSI service end-to-end in particular when involving video.

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
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<b>Yes</b>		X		X	
<b>No</b>	X		X		X
<b>Don't know</b>					

## 10 Expected Output and Time scale \*

<b>New specifications *</b> [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
26.924	Study on improved end-to-end QoS handling for MTSI	SA4		SA#67	SA#68
<b>Affected existing specifications *</b> [None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments
26.114		End-to-end MTSI extension		SA#68 (June 2015)	

## 11 Work item rapporteur(s) \*

Tomas Frankkila <tomas.frankkila@ericsson.com>

## 12 Work item leadership \*

TSG SA WG4,

Co-ordination needed with 3GPP SA WG2, TSG CT WG1, CT WG3 and CT WG4.

## 13 Supporting Individual Members \*

Supporting IM name
Ericsson
ORANGE
Deutsche Telekom AG
TELECOM ITALIA S.p.A.

**3GPP TSG CT Meeting #66  
Maui, US; 8<sup>th</sup> – 9<sup>th</sup> December 2014**

**CP-140925**

3GPP TSG CT3 Meeting #78bis  
3GPP TSG CT1 Meeting #88bis  
3GPP TSG CT4 Meeting #66bis

C3-144172  
C1-143855  
C4-141936

Sophia Antipolis, France; 20<sup>th</sup> – 24<sup>th</sup> October 2014

**Source:** CT3  
**Title:** New WID on CT Aspects of QoS End-to-End MTSI Extensions  
**Agenda Item:** 13.1  
**Document for:** Approval

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** CT Aspects of QoS End to End MTSI extensions

**Acronym:** QOSE2EMTSI-CT

**Unique identifier:**

### 1 3GPP Work Area

	Radio Access
x	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
x	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
650032	QoS End-to-End Multimedia Telephony Service for IMS (MTSI) extensions	

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any)</b>		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

<b>Corresponding stage 1 work item</b>		
Unique ID	Title	TS

<b>Other source of stage 1 information</b>		
TS or CR(s)	Clause	Remarks

**If no identified source of stage 1 information, justify:**

Stage 2 MGW control procedures are derived from SA4 specification TS 26.114.

Go to §3.

### 2.3.3 Stage 3

<b>Corresponding stage 2 work item (if any)</b>		
Unique ID	Title	TS

<b>Else, corresponding stage 1 work item</b>		
Unique ID	Title	TS

<b>Other justification</b>		
TS or CR(s) or external document	Clause	Remarks

**If no identified source of stage 2 information, justify:**

Go to §3.

### 2.3.4 Test spec

<b>Related Work Item(s)</b>		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

### End-to-end QoS handling (introducing an enhanced bandwidth negotiation mechanism for MTSI sessions)

Current end-to-end media QoS handling is based on identification of SDP media type (*m*=audio/video) and maximum bandwidth (*b*=). However, there are several bandwidth characteristics in terms of UE bandwidth usage and 3GPP systems bandwidth availability that cannot be expressed with the current bandwidth attribute since it is only a single value, the usage is vaguely defined, mainly applies to the receive direction, and is only an "application specific" maximum value. UEs and intermediate nodes relying on SDP information thus cannot take those characteristics into account in their media handling, unless they are exactly the same for all implementations and thus dependent on a much more thorough and precise specification than today. This is especially important for high bitrate and potentially highly variable bitrate media such as video. Such bandwidth characteristics include, but are not limited to:

- Bearers having Maximum Bitrate (MBR) different from Guaranteed Bitrate (GBR).
- Bearers using GBR, as compared to non-GBR with the same bitrate value.
- Although there are currently no such services defined, it is conceivable that a multimedia communication client has a desire to use bi-directional media of the same type (and thus applicable to the same b-line) but with significantly different media bitrates in the two directions. As an example, consider a mobile sender with limited uplink bandwidth but good downlink bandwidth participating in a rich multimedia conference with both fixed and mobile participants. This is already possible to express in SDP by using separate *m*-lines for send (*a*=sendonly) and receive (*a*=recvonly), but that solution may be undesirable since it has interoperability implications.
- Some end-user services benefit from using media with a dynamically varying bitrate, such as for example high quality video that is inherently variable bitrate, and imposing a strict constant bitrate restriction will impact the perceived media quality negatively. On the other hand, network services may have limited capability to handle varying bitrate, may want to optimize resource usage, or protect the network from too much variation (bandwidth policing). These opposing preferences introduce a need to communicate and agree on the wanted and permissible bandwidth *variation* between end-users and potentially multiple network services. If the bandwidth variation is not agreed between media sender and network, media may risk to unnecessarily overloading the network and network may risk to unnecessarily and severely impairing media, without either part knowing that those negative implications could in fact have been avoided.

It is proposed to amend SDP bandwidth signalling to cover the wanted aspects, while keeping the existing bandwidth attribute (*b*=) for backward compatibility.

## 4 Objective

The objective of this building block is to specify the Core Network aspects of the feature described in the justification. More precise objective of this WID will be defined based on the SA4 TR outcome. CT WGs will consult with SA4 over the possible solutions before finalising normative specification work.

It should be noted that not all of the requirements in Clause 3 which are inherited from the feature level have been endorsed by CT Working Groups and may result in a reduced scope after further considerations over the impacts.

## 5 Service Aspects

None.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

None.

## 8 Security Aspects

None.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale

Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	New specifications [If Study Item, one TR is anticipated]	
				Presented for information at plenary#	Approved at plenary

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
24.229		Possible Introduction of SDP parameters for an enhanced bandwidth negotiation mechanism for MTSI sessions.	CT#69 (September 2015)	CT1 responsibility
29.213		Impacts to Rx session information mapping once such new information has been added to the IMS by SA4 and CT1.	CT#69 (September 2015)	CT3 responsibility
29.214		Possible impacts to Rx for E2E QoS. If the "preferred bandwidth variability" contains additional information, Rx extensions might be required.	CT#69 (September 2015)	CT3 responsibility
23.334		Possibly Introducing an enhanced bandwidth negotiation mechanism for MTSI sessions.	CT#69 (September 2015)	CT4 responsibility
29.334		Possibly Introducing an enhanced bandwidth indication for MTSI sessions.	CT#69 (September 2015)	CT4 responsibility
29.162		Possible Introducing an enhanced bandwidth negotiation mechanism for MTSI sessions.	CT#69 (September 2015)	CT3 responsibility
29.238		Possibly Introducing an enhanced bandwidth indication for MTSI sessions.	CT#69 (September 2015)	CT4 responsibility
23.333		Possibly Introducing an enhanced bandwidth negotiation mechanism for MTSI sessions.	CT#69 (September 2015)	CT4 responsibility
29.333		Possibly Introducing an enhanced bandwidth indication for MTSI sessions.	CT#69 (September 2015)	CT4 responsibility
29.163		Possibly Introducing an enhanced bandwidth negotiation mechanism for MTSI sessions.	CT#69 (September 2015)	CT3 responsibility
29.332		Possibly Introducing an enhanced bandwidth indication for MTSI sessions.	CT#69 (September 2015)	CT4 responsibility

## 11 Work item rapporteur(s)

Ericsson, Susana Fernandez (susana.fernandez@ericsson.com)

## 12 Work item leadership

CT3

## 13 Supporting Individual Members

Supporting IM name
Ericsson
Huawei
Deutsche Telekom
Orange
Telecom Italia

2013-10-03 version 1.14.0

## MTSI Extension on Multi-stream Multiparty

660050	MTSI Extension on Multi-stream Multiparty	MMCMH	1	S4	Dec-14	Dec-15	60%	SP-150097
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### 3GPP TSG SA Meeting #67

TD SP-150097

Shanghai, China, 11-13 March 2015

Agenda Item: 13.35

### 3GPP TSG SA WG4 Meeting #82

S4-150167

Dubrovnik, Croatia, 26-30 January 2015

revision of S4-150032

Source:	Qualcomm Incorporated, Ericsson LM, and Cisco Systems
Title:	Updated Work Item Description on MTSI Extension on Multi-stream Multiparty Conferencing Media Handling
Document for:	Approval
Agenda Item:	14.2

## Updated 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

## Title: MTSI Extension on Multi-stream Multiparty Conferencing Media Handling

Acronym: MMCMH

Unique identifier:

## 1 3GPP Work Area

	Radio Access
	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
7040	MTSI-MHI	Base specification for IMS Multimedia Telephony

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

**If no identified source of stage 2 information, justify:**

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Media handling of IMS communication services like voice and video over LTE are based on 3GPP SA4 TS 26.114. Multimedia Telephony Service over IMS, MTSI, has a wide device reach. MTSI clients can connect to conferencing IMS communication services. It is proposed to specify an increment to MTSI client specifications to enable a mass market multiparty communication service with excellent multiparty user experience and media quality. Such Operator communication service evolution would match proprietary communication services in quality with excellent efficiency and device reach.

## 4 Objective

The main objective of the work item is to specify a backward compatible media handling extensions of 3GPP MTSI TS 26.114 to support Multi-stream Multiparty Conferencing Media Handling. These extensions are listed below:

- Multi-stream video support;
- Support for at least 2 video contents: one main and one presentation;
- Multi-stream audio support;
- Support for at least 2 audio contents;
- Addition of stereo audio support (enabling dual-mono and stereo codecs), in particular in receiving direction for better multiparty experience;
- Applicability to both mobile and fixed access;
- Provisioning of Talker ID;
- Compatibility with MTSI TS 26.114 and GSMA IR.94 (Video over LTE) and IR.92 (VoLTE) are required. Communication with the relevant GSMA working group will therefore be necessary.
- Alignment with IETF is desirable.

No new codec requirements are expected beyond the support for multi-stream video and multi-stream audio. However, these extensions should cater for any normative conclusions arising from ongoing and future study or work items dealing with codec evolutions in MTSI.

These media handling extensions are not dependent on TP UEs (Telepresence UEs) media handling requirements and are targeting MTSI clients in Terminals. TP UEs inherit all MTSI requirements and care will be taken in the coordination with other ongoing work item relating to TP UE media handling (IMS\_TELEP\_S4).

Coordination with CT groups might be required to identify potential impacts to e.g. H.248 for the Mp interface.

## 5 Service Aspects

Improvements to MTSI and Conferencing services media handling.

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

Affected existing specifications [None in the case of Study Items]				
Spec No	CR	Subject of the CR	Approved at plenary#	Comments
26.114		Multi-stream Multiparty Conferencing	SA#69	

## 11 Work item rapporteur(s)

Tomas Frankkila <tomas.frankkila@ericsson.com>

## 12 Work item leadership

3GP SA WG4

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Ericsson LM
Telecom Italia S.p.A.
Cisco Systems
Qualcomm Incorporated
Sony Mobile Communications
Samsung Electronics Co., Ltd.
Intel
Nokia Corporation

## Video Telephony Robustness Improvements Extensions

660051	<a href="#">Video Telephony Robustness Improvements Extensions</a>	VTRI_EXT	1	S4	Dec-14	Sep-15	100%	SP-140739
660151	<a href="#">TR on Video Telephony Robustness Improvements</a>	VTRI_EXT	2	S4	Dec-14	Sep-15	100%	SP-140739
660251	<a href="#">Specification on Video Telephony Robustness Improvements</a>	VTRI_EXT	2	S4	Dec-14	Sep-15	100%	SP-140739

3GPP TSG|WG-4 Meeting #81  
Santa Cruz, Tenerife, Spain, 3-7 November, 2014

S4-141317

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Source: Qualcomm Incorporated  
Title: New Work Item Description on Video Telephony Robustness Improvements Extensions  
Document for: Approval  
Agenda Item: 10

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: Video Telephony Robustness Improvements Extensions

Acronym: VTRI\_EXT

Unique identifier:

## 1 3GPP Work Area

	Radio Access
	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
640057	VTRI	Previous work defining sender and receiver behaviour under packet loss conditions.

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Video communication systems, particularly conversational applications such as video telephony, can experience errors originating from losses that occur during transmission as well as losses resulting from dropping of packets due to strict timing constraints of the end-to-end system. To cater for these errors and losses, Multimedia Telephony Service for IMS (MTSI 3GPP TS 26.114) defines MTSI clients' sender and receiver behaviour utilizing RFC 4585 AVPF Generic NACK and Picture Loss Indication (PLI) feedback messages. Current error correction scheme provides basic error correction through codec level error resiliency (ER) mechanisms. Transport and application level error resiliency schemes such as Retransmission (NACK), Forward Error Correction (FEC) along with advanced codec level ER schemes such as Reference Picture Selection (RPS) provide alternative error correction mechanisms that offer different performance trade-offs. The performance of error correction schemes varies with end-to-end delay, channel bandwidth and packet loss rate.

Reference picture selection indication (RPSI) feedback message in AVPF that is currently not supported in TS 26.114 offers more efficient error recovery by providing greater certainty on establishing common reference point for recovery between the sender and the receiver. The sender can make more informed decision on how to respond to the feedback message than the current NACK based scheme.

Retransmission (NACK) scheme provides efficient error correction in terms of bandwidth under short round-trip-time (RTT) cases with low packet loss rates. The efficiency of retransmission scheme becomes more pronounced at higher bitrates since selective retransmission of lost packets instead of entire pictures needs to be transmitted. Under low RTT scenarios it can provide low video rendering jitter.

Forward Error Correction (FEC) schemes provide a mechanism that balances video quality and end-to-end delay. FEC schemes can adapt to varying channel error conditions. FEC is suitable for high RTT channels with high packet loss rates where retransmission leads to high video rendering delay and codec based recovery mechanisms like RPSI, PLI lead to frequent video freezes and/or corruptions. The overhead of FEC schemes under limited bandwidth conditions can be balanced by employing unequal error protection on the video. FEC schemes are complemented by retransmission (NACK) or RPSI, PLI feedback mechanisms to address FEC failure cases.

As video bitrates go higher and inter-working with WLAN becomes more prominent, the support for more advanced error robustness mechanisms become more important. In order to be technically competitive, e.g. to some proprietary systems, MTSI should have the capability to employ mechanisms that can offer different trade-offs between rendering delay, video rendering jitter (smoothness) and video quality that can adapt to varying channel conditions for better user experience.

No impact is expected in service requirements or architecture.

## 4 Objective

The work will be organized in two phases:

1. Study benefits and needs of additional error resiliency (ER) tools to improve the performance of the Multimedia Telephony Service for IMS under various channel conditions. In particular:
  - Study benefits of RFC 4585 AVPF RPSI feedback message support. Provide appropriate support for RPSI message in TS 26.114.
  - Study NACK based selective retransmission support with appropriate payload for retransmitted packets such as RFC 4588 Retransmission Payload Format. Provide support for selective retransmission in TS 26.114.
  - Study FEC block code support such as RFC 5109 RTP Payload for Generic Forward Error Correction or alternatives. Add basic FEC block code support for video in TS 26.114.
2. According to the results of the study, specify, if needed, additional and complementary error resiliency tools that can improve QoE.

Work related to the RPSI and FEC support will be aligned with IETF Payload, AVTEXT, RTCWEB WGs.

## 5 Service Aspects

The updates of the 3GPP specification will provide additional robustness improvements tools for MTSI video services.

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
TR 26.9xx	SA4			SA#68	SA#69

Spec No	CR Subject of the CR	Affected existing specifications [None in the case of Study Items]	
		Approved at plenary#	Comments
26.114	Guidelines and Requirements for Video Telephony Robustness Improvements Extensions	SA#69 (September 2015)	

## 11 Work item rapporteur(s)

Muhammed Coban, Qualcomm Incorporated, E-mail: [mcoban@qti.qualcomm.com](mailto:mcoban@qti.qualcomm.com)

## 12 Work item leadership

TSG SA WG4

## 13 Supporting Individual Members

Supporting IM name
Qualcomm Incorporated
Telecom Italia S.p.A.
Ericsson LM
Cisco Systems

660052	<a href="#">Acoustic Test methods and Performance Objectives for Speakerphone Performance in Noisy Environments</a>	ATeMPO_SPINE	1	S4	Dec-14	Dec-15	30%	SP-140740
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3GPP TSG SA WG4 Meeting #81  
Tenerife, Spain, November, 3<sup>rd</sup> – 7<sup>th</sup>, 2014

▪ S4-141407

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Source:	Qualcomm, Incorporated, HEAD acoustics GmbH, Sony Mobile Communications, Vodafone GmbH, Audience, Inc., ORANGE
Title:	New work item on Acoustic Test Methods and Performance Objectives for Speakerphone Performance in Noisy Environments (ATeMPO_SPINE)
Document for:	Approval
Agenda Item:	18

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

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### Title \* : Acoustic Test methods and Performance Objectives for Speakerphone Performance in Noisy Environments

Acronym \* : ATeMPO\_SPINE

Unique identifier \*

### 1 3GPP Work Area \*

	Radio Access
	Core Network
X	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<a href="#">Study Item (go to 2.1)</a>
X	<a href="#">Feature (go to 2.2)</a>
	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

**If no identified source of stage 2 information, justify: \***

Go to §3.

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

Test methods and requirements for objective speech quality in the presence of background noise have recently been finalized in 3GPP SA4. Current test methods and requirements in 3GPP TS 26.131/132 are limited to handset mode only. However, the receiving UE listening experience is equally impacted by the speech quality of the sending UE in other modes, including speakerphone.

Most MNOs currently have test methods and requirements in place for speakerphone mode noise suppression. Many of these test methods have been an adaptation of the current 3GPP handset test plan. Because 3GPP does not actually define a test setup for speakerphone noise suppression, the test plans have been inconsistent in the choice of suitable noise environments, proper calibration of the noise field at the UE hand-held hands-free position, definition of adequate test speech material, and performance targets. Recently, new background noise generation methods have been defined in ITU-T SG12 and ETSI STQ that may have enhanced noise rendering properties at the UE location. Those methods may prove useful in tackling some of the issues mentioned.

The lack of an industry standard on speakerphone testing leads to increased costs for OEMs in development, tuning and certification of UEs. For MNOs, inconsistent performance of devices is a concern. This work item aims to address those problems.

## 4 Objective \*

Develop a test method and performance objectives for objective speech quality in the presence of background noise for speakerphone operation. It is expected the following is defined as an outcome of the work:

- Appropriate test position(s).
- Adequate reproducibility and repeatability of results for the test position(s).
- Noise scenarios and speech signals that are representative of speakerphone usage.
- Appropriate performance objectives.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X	X	
Don't know					X

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp WG(s)	Presented for information at plenary#	Approved at plenary#
Affected existing specifications * [None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments
26.131		Terminal acoustic characteristics for telephony; Requirements	SA#68		
26.132		Speech and video telephony terminal acoustic test specification	SA#68		

## 11 Work item rapporteur(s) \*

Andre Schevciw, Qualcomm Incorporated, E-mail: aschevci@qti.qualcomm.com

Scott Isabelle, Audience, Inc., E-mail: sisabelle@audience.com

## 12 Work item leadership \*

TSG SA WG 4

## 13 Supporting Individual Members \*

Supporting IM name
Qualcomm, Incorporated
HEAD Acoustics, GmbH
Sony Mobile Communications
Vodafone, GmbH
Audience, Inc.
ORANGE

## Rel-13 Operations, Administration, Maintenance and Provisioning (OAM&P)

630010	<b>Rel-13 Operations, Administration, Maintenance and Provisioning (OAM&amp;P)</b>	OAM13	1	S5	Jun-12	Mar-16	67%	SP-150305
560132	<b>Enhanced Network Management (NM) centralized Coverage and Capacity Optimization</b>	SON-NM-CCO	2	S5	Sep-14	Dec-15	60%	SP-140060
560034	<b>Compliance of 3GPP SA5 specifications to the NGMN Top Operational Efficiency (OPE) Recommendations</b>	OAM-NGMN_OPE	2	S5	Jun-12	Mar-15	70%	SP-140538
560134	TR on Compliance of 3GPP SA5 specifications to the NGMN Top Operational Efficiency (OPE) Recommendations	OAM-NGMN_OPE	3	S5	Jun-12	Mar-15	90%	SP-140538
560234	TS work on Compliance of 3GPP SA5 specifications to the NGMN Top Operational Efficiency (OPE) Recommendations	OAM-NGMN_OPE	3	S5	Jun-12	Mar-15	50%	SP-140538
560235	<b>Converged management Performance Management Interface Definitions</b>	OAM-PMID	2	S5	Jun-12	Dec-15	80%	SP-140613
560036	<b>WLAN Management</b>	WLAN-OAM	2	S5	Jun-12	Jun-15	70%	SP-140535
560136	WLAN Network Resource Model for Type-2 interface	WLAN-OAM-SA5	3	S5	Jun-12	Jun-15	80%	SP-140535
560236	WLAN measurements defined in IEEE and IETF WLAN performance measurements for use on Type-2 interface	WLAN-OAM-SA5ietf	3	S5	Jun-12	Jun-15	60%	SP-140535
600044	<b>Energy Efficiency related Performance Measurements</b>	OAM-PM_EE	2	S5	Jun-13	Jun-15	50%	SP-140612
660055	<b>Multi-Broadcast Single Frequency Network (MBSFN) Minimization of Drive Tests (MDT) enhancement</b>	MBSFN-MDT	2	S5	Dec-14	Dec-14	100%	SP-140786
680035	<b>Management of mobile networks that include virtualized network functions</b>	MAMO_VNF	2	S5	Jun-15	Mar-16	20%	SP-150362
680036	Management concept, architecture and requirements for mobile networks that include virtualized network functions	MCAR_MAMO_VNF	3	S5	Jun-15	Mar-16	20%	SP-150363

## 3GPP TSG SA Meeting #68

**SP-150305**

**Malmö, Sweden, 17-19 June 2015**

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**Source:** TSG SA WG5

**Title:** Revised WID Energy Efficiency related Performance Measurements

**Document for:** Approval

**Agenda Item:** 13.40

## 3GPP TSG SA WG5 (Telecom Management) Meeting #101

**S5-153347**

**Ljubljana, Slovenia, 25-29 May 2015**

*Revision of S5-153232*

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**Source:** Orange

**Title:** Proposal for revised WID Energy Efficiency related Performance Measurements

**Document for:** Discussion and Decision

**Agenda Item:** 6.4.3

# 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

Title \* : Energy Efficiency related Performance Measurements

Acronym \* : OAM-PM\_EE

Unique identifier \* 600044

## 1 3GPP Work Area \*

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
630010	Rel-13 Operations, Administration, Maintenance and Provisioning (OAM&P)	SA5 umbrella Feature

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

Parent Building Block		
Unique ID	Title	TS

### 3 Justification \*

3GPP SA5 has been requested by ETSI TC EE to identify and define the energy efficiency related performance measurements for E-UTRAN, several liaisons (see [S5-121991](#), [S5-121678](#), [S5-122600](#), [S5-130060](#), [S5-130061](#), [S5-130355](#)) have been made on this matter between 3GPP SA5, SA, RAN2 and ETSI TC EE.

A joint conference between 3GPP SA5 and ETSI TC EE was made at March.13 2013; the minutes were documented in [S5-130468](#).

By the discussions mentioned above, the 3GPP proposed procedure for cooperation on this matter as following was agreed:

**Step 1: ETSI EE defines use cases, requirements and global KPIs to measure energy efficiency.**

**Step 2: 3GPP TSG RAN WG 2 crosschecks which of the current L2 measurements/KPIs can be used to fulfil the requirements or which new definitions are needed. 3GPP TS 36.314 may be extended, if missing L2 measurements are the only way to fulfil the requirements.**

**Step 3: Based on steps 1 and 2 SA5 provides the necessary additions to 3GPP TS 32.425.**

Since GERAN and UTRAN are also included in ETSI TC EE scope, they have to be also addressed by the present work item.

This work item is concentrated to cooperate with ETSI TC EE, 3GPP RAN2, 3GPP GERAN and other 3GPP WGs if needed, on energy efficiency related performance measurements for GERAN, UTRAN and E-UTRAN based on the agreed procedure.

In case of shared RAN, cooperation with 3GPP RAN WG2 and 3GPP GERAN is needed to check if energy efficiency related performance measurements can be made available per participating operator.

### 4 Objective \*

For the use cases, requirements and/or global KPIs provided by ETSI TC EE related to energy efficiency, by cooperation with 3GPP RAN2 and if needed with other 3GPP WGs, to

- identify whether or not the existing performance measurements and/or MDT data can be reused to support these needs;
- define the new performance measurements if needed;
- introduce the relevant L2 performance measurements if any newly defined by RAN2 to SA5 specification;
- reply to ETSI TC EE with the outcome of work listed above in a formal approach.

Note: the works mentioned above shall be based only on formal requests (e.g. by LS) from ETSI TC EE.

### 5 Service Aspects

No impact

### 6 MMI-Aspects

No impact

## 7 Charging Aspects

## 8 Security Aspects

No impact

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X		
No	X	X		X	
Don't know					X

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
Affected existing specifications * [None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments
32.425		Energy efficiency related measurements for E-UTRAN		SA#70 Dec 2015	
32.405		Energy efficiency related measurements for UTRAN		SA#70 Dec 2015	
52.402		Energy efficiency related measurements for GERAN		SA#70 Dec 2015	

## 11 Work item rapporteur(s) \*

Yizhi Yao (Yizhi.Yao@nokia.com), Nokia Networks

## 12 Work item leadership \*

SA5

## 13 Supporting Individual Members \*

Supporting IM name
Nokia Networks
<a href="#">TELECOM ITALIA</a>
China Mobile
Alcatel-Lucent
Vodafone
<a href="#">ORANGE</a>
<a href="#">Deutsche Telekom</a>
ZTE
NEC

Fukuoka, Japan, 05-07 March 2014

<b>Title:</b>	<b>Revised WID SP-130045 on Enhanced Network Management (NM) centralized Coverage and Capacity Optimization</b>
<b>Source:</b>	<b>SA WG5</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>15</b>

Split of Rel-12 SP-130045 WID (Enhanced NM Centralized Coverage and Capacity Optimization) into a Rel-12 Study and a Rel-13 Normative WI.

Vienna, Austria, 04 - 06 March, 2013

<b>Title:</b>	<b>Revised WID on Enhanced NM Centralised Coverage and Capacity Optimisation</b>
<b>Source:</b>	<b>SA WG5</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>12.37</b>

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

**Title \* : Enhanced Network Management (NM) centralized Coverage and Capacity Optimization**

**Acronym \* : SON-NM-CCO**

**Unique identifier \*560132**

### 1 3GPP Work Area \*

X	Radio Access
	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
X	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any) *</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any) *</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2 \*

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS
6301xy	To be created BB Rel-13 Self-Organizing Networks (SON) - OAM aspects	
6300xy	Under the to be created Feature Rel-13 Operations, Administration, Maintenance and Provisioning (OAM&P)	

## 3 Justification \*

Rel-12 TR 32.836 has studied how the NM centralized CCO function should be enhanced and has recommended required (potentially new) UE and network-based measurements for an NM centralized CCO function.

Specification 3GPP TS 32.522 defines the architecture for distributed and NM centralized Coverage and Capacity Optimization (CCO) function but it does not specify a solution, or a description of the NM centralized CCO. At the same time, an NM centralized CCO function has some enablers defined in the 3GPP standard (e.g., MDT, PM data collection) but it is unclear whether these are sufficient for a complete solution. The MDT data collection function includes some measurements which can be useful for CCO purposes but it is not complete and may require enhancements, e.g., in terms of correlation or anonymization of information.

These enhancements had been identified in the study Rel-12 TR 32.836

For an NM centralized CCO solution to work, there need to be standard support in terms of information collection from the network (e.g., measurements).

The current 3GPP specification describes collection methods as part of the MDT functionality in the trace specifications, configuration methods as defined in the NRM specifications, and traditional PM measurements which are defined in the Performance Measurement specifications. Currently there is no description in a single place, which would explain what needs to be supported for a working NM centralized CCO.

Use cases are identified in the Study on Enhanced Network Management (NM) centralized Coverage and Capacity Optimization.

For UE measurements that do not currently exist, co-operation with RAN2 is needed.

There is a need to recommend the required (potentially new) UE and network-based measurements for an NM centralized CCO function.

For UE measurements that do not currently exist, co-operation with RAN2 might be needed.

An NM centralized CCO function needs to collect different types of information about the actual network conditions with sufficient details in order to execute the optimization in a correct way. Parts of this information are already delivered in some forms over Itf-N, while others are being just specified in the standard (e.g., delivering location information) and yet others may be missing from the standard. Therefore, there is a need to identify the list of measurements and information that shall be made available over Itf-N for the NM centralized CCO function. Some of the required information might need to be specified by other 3GPP working groups (e.g. RAN2 on location information).

The collection mechanism needs to fulfil certain requirements to ensure that an NM centralized SON function, e.g., a CCO function can be effectively built on top of it. Currently there are multiple collection mechanisms defined for collection of different types of data, which can be all relevant input sources for an NM centralized CCO function. For example, today, MDT data and RLF data are reported separately by UE and collected in separate trace jobs, although both of them would be useful input for NM centralized CCO function. Independent collection mechanisms make correlation of different types of data difficult or impossible, which degrades the value of collected information for the CCO function. A solution is needed where different pieces of information connected to the occurrence of the same incident can be combined by the CCO function.

## 4 Objective \*

Based on the result of the study Rel-12 TR 32.836, specify potential new performance indicators, e.g. UE measurements and/or network measurements to be reported over Itf-N to support the NM centralized CCO function.

Performance Measurements for detecting coverage quality problems shall be specified based on identified physical layer measurements defined in TS 36.214.

## 5 Service Aspects

No impact.

## 6 MMI-Aspects

No impact.

## 7 Charging Aspects

No impact.

## 8 Security Aspects

No impact.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X		
No	X	X		X	
Don't know					X

## 10 Expected Output and Time scale \*

<b>New specifications *</b> [If Study Item, one TR is anticipated]					
Spec No	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
<b>Affected existing specifications *</b> [None in the case of Study Items]					
Spec No	CR	Subject		Approved at plenary#	Comments
28.627		Use cases and requirements for enhanced Coverage and Capacity Optimization	SA#68 Jun 2015		
28.628		Architecture and solution for enhanced Coverage and Capacity Optimization	SA#68 Jun 2015		
32.425		Measurements for CCO	SA#70 Jun 2015		
32.103		Integration Reference Point (IRP) overview and usage guide	SA#70 Jun 2015		
32.422		Add new NM centralised CCO information.	SA#70 Dec 2015		
32.442		Add new NM centralised CCO request information.	SA#70 Dec 2015		

## 11 Work item rapporteur(s) \*

Robert Petersen, Ericsson

## 12 Work item leadership \*

SA5

## 13 Supporting Individual Members \*

Supporting IM name
Ericsson
China Mobile
Qualcomm
Orange
AT&T
NSN
Intel
Deutsche Telekom

3GPP TSG SA Meeting #65

TD SP-140538

Edinburgh, Scotland, 15-17 September, 2014

Agenda item: 12.50

3GPP TSG-SA5 (Telecom Management) Meeting#96

S5-144492

18-22 August 2014, Sophia Antipolis, France

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Source: Christian Toche, Huawei

Title: Revised WID for Compliance of 3GPP SA5 specifications to the NGMN Top Operational Efficiency (OPE) Recommendations

Document for: Approval

Agenda Item: 7.1

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

Title \* : Compliance of 3GPP SA5 specifications to the NGMN Top Operational Efficiency (OPE) Recommendations

Acronym \* : OAM-NGMN\_OPE

Unique identifier \* 560034

## 1 3GPP Work Area \*

X	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
630010	Rel-13 Operations, Administration, Maintenance and Provisioning (OAM&P)	

This work item is ... \*

X	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks
NGMN	NGMN Top OPE Recommendations 1.0	<a href="http://www.ngmn.org/uploads/media/NGMN_Top_OPE_Recommendations_1.0.pdf">http://www.ngmn.org/uploads/media/NGMN_Top_OPE_Recommendations_1.0.pdf</a>

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

Parent Building Block		
Unique ID	Title	TS

### 3 Justification \*

It is required to ensure that the operators' recommendations expressed in NGMN Top OPE Recommendations are already taken into account or will be incorporated into SA5 specifications.

For this purpose, it is needed to provide a detailed compliance statement of SA5 specifications against NGMN Top OPE Recommendations.

The results of the detailed gap analysis performed by SA5 should be recorded in the TR 32.838. It is also needed to track the work already done and the work remaining to be done.

The clear identification of the work remaining to be done may lead to the creation of new WIs or new CRs.

### 4 Objective \*

The objectives of this WI are:

- Record the detailed gap analysis already performed by 3GPP SA5
- Identify for each requirement the work already done by 3GPP SA5 (WIs, CRs, etc)
- Discuss and agree on the work remaining to be done by 3GPP SA5, and produce new WIs or CRs as needed
- Identify the requirements – if any- which cannot be satisfied e.g. out of scope of 3GPP SA5 specifications
- Provide a final compliance statement of 3GPP SA5 specifications against NGMN Top OPE Recommendations.

The scope of the compliance statement is NGMN Top OPE Recommendations 1.0:

- 1 - Quality and Quantity of Alarms
- 2 - Automatic Software Management
- 3 - Energy Saving
- 4 - Self Organizing Networks
- 5 - Performance Management Enhancements
- 6 - Enhancement of Trace Functionality
- 7 - eNodeB Plug & Play - Self Commissioning
- 8 - OSS Standard Ift-N
- 9 - OSS Tool Support for Optimization & Operation
- 10 - Automatic Inventory

### 5 Service Aspects

No impact.

### 6 MMI-Aspects

No impact.

### 7 Charging Aspects

No impact.

### 8 Security Aspects

No impact.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			X
Don't know					

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR 32.838	Gap analysis between 3GPP SA5 specifications and NGMN Top Operational Efficiency (OPE) Recommendations	SA5		SA#64 Jun-2014	SA#67 Mar-2015	The TR may lead to creation of WIs if needed in order to address NGMN requirements
Affected existing specifications * [None in the case of Study Items]						
Spec No.	CR	Subject		Approved at plenary#	Comments	
32.111-1		Quality and Quantity of Alarms		SA#67 Mar-2015		
32.111-2		Quality and Quantity of Alarms		SA#67 Mar-2015		
32.111-6		Quality and Quantity of Alarms		SA#67 Mar-2015		
32.531		Automatic Software Management		SA#67 Mar-2015		
32.532		Automatic Software Management		SA#67 Mar-2015		
32.536		Automatic Software Management		SA#67 Mar-2015		
32.551		Energy Saving		SA#67 Mar-2015		
32.762		Energy Saving		SA#67 Mar-2015		
32.500		Self Organizing Networks		SA#67 Mar-2015		
32.521		Energy Saving & Self Organizing Networks & OSS Tool Support for Optimization & Operation		SA#67 Mar-2015		
32.522		Energy Saving & Self Organizing Networks & OSS Tool Support for Optimization & Operation		SA#67 Mar-2015		
32.526		Energy Saving & Self Organizing Networks & OSS Tool Support for Optimization & Operation		SA#67 Mar-2015		
32.401		Performance Management Enhancements		SA#67 Mar-2015		
32.411		Performance Management Enhancements		SA#67 Mar-2015		
32.412		Performance Management Enhancements		SA#67 Mar-2015		
32.431		Performance Management Enhancements		SA#67 Mar-2015		
32.432		Performance Management Enhancements		SA#67 Mar-2015		
32.436		Performance Management Enhancements		SA#67 Mar-2015		
32.421		Enhancement of Trace Functionality		SA#67 Mar-2015		
32.422		Enhancement of Trace Functionality		SA#67 Mar-2015		
32.423		Enhancement of Trace Functionality		SA#67 Mar-2015		
32.441		Enhancement of Trace Functionality		SA#67 Mar-2015		
32.442		Enhancement of Trace Functionality		SA#67 Mar-2015		
32.446		Enhancement of Trace Functionality		SA#67 Mar-2015		
32.501		eNodeB Plug & Play - Self Commissioning		SA#67 Mar-2015		
32.502		eNodeB Plug & Play - Self Commissioning		SA#67 Mar-2015		
32.506		eNodeB Plug & Play - Self Commissioning		SA#67 Mar-2015		
32.101		OSS Standard Itf-N		SA#67 Mar-2015		
32.102		OSS Standard Itf-N		SA#67 Mar-2015		
32.103		OSS Standard Itf-N		SA#67 Mar-2015		
32.15x		OSS Standard Itf-N		SA#67 Mar-2015		
32.691		Automatic Inventory		SA#67 Mar-2015		
32.692		Automatic Inventory		SA#67 Mar-2015		
32.696		Automatic Inventory		SA#67 Mar-2015		

## 11 Work item rapporteur(s) \*

Huawei Technologies Christian Toche (christian.toche@huawei.com)

## 12 Work item leadership \*

SA5

## 13 Supporting Individual Members \*

Supporting IM name
Huawei Technologies
Nokia Networks
Orange
Deutsche Telekom
China Mobile
Alcatel-Lucent
TeliaSonera
Telecom Italia
ZTE
Ericsson
NEC

3GPP TSG SA Meeting #65

TD SP-140613

Edinburgh, Scotland, 15-17 September, 2014

Agenda item: 12.50

3GPP TSG-SA5 (Telecom Management) Meeting#96

S5-144493

18-22 August 2014, Sophia Antipolis, France

Source: Christian Toche, Huawei

Title: Revised WID "Converged Management PM Interface Definitions"

Document for: Approval

Agenda Item: 7.3.2

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

Title \* : Converged Management PM Interface Definitions

Acronym \* : OAM-PMID

Unique identifier \* 560235

## 1 3GPP Work Area \*

X	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
630010	Rel-13 Operations, Administration, Maintenance and Provisioning (OAM&P)	SA5 umbrella Feature

This work item is ... \*

X	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

##### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

**If no identified source of stage 1 information, justify: \***

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

**If no identified source of stage 2 information, justify: \***

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

Performance Management (PM) is a key functionality that provides the operator with visibility into how its network is performing. Performance measurements and Key Performance Indicators (KPIs) are critical inputs into optimization of networks.

Accurate and a rich set of measurements and KPIs delivered in a timely manner is essential for trouble shooting purposes and enable support for automatic identification of network problems and automatic error correction and optimization of the network.

To that effect, there is a need to provide consistent measurements and KPIs for all elements in a converged network and to define common PM interface solutions (stage 2) to collect these measurements.

## 4 Objective \*

The work item will address (in that priority order):

1. Requirements, Service Level Agreement (SLA), business objectives to be worked in interaction with NGCOR project,
2. Measurement & KPI definition template,
3. Measurement file format,
4. Measurement file reporting interface (will be addressed depending on the progress of the Multi-SDO Joint Working Group),
5. Measurement job & threshold administration (will be addressed depending on the progress of the Multi-SDO Joint Working Group).

This work will be based on:

- Potential NGCOR phase 2 requirements inputs (early cross-interactions suggested),
- NGMN Top OPE Recommendations 1.0,
- Rel-10 TR 32.831 Study on Alignment of 3GPP PM IRP and TMF Interface Program (TIP) PM,Solutions from 3GPP & TMF.

Note that performance measurement types, definition of measurements and KPIs are very specific to different domains and are being defined for each network element by groups/SDOs that are most knowledgeable in that area.

Enhancement of KPIs and clear, rich definition of measurements in a manner that is consistent and valid in the domain and cross domain based on various converged management scenarios will need further consideration but is not part of this work item.

## 5 Service Aspects

No impact.

## 6 MMI-Aspects

No impact.

## 7 Charging Aspects

No impact.

## 8 Security Aspects

No impact.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			X
Don't know					

## 10 Expected Output and Time scale \*

## Work item rapporteur(s) \*

Huawei Christian Toche (christian.toche@huawei.com)

## 12 Work item leadership \*

SA5

## 13 Supporting Individual Members \*

	Supporting IM name
Alcatel-Lucent	
China Mobile	
Deutsche Telekom	
Ericsson	
Huawei	
Nokia Networks	
Orange	
Vodafone	
ZTE	

3GPP TSG SA Meeting #65

**TD SP-140535**

**Edinburgh, Scotland, 15-17 September, 2014**

## **Agenda item: 12.50**

3GPP TSG SA WG5 (Telecom Management) Meeting #96

**18-22 August 2014; Sophia Antipolis, France**

S5-144488

Source: Intel

## Title: Revised WID on WLAN Management

## **Document for: Approval**

## **Agenda Item: 6.8.1 – TR on WLAN impacts to Type-2 management (560036)**

3GPP TSG SA Meeting #59

TD SP-130042

**Vienna, Austria, 04 - 06 March, 2013**

## Title: Revised WID on WLAN Management

Source: SA WG5

**Document for:** Approval  
**Agenda Item:** 12.37

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

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**Title \* :** WLAN Management

**Acronym \* :** WLAN-OAM

**Unique identifier \* :** 560336

### 1 3GPP Work Area \*

X	Radio Access
-	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
630010	Rel-13 Operations, Administration, Maintenance and Provisioning (OAM&P)	SA5 umbrella Feature

This work item is ... \*

X	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1        Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2        Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3        Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4        Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

To enable WLAN playing a role as a complement to cellular technology, the performance of WLAN needs to be known by cellular operators. However, WLAN performance data is not available in 3GPP network management systems, since cellular networks and WLAN are currently managed by two independent OAM systems.

This WI is intended to define the resource model for fault and performance monitoring and specify/capture existing WLAN measurements defined in IEEE and IETF WLAN performance measurements for use on Type-2 interface to the 3GPP Network Manager. It is the intention that the performance measurements, such as traffic load, Quality of Service (e.g. packet throughput, etc), resource availability (e.g. the recording of begin and end times of service unavailability) are to be defined. The Type-1 interface to WLAN NE (i.e. Access Point) is not impacted by this WI, and it is expected that this WI will not modify WLAN MIBS (that are defined in IEEE std 802.11) or will not specify alternatives of WLAN MIBs. This WI will rely on information defined by WLAN MIBs.

It is expected that operator can monitor the WLAN as well as the E-UTRAN/UTRAN/GERAN performance data. The WLAN performance data can also be used in network planning.

## 4 Objective \*

3GPP SA5 has studied the impacts on Type-2 interface in supporting WLAN that is documented in TR 32.841 "Study on WLAN management".

This work item is to accomplish the following objectives, by taking into account the outcome of WLAN management study in TR 32.841 :

1. Specify the WLAN Network Resource Model for Type-2 interface (that is intended to support fault and performance monitoring only)
2. Specify/capture existing WLAN measurements defined in IEEE and IETF WLAN performance measurements for use on Type-2 interface (this is not intended for SA5 to define new WLAN performance measurements)

## 5 Service Aspects

N/A

## 6 MMI-Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

N/A

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes					X
No	X	X	X	X	
Don't know					

## 10 Expected Output and Time scale \*

Spec No.	Title	Prim rsp. WG	Secondary rsp. WG(s)	New specifications *		Comments
				Presented for information at plenary#	Approved at plenary#	
TS 28.680	WLAN Requirements	SA5		SA#67 Mar 2015	SA#68 Jun 2015	Specify the WLAN Network Resource Model for Type-2 interface (that is intended to support fault and performance monitoring only)
TS 28.682	WLAN NRM; Information Service (IS)	SA5		SA#67 Mar 2015	SA#68 Jun 2015	
TS 28.403	Performance Management; performance measurements for WLAN;	SA5		SA#67 Mar 2015	SA#68 Jun 2015	Specify/capture existing WLAN measurements defined in IEEE and IETF WLAN performance measurements for use on Type-2 interface (this is not intended for SA5 to define new WLAN performance measurements)

## 11 Work item rapporteur(s) \*

Intel (Joey Chou, [joey.chou@intel.com](mailto:joey.chou@intel.com))

## 12 Work item leadership \*

SA5

## 13 Supporting Individual Members \*

Supporting IM name
Intel
Nokia Networks
Ericsson
Juniper

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Source: Nokia Networks  
Title: Revised WID Energy Efficiency related Performance Measurements (OAM-PM\_EE)  
Document for: Approval  
Agenda Item: 6.5.2

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

Title \* : Energy Efficiency related Performance Measurements

Acronym \* : OAM-PM\_EE

Unique identifier \* 600044

### 1 3GPP Work Area \*

X	Radio Access
	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		TS
Unique ID	Title	TS
630010	Rel-13 Operations, Administration, Maintenance and Provisioning (OAM&P)	SA5 umbrella Feature

This work item is ... \*

<b>Stage 1 (go to 2.3.1)</b>
<b>Stage 2 (go to 2.3.2)</b>
<b>Stage 3 (go to 2.3.3)</b>
<b>Test spec (go to 2.3.4)</b>
<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

3GPP SA5 has been requested by ETSI TC EE to identify and define the energy efficiency related performance measurements for E-UTRAN, several liaisons (see [S5-121991](#), [S5-121678](#), [S5-122600](#), [S5-130060](#), [S5-130061](#), [S5-130355](#)) have been made on this matter between 3GPP SA5, SA, RAN2 and ETSI TC EE.

A joint conference between 3GPP SA5 and ETSI TC EE was made at March.13 2013; the minutes were documented in [S5-130468](#).

By the discussions mentioned above, the 3GPP proposed procedure for cooperation on this matter as following was agreed:

**Step 1: ETSI EE defines use cases, requirements and global KPIs to measure energy efficiency.**

**Step 2: 3GPP TSG RAN WG 2 crosschecks which of the current L2 measurements/KPIs can be used to fulfil the requirements or which new definitions are needed. 3GPP TS 36.314 may be extended, if missing L2 measurements are the only way to fulfil the requirements.**

**Step 3: Based on steps 1 and 2 SA5 provides the necessary additions to 3GPP TS 32.425.**

This work item is concentrated to cooperate with ETSI TC EE, 3GPP RAN2 and other 3GPP WGs if needed, on energy efficiency related performance measurements for E-UTRAN based on the agreed procedure.

## 4 Objective \*

For the use cases, requirements and/or global KPIs provided by ETSI TC EE related to energy efficiency, by cooperation with 3GPP RAN2 and if needed with other 3GPP WGs, to

- identify whether or not the existing performance measurements and/or MDT data can be reused to support these needs;
- define the new performance measurements if needed;
- introduce the relevant L2 performance measurements if any newly defined by RAN2 to SA5 specification;

- reply to ETSI TC EE with the outcome of work listed above in a formal approach.

Note: the works mentioned above shall be based only on formal requests (e.g. by LS) from ETSI TC EE.

## 5 Service Aspects

No impact

## 6 MMI-Aspects

No impact

## 7 Charging Aspects

## 8 Security Aspects

No impact

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X		
No	X	X		X	
Don't know					X

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp WG(s)	Presented for information at plenary#	Approved at plenary#
Affected existing specifications * [None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments
32.425		Energy efficiency related measurements for E-UTRAN		SA#68 Jun 2015	

## 11 Work item rapporteur(s) \*

Yizhi Yao ([Yizhi.yao@nsn.com](mailto:Yizhi.yao@nsn.com)), Nokia Networks

## 12 Work item leadership \*

SA5

## 13 Supporting Individual Members \*

Supporting IM name
Nokia Networks
<a href="#"><u>TELECOM ITALIA</u></a>
China Mobile
Alcatel-Lucent
Vodafone
<a href="#"><u>ORANGE</u></a>
<a href="#"><u>Deutsche Telekom</u></a>
ZTE
NEC

---

Title: New WID on Multi-Broadcast Single Frequency Network (MBSFN) Minimization of Drive Tests (MDT) enhancement

Agenda Item: 13.34

Source: SA5

3GPP SA5 Meeting #97  
Venice, Italy 20-24 October 2014

S5-145398

revision of S5-145396

---

Source: Alcatel-Lucent, Verizon Wireless  
Title: New WID on MBSFN MDT enhancements  
Document for: Approval  
Agenda Item: 6.2

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

## Title: Multi-Broadcast Single Frequency Network (MBSFN) Minimization of Drive Tests (MDT) enhancement

Acronym: MBSFN\_MDT

Unique identifier: abcdef

### 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
630010	Rel-13 Operations, Administration, Maintenance and Provisioning (OAM&P) OAM13	OAM13 is an umbrella Feature for changes that are not part of any other dedicated feature/WI

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
X	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of stage 1 requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 2 information		
TS or CR(S)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR
610024	Rel-12 Feature (R2,R1,R3,R4) Further MBMS operations support for E-UTRAN (MBMS_LTE_OS)		
610124	Rel-12 BB (R2,R1,R3,R4) Core part: Further MBMS operations support for E-UTRAN (MBMS_LTE_OS-Core)	SA5 has been requested to take into account work and agreements in the 3GPP RAN groups for collecting measurements for MBMS	RAN2 TS 37.320

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Signalling based MDT and management based MDT functionality needs to be enhanced to configure UEs for collecting Multi-Broadcast Single Frequency Network (MBSFN) measurements.

In LS on MBSFN MDT (S5-144096 / R2-142873) from RAN2, SA5 has been requested to take into account work and agreements in the 3GPP RAN groups for collecting measurements for MBMS.

In order to support this capability, enhancements have to be made to existing SA5 specifications for signalling and management based MDT.

## 4 Objective

This Work Item will address enhancing existing MDT functionality to support MBMS MDT.

The objective of the work will include support for triggering, configuring and collecting of signalling based Logged MDT and management based Logged MDT for MBSFN measurement in both RRC\_CONNECTED and RRC\_IDLE modes.

This work item will take into account all the conditions and measurements defined for MBSFN by RAN2 in TS 37.320.

## 5 Service Aspects

N/A

## 6 MMI-Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

N/A

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X		
No	X	X		X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

Affected existing specifications [None in the case of Study Items]			
Spec No	CR	Subject of the CR	Approved at plenary#
32.421		MBMS MDT requirements	SA#68, Jun-2015
32.422		MBMS MDT trigger and configuration management	SA#68, Jun-2015
32.423		MBMS Trace definition and management	SA#68, Jun-2015
32.441		MBMS MDT requirements	SA#68, Jun-2015
32.442		MBMS MDT IS support	SA#68, Jun-2015
32.446		MBMS MDT SS support	SA#68, Jun-2015

## 11 Work item rapporteur(s)

Padma Sudarsan (Alcatel-Lucent) - padma.sudarsan<AT>alcatel-lucent<DOT>com

## 12 Work item leadership

SA5

## 13 Supporting Individual Members

Supporting IM name
Alcatel-Lucent
Verizon Wireless
Deutsche Telekom
Vodafone
Huawei
Cisco
AT&T
Qualcomm

Malmö, Sweden, 17-19 June 2015

Source: TSG SA WG5

Title: New WID Management of mobile networks that include virtualized network functions

Document for: Approval

Agenda Item: 16

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

Title: Management of mobile networks that include virtualized network functions

Acronym: MAMO\_VNF

Unique identifier: 68xxxx

### 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
630010	Rel-13 Operations, Administration, Maintenance and Provisioning (OAM&P)	

This work item is ...

Stage 1 (go to 2.3.1)
Stage 2 (go to 2.3.2)
Stage 3 (go to 2.3.3)
Test spec (go to 2.3.4)
Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The output of the study on Network Management of Virtualized Networks in TR 32.842 has identified the use cases and requirements for the management of mobile networks that include VNFs. The following aspects that require future normative work were identified:

- Use cases and potential requirements for Fault Management (FM), Configuration Management (CM), Performance Management (PM), Lifecycle Management (LCM) functions.
- End to end management procedure flows to manage the mobile networks that include VNFs.
- Gap analysis between existing 3GPP management functions and management functions specified in ETSI ISG NFV.
- Management areas that need cooperation between SA5 and ETSI ISG NFV.

Normative solutions are needed for the management of mobile networks that include VNFs. The solutions need to consider the reuse and if needed the extension of the Management reference model and network management functions. In order to protect the operators' investments (e.g. reuse of operator planning tools) and ensure a smooth migration to virtualized network functions, it is recommended that the management of mobile networks that include VNFs to be compatible with the Management reference model and network management functions.

## 4 Objective

The objective of this building block is to provide solutions for the management of mobile networks that include VNFs which can be part of EPC or IMS.

The scope of this building block includes:

1. Concept, reference model and requirements for the management of mobile networks that include VNFs.
2. LCM for mobile networks that include VNFs.
3. CM for mobile networks that include VNFs.
4. FM for mobile networks that include VNFs.
5. PM for mobile networks that include VNFs.

6. Policy management for mobile networks that include VNFs.
7. Network Resource Model, alarms types and performance measurements for the management of mobile networks that include VNFs.

Item 1 will need to be addressed first as the other items have dependency on the progress of item 1.

SA5 work will be based on ETSI ISG NFV Group Specifications where applicable. SA5 will coordinate with ETSI ISG NFV as necessary.

If SA5 identifies issues in ETSI ISG NFV Group Specifications, SA5 should indicate that to ETSI ISG NFV.

## 5 Service Aspects

No impact.

## 6 MMI-Aspects

No impact.

## 7 Charging Aspects

No impact.

## 8 Security Aspects

No impact.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR	Subject of the CR	Approved at plenary#

Note: Expected output and time scale can be found in WTs under this BB.

## 11 Work item rapporteur(s)

China Mobile Jinglei Liu (liujinglei@chinamobile.com)

## 12 Work item leadership

SA5

## 13 Supporting Individual Members

Supporting IM name
China Mobile
Huawei Technologies
KDDI
Ericsson
Nokia Networks
Intel
ZTE
Deutsche Telekom
NTT DOCOMO
NEC
P.I. Works
Alcatel-Lucent
TeliaSonera
CATT

3GPP TSG SA Meeting #68

SP-150363

Malmö, Sweden, 17-19 June 2015

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Source: TSG SA WG5

Title: New WID Management concept, architecture and requirements for mobile networks that include virtualized network functions

Document for: Approval

Agenda Item: 16

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3GPP TSG|WG-5 Meeting #101

S5-153369

Ljubljana (Slovenia) 25-29 May 2015

revision of S5-153306

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Source: China Mobile, Huawei

Title: New WID Management concept, architecture and requirements for mobile networks that include virtualized network functions

Document for: Approval

Agenda Item: 6.2

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: Management concept, architecture and requirements for mobile networks that include virtualized network functions

Acronym: MCAR\_MAMO\_VNF

Unique identifier: 68xxxx

# 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
	Building Block (go to 2.3)
X	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

##### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS
68xxxx	Management of mobile networks that include virtualized network functions	

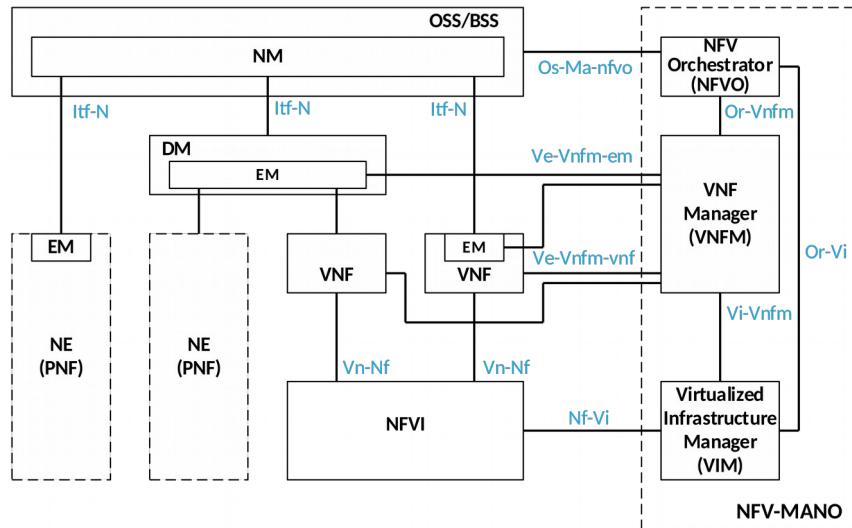
## 3 Justification

The output of Study on Network Management of Virtualized Networks in TR 32.842 has identified:

- The use cases and requirements for the management of mobile networks that include VNFs.

- The management concepts of mobile networks that include VNFs and the differences between traditional 3GPP management system and ETSI ISG NFV Group Specifications.
- The management architecture for mobile networks that include VNFs.
- Gaps between ETSI NFV specifications and 3GPP specifications.

The following diagram identified the management architecture for the mobile networks that include VNFs:



Based on the study, normative work is needed to continue to specify use cases, requirements, management concepts and management architecture for mobile networks that include VNFs. It will help figuring out the management requirements for the operators, clarifying the impacts of NFV architecture on the existing 3GPP management reference model.

## 4 Objective

The scope of this work task is to specify the management concepts, the NFV management requirements for operators and to provide the management architecture for mobile networks that include VNFs which can be part of EPC or IMS.

The objectives of the work task include:

- Specify network management concept for mobile networks that include VNFs
- Specify use cases and requirements for mobile networks that include VNFs
- Specify management architecture and reference model for mobile networks that include VNFs

SA5 work will be based on ETSI ISG NFV Group Specifications where applicable. SA5 will coordinate with ETSI ISG NFV as necessary.

If SA5 identifies issues in ETSI ISG NFV Group Specifications, SA5 should indicate that to ETSI ISG NFV.

## 5 Service Aspects

No impact.

## 6 MMI-Aspects

No impact.

## 7 Charging Aspects

No impact.

## 8 Security Aspects

No impact.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
28.xyz	Concept, architecture and requirements for mobile networks that include virtualized network functions	SA5		Dec.2015 SA#70	Mar.2016 SA#71	

Affected existing specifications [None in the case of Study Items]				
Spec No	CR	Subject of the CR	Approved at plenary	Comments
32.101		Network management concept and architecture for mobile networks that include VNFS	Mar.2016 SA#71	

## 11 Work item rapporteur(s)

China Mobile Jinglei Liu (liujinglei@chinamobile.com)

## 12 Work item leadership

SA5

## 13 Supporting Individual Members

Supporting IM name
China Mobile
Huawei Technologies
KDDI
Nokia Networks
Ericsson
ZTE
Intel
NTT DOCOMO
NEC
Alcatel-Lucent
CATT

## Rel-13 Charging

641000	<a href="#">Rel-13 Charging</a>	CH13	1	S5	Jun-14	Dec-15	72%	SP-150307
640059	<a href="#">Inter-PLMN PS domain online charging</a>	iPLMN-PS-OCH	2	S5	Jun-14	Dec-15	88%	SP-140324
640159	<a href="#">TR on Inter-PLMN PS domain online charging</a>	iPLMN-PS-OCH	3	S5	Jun-14	Jun-15	100%	SP-140324
640259	<a href="#">Specification of Inter-PLMN PS domain online charging</a>	iPLMN-PS-OCH	3	S5	Jun-14	Dec-15	80%	SP-140324
660056	<a href="#">ULI and release causes for charging enhancement for VoLTE</a>	ULRELC-CH	2	S5	Dec-14	Sep-15	40%	SP-140785
670025	<a href="#">Charging on enhancements for IMS Service Continuity</a>	CHeISC	2	S5	Mar-15	Sep-15	100%	SP-150055
680037	<a href="#">Announcements for IMS Online Charging</a>	ANIMO	2	S5	Jun-15	Dec-15	30%	SP-150307
680038	<a href="#">Enhanced S2a Mobility Over Trusted WLAN access to EPC - Charging</a>	eSaMOG-CH	2	S5	Jun-15	Sep-15	30%	SP-150344

## 3GPP TSG SA Meeting #68

**SP-150307**

**Malmö, Sweden, 17-19 June 2015**

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**Source:** [TSG SA WG5](#)

**Title:** [New WID Announcements for IMS Online Charging](#)

**Document for:** Approval

**Agenda Item:** 13.42

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## 3GPP TSG|WG-5 Meeting #100

**S5-152264**

**13-17 April 2015, Dubrovnik (Croatia)**

*revision of S5-152239*

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**Source:**

Amdocs

**Title:**

[New WID Announcements for IMS Online Charging](#)

**Document for:**

Approval

**Agenda Item:**

8.2 New Charging Work Item proposals

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** [Announcements for IMS Online Charging](#)

**Acronym:** ANIMO

**Unique identifier:**

## 1 3GPP Work Area

	<b>Radio Access</b>
X	<a href="#">Core Network</a>
X	<a href="#">Services</a>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
641000	Rel-13 Charging (CH13)	CH13 is an umbrella Feature for changes that are not part of any other dedicated feature/WI of the current release

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

##### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks
TS 32.240	5.2.2 Charging Data Transfer in Online Charging	

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

The stage 3 will be specified based on stage 2 charging specifications from this Work Item.

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

During any phase of an IMS voice or video call, Online Charging System may need to deliver billing/charging in-session notifications to the end user via announcements as part of rating, balance management and billing process. For example, OCS may need to inform the user about usage states, threshold crossings, offer statuses, reason for call rejection, alerts about low balances, etc.

In Circuit Switch domain, online charging of voice session is performed using CAMEL mechanisms. In order to deliver in-session notifications or to interact with the end user, OCS can use CAMEL messages such as: Play Announcement,

Prompt and Collect, Connect to Resource, Establish Temporary Connection. Such notifications can be delivered pre, mid or post-call. However, in IMS and MMTEL charging TS 32.260 and TS 32.275 as well as in DCCA RFC 4006, announcement capabilities, available at OCS level, are limited to redirection of a session to a given SIP URI at completion of the session. When redirected the session may be connected to a resource that delivers an announcement. The current Ro specification doesn't include announcement capabilities for pre and mid-session phases. In addition, no standard announcement information was defined for any phase of the multi-media session.

Hence, adding announcements events and related information as part of Ro session at all phases of a multi-media session will provide the ability to deliver charging/billing-related announcements to users in a standard way and will lead to parity with CS online charging announcements capabilities.

## 4 Objective

The objective of this work item is to start the normative work on announcement notification mechanisms and information in Ro interface.

Normative work will address the following aspects:

- 1- Announcements notification mechanism for pre, mid and post call phases
- 2- Common announcement information including: Life cycle notifications, usage notifications, call disconnection/rejection reasons, alerts etc.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

This is a charging WI.

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary	Comments

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
32.260		Introduce Announcement functionality and information over Ro reference point	SA#69 (September 15)	SA5 Responsibility (Stage 2)
32.275		Introduce Announcement information over Ro reference point	SA#69 (September 15)	SA5 Responsibility (Stage 2)
32.299		Corresponding AVPs definition	SA#70 (December 15)	SA5 Responsibility (Stage 3)

## 11 Work item rapporteur(s)

Amdocs, Naceur <dot> Lagha <at> Amdocs <dot> com

## 12 Work item leadership

SA5

## 13 Supporting Individual Members

Supporting IM name
Amdocs
Deutsche Telekom
Orange
Ericsson
Alcatel Lucent
Nokia Networks
Openet

---

**Sophia Antipolis, France, 16 - 18 June, 2014****Source:** SA WG5**Title:** New WID Inter-PLMN PS domain online charging**Presented for:** Approval**Agenda Item:** 15**3GPP TSG|WG-5 Meeting #94****Palm Beach, Aruba 24-28 March 2014****S5-140693**

revision of S5-140672

---

**Source:** Alcatel-Lucent**Title:** New Work Item on Inter-PLMN PS domain online charging**Document for:** Approval**Agenda Item:** 8.2

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Inter-PLMN PS domain online charging**Acronym:** iPLMN-PS-OCH**Unique identifier:**

### 1 3GPP Work Area

	<b>Radio Access</b>
X	<b>Core Network</b>
	<b>Services</b>

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
641000	Rel-13 Charging (CH13)	CH13 is an umbrella Feature for changes that are not part of any other dedicated feature/WI

This work item is ...

	Stage 1 (go to 2.3.1)
x	Stage 2 (go to 2.3.2)
x	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

**If no identified source of stage 2 information, justify:**

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

There are different scenarios where “Flow Based Online Charging” needs to be supported using a roaming interface, i.e. with the Gy reference point residing between the Online Charging System (OCS) in HPLMN and the PCEF in VPLMN.

This is the case in Roaming scenario with Local breakout (LBO) of IP traffic via the visited PLMN, and “Flow Based Online Charging” is required to be applied to this IP Traffic by the HPLMN. This configuration relies on Roaming LBO architecture in TS 23.401 3GPP Evolved Packet Core (EPC) and corresponding TS 23.203 Policy and Charging Control (PCC) architecture.

In Roaming conditions, this 3GPP roaming LBO scheme has been retained by GSMA for VoLTE and for all IMS services as soon as VoLTE is provided and an IMS Roaming Agreement is in place. For VoLTE, the adopted online charging model in roaming relies on IMS level control (i.e. duration based) only (i.e. Gy is not used). For other IMS services such as e.g. video over LTE and RCS, GSMA is considering the application of data/volume online charging control, using the Gy roaming interface.

Another scenario relates to the Convergent fixed-mobile Operator context: when 3GPP UE is roaming under a fixed broadband access owned by a Convergent fixed-mobile Operator (VPLMN), and online charging for the traffic offloaded over the WLAN access (Non Seamless WLAN Offload, i.e. NSWO) is performed through Gy from OCS in HPLMN.

The Gy Reference Point supporting “service data flows based online charging” and specified in TS 32.251 and TS 32.299, has not been studied in the particular context of roaming. Especially whether there are some gaps in the current description due to inter-PLMN situation (e.g. whether an OCS proxy is needed, whether some information is missing between HPLMN and VPLMN, whether the full set of features are required to be supported) have not been considered.

In addition, Application based charging makes use of Gyn Reference Point residing between the Online Charging System (OCS) in HPLMN and the Traffic Detection Function (TDF) in VPLMN. Gyn inter-PLMN situation has not been considered either.

## 4 Objective

Objective of this Work item is to study and specify Gy Reference Point “service data flows based online charging” for inter-PLMN situations. In particular, the following configurations will be addressed:

- Gy between OCS residing in HPLMN and PCEF located in PGW VPLMN, for Local Breakout Roaming configuration defined by TS 23.401 and TS 23.203;
- Gy between OCS residing in HPLMN and PCEF located in IP-Edge fixed broadband access owned by a Convergent fixed-mobile VPLMN, for Non Seamless WLAN Offload (NSWO) 3GPP UEs traffic.

The following aspects will be studied:

- Determine the set of information (e.g. Rating-group, service Id) needed to be available on both sides (HPLMN and VPLMN), and if not already specified as exchanged via other interfaces (e.g. S9), investigate by which means they can be exchanged (e.g. assumed as configured based of inter-Operator agreements);
- Inter-PLMN connection general aspects (e.g. OCS determination, Routing, Filtering, Topology hiding);
- whether inter-operator charging can be fulfilled with current description.
- Whether a “proxy OCS” is needed;
- Whether it would be beneficial to introduce a Dedicated Gy profile as a sub-set of Gy features in order to simplify IOT efforts between Operators. This Dedicated Gy profile is expected to be applicable for any data usage in roaming when the requested service is commonly identified on both sides. RCS services and Video over LTE as defined in GSMA could be used as starting point. Such dedicated Gy profile description would be achieved through call flows with clarification on selected online charging mechanisms.

The first phase of the study will address the objective described above, and when comes to the conclusion, move to normative work and second phase of the study.

This second phase of the study will address the inter-PLMN Gyn Reference Point for the support of Application based charging, and continue the normative work according to corresponding conclusion.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

This is a Charging Work item

## 8 Security Aspects

See reply LS S5-140255 received from SA3: “SA3 reviewed the PCC architecture with Gy/Gyn interface between OCS in HPLMN and PCEF/TDF in VPLMN, and confirms Network Domain Security (NDS)/IP Network Layer security specified in TS 33.210 is appropriate for securing interconnection between two Operators (i.e. different security Domains) for Diameter signalling (through use of IPsec Security Gateways (SEG))”.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1 <sup>st</sup> rsp. WG	2 <sup>nd</sup> rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
TR 32.8xy	Study on Inter-PLMN PS domain online charging	SA5		SA#66 (Dec 2014)	SA#68 (June 2015)	

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR	Subject of the CR	Approved at plenary#
32.251		Introduce Inter-PLMN PS domain online charging	SA#69 (Sept 2015)
32.299		Enhance Ro support of Inter-PLMN PS domain online charging	SA#70 (Dec 2015)

## 11 Work item rapporteur(s)

Alcatel-Lucent, Maryse <dot> Gardella <at> Alcatel-Lucent <dot> com

## 12 Work item leadership

SA5

## 13 Supporting Individual Members

Supporting IM name
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Allot Communications
Amdocs
China Mobile
Ericsson
NSN
Openet
Orange
Verizon Wireless
Vodafone

Maui, USA, 10-12 December 2014

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Title: New WID on ULI and release causes for charging enhancement for VoLTE

Agenda Item: 13.33

Source: SA5

3GPP TSG|WG-5 Meeting #98

S5-146227

San Francisco (US) 17-21 November 2014

revision of S5-146186

---

Source: Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, AT&T  
Title: New WID ULI and release causes for charging enhancement for VoLTE  
Document for: Approval  
Agenda Item: 8.2

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: ULI and release causes for charging enhancement for VoLTE

Acronym:

Unique identifier:

### 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
641000	Rel-13 Charging	

This work item is ...

	Stage 1 (go to 2.3.1)
X	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
480038	Stage 2 for Network-provided Location information for IMS (NETLOC)	SA2 Stage 2 TSs 23.203, 23.401, 23.228

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks
TS 23.203 CR#850 rev3		Reporting ULI, TimeZone and RAN/NAS cause from PCRF to AF on releases procedures (This SA2 REL-12 CR was approved by SA #62 in SP-130534 under WI code TEI12, NWK-PL2IMS. NWK-PL2IMS was a REL-11 WI.)
TS 23.401 CR#2623 rev5		Reporting ULI, TimeZone and RAN/NAS cause from MME to PGW and to PCRF on releases procedures (This SA2 REL-12 CR was approved by SA #62 in SP-130534 under WI code TEI12, NWK-PL2IMS. NWK-PL2IMS was a REL-11 WI.)

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Within 3GPP Rel-11 Network Provided Location Information (NPLI) for IMS (WI NWK-PL2IMS), a set of procedures were specified so the IMS services can be provided adequate location information from the network, in order to be used by Operators, in particular for charging purpose.

Different solutions were defined in Rel-11 for such NPLI to be available to AS in IMS: PCC-based solution invoked by P-CSCF during initial INVITE or in a subsequent SIP messages, location information provided from MSC server and HSS based retrieval from an AS. IMS offline and online charging were specified to introduce NPLI, however only the initial Network Provided User Location Information (ULI)/UE Time Zone were considered.

In addition to ULI/UE Time Zone obtention from AS on a per-need during an ongoing session, reporting to AS of the most up-to-date ULI/ UE Time Zone on PDN connection release, and/or bearer deactivation were introduced for Rel-12 (see SA2 CRs indicated under 2.3.3). EPC offline charging evolved in Rel-12 to incorporate such ULI/ UE Time Zone at the time of PDN connection release, however this has not been considered in IMS offline charging.

In order to meet Operator's requirements related to VoLTE to have similar behaviour as the existing Circuit Switched network, an additional enhancement was introduced in Rel-12 (see SA2 CRs indicated under 2.3.3): RAN/NAS release

causes availability to PGW, and IMS through PCC procedures, for charging purpose. These RAN/NAS causes are specified as part of TS 24.229 SIP Reason-header, which is already specified in IMS offline charging, but not in IMS online charging.

## 4 Objective

Objective of this work item is to specify:

- for IMS online and offline charging: introduction of subsequent ULI/UE Time Zone (s), including the one provided at the time of PDN connection release and/or bearer deactivation as enhancement of the initial Network Provided ULI/UE Time Zone specified in Rel-11. The (e)SRVCC transfers scenario will also be addressed.
- for EPC offline charging: include RAN/NAS release causes (received over GTP-C as specified in TS 29.274). It should be possible to further extend to other EPS protocol release causes.
- for IMS online charging: introduction of SIP Reason-header.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

This is a Charging Work Item

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary

Affected existing specifications [None in the case of Study Items]			
Spec Nd	CR	Subject of the CR	Approved at plenary#Comments
32.251	Introduce EPS protocol release causes	SA#68 (June 2015)	Packet Switched (PS) domain charging (Stage 2)
32.260	Introduce subsequent ULI/TZ	SA#68 (June 2015)	IMS domain charging (Stage 2)
32.299	Corresponding AVPs definition	SA#69 (Sept 2015)	Diameter Charging application (Stage 3)
32.298	Corresponding ASN.1 description	SA#69 (Sept 2015)	CDR parameter description (Stage 3)

## 11 Work item rapporteur(s)

Alcatel-Lucent, Maryse <dot> Gardella <at> Alcatel-Lucent <dot> com

## 12 Work item leadership

SA5

## 13 Supporting Individual Members

Supporting IM name
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
AT&T
Ericsson
Orange
ZTE
Vodafone

3GPP TSG SA Meeting #67

TD SP-150055

Shanghai, P. R. China, U.S.A, 11 - 13 March 2015

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Source: SA WG5

Title: New WID Charging on enhancements for IMS Service Continuity

Presented for: Approval

Agenda Item: 15

3GPP TSG|WG-5 Meeting #99

S5-151382

Taipei (Taiwan) 2-6 February 2015

revision of S5-151269

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Source: Nokia Networks

Title: Charging on enhancements for IMS Service Continuity

Document for: Approval

Agenda Item: 8.2

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: Charging on enhancements for IMS Service Continuity

Acronym: CHeISC

Unique identifier: 670025

## 1 3GPP Work Area

	Radio Access
x	Core Network
x	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
x	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
641000	Rel-13 Charging (CH13)	CH13 is an umbrella Feature for changes that are not part of any other dedicated feature/WI of the current release

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
x	<b>Stage 2 (go to 2.3.2)</b>
x	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

##### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS
410034	IMS Service Continuity Enhancements: Service, Policy and Interactions (IMSSCC-SPI)	23.237 IP Multimedia Subsystem (IMS) Service Continuity

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

In Rel-8, 3GPP TR 23.893, 'Feasibility Study on Multimedia Session Continuity', has studied the general problem of IMS-level multimedia session continuity, including potential enhancements to IMS specifications that can improve the multimedia session continuity experience. Results of the feasibility study in 3GPP TR 23.838 'IMS Service Continuity Enhancements: Service, Policy and Interactions' have been standardized in 3GPP TS 23.237, 'IMS Service Continuity'. Some features (e.g. Inter-UE transfer, Network-initiated Session Transfer) studied during feasibility study and standardized in Rel-9 in order to provide an efficient IMS-level service continuity.

3GPP TS 23.237 defines various access transfer procedures for IMS service continuity. These procedures may involve

- a single UE, when a session anchored at the SCC-AS/ATCF or selected media of the session is transferred between different access networks used by the particular UE, or
- more than one UE, when a session anchored at the SCC-AS or selected media of the session is transferred between two devices, called Inter-UE transfer.

3GPP TS 23.237 differentiates access transfers based on the type of the access networks, between which the access transfer is executed. With the introduction of Inter-UE transfer it is possible to transfer a session between two devices, each of which may use either PS or CS access domain.

As the SCC-AS/ATCF shall be able to provide a complete service continuity history, and the access domain may be relevant to charging, the SCC-AS/ATCF as specified in 3GPP TS 32.260 should be able to indicate any type of access transfer in IMS offline and online charging, including

- the access domain (PS or CS) prior and after the transfer, and
- whether Inter-UE transfer has occurred.

## 4 Objective

The main objectives are to provide Charging for IMS Service Continuity enhancements and solutions for mobility of media components of a session between different devices under the control of the same user (Inter-UE Transfer) with regards to the following aspects:

- complementing of access transfer information with
  - PS to PS and CS to CS access transfer types,
  - a separate indication of Inter-UE transfer;
- extending IMS online Charging with
  - a new trigger type for access transfer,
  - access transfer information;
- extending the charging interfaces of the SCC-AS/ATCF with ICID allocated for the new access leg.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

This is a Charging Work Item.

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR	Subject of the CR	Approved at plenary#
32.260	Refinements on Service Information used for IMS Charging	SA#69 (Sep 2015)	Charging management; IP Multimedia Subsystem (IMS) charging (Stage 2)
32.299	Corresponding AVP definition AVP coding and parameter description	SA#70 (Dec 2015)	Charging management; Diameter charging applications (Stage 3)
32.298	Corresponding ASN.1 description CDR coding and parameter description	SA#70 (Dec 2015)	Charging management; Charging Data Record (CDR) parameter description (Stage 3)

## 11 Work item rapporteur(s)

Nokia Networks, Gerald <dot> Goermer <at> nokia<dot> com

## 12 Work item leadership

SA5

## 13 Supporting Individual Members

Supporting IM name
Alcatel-Lucent
Amdocs
Nokia Networks
Openet
Orange
Vodafone
ZTE

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Malmö, Sweden, 17-19 June 2015

Source: TSG SA WG5

Title: New WID Announcements for IMS Online Charging

Document for: Approval

Agenda Item: 13.42

13-17 April 2015, Dubrovnik (Croatia)

*revision of S5-152239*

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Source:

Amdocs

Title:

New WID Announcements for IMS Online Charging

Document for:

Approval

Agenda Item:

8.2 New Charging Work Item proposals

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: Announcements for IMS Online Charging

Acronym: ANIMO

Unique identifier:

## 1 3GPP Work Area

	Radio Access
X	Core Network
X	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
641000	Rel-13 Charging (CH13)	CH13 is an umbrella Feature for changes that are not part of any other dedicated feature/WI of the current release

This work item is ...

	Stage 1 (go to 2.3.1)
X	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks
TS 32.240	5.2.2 Charging Data Transfer in Online Charging	

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

The stage 3 will be specified based on stage 2 charging specifications from this Work Item.

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

During any phase of an IMS voice or video call, Online Charging System may need to deliver billing/charging in-session notifications to the end user via announcements as part of rating, balance management and billing process. For example, OCS may need to inform the user about usage states, threshold crossings, offer statuses, reason for call rejection, alerts about low balances, etc.

In Circuit Switch domain, online charging of voice session is performed using CAMEL mechanisms. In order to deliver in-session notifications or to interact with the end user, OCS can use CAMEL messages such as: Play Announcement, Prompt and Collect, Connect to Resource, Establish Temporary Connection. Such notifications can be delivered pre, mid or post-call. However, in IMS and MMTEL charging TS 32.260 and TS 32.275 as well as in DCCA RFC 4006, announcement capabilities, available at OCS level, are limited to redirection of a session to a given SIP URI at completion of the session. When redirected the session may be connected to a resource that delivers an announcement. The current Ro specification doesn't include announcement capabilities for pre and mid-session phases. In addition, no standard announcement information was defined for any phase of the multi-media session.

Hence, adding announcements events and related information as part of Ro session at all phases of a multi-media session will provide the ability to deliver charging/billing-related announcements to users in a standard way and will lead to parity with CS online charging announcements capabilities.

## 4 Objective

The objective of this work item is to start the normative work on announcement notification mechanisms and information in Ro interface.

Normative work will address the following aspects:

- 3- Announcements notification mechanism for pre, mid and post call phases
- 4- Common announcement information including: Life cycle notifications, usage notifications, call disconnection/rejection reasons, alerts etc.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

This is a charging WI.

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary	Comments

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
32.260		Introduce Announcement functionality and information over Ro reference point	SA#69 (September 15)	SA5 Responsibility (Stage 2)
32.275		Introduce Announcement information over Ro reference point	SA#69 (September 15)	SA5 Responsibility (Stage 2)
32.299		Corresponding AVPs definition	SA#70 (December 15)	SA5 Responsibility (Stage 3)

## 11 Work item rapporteur(s)

Amdocs, Naceur <dot> Lagha <at> Amdocs <dot> com

## 12 Work item leadership

SA5

## 13 Supporting Individual Members

Supporting IM name
Amdocs
Deutsche Telekom
Orange
Ericsson
Alcatel Lucent
Nokia Networks
Openet

Source: TSG SA WG5

Title: New WID Enhanced S2a Mobility Over Trusted WLAN access to EPC - Charging

Document for: Approval

Agenda Item: 13.42

3GPP TSG SA WG5 (Telecom Management) Meeting #100

S5-152261

13-17 April 2015, Dubrovnik (Croatia)

revision of S5-152189

Source: Alcatel-Lucent, Alcatel-Lucent Shanghai Bell

Title: New WID Enhanced S2a Mobility Over Trusted WLAN access to EPC - Charging

Document for: Approval

Agenda Item: 8.2

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

Title: Enhanced S2a Mobility Over Trusted WLAN access to EPC - Charging

Acronym: eSaMOG-CH

Unique identifier:

### 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
641000	Rel-13 Charging	

This work item is ...

	Stage 1 (go to 2.3.1)
X	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks
TS 23.402	Clause 16: Architecture, Functional description and Procedures for GTP and PMIPv6 based S2a over Trusted WLAN Access	

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

#### If no identified source of stage 2 information, justify:

The stage 3 will be specified based on stage 2 charging specifications from this Work Item.

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The support of GTPv2 & PMIPv6 on S2a access to EPC through WLAN access, was introduced from Rel-11 in TS 23.402 and enhanced in Rel-12 in order to remove a set of limitations (limitations due to avoidance of impacts to the UE).

In the corresponding Architecture, the WLAN, which is considered as trusted by the operator is reflected as the Trusted WLAN Access Network (TWAN) encompassing the Trusted WLAN Access Gateway (TWAG), which is the function terminating S2a interface to the PDN GW.

When the TWAN is operated by a Mobile Operator (PLMN), the TWAG entity should be able to support offline charging towards this PLMN's OFCS, similarly as the ePDG pertaining to this PLMN for untrusted WLAN access. This is especially needed in roaming Home Routed scenario, for reconciliation between VPLMN and HPLMN.

## 4 Objective

Objective of this work item is to specify for the Trusted WLAN Access Gateway (TWAG) specified in TS 23.402:

- Offline charging from TWAG for traffic routed to the PDN GW over S2a, also considering handover between TWAN and 3GPP access.
- Offline Charging for Rf, Ga and Bp, with TWAG supporting Rf only.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

This is a Charging Work Item

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary

Affected existing specifications [None in the case of Study Items]			
Spec No	CR	Subject of the CR	Approved at plenary
32.240		Introduce TWAG	SA#69 (Sept 2015) Charging architecture and principles (Stage 2)
32.251		Introduce TWAG offline charging	SA#69 (Sept 2015) Packet Switched (PS) domain charging (Stage 2)
32.299		Corresponding AVPs definition	SA#70 (Dec 2015) Diameter Charging application (Stage 3)
32.298		Corresponding ASN.1 description	SA#70 (Dec 2015) CDR parameter description (Stage 3)

## 11 Work item rapporteur(s)

Alcatel-Lucent, Maryse <dot> Gardella <at> Alcatel-Lucent <dot> com

## 12 Work item leadership

SA5

## 13 Supporting Individual Members

Supporting IM name
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Orange
ZTE
Amdocs

Support of Real-time Transport Protocol (RTP) / Real-time Transport Control Protocol (RTCP) multiplexing (signalling) in IMS

610005	<b>Support of Real-time Transport Protocol (RTP) / Real-time Transport Control Protocol (RTCP) multiplexing (signalling) in IMS</b>	RTCP_M UX	1	C4, C1, C3	Sep-13	Dec-15	33%	CP-130436
610105	<b>CT4 part of Support of RTP / RTCP multiplexing (signalling) in IMS</b>	RTCP_M UX	2	C4	Sep-13	Dec-15	100%	CP-130436
610205	<b>CT1 part of Support of RTP / RTCP multiplexing (signalling) in IMS</b>	RTCP_M UX	2	C1	Sep-13	Dec-15	0%	CP-130436
610305	<b>CT3 part of Support of RTP / RTCP multiplexing (signalling) in IMS</b>	RTCP_M UX	2	C3	Sep-13	Dec-15	0%	CP-130436

**3GPP TSG CT Meeting #61**  
**Porto, Portugal; 4<sup>th</sup> – 6<sup>th</sup> September 2013**

**CP-130436**

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

### Title \* : **Support of RTP / RTCP transport multiplexing (signalling) in IMS**

Acronym \* : RTCP-MUX

Unique identifier \* : 610005

### 1 3GPP Work Area \*

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
	None	

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

Optimisations for NAT traversal (NAT-T) mechanism for the IMS media plane are provided by IETF RFC 5761 (Multiplexing RTP and RTCP).

RTP / RTCP transport multiplexing, - using a single IP transport (L4) port for RTP and RTCP packets -, enhances NAT traversal by minimizing the number of port bindings in NAT devices. More detailed information is provided in RFC 5761, which defines the capability to multiplex RTP and RTCP only a single port, and provides the following use case.

The Real-time Transport Protocol (RTP) [1] comprises two components: a data transfer protocol and an associated control protocol (RTCP). Historically, RTP and RTCP have been run on separate UDP ports. With increased use of Network Address Port Translation (NAPT) [14], this has become problematic, since maintaining multiple NAT bindings can be costly. It also complicates firewall administration, since multiple ports must be opened to allow RTP traffic. This memo discusses how the RTP and RTCP flows for a single media type can be run on a single port, to ease NAT traversal and simplify firewall administration, and considers when such multiplexing is appropriate. The multiplexing of several types of media (e.g., audio and video) onto a single port is not considered here (but see Section 5.2 of [1]).

Optimisations applicable for the NAT traversal architecture reference model in Figure G.1 of 3GPP TS 23.228 (i.e., the IMS-AGW with network side NAT-T support) will be provided:

The IMS-AGW, IMS ALG and UE are enhanced with an optional support of RTP / RTCP transport multiplexing in the media plane.

Existing media plane NAT-T support functions by the IMS-AGW (Iq interface, 3GPP TS 23.334 and TS 29.334):

1. Latching according ITU-T H.248.37;

2. Explicit RTCP port allocation according ITU-T H.248.57, using the RFC 3605 SDP attribute "a=rtcp" (note: NAT-T objective see clause 1/RFC 3605);
3. Not supported: ICE/STUN-based NAT-T (see 23.228, Annex G.2.2), which would demand for support of ITU-T H.248.50.

The work item aims to add

4. RTP / RTCP transport multiplexing (RFC 5761) as additional NAT-T optimisation.

Relation between the various NAT-T support functions:

- All four mechanisms relate to the traversal of L3/L4 NATs in the media plane, with following characteristics concerning media traffic:
  - o (1) is independent on transport protocol and application;
  - o (2, 4) are defined for RTP traffic;
  - o (3) is application agnostic, but provides L4 specific tools (UDP, TCP)
- RFC 3605 (2) relies on the capability of the UE to obtain the ports allocated by the NAT using mechanisms such as STUN and TURN (3)
- RTP / RTCP transport multiplexing (4) and latching (1): Latching requires that media successfully traverses the NAT device in direction from UE towards IMS-AGW, then the IMS-AGW may apply latching (note: see also latching deadlock detection, Appendix II/H.248.40).  
RTP / RTCP transport multiplexing may be applied together with latching.
- RTP / RTCP transport multiplexing (4) and explicit RTCP port allocation (2): RFC 5761 provides a further enhancement to RFC 3605 (see clause 4.2.2/RFC 6314). Both RFCs share the purpose of explicit port allocation for RTCP traffic, but *differ* concerning the specific port allocation rule.
- RTP / RTCP transport multiplexing (4) and ICE (3): RTP / RTCP transport multiplexing can be used as an optimisation of ICE (note: it allows to reduce the number of "address candidates" of ICE (3), leading to positive side effects of optimized communication establishment times besides enhanced NAT-T support).

Given that above RFC 5761 use case applies in current IMS environments, it seems appropriate to document explicitly the support for this optional capability.

The key component of signalling for this capability is an SDP attribute "a=rtcp-mux".

For the required H.248 extensions, associated work exists in ITU-T SG16:

The port allocation rules in 3GPP H.248 IMS gateways are following the framework of ITU-T H.248.57 (so called RTCP handling), which contains already the NAT-T driven port allocation rules with regards to (2). RTP / RTCP transport multiplexing (4) would add further port allocation rules, which are not yet documented by H.248.57.

Policy and Charging control would require enhancements to support IETF RFC 5761 (Multiplexing RTP and RTCP).

## 4 Objective \*

Enhance UE, IMS-ALG and IMS-AGW with an optional support of RTP / RTCP transport multiplexing according to RFC 5761 between UE and IMS-AGW in the IMS-ALG and IMS Access Gateway model according to Figure G.1 of 3GPP TS23.228. This includes:

1. Extending the SIP/SDP signalling with the "a=rtcp-mux" SDP attribute
2. Extensions of the Iq interface to configure RTP / RTCP transport multiplexing.

## 5 Service Aspects

None under this WID

## 6 MMI-Aspects

None under this WID

## 7 Charging Aspects

None under this WID

## 8 Security Aspects

None under this WID

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp WG(s)	Presented for information at plenary#	Approved at plenary#
Affected existing specifications * [None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments
24.229		Inclusion of RFC 5761 and a=rtcp-mux in SDP negotiation in UE and in IMS nodes.		CT#62 (December 2013)	CT1 responsibility
23.334		Inclusion of requirement and procedure for the rtcp-mux attribute received in the SDP negotiation and requesting the IMS-AGW to use the associated capability		CT#62 (December 2013)	CT4 responsibility
29.213		Potential PCC impacts.		CT#62 (Decermber 2013)	CT3 responsibility
29.214		Potential PCC impacts.		CT#62 (Decermber 2013)	CT3 responsibility
29.334		Inclusion of the rtcp-mux attribute when performing RTCP/RTP multiplexing on a single port		CT#62 (Decermber 2013)	CT4 responsibility

## 11 Work item rapporteur(s) \*

Albrecht Schwarz

Alcatel-Lucent (Albrecht.Schwarz@alcatel-lucent.com)

## 12 Work item leadership \*

CT4

### 13 Supporting Individual Members \*

Supporting IM name
Alcatel-Lucent
AT&T
TELECOM ITALIA S.p.A
Huawei



LTE in the 1670-1675 MHz Band for US (on hold till 12/2014)

550017	<a href="#">LTE in the 1670-1675 MHz Band for US (on hold till 12/2014)</a>	LTE_FDD_1670_US	1	R4, R2, R3	Mar-12	Jun-15	8%	RP-121397
550117	Core part: LTE in the 1670-1675 MHz Band for US (on hold till 12/2014)	LTE_FDD_1670_US-Core	2	R4, R2, R3	Aug-13	Mar-15	15%	RP-121397
550217	Perf. Part: LTE in the 1670-1675 MHz Band for US (on hold till 12/2014)	LTE_FDD_1670_US-Perf	2	R4	Mar-12	Jun-15	5%	RP-121397

**3GPP TSG RAN Meeting #57**  
**Chicago, USA, Sep. 4 - 7, 2012**

**RP-121397**

**Source** [LightSquared Inc.](#)

**Title:** [Revised WID for LTE in the 1670-1675MHz Band for the United States - Core](#)

**Agenda item:** [10.7.3.2](#)

**Document for:** [Approval](#)

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

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**Title \*: LTE in the 1670-1675MHz Band for the United States**

**Acronym \* : LTE\_FDD\_1670\_US-Core**

**Unique identifier \* 550117**

## 1 3GPP Work Area \*

x	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items \*

This work item is a ... \*

	<a href="#">Study Item (go to 2.1)</a>
	<a href="#">Feature (go to 2.2)</a>
x	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
550117		

This work item is ... \*

<b>Stage 1 (go to 2.3.1)</b>
<b>Stage 2 (go to 2.3.2)</b>
<b>Stage 3 (go to 2.3.3)</b>
<b>Test spec (go to 2.3.4)</b>
<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

#### 2.3.4 Test spec \*

Corresponding stage 3 work item		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS
TBD	LTE in the 1670-1675MHz Band for the United States	

## 3 Justification \*

See "feature WID"

## 4 Objective \*

The objectives of this work item are

- Define the specific RF requirements for the LTE DL band 1670-1675MHz paired with 5MHz UL from 1646.7 to 1651.7MHz to operate in North America.
- Add the performance requirements for this band combination in the relevant specifications.
- RAN5 testing aspects will be considered

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale \*

New specifications						
Spec No.	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
TR36.832	LTE in the 1670-1675MHz Band for the United States	R4		RAN #59 – Mar 2013	RAN #60 – Jun 2013	This TR will track the progress of the necessary work
Affected existing specifications						
Spec No.	CR	Subject			Approved at plenary#	Comments
25.101		UE Radio transmission and reception (FDD)			RAN#60	Core part
25.104		UTRA (BS) FDD; Radio transmission and reception			RAN#60	Core part
25.113		Base Station Electromagnetic compatibility			RAN#60	Core part
25.133		Requirements for Support of Radio Resource Management (FDD)			RAN#60	Core part
25.306		UE Radio Access capabilities			RAN#60	Core part
25.307		Requirements on UE supporting a release-independent frequency band			RAN#60	Core part
25.331		Radio Resource Control (RRC): Protocol specification			RAN#60	Core part
25.461		UTRAN Iuant interface: Layer 1			RAN#60	Core part
25.466		UTRAN Iuant interface: Application Part			RAN#60	Core part
34.124		EMC requirements for mobile terminals and ancillary equipment			RAN#60	Core part
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception			RAN#60	Core part
36.104		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception			RAN#60	Core part
36.113		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) and repeater ElectroMagnetic Compatibility (EMC)			RAN#60	Core part
36.124		Evolved Universal Terrestrial Radio Access (E-UTRA); Electromagnetic compatibility (EMC) requirements for mobile terminals and ancillary equipment			RAN#60	Core part
36.133		Requirements for Support of Radio Resource Management			RAN#60	Core part
36.307		E-UTRA; Requirements on User Equipments (UEs) supporting a release-independent frequency band			RAN#60	Core part

## 11 Work item rapporteur(s) \*

LightSquared, Masoud Olfat, PhD

([Masoud.Olfat@LightSquared.com](mailto:Masoud.Olfat@LightSquared.com))

## 12 Work item leadership \*

RAN4

## 13 Supporting Individual Members \*

Supporting IM name
LightSquared
Qualcomm
Alcatel-Lucent
Fujitsu
KT
AT&T Wireless

## Enhanced Signalling for Inter-eNB Coordinated Multi-Point (CoMP) for LTE

640019	<b>Enhanced Signalling for Inter-eNB Coordinated Multi-Point (CoMP) for LTE</b>	COMP_LT_E_leNB_sig	1	R3	Jun-14	Sep-15	90%	RP-141032
640119	Core part: Enhanced Signalling for Inter-eNB Coordinated Multi-Point (CoMP) for LTE	COMP_LT_E_leNB_sig-Core	2	R3	Jun-14	Sep-15	90%	RP-141032

**3GPP TSG RAN Meeting #64  
Sophia Antipolis, France, 10 - 13 June 2014**

**RP-141032**

---

<b>Source:</b>	<b>Samsung</b>
<b>Title:</b>	<b>New Work Item on Enhanced Signalling for Inter-eNB CoMP</b>
<b>Document for:</b>	<b>Discussion/Decision</b>
<b>Agenda Item:</b>	<b>14.1.3</b>

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Enhanced Signalling for Inter-eNB CoMP

**Acronym:** [ES\_ COMP\_LTE\_leNB]

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	

## 1 3GPP Work Area

X	<b>Radio Access</b>
	<b>Core Network</b>
	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

X	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
600015	Study on Coordinated Multi-Point (CoMP) operation for LTE with Non-Ideal Backhaul	TR 36.874

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The following signalling for support of inter-eNB CoMP was agreed to be included in Rel-12 and RAN3 is developing detailed specifications.

- One or more CoMP hypotheses, each comprising a hypothetical resource allocation associated with a cell ID, where the cell identified by the cell ID is not necessarily controlled by the receiving eNB
- A benefit metric associated with one or more CoMP hypothesis/es, quantifying the benefit that a cell of the sender node expects in its scheduling when the associated CoMP hypothesis/es is assumed
- RSRP measurement reports of one or more UEs

Need for additional signaling was discussed.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

RAN WG3 specifies the following signaling for enhanced support of inter-eNB CoMP taking into account limitations of existing X2 interface.

- Signaling of one or more sets of CSI information (RI, CQI) of a set of UEs
  - Signaling period

- Same as CoMP hypothesis for periodic exchange
- Mechanism to provide CSI reports upon request from an eNB should be made available.
- Per CSI process per subband per UE per cell (1 subband = 6 RBs)
- Enhanced RNTP signaling between eNBs
  - Information granularity of the Enhanced RNTP is extended to the frequency/time domain
    - Signaling periodicity: Event triggered (the same as the current RNTP)
    - Exchanged with the corresponding subframe index with common understanding of the subframe index among cells
    - Pattern assumed to be repeated after specified periodicity
  - Information in the Enhanced RNTP is (optionally multi-level) transmit power threshold for only the sender eNB
    - Necessary granularity of transmit power threshold and levels: same set as the current RNTP
  - Possible enhancement on existing Status report, which can be signaled between eNBs to exchange the usage status of the indicated frequency/time resources

## 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

## 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
 For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
 Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #64		Q3/2014										RAN	
#65		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf		
78	78	87	87	87	87	85	72	72	72	72	72		
						1TU							

RAN #65		Q4/2014										RAN	
#66		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R4RF Core	R4RD Core
78bis	78bis	87bis	87bis	87bis	87bis	85bis	72bis	72bis	72bis	79	79	88	88
					2TU							2TU	

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X		
No	X	X		X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.  
By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				Approved at plenary#	Comments
Spec No.	CR	Subject of the CR			
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2		RAN#66	
36.423		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 application protocol (X2AP)		RAN#66	

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.  
If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Won, Sung Hwan

**Company:** Samsung

**Email:** sunghwan.won@samsung.com

## 12 Work item leadership

Primary responsibility: RAN WG3

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Samsung
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
AT&T
China Telecom
China Unicom
CHTTL
CMCC
Deutsche Telekom
ETRI
KDDI
KT
LG Electronics
LG Uplus
NEC
New Postcom
NTT DOCOMO
Orange
Potevio
SK Telecom
Telefonica
Telecom Italia
T-Mobile USA
Verizon
ZTE

## 2GHz FDD LTE in Region 1 (1980-2010MHz and 2170-2200MHz Bands)

640036	<b>2GHz FDD LTE in Region 1 (1980-2010MHz and 2170-2200MHz Bands)</b>	LTE_1980 _2170_R EG1	1	R4	Jun-14	Dec-15	35%	RP-141710
640136	Core part: 2GHz FDD LTE in Region 1 (1980-2010MHz and 2170-2200MHz Bands)	LTE_1980 _2170_R EG1-Core	2	R4	Jun-14	Dec-15	70%	RP-150424
640236	Perf. Part: 2GHz FDD LTE in Region 1 (1980-2010MHz and 2170-2200MHz Bands)	LTE_1980 _2170_R EG1-Perf	2	R4	Jun-14	Dec-15	0%	RP-150424

**3GPP TSG RAN Meeting #65**  
**Edinburgh, Scotland, 9 - 12 September 2014**

**RP-141710**

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<b>Source:</b>	DISH Network, Solaris Mobile Ltd
<b>Title:</b>	Revised WID: 2 GHz LTE Band for Region 1
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	12.3.2

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Work Item Proposal: 2 GHz LTE Band for Region 1

**Acronym:** LTE\_1980\_2170\_REG1

**Unique identifier:** 640036

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

This WID includes a Core part	X
This WID includes a Performance part	X

1        3GPP Work Area

X	Radio Access
	Core Network
	Services

2        Classification of WI and linked work items

2.0      Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
	Study on 2GHz FDD for UTRA and LTE in Region 1 (1980-2010 MHz and 2170-2200 MHz Bands)	TR 37.846

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

2.4 Work task

Parent Building Block		
Unique ID	Title	TS

### 3 Justification

Within the European Union (EU), the frequency band 1980-2010 MHz and 2170-2200 MHz can be used for terrestrial mobile networks operated. A Study Item on “2 GHz FDD for UTRA and LTE in Region 1 (1980-2010 MHz and 2170-2200 MHz Bands)” was approved at the Barcelona RAN Meeting in December 2012 [1]. The purpose of the study item on FDD in the band 1980-2010 MHz and 2170-2200 MHz is to facilitate the efficient use of this band for LTE technologies in applicable countries in Region 1. This contribution proposed a new WI standardizing the band for LTE in Region 1, building upon the study item findings.

The purpose of the proposed work item is to facilitate the efficient use of the band for LTE technology in Region 1. This work item proposes the following extended band plan:

- 2x90 MHz (1920-2010 MHz uplink and 2110-2200 MHz downlink)

The scope of the WI will include:

- Standardization of new FDD E-UTRA band in the 2 GHz MSS band in Region 1
- Implement coexistence requirements with adjacent bands applicable in Region 1
- Address regulatory issues applicable to deploying the proposed band in applicable countries in Region 1 in the 3GPP specifications.
- Specify the UE RF requirements for the new band based on optimized UE duplexer assumptions
- Update the related E-UTRA technical specifications to include support for the new band

4 Objective

#### **4.1 Objective of SI or Core part WI or Testing part WI**

The core objectives of this WI are:

- The starting assumption is that we will have the 2x90 Band Plan, however, in the 1<sup>st</sup> Phase of the work we will evaluate potential impacts on 1920-1980 MHz, 2110-2170 MHz before making a final decision on the Band Plan. If any impact on performance or any changes w.r.t. existing requirements of Band-1 are found, then we will re-visit the Band Plan assumption.
  - Standardization of new FDD E-UTRA band in the 2 GHz MSS band in Region 1
  - Specify band numbering and RF characteristics of the new band
  - Address potential BS an UE coexistence issues
  - Specify the UE RF requirements for the new band based on optimized UE duplexer assumptions
  - Update the related E-UTRA technical specifications to include support for the new band
  - Identify RAN5 testing requirements

#### 4.2 Objective of Performance part WI

The performance objectives of this WI are:

- Specify demodulation performance requirements for the proposed band in the relevant technical specifications
  - Specify RRM performance requirements for the proposed band in the relevant technical specifications

#### 4.3 RAN time budget proposal

**NOTE:** For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #65 Q4/2014 RAN  
#66

						Core	Core	Perf	Perf								Core	Core	Perf	Perf
78bis	78bis	87bis	87bis	87bis	85bis	72bis	72bis	72bis	72bis	79	79	88	88	88	86	73	73	73	73	
						0.125										0.125		0.125		

RAN #66										Q1/2015										RAN									
#67										Q1/2015										RAN									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf										
80	80	89	89	89	87	74	74	74	74																				
						0.125		0.125																					

RAN #67										Q2/2015										RAN									
#68										Q2/2015										RAN									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf										
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75										
						0.125		0.125												0.125		0.125							

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

#### additional comments to the time budget proposal:

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
36.862	Technical Report for 2 GHz Band in Region 1	RAN4			RAN#68 (June 2015)	Core Part

NOTE: If this is a RAN WID including Core and Perf. Part, then all new Core part specs have to be listed first and then all new Perf. Part specs. Indicate "Core part" or "Perf. Part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.101		E-UTRA; UE Radio transmission and reception	RAN#68 (June 2015)	Core Part
36.104		E-UTRA; BS Radio transmission and reception	Same as above	Core Part
36.113		E-UTRA; BS and repeater EMC	Same as above	Core Part
36.124		E-UTRA; EMC requirements for mobile terminals and ancillary equipment	Same as above	Core Part
36.133		E-UTRA; Requirements for support of RRM	Same as above	Core Part
36.307		E-UTRA; Requirements on User Equipment (UE) supporting a release-independent frequency band	Same as above	Core Part
36.331		E-UTRA; RRC; protocol specification	Same as above	Core Part
36.133		E-UTRA; Requirements for support of RRM	Same as above	Perf. Part
36.141		E-UTRA; BS conformance testing	Same as above	Perf. Part
36.101		E-UTRA; UE demodulation performance	Same as above	Perf. Part
36.862		Technical Report for 2 GHz Band in Region 1	Same as above	Perf. Part

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Kim, John; Sorond, Mariam

**Company:** DISH Network

**Email:** [johny.kim@dish.com](mailto:johny.kim@dish.com), [mariam.sorond@dish.com](mailto:mariam.sorond@dish.com)

## 12 Work item leadership

RAN 4

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
DISH Network
Solaris Mobile Ltd
Qualcomm, Inc.
NII
LGE
Ericsson

## References

- [1] RP-122031, "Study on 2GHz FDD for UTRA and LTE in Region 1 (1980-2010 MHz and 2170-2200 MHz Bands)", Solaris Mobile Ltd., Eutelsat S.A., SES S.A., Inmarsat plc, DISH Network. 3GPP RAN #58, Barcelona, Spain, December 2012

**3GPP TSG RAN Meeting #67**  
**Shanghai, China, 9 - 12 March 2015**

**RP-150424**

revision of RP-150107

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**Source:** DISH Network, Solaris Mobile Ltd  
**Title:** Revised WID: 2 GHz LTE Band for Region 1  
**Document for:** Approval  
**Agenda Item:** 11.5.1

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Work Item Proposal: 2 GHz LTE Band for Region 1

**Acronym:** LTE\_1980\_2170\_REG1

**Unique identifier:** 640036

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

This WID includes a Core part	X
This WID includes a Performance part	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
	Study on 2GHz FDD for UTRA and LTE in Region 1 (1980-2010 MHz and 2170-2200 MHz Bands)	TR 37.846

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Within the European Union (EU), the frequency band 1980-2010 MHz and 2170-2200 MHz can be used for terrestrial mobile networks operated. A Study Item on “2 GHz FDD for UTRA and LTE in Region 1 (1980-2010 MHz and 2170-2200 MHz Bands)” was approved at the Barcelona RAN Meeting in December 2012 [1]. The purpose of the study item on FDD in the band 1980-2010 MHz and 2170-2200 MHz is to facilitate the efficient use of this band for LTE technologies in applicable countries in Region 1. This contribution proposed a new WI standardizing the band for LTE in Region 1, building upon the study item findings.

The purpose of the proposed work item is to facilitate the efficient use of the band for LTE technology in Region 1. This work item proposes the following extended band plan:

- 2x90 MHz (1920-2010 MHz uplink and 2110-2200 MHz downlink)

The scope of the WI will include:

- Standardization of new FDD E-UTRA band in the 2 GHz MSS band in Region 1
- Implement coexistence requirements with adjacent bands applicable in Region 1
- Address regulatory issues applicable to deploying the proposed band in applicable countries in Region 1 in the 3GPP specifications.
- Specify the UE RF requirements for the new band based on optimized UE duplexer assumptions
- Update the related E-UTRA technical specifications to include support for the new band

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The core objectives of this WI are:

- Under the agreed 2x90 MHz (1920-2010 MHz uplink and 2110-2200 MHz downlink) band plan [BXXX]:
  - The duplexer assumption for [BXXX] requirements specification will be
    - The lower duplexer is LTE Band 1 (2x60MHz)
    - The upper duplexer is 2x90MHz
  - For a UE that supports both LTE Band 1 and the new band [BXXX], no relaxation is allowed for Band 1 when all the carrier(s) are located within Band 1 operating frequency range
  - For BXXX, we study the specification impact of the following approaches:
    - Specifying requirements based on channel bandwidth assignment (e.g. when all the channel bandwidth(s) is confined within LTE Band 1 frequency range, at least the Band 1 requirements apply)
    - UEs that support the new band [BXXX] shall also support LTE band 1 and all its capabilities
    - Other approaches are not precluded
- Standardization of new FDD E-UTRA band 1920-2010 MHz uplink and 2110-2200 MHz downlink in Region 1
- Specify band numbering and RF characteristics of the new band
- Address potential BS and UE coexistence issues
- Update the related E-UTRA technical specifications to include support for the new band
- Identify RAN5 testing requirements

### 4.2 Objective of Performance part WI

The performance objectives of this WI are:

- Specify demodulation performance requirements for the proposed band in the relevant technical specifications
- Specify RRM performance requirements for the proposed band in the relevant technical specifications

### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #64										Q3/2014					RAN				
#65																			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf										
78	78	87	87	87	85	72	72	72	72										
					0.125														

RAN #65										Q4/2014					RAN				
#66																			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
78bis	78bis	87bis	87bis	87bis	85bis	72bis	72bis	72bis	72bis	79	79	88	88	88	86	73	73	73	73
					0.125										0.125		0.125		

RAN #66										Q1/2015					RAN				
#67																			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
80	80	89	89	89	87	74	74	74	74										
					0.125			0.125											

RAN #67										Q2/2015					RAN				
#68																			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75
					0.125			0.125							0.125		0.125		

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
36.862	Technical Report for 2 GHz Band in Region 1	RAN4			RAN#68 (June 2015)	Core Part

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.101		E-UTRA; UE Radio transmission and reception	RAN#68 (June 2015)	Core Part
36.104		E-UTRA; BS Radio transmission and reception	Same as above	Core Part
36.113		E-UTRA; BS and repeater EMC	Same as above	Core Part
36.124		E-UTRA; EMC requirements for mobile terminals and ancillary equipment	Same as above	Core Part
36.133		E-UTRA; Requirements for support of RRM	Same as above	Core Part
36.307		E-UTRA; Requirements on User Equipment (UE) supporting a release-independent frequency band	Same as above	Core Part
36.331		E-UTRA; RRC; protocol specification	Same as above	Core Part
25.461		UTRAN IuANT interface: Layer 1	Same as above	Core Part
25.466		UTRAN IuANT interface: Application part	Same as above	Core Part
36.133		E-UTRA; Requirements for support of RRM	Same as above	Perf. Part
36.141		E-UTRA; BS conformance testing	Same as above	Perf. Part
36.101		E-UTRA; UE demodulation performance	Same as above	Perf. Part
36.862		Technical Report for 2 GHz Band in Region 1	Same as above	Perf. Part

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Kim, John; Fernandes, Edgar

**Company:** DISH Network

**Email:** [johny.kim@dish.com](mailto:johny.kim@dish.com), [edgar.fernandes@dish.com](mailto:edgar.fernandes@dish.com)

## 12 Work item leadership

RAN 4

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
DISH Network
Solaris Mobile Ltd
Qualcomm, Inc.
LGE
Ericsson

## Self Organizing Networks (SON) for Active Antenna System (AAS) based deployments

650034	<b>Self Organizing Networks (SON) for Active Antenna System (AAS) based deployments</b>	UTRA_LT E SON_A AS	1	R3, G2	Sep-14	Jun-15	100%	RP-141624
650134	Core part: Self Organizing Networks (SON) for Active Antenna System (AAS) based deployments	UTRA_LT E SON_A AS-Core	2	R3	Sep-14	Jun-15	100%	RP-141624

**3GPP TSG RAN Meeting #65**  
**Edinburgh, Scotland, 9 - 12 September 2014**

**RP-141624**

revision of [RP-141345](#)

---

<b>Source:</b>	<b>Nokia Networks</b>
<b>Title:</b>	<b>New WI on SON for AAS-based deployments</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>14.1.3</b>

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** SON for AAS-based deployments

**Acronym:**

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks
TR 37.822	4.2 SON for AAS-based deployments	

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The study item on next-generation SON enhancements collected a list of possible enhancements for SON related to new features in LTE networks: different services, various UE types and dynamic deployment changes possible thanks to wider usage of AAS. In the AAS area, TR 37.822 first discusses the triggering of AAS reconfigurations: it has been discussed that such changes can be based on OAM control, but also on distributed, eNB-based, logic. Because of that, additional information is needed to be exchanged between eNBs. The TR offers following recommendations regarding the handling of dynamic deployment changes:

- 1) Any work impacting RRM mechanism shall be consulted with appropriate WGs, e.g. RAN2.
- 2) Connection continuity within modified cell may be provided based on existing functionality; inter-eNB mobility requires inter-eNB coordination (prior to the planned change)
- 3) AAS-based deployment changes impact MRO; the impact may be mitigated if inter-eNB coordination is enabled
- 4) There are benefits of re-using the PCI, but this requires a solution to avoid possible PCI/ECGI ambiguity creating inter-RAT mobility problems and problems with RLF indication.

- 5) The explicit indicator can be sent before AAS reconfiguration is executed and, therefore, can resolve both problems related to SON for AAS-based deployments. Thus, it is considered to be the most appropriate solution.

Therefore, the usage of AAS requires enabling of additional signalling to enhance MRO performance and user connectivity.

## 4 Objective

#### 4.1 Objective of SI or Core part WI or Testing part WI

The work item applies to AAS-based deployment changes in LTE and shall address following objectives:

- Adapt the existing SON procedures (e.g. MRO) to dynamic deployment changes
  - Enable support for automatic AAS-based cell splitting/merging
    - Identify and enable transferring, if needed, of the information required to optimise the splitting/merging triggering
    - Identify and enable transferring of the information required to reduce intra LTE and inter RAT mobility issues due to cell splitting/merging

Note: the enhancements should not impact RRM mechanism.

#### 4.2 Objective of Performance part WI

**NOTE:** Leave empty if the WI proposal does not contain a RAN performance part.

## 4.3 RAN time budget proposal

**NOTE:** For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

i.e. one value for each session/ herd. If no time unit is needed, leave the field empty.  
Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #66 #67	Q1/2015								RAN
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
80	80	89	89	89	87	74	74	74	74
					1				

RAN #67										Q2/2015										RAN			
#68																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75				
					1										1								

RAN #68										Q3/2015										RAN			
#69																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82	82	91	91	91	91					89		76		76	76								

RAN #69										Q4/2015										RAN			
#70																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77				

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

#### additional comments to the time budget proposal:

## 5 Service Aspects

No impact.

## 6 MMI-Aspects

No impact.

## 7 Charging Aspects

No impact.

## 8 Security Aspects

No impact.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X		
No	X	X			
Don't know				X	X

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

<b>Affected existing specifications</b> [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.300		stage 2 aspects of SON inter-RAT Enhancements	RAN#68	
36.423		X2 specific stage 3 aspects of SON inter-RAT enhancements	RAN#68	
36.413		S1 specific stage 3 aspects of SON inter-RAT enhancements	RAN#68	
25.413		Iu specific stage 3 aspects of SON inter-RAT enhancements	RAN#68	
48.018		Enhancements of RIM	RAN#68	

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Kordybach,Krzysztof

**Company:** Nokia Networks

**Email:** krzysztof.kordybach@nsn.com

## 12 Work item leadership

RAN WG3

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Nokia Networks
Deutsche Telekom
CATT
AT&T
CMCC
Nomor Research
Mitsubishi Electric
China Unicom
Fujitsu
LG Electronics
Samsung
NEC
Huawei
HiSilicon



## Usage Monitoring Control PCC Extension

660001	<a href="#">Usage Monitoring Control PCC Extension</a>	eUMONC	1	S2	Dec-14	Jun-15	99%	SP-140709
660022	<a href="#">Stage 2 of Usage Monitoring Control PCC Extension</a>	eUMONC -SA2	2	S2	Dec-14	Jun-15	100%	SP-140709
660020	<a href="#">CT3 Aspect of Usage Monitoring Control extension</a>	eUMONC -CT3	2	C3	Dec-14	Mar-15	100%	CP-140927

### 3GPP TSG SA Meeting #66

**TD SP-140709**

**Maui, Hawaii, U.S.A, 10 - 12 December 2014**

**Title:** New WID: Usage Monitoring Control PCC Extension <eUMONC>

**Source:** SA WG2

**Agenda Item:** 15

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### 3GPP TSG SA2 Meeting #103

**S2-143019**

**Sapporo, Japan, 13 - 17 Oct, 2014**

**Source:** China Telecom, ZTE, Allot communications, Alcatel-Lucent, Alcatel-Lucent ShangHai Bell, Orange

**Title:** New WID: Usage Monitoring Control PCC Extension

**Document for:** Approval

**Agenda Item:** 8.1

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

**Title \* : Usage Monitoring Control PCC Extension**

**Acronym \* : eUMONC**

**Unique identifier \***

### 1 3GPP Work Area \*

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any) *</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>
520035	FS_UMONC_sas	This work item is based on the conclusions from FS_UMONC_sas.

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any) *</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2 \*

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)		
Unique ID	Title	Nature of relationship
		TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

Usage monitoring control has been introduced into PCC since Rel-9 which provides the operator the capability to enforce dynamic policy decisions based on total network usage in real-time. It was enhanced under SAPP Work Item in Rel-11 to support usage monitoring for applications that are detected by the TDF/PCEF. The issues for the usage monitoring enhancement are studied in the FS\_UMONC and some functions were standardized in Rel-12. During the FS\_UMONC further study in Rel-13, it was concluded that the following requirements should be fulfilled within the existing PCC framework in Rel-13:

- Exclude Usage of a Service/Application from IP-CAN session/TDF session Usage

## 4 Objective \*

This Work item aims to enhance the system to support the following functions as per related conclusions defined in the TR23.858:

- Exclude Usage of a Service/Application from IP-CAN session/TDF session Usage (key issue 3 in TR 23.858)

This Work item also aims at documenting in an informative Annex a solution for key issue 1 as concluded in TR 23.858 :

- How to monitor service usage in multiple monitoring groups.

## 5 Service Aspects

No services should be impacted.

## 6 MMI-Aspects

N/A

## 7 Charging Aspects

N/A

8 Security Aspects

N/A

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale \*

## 11 Work item rapporteur(s) \*

China Telecom, Jinyan Li ( [lijy@ctbri.com.cn](mailto:lijy@ctbri.com.cn))

## 12 Work item leadership \*

SA2

## 13 Supporting Individual Members \*

## **3GPP TSG CT Meeting #66 Maui, US; 8<sup>th</sup> – 9<sup>th</sup> December 2014**

CP-140927

3GPP TSG-CT WG3 Meeting #78bis  
Sophia Antipolis, France, 20 - 24 October 2014

C3-144174

**Source:** CT3  
**Title:** New WID: CT3 Aspect of Usage Monitoring Control PCC Extension  
**Agenda Item:** 13.1  
**Document for:** Approval

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#). Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: CT3 Aspect of Usage Monitoring Control PCC Extension

Acronym: eUMONC-CT3

Unique identifier:

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
?????	Usage Monitoring Control PCC Extension	TS 23.203

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
?????	Stage 2 for Usage Monitoring Control PCC Extension	TS 23.203

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Usage monitoring control has been introduced into PCC since Rel-9 which provides the operator the capability to enforce dynamic policy decisions based on total network usage in real-time. It was enhanced under SAPP Work Item in Rel-11 to support usage monitoring for applications that are detected by the TDF/PCEF. The issues for the usage monitoring enhancement are studied in the FS\_UMONC and some functions were standardized in Rel-12. During the eUMONC study in Rel-13 in stage 2, it was concluded that the following requirements should be fulfilled within the existing PCC framework in Rel-13:

- Exclude Usage of a Service/Application from IP-CAN session/TDF session Usage

## 4 Objective

This work item aims to specify the stage 3 aspects of the usage monitoring control PCC extension to exclude usage of a service/application from IP-CAN session/TDF session usage based on the agreed normative stage 2 changes.

## 5 Service Aspects

No services should be impacted.

## 6 MMI-Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

N/A

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		
Don't know					X

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR Subject of the CR	Approved at plenary#	Comments
29.212	Enhance the Gx and Sd interface to support excluding usage of a service/application from IP-CAN session/TDF session usage	CT#67 (Mar. 2015)	CT3 Responsibility
29.215	Enhance the S9 interface to support excluding usage of a service/application from IP-CAN session/TDF session usage	CT#67 (Mar. 2015)	CT3 Responsibility

## 11 Work item rapporteur(s)

Zhou Xiaoyun (ZTE) [zhou.xiaoyun@zte.com.cn](mailto:zhou.xiaoyun@zte.com.cn)

## 12 Work item leadership

CT3

## 13 Supporting Individual Members

Supporting IM name
China Telecom
ZTE
Orange
Allot Communications
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell

2013-10-03 version 1.14.0

## Enhanced P-CSCF discovery using signalling for access to EPC via WLAN

660030	Enhanced P-CSCF discovery using signalling for access to EPC via WLAN	ePCSCF_WLAN	1	C1	Oct-14	Mar-15	99%	CP-140813
660014	CT1 aspects of Enhanced P-CSCF discovery using signalling for access to EPC via WLAN	ePCSCF_WLAN	2	C1	Dec-14	Mar-15	100%	CP-140813
660023	CT4 aspects of Enhanced P-CSCF discovery using signalling for access to EPC via WLAN	ePCSCF_WLAN	2	C4	Oct-14	Mar-15	100%	CP-140813

**3GPP TSG CT Meeting #66**  
**Maui, US; 8<sup>th</sup> – 9<sup>th</sup> December 2014**

**CP-140813**

---

**Source:** CT1  
**Title:** New WID on Enhanced P-CSCF discovery using signalling for access to EPC via WLAN  
**Document for:** Approval  
**Agenda Item:** 13.1

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** WID on Enhanced P-CSCF discovery using signalling for access to EPC via WLAN

**Acronym:** ePCSCF\_WLAN

**Unique identifier:**

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
610009	Enhanced S2a Mobility Over Trusted WLAN access to EPC for Stage 3	eSaMOG-St3 WI defined transport for protocol configuration options when UE accesses EPC via WLAN connected to EPC using S2a.

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

When UE uses EPC via WLAN to access IMS, 24.229 Annex R defines several methods for P-CSCF discovery. The existing methods for the P-CSCF discovery defined in 24.229 Annex R have disadvantages, in terms of functionality and performance.

It is advantageous to introduce a method for the P-CSCF discovery using the signalling for access to EPC via WLAN as:

- 1) after the PDN connection is established, there is no need of additional round trip to communicate with DHCP server or DNS server deployed in the PDN of the P-CSCF.
- 2) there is no need to deploy the DHCP server or the DNS server in the PDN of P-CSCF.
- 3) solution is aligned with the P-CSCF discovery using protocol configuration option as used in 3GPP access.
- 4) the P-CSCF addresses can be provided to the UE along with other IP parameters provided to the UE (e.g. IPv4 address).

- 5) if the UE moves the PDN connection between WLAN and 3GPP access, the UE can be provided with the same set of the P-CSCF addresses upon each PDN connection move.

When the UE accesses EPC via WLAN connected using S2a, then means for transport of the P-CSCF addresses (using the protocol configuration options) are already specified in TS 24.302 and TS 24.244, but not used yet in the P-CSCF discovery procedures in TS 24.229 Annex R.

When the UE accesses EPC via WLAN connected using S2b, then 3GPP so far has not defined means for transport of the P-CSCF addresses. However, IETF works on IKEv2 configuration attributes in draft-gundavelli-ipsecme-3gpp-ims-options which could be used for transport of the P-CSCF addresses.

## 4 Objective

The objective of this work item is:

- 1) to define means for transport of the P-CSCF addresses using signalling for access to EPC via WLAN connected using S2b; and
- 2) extend the P-CSCF discovery procedures in TS 24.229 Annex R with an additional P-CSCF discovery method for the UE accessing EPC via WLAN connected using S2a and S2b. The additional P-CSCF discovery method would use the P-CSCF addresses provided using signalling for access to EPC via WLAN, i.e. provided:
  - A) via the PCO for transport of the P-CSCF addresses passed using signalling for access to EPC via WLAN connected using S2a, as already specified in eSaMOG-St3 WI; and
  - B) via the means for transport of the P-CSCF addresses using signalling for access to EPC via WLAN connected using S2b, as defined by this WID.

Within the scope of this work item, care should be taken in the development of this work to maintain alignment of selection among discovered P-CSCFs with method II of Annex B and L of 24.229 in the same release.

## 5 Service Aspects

None identified

## 6 MMI-Aspects

None identified

## 7 Charging Aspects

None identified

## 8 Security Aspects

None identified

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		x		x	
No	x		x		x
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
24.229		New P-CSCF discovery method for the UE accessing EPC via WLAN connected using S2a and S2b. The new P-CSCF discovery method uses the P-CSCF addresses provided using signalling for access to EPC via WLAN.	CT#67 (March 2015)	CT1 responsibility
24.302		Means for transport of the P-CSCF addresses using signalling for access to EPC via WLAN connected using S2b	CT#67 (March 2015)	CT1 responsibility
29.274		Means for transport of the P-CSCF addresses using S2b	CT#67 (March 2015)	CT4 responsibility
29.275		Means for transport of the P-CSCF addresses using S2b	CT#67 (March 2015)	CT4 responsibility

## 11 Work item rapporteur(s)

Ivo Sedlacek, Ericsson, ivo dot sedlacek at ericsson dot com

## 12 Work item leadership

CT1

## 13 Supporting Individual Members

Supporting IM name
Ericsson
Broadcom Corporation
Cisco Systems
Samsung
Deutsche Telekom AG
T-Mobile USA Inc.
Verizon
Orange
AT&T
Nokia Networks
Vodafone
Telecom Italia S.p.A.
TeliaSonera
Huawei



## P-CSCF Restoration Enhancements with WLAN

660028	<a href="#">P-CSCF Restoration Enhancements with WLAN</a>	PCSCF_R ES_WLA N	1	C4	Dec-14	Dec-15	78%	CP-150275
660041	<a href="#">CT1 aspects of P-CSCF Restoration Enhancements with WLAN</a>	PCSCF_R ES_WLA N	2	C1	Dec-14	Dec-15	70%	CP-150275
660040	<a href="#">CT4 aspects of P-CSCF Restoration Enhancements with WLAN</a>	PCSCF_R ES_WLA N	2	C4	Dec-14	Dec-15	85%	CP-150275

**3GPP TSG CT Meeting #68**  
**Malmö, SWEDEN; 15<sup>th</sup> – 16<sup>th</sup> June 2015**

**CP-150275**

Revision of CP-140995

**Source:** TSG CT WG4  
**Title:** Revised WID on P-CSCF restoration enhancements with WLAN  
**Document for:** Approval  
**Agenda Item:** 13.1

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

**Title:** P-CSCF restoration enhancements with WLAN

**Acronym:** PCSCF\_RES\_WLAN

**Unique identifier:** 660040

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
610004	P-CSCF restoration enhancements	P-CSCF restoration enhancements have been specified in Release 12, for 3GPP accesses mainly. Annex D of TR 29.806 started to investigate potential enhancements for WLAN accesses, but this part of the work was decoupled from Release 12 due to lack of time.
660030	Enhanced P-CSCF discovery using signalling for access to EPC via WLAN	This WID defines an additional PCO-based P-CSCF discovery mechanism for a UE under WLAN making use to harmonize the P-CSCF discovery across 3GPP and non-3GPP accesses. This includes IKEv2 extensions to carry P-CSCF addresses via IKE.

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

UEs may use EPC via WLAN to access IMS. Currently 3GPP TS 24.229 in Annex R.2.2.1C only specifies the keep-alive mechanism for P-CSCF restoration.

The PCSCF\_RES Work item has studied and specified in Release 12 enhancements to the P-CSCF restoration procedure. The stage 2 is documented in 3GPP TS 23.380. For 3GPP accesses, it is defined a basic mechanism (tearing down the IMS PDN connection) and an extension avoiding the PDN disconnection, both applicable for the HSS based and the PCRF based solutions. 3GPP TS 23.380 also includes the support of the basic mechanism for WLAN access with the PCRF based solution.

There is the need to pursue the work regarding enhancements to P-CSCF restoration for UEs with an IMS PDN connection via trusted or untrusted WLAN accesses (S2a and S2b). The reasons are:

- avoid massive signalling over the core and radio networks at P-CSCF failure;
- improve reliability;
- possible reuse of the failed P-CSCF when again available;
- avoid a continuous extra signalling of the keep-alive mechanism between the UEs and the P-CSCF, involving radio, WLAN and core network resources, and impacting battery consumption;
- have an extension to avoid the IMS PDN disconnection;
- ensure an harmonization with the P-CSCF restoration solutions supported for 3GPP accesses, and supported for WLAN accesses by the PCRF based solution.

GSMA in GSMA PRD IR.51 (IMS Over Wi-Fi) specification currently does not have statements about P-CSCF restoration but recommends the use of P-CSCF discovery on the basis of a PCO list of available P-CSCF addresses, which is also used in the enhanced P-CSCF restoration mechanism over 3GPP accesses.

It is desirable to specify a homogeneous set of procedures covering P-CSCF discovery and P-CSCF restoration, for 3GPP and WLAN accesses to EPC.

## 4 Objective

The objective of the WI is to:

- add a basic mechanism of P-CSCF restoration for the HSS based solution for UEs with an IMS PDN connection via trusted or untrusted WLAN accesses (S2a and S2b), similar to the one defined for 3GPP access. This can rely on the study in 3GPP TR 29.806 annex A.
- dependent on the outcomes of the study phase, possibly add an extension avoiding the release of the IMS PDN connection, applicable to both PCRF based and HSS based solutions, by possibly reusing the information elements describing lists of available P-CSCFs addresses between the PGW and the UE as they will be defined in the ePCSCF\_WLAN work item and by introducing relevant UE capabilities for the support of P-CSCF restoration procedures, these UE capabilities being defined per access type (trusted WLAN, untrusted WLAN). The impact to the UE shall be minimized and be common to the HSS based or PCRF based solutions.

This work item covers both stage 2 and stage 3 work. An initial study phase will be done to describe potential solutions for trusted and untrusted WLAN accesses (S2a and S2b), including potential extensions of the PDN GW initiated bearer modification procedures to carry P-CSCF addresses to the UE.

Within the scope of this work item, care should be taken in the development of this work to maintain alignment of the new restoration mechanisms with the procedures specified in Release 12 for 3GPP accesses.

## 5 Service Aspects

None identified

## 6 MMI-Aspects

None identified

## 7 Charging Aspects

None identified

## 8 Security Aspects

None identified

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
29.826	P-CSCF restoration enhancements for WLAN	CT4		CT#68 (June 2015)	CT#68 (June 2015)	

Affected existing specifications [None in the case of Study Items]				
Spec No	CR	Subject of the CR	Approved at plenary#	Comments
23.380		Enhanced P-CSCF restoration for WLAN accesses	CT#69 (Sept. 2015)	CT4 responsibility
23.008		Update of the storage of the UE support of the extended P-CSCF restoration mechanism for WLAN in the PDN GW.	CT#70 (Dec. 2015)	CT4 responsibility
29.273		Impacts on SWx and S6b interfaces for the support of P-CSCF restoration triggering messages in the HSS based solution	CT#70 (Dec. 2015)	CT4 responsibility
29.274		Potential updates for the support of the basic mechanism with WLAN. Means for transport of indications such as UE indication of the support of P-CSCF restoration enhancements with WLAN using S2a or S2b Means for transport of the P-CSCF addresses over an existing PDN connection.	CT#70 (Dec. 2015)	CT4 responsibility
29.275		Potential updates for the support of the basic mechanism with WLAN. Means for transport of potential indications such as UE indication of the support of P-CSCF restoration enhancements with WLAN using S2a or S2b Means for transport of the P-CSCF addresses over an existing PDN connection.	CT#70 (Dec. 2015)	CT4 responsibility
24.302		Means for transport of potential indications such as UE indication of the support of P-CSCF restoration enhancements with WLAN using S2a or S2b Means for transport of the P-CSCF addresses over an existing PDN connection.	CT#70 (Dec. 2015)	CT1 responsibility
24.229		Updates of P-CSCF restoration in Annex R	CT#70 (Dec. 2015)	CT1 responsibility
24.244		WLCP signalling extensions to support transport of the P-CSCF addresses over an existing PDN connection and other potential indications such as UE indication of the support of the P-CSCF restoration enhancements with WLAN using S2a.	CT#70 (Dec. 2015)	CT1 responsibility
24.008		Impact on PCO to provide indication of the support of the P-CSCF restoration enhancements with WLAN.	CT#70 (Dec. 2015)	CT1 responsibility

## 11 Work item rapporteur(s)

Jean-Jacques Trottin, Alcatel-Lucent, [jean-jacques.trottin@alcatel-lucent.com](mailto:jean-jacques.trottin@alcatel-lucent.com)

## 12 Work item leadership

CT4

## 13 Supporting Individual Members

Supporting IM name
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Verizon
AT&T
Orange
Ericsson
Nokia Networks
Telecom Italia
ZTE

## Mobile Equipment Identity signalling over WLAN

680012	Mobile Equipment Identity signalling over WLAN	MEI_WL AN	1	C4	Jun-15	Sep-15	85%	CP-150236
680039	CT1 aspects of Mobile Equipment Identity signalling over WLAN	MEI_WL AN	2	C1	Jun-15	Sep-15	80%	CP-150236
680040	CT4 aspects of Mobile Equipment Identity signalling over WLAN	MEI_WL AN	2	C4	Jun-15	Sep-15	90%	CP-150236

**3GPP TSG CT Meeting #68**  
**Malmö, SWEDEN; 15<sup>th</sup> – 16<sup>th</sup> June 2015**

**CP-150236**

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**Source:** TSG CT WG4  
**Title:** New WID on Mobile Equipment Identity signalling over WLAN  
**Document for:** Approval  
**Agenda Item:** 13.1

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Mobile Equipment Identity signalling over WLAN

**Acronym:** MEI\_WLAN

**Unique identifier:**

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

For feature parity and consistency across 3GPP and WLAN accesses, the EPC should be able to retrieve, over the WLAN access, the Mobile Equipment Identity (i.e. IMEI) of UEs accessing the network via a trusted or untrusted WLAN access.

This would provide support of the following functionalities for UEs accessing WLAN:

1. Automatic Device Detection, i.e. 3GPP AAA Server reporting the IMEI to the HSS, e.g. to enable an automatic configuration of terminals by the operator for specific applications/services if so needed
2. Terminal specific behaviour in the network, e.g. for misbehaving UEs or UEs which need to be tracked by the network (for evaluation or other purposes)
3. Online and Offline Charging (storing the IMEI in CDRs)
4. Lawful interception at the TWAN, ePDG and PGW
5. Management based trace activation/deactivation at PGW (see 3GPP TS 32.422 subclause 4.1.1.7)
6. IMEI checking, e.g. disallow WLAN access for stolen equipment or equipment of which the use in the PLMN cannot or no longer be tolerated for technical reasons.

Although the Mobile Equipment Identity can be signalled to IMS, this information is not available at the EPC, and the above functionalities need to be supported independently from the upper layer applications.

## 4 Objective

This WI will define the signalling extensions required to convey to the EPC, over the WLAN access, the Mobile Equipment Identity, if available, of devices accessing a trusted or untrusted WLAN.

This will cover the following extensions:

1. Extensions to carry the IMEI from the UE to the 3GPP AAA Server, for trusted and untrusted WLAN
2. Potential STa, SWm, SWx and S6b extensions to carry the IMEI between the TWAN/ePDG and the 3GPP AAA Server, and between the 3GPP AAA Server and the HSS
3. S2a and S2b extensions to carry the IMEI from the TWAN or ePDG to the PGW

The following aspects will not be covered as part of this work item:

4. IMEI checking (this would require the definition of a new interface to the EIR and thus stage 2 involvement)
5. Extensions for emergency calls over WLAN for unauthenticated UEs (will be handled in a future dedicated work item)

The Mobile Equipment Identity will be sent confidentiality protected over the WLAN access.

Signalling the IMEISV (as defined in TS 22.016) to the EPC will also be supported.

This work will not affect existing network functionalities for devices that do not have an IMEI.

## 5 Service Aspects

None.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

Charging aspect will be covered by SA5.

## 8 Security Aspects

Lawful interception aspect will be covered by SA3.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary	Comments

Affected existing specifications [None in the case of Study Items]						
Spec No.	CR	Subject of the CR			Approved at plenary#	Comments
24.244		Potential extensions to carry the IMEI from the UE to the TWAN, for the Multi Connection Mode.			CT#69 (Sept. 2015)	CT1 responsibility
24.302		Extensions to carry the IMEI from the UE to the 3GPP AAA Server, for trusted and untrusted WLAN.			CT#69 (Sept. 2015)	CT1 responsibility
29.273		Potential STa, SWm, SWx and S6b extensions to carry the IMEI between the TWAN/ePDG and the 3GPP AAA Server, and between the 3GPP AAA Server and the HSS			CT#69 (Sept. 2015)	CT4 responsibility
29.274		S2a and S2b GTPv2 extensions to carry the IMEI from the TWAN or ePDG to the PGW			CT#69 (Sept. 2015)	CT4 responsibility
29.275		S2a and S2b PMIPv6 extensions to carry the IMEI from the TWAN or ePDG to the PGW			CT#69 (Sept. 2015)	CT4 responsibility
23.008		Storage of the IMEI at the TWAN, ePDG, 3GPP AAA Server			CT#69 (Sept. 2015)	CT4 responsibility

## 11 Work item rapporteur(s)

Alcatel-Lucent, Bruno Landais (bruno.landais@alcatel-lucent.com)

## 12 Work item leadership

CT4

## 13 Supporting Individual Members

Supporting IM name
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
AT&T
China Mobile
Deutsche Telekom
Ericsson
Huawei
Orange
Telecom Italia
Verizon
Vodafone
ZTE

2013-10-03 version 1.14.0

## Authentication Signalling Improvements for WLAN

680041	Authentication Signalling Improvements for WLAN	ASI_WLAN	1	C1	Jun-15	Dec-15	40%	CP-150330
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**3GPP TSG CT Meeting #68**  
Malmö, SWEDEN; 15<sup>th</sup> – 16<sup>th</sup> June 2015

**CP-150330**

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**3GPP TSG-CT WG1 Meeting #92**  
China (Sanya), 25-29 May 2015

**C1-152464**

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**Source:** Huawei  
**Title:** New WID on authentication signalling improvements for WLAN  
**Document for:** Agreement  
**Agenda Item:** 13.2.1

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Authentication Signalling Improvements for WLAN

**Acronym:** ASI\_WLAN

**Unique identifier:**

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

In order to access EPC via WLAN, the UE will use authentication procedures based on EAP-AKA or EAP-AKA' and it will be carried out seamlessly with no input required from the user. With more and more devices supporting WLAN access, various applications (e.g., voice over WLAN (VoWi-Fi)) request WLAN access as the preferred option. However, in some conditions, the authentication procedures may fail, for example, when the UE accesses WLAN deployed by the VPLMN which the UE is not allowed to roam into or the UE is not allowed to use the APN which was requested. In such cases, the UE's repeated authentication attempts to the same WLAN or the same APN do not solve the problem. Based on the current specification, as the UE cannot know the exact failure cause, it can result in large and frequent authentication signalling towards operator's mobile network and unlimited retry behavior after authentication failure. This severely wastes the network resources as well as drains the battery of devices.

## 4 Objective

The objective of this work item is to improve the performance of the system for effective handling of device's behavior on authentication procedures, according to existing or new cause value sent by the network.

The objectives of this work item include:

1. For untrusted WLAN access, extend EAP-AKA, and maybe IKEv2 if necessary protocol to support the authentication failure scenarios defined in 3GPP TS 29.273, such as user unknown, no non3GPP user subscription data, no APN subscription and roaming or RAT type not allowed scenarios.
2. For trusted WLAN access, extend the EAP-AKA' and WLCP protocol to support the authentication and authorization failure scenario defined in 3GPP TS 29.273, such as user unknown, no non 3GPP user subscription data, no APN subscription and roaming or RAT type not allowed scenarios.
3. To specify the device's behaviour upon receipt of some reject cause values to avoid unnecessary signalling to the network.

Stage 3 changes that require stage 2 changes are out of scope of this work item.

## 5 Service Aspects

The proposed work will not impact specific services but is anticipated to have positive impact on service delivery.

## 6 MMI-Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

N/A

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

<b>Affected existing specifications</b> [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
24.302		Enhance authentication to cover the authentication failure scenarios defined in 3GPP TS 29.273; Specify the UE behaviour for some reject cause values and to limit the repeated number of attempts; Enhance the UE behaviour to avoid signalling loops.	CT#70 (December 2015)	CT1 responsibility
24.244		Enhance WLCP to cover the APN not allowed scenario as defined in 3GPP TS 29.273; Specify the UE behaviour for the reject cause value;	CT#70 (December 2015)	CT1 responsibility

## 11 Work item rapporteur(s)

Youyang Yu (yuyouyang@huawei.com)

## 12 Work item leadership

CT1

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Huawei
HiSilicon
China Mobile
China Telecom
China Unicom
LG Electronics
Vodafone
ZTE Corporation
ZTE Mobile

## Stage-3 SAE Protocol Development - Phase 4

660016	<a href="#">Stage-3 SAE Protocol Development - Phase 4</a>	SAES4	1	C1	Dec-14	Dec-15	63%	CP-140814
670037	<a href="#">SAE Protocol Development (Stage 3) - Phase 4</a>	SAES4	2	C1	Dec-14	Dec-15	70%	CP-140814
670038	<a href="#">CS Fallback in EPS - Phase 4</a>	SAES4-CSFB	2	C1	Dec-14	Dec-15	70%	CP-140814
670039	<a href="#">SAE for support for non-3GPP accesses - Phase 4</a>	SAES4-non3GPP	2	C1	Dec-14	Dec-15	50%	CP-140814

**3GPP TSG CT Meeting #66**  
**Maui, US; 8<sup>th</sup> – 9<sup>th</sup> December 2014**

**CP-140814**

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<b>Source:</b>	<b>CT1</b>
<b>Title:</b>	<b>New WID on Stage-3 SAE Protocol Development</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>13.1</b>

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Stage-3 SAE Protocol Development

**Acronym:** SAES4, SAES4-CSFB, SAES4-non3GPP

**Unique identifier:** TBD

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
X	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

#### If no identified source of stage 2 information, justify:

This work item is about collecting the minor SAE developments required in release 13, and packaging them under a single work item.

Having said that, there may be minor stage 1 and stage 2 enhancements produced under TEI13, or minor stage 1/stage 2 requirements coming from 3GPP2 that could be further developed at stage 3 under this work item. Note that this work item also includes stage 2 documentation for the UE in idle mode.

It is expected that much of the work in this WID will not however require separate stage 1 and stage 2 development.

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

In Release 8, LTE was added as an access technology. The feature set in Release 8 provides a basis for EPS support. At Release 9, 10, 11 and 12 further work was identified. At Release 13 the need for other new capabilities is being identified.

## 4 Objective

There may be technical improvements and enhancements to EPS, not of sufficient significance to be normally covered by a work item, that can be dealt with by this work item.

The scope of the work also includes:

1. Such changes relating to SAE involved in CS fallback (including SGs enhancements) or CS fallback to 1x (A separate acronym is requested for this set of work "SAES4-CSFB").
2. Impact on GPRS relating to interworking with LTE.

Changes relating to the support of EPC on non-3GPP accesses are covered on the separate acronym "SAES4-non3GPP"

The work does not cover PS domain enhancements where parallel changes are identified to both EPS and GPRS.

The work also does not cover changes to home Node B and home eNode B.

The work also does not cover changes or enhancements to functionality related to machine-type communications (MTC).

The work item is not a substitute for issues where a feature has already been created by other WG (a separate building block should be created for that WID), or for work involving significant changes over multiple CRs in CT1 (where a separate feature WID should be created).

## 5 Service Aspects

Service aspects are covered by other work item descriptions.

## 6 MMI-Aspects

MMI Aspects are covered by other work item descriptions.

## 7 Charging Aspects

None.

## 8 Security Aspects

None. Security Aspects are covered by other work item descriptions. Within release 8 and later releases there are protocol mechanism providing in support of security, and these may require enhancement by work areas described by this work item.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No	X		X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #Comments

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR Subject of the CR	Approved at plenary#	Comments
23.122	changes in the EPS related UE idle mode stage 2	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
24.008	Additional capabilities and corrections relating to: o coding of IEs used by TS 24.301; o CS fallback; and o interworking with LTE	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
24.167	Changes to 3GPP IMS Management Object relating to EPS changes	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
24.229	Additional capabilities and corrections to annex L	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
24.301	Additional capabilities and corrections	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
24.302	Additional capabilities and corrections	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
24.303	Additional capabilities and corrections	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
24.304	Additional capabilities and corrections	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
24.305	Changes to Selective Disabling of 3GPP User Equipment Capabilities arising from EPS changes	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
24.312	Additional capabilities and corrections consequent on changes to 24.302	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
29.018	Additional capabilities and corrections relating to: o coding of IEs used by TS 29.118; o CS fallback; and o interworking with LTE	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
29.118	Additional capabilities and corrections	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.

## 11 Work item rapporteur(s)

Behrouz Aghili (behrouz.aghili@interdigital.com)

## 12 Work item leadership

CT1

## 13 Supporting Individual Members

Supporting IM name
InterDigital
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Qualcomm
Huawei
ZTE
Samsung
NSN



Interworking solution for Called IN number and original called IN number ISUP parameters

660034	Interworking solution for Called IN number and original called IN number ISUP parameters	INNB_IW	1	C1, C3	Dec-14	Mar-15	73%	CP-140928
660134	Interworking solution for Called IN number and original called IN number ISUP parameters	INNB_IW	2	C1	Dec-14	Mar-15	100%	
660036	(IETF) CT1 part of Interworking solution for Called IN number and original called IN number ISUP parameters	INNB_IW	2	C1 - IET F	Dec-14	Mar-15	0%	CP-140928
660021	CT3 aspects of Interworking solution for Called IN number and original called IN number ISUP parameters	INNB_IW	2	C3	Dec-14	Mar-15	99%	CP-140928

**3GPP TSG CT Meeting #66** **CP-140928**  
**Maui, US; 8<sup>th</sup> – 9<sup>th</sup> December 2014**

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**3GPP TSG-CT WG3 Meeting #78bis** **C3-144280**  
**Sophia Antipolis, France, 20 - 24 October 2014** revision of C3-144171

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**3GPP TSG-CT WG1 Meeting #88bis** **C1-144154**  
**Sophia Antipolis (France), 20-24 October 2014** revision of C1-144004

---

**Source:** CT3  
**Title:** New Work Item on Interworking solution for ISUP Called IN number and original called IN number  
**Agenda Item:** 13.1  
**Document for:** Approval

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Interworking solution for Called IN number and original called IN number ISUP parameters

**Acronym:** INNB\_IW

**Unique identifier:**

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>
	Interworking solution for Called IN number and original called IN number ISUP parameters	

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any)</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification			
TS or CR(s) or external document	Clause	Remarks	

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

In PSTN/ISDN, the called IN number and original called IN number parameters defined as optional parameters in ITU-T Q.763 can be populated in an ISUP message when number translation is performed for services (e.g. freephone, premium rate number). These ISUP parameters are used for delivering the history information of the original destination number(s) to the terminating side, where the original destination number(s) is required in order to enable an expected service.

On the other hand, in IMS network, the history information of the original destination identity(ies) can be populated in the History-Info header field with the optional "mp" header field parameter, when a number translation equivalent to that of PSTN is performed for a service at the application server (AS).

However, it is impossible to deliver the original destination number between IMS network and PSTN/ISDN according to the current TS 29.163, where no interworking procedure for the corresponding parameters at

the MGCF is specified. Then, the services commonly provided in both IMS network and PSTN/ISDN (e.g. freephone) cannot be interworked between these networks. In the current TS 29.163, only the call diversion service uses the History-Info header field.

## 4 Objective

The objective of this work item is to have a new interworking procedure for the ISUP "Called IN number" and "Original called IN number" parameters.

Depending on the final solution, this work will possibly have impact on interworking at II-NNI. The ability for an AS to populate the original destination identity into the History-Info when it is an access service number that has been translated and for a UA to use this information to identify the requested service number will also be studied.

However, if the retained solution is based on a protocol extension, it will be required to first have CT1 mentioning this extension in TS 24.229 before being referenced in other 3GPP specifications.

One possible encoding solution would be to adopt a new value for the cause URI parameter as proposed in the new Internet-Draft <http://tools.ietf.org/html/draft-mohali-cause-for-services-00> to finally have a similar behaviour as for call forwarding reasons in CDIV service.

The work item results in the actions to be taken for the related specifications: TS 29.163, TS 29.165 and TS 24.229.

## 5 Service Aspects

None.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

Charging aspect will be checked with SA5.

## 8 Security Aspects

If the cause URI parameter is used in the solution, the security considerations in [[RFC4458](#)] apply.

A privacy service that performs the "Privacy: header" Service [[RFC3323](#)] must remove the cause URI parameter from the URI. Privacy of the parameters, when they form part of a URI within the History-Info header field, is covered in [[RFC7044](#)].

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #Comments

<b>Affected existing specifications</b> [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
TS 24.229		Introduction of the new cause URI parameter value possibly used in the History-Info header field.	CT#67 (March 2015)	CT1 responsibility
TS 29.163		Introduction of a new ISUP/BICC-SIP interworking procedure at MGCF for Called IN number and original called IN number ISUP parameters using cause URI parameter in History-info header field.	CT#67 (March 2015)	CT3 responsibility
TS 29.165		Introduction of a new II-NNI requirement regarding interworking of in History-info header field containing a cause URI parameter for service number translation.	CT#67 (March 2015)	CT3 responsibility

## 11 Work item rapporteur(s)

Orange, Marianne Mohali (marianne(dot)mohali(at)orange(dot)com)

## 12 Work item leadership

CT3

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Orange
NTT
Ericsson
Nokia Networks
Deutsche Telekom

## Warning Status Report in EPS

660042	<a href="#">Warning Status Report in EPS</a>	WSR_EPS	1	C4	Dec-14	Sep-15	13%	CP-140998
660015	<a href="#">CT1 aspects of Warning Status Report in EPS</a>	WSR_EPS	2	C1	Dec-14	Sep-15	25%	CP-140998
660029	<a href="#">CT4 aspects of Warning Status Report in EPS</a>	WSR_EPS	2	C4	Dec-14	Sep-15	0%	CP-140998

**3GPP TSG CT Meeting #66**  
**Maui, US; 8<sup>th</sup> – 9<sup>th</sup> December 2014**

**CP-140998**

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**Source:** CT1  
**Title:** New WID on Warning Status Report in EPS  
**Document for:** Approval  
**Agenda Item:**

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Warning Status Report in EPS

**Acronym:** WSR\_EPS

**Unique identifier:** 660042

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related work items(s) (if any)		
Unique ID:	Date:	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
580009	Rel-12 Building Block on Reporting Enhancements in Warning Message Delivery (REP_WMD)	Objective e) of the REP_WMD WI ( <i>eNodeB reporting to the CBC on (un-)availability of cells for broadcasting warning messages</i> ) was only partly realized, which led to the new WI.

Go to §3.

## 2.3 Building Block

Parent Feature or Study Item		
Unique ID	Title	TS

This work item is ...

	1
	2
	3
	4
	Other (no to 2-3-5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or TS(S)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) of external document	Clauses	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)		
Unique ID	Title	Nature of relationship
		TS / TR

Go to §3.

## 2.4 Work task

Parametrization Block		
Unique ID	Title	TS

## 3 Justification

Message originators (mobile network operators as well as government authorities that want to broadcast Public Warning Messages) require knowing if warning the population is likely to be successful, or if alternative means of warning citizens need to be considered. Mobile operators require knowing if they fulfil the service requirements and have actually broadcasted Warning Messages to citizens.

Currently a Warning Message expires after the requested number of repetitions has been completed and there is no reporting about the success or failure of broadcast.

Secondly, there needs to be a capability for reporting on the availability of cells for Warning Message Delivery without actually sending messages to the general public.

## 4 Objective

The objective of the work is to enhance the reporting capabilities of Warning Message Delivery in LTE.

The work will consider/assess alternatives in particular to fulfil the following capabilities:

- a) the (H)eNodeB reporting at the end of the broadcast period and possibly also during the broadcast period, for each cell in the Warning Area, whether the alert broadcast was successful, partially successful, or (fully) unsuccessful, by reporting the number of completed broadcasts of the warning message for each cell, and by including the cause if the broadcast was not completely successful;
- b) the (H)eNodeB reporting whether the cells in a Warning Area are available or not available for PWS, and in the latter case, including the cause of the non-availability.

The work will include a study phase to specify the requirements and assess potential alternatives.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
23.712	Study on Warning Status Reporting	CT1		CT#68 (06-2015)	CT#68 (06-2015)	

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
23.041		Stage 2 of Warning Status Report feature	CT#68 (06-2015)	CT1 responsibility
29.168		Stage 3 of Warning Status Report feature	CT#69 (09-2015)	CT4 responsibility

## 11 Work item rapporteur(s)

Peter Sanders, one2many (peter.sanders@one2many.eu)

## 12 Work item leadership

CT1

## 13 Supporting Individual Members

<b>Supporting IM name</b>
one2many
AT&T
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
KPN
T-Mobile US

## Shared Data Update for Multiple Subscriber

660026	Shared Data Update for Multiple Subscriber	SHARED_SubData_UPD	1	C4	Dec-14	Dec-14	100%	CP-150013
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**3GPP TSG CT Meeting #67**  
**Shanghai, P.R. China; 9<sup>th</sup> – 10<sup>th</sup> March 2015**

**CP-150013**

revision of CP-142443

---

**Source:** 3GPP TSG CT WG4  
**Title:** Revised WID on Shared Data Update  
**Document for:** Approval  
**Agenda Item:** 13.1

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Shared Data for Multiple Subscribers

**Acronym:** SHARED\_SubData\_UPD

**Unique identifier:** 660022

### 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
620002	Study on Shared Data Update for Multiple Subscribers	This TR analyses scenarios and existing mechanisms for updates on subscriber data shared by multiple subscribers within 3GPP system, and provides solutions for CS/PS/EPS/IMS respectively.

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

<a href="#">Stage 1 (go to 2.3.1)</a>
<a href="#">Stage 2 (go to 2.3.2)</a>
<a href="#">Stage 3 (go to 2.3.3)</a>
<a href="#">Test spec (go to 2.3.4)</a>
<a href="#">Other (go to 2.3.5)</a>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The Study on Shared Data for Multiple Subscribers (FS\_SHARED\_SubData\_UPD), as described in the TR 29.854, analyses scenarios and existing mechanisms for updates on subscriber data shared by multiple subscribers within 3GPP system, and provides corresponding recommendation and conclusion for CS/PS/EPS/IMS respectively.

The TR concludes to continue the normative work on the following aspects:

- Introduce a kind of dummy subscriber and store the dummy subscriber identities as repository data of the subscribers who share the service data stored with the dummy subscribers for subscription data update shared by multiple subscribers stored in the IMS AS.

## 4 Objective

The aim of this work item is to define mechanisms for update of subscriber data shared by multiple subscribers according to the conclusion as described in the justification part.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

Affected existing specifications [None in the case of Study Items]					
Spec No.	CR	Subject of the CR		Approved at plenary#	Comments
29.328		Possible impact for documentation of the mechanism with introduction of kind of dummy subscribers and storage of the dummy subscriber identities as repository data of the subscribers who share the service data stored with the dummy subscribers.		CT#68 (Jun 2015)	CT4 responsibility
29.364		Possible impact for documentation of the mechanism with introduction of kind of dummy subscribers and storage of the dummy subscriber identities as repository data of the subscribers who share the service data stored with the dummy subscribers.		CT#68 (Jun 2015)	CT4 responsibility

## 11 Work item rapporteur(s)

Huawei, Susan Shi ([susan.shishufeng@huawei.com](mailto:susan.shishufeng@huawei.com))

## 12 Work item leadership

CT4

## 13 Supporting Individual Members

Supporting IM name
Huawei
China Telecom
China Mobile
HiSilicon
Nokia Networks

## IMS Stage-3 IETF Protocol Alignment

660017	<a href="#">IMS Stage-3 IETF Protocol Alignment</a>	IMSProtoc7	1	C1	Dec-14	Dec-15	55%	CP-140815
670096	<a href="#">CT1 aspects of IMS Stage-3 IETF Protocol Alignment</a>	IMSProtoc7	2	C1	Dec-14	Dec-15	70%	CP-140815
670097	<a href="#">CT3 aspects of IMS Stage-3 IETF Protocol Alignment</a>	IMSProtoc7	2	C3	Dec-14	Dec-15	40%	CP-140815

**3GPP TSG CT Meeting #66**  
**Maui, US; 8<sup>th</sup> – 9<sup>th</sup> December 2014**

**CP-140815**

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<b>Source:</b>	<b>CT1</b>
<b>Title:</b>	<b>New WID on IMS Stage-3 IETF Protocol Alignment</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>13.1</b>

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** IMS Stage-3 IETF Protocol Alignment

**Acronym:** IMSProtoc7

**Unique identifier:**

### 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

Stage 1 (go to 2.3.1)
Stage 2 (go to 2.3.2)
Stage 3 (go to 2.3.3)
Test spec (go to 2.3.4)
Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

In Release 5, the IMS was defined to support IP Multimedia services. The feature set in Release 5 provides a basis for IP Multimedia support. At Release 6, 7, 8, 9, 10, 11 and 12 further work was identified. At Release 13 the need for other new capabilities is being identified, and there is still significant ongoing work in IETF that should be documented in relation to its impact on IMS.

In general this work item is about maintaining alignment of the development of the SIP used in IMS with that currently defined by IETF. Such changes are principally the end-to-end or end-to-application support of information without necessarily the need for other core network developments (such as interworking), and go beneath the level of detail of what is required from the stage 1 and stage 2 descriptions.

Having said that, there may be minor stage 1 and stage 2 enhancements produced under TEI13, or minor stage 1/stage 2 requirements coming from 3GPP2, OMA or ETSI E2NA that could be further developed at stage 3 under this work item.

## 4 Objective

The areas to be considered are:

1. Ensure protocol alignment between 3GPP Stage 3 IMS work and IETF. Review of existing and future capabilities provided in SIP by IETF, and provide documentation as whether these capabilities are supported in the IM CN subsystem or not.

In addition to the above listed items, there may be minor technical improvements and enhancements to IMS, not of sufficient significance to be normally covered by a work item, that can be dealt with by this work

item. The scope of this WID is protocol alignment, and those capabilities that may lead to new or enhanced IMS applications are not dealt with as part of this WID.

The changes are limited to SIP and SDP related issues.

## 5 Service Aspects

None. Service aspects are covered by other work item descriptions.

## 6 MMI-Aspects

None. MMI Aspects are covered by other work item descriptions.

## 7 Charging Aspects

None. Charging Aspects are covered by other work item descriptions. Within release 5 and later releases there are protocol mechanism providing in support of charging, and these may require enhancement by work areas described by this work item.

## 8 Security Aspects

None. Security Aspects are covered by other work item descriptions. Within release 5 and later releases there are protocol mechanism providing in support of security, and these may require enhancement by work areas described by this work item.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No			X		
Don't know	X				X

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
23.218		Review of additional capabilities provided in SIP by IETF, and provide documentation as whether these capabilities are supported in the IM CN subsystem or not	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
24.229		Review of additional capabilities provided in SIP by IETF, and provide documentation as whether these capabilities are supported in the IM CN subsystem or not	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
24.930		Correction of any errors in this TR	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT1 ownership.
29.163		Changes to this specification consequent on changes to 24.229 made under this work item	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT3 ownership.
29.165		Changes to this specification consequent on changes to 24.229 made under this work item	CT#70 (Dec 2015)	End date will be coincident with freezing of release 13. CT3 ownership.

## **11 Work item rapporteur(s)**

Keith Drage

Email: keith.drage@alcatel-lucent.com

## **12 Work item leadership**

CT1

## **13 Supporting Individual Members**

<b>Supporting IM name</b>
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Ericsson
Huawei
Nokia Networks
Blackberry
Deutsche Telekom
Orange
Qualcomm



## IMS Signalling Activated Trace

630007	<a href="#">IMS Signalling Activated Trace</a>	ISAT	1	C1, C3, C4, IET F	Mar-14	Dec-15	28%	CP-150091	
630107	<a href="#">CT1 part of IMS Signalling Activated Trace</a>	ISAT	2	C1	Mar-14	Dec-15	0%	CP-150091	
651003	<a href="#">(IETF) IMS Signalling Activated Trace (draft-dawes-sipping-debug)</a>	ISAT	2	C1 - IET F	Sep-14	Dec-15	25%	CP-150091	
651103	<a href="#">(IETF) IMS Signalling Activated Trace (draft-dawes-sipping-debug)</a>	ISAT	2	C3 - IET F	Sep-14	Dec-15	25%	CP-150091	
651203	<a href="#">(IETF) IMS Signalling Activated Trace (draft-dawes-sipping-debug)</a>	ISAT	2	C4 - IET F	Sep-14	Dec-15	25%	CP-150091	
630207	<a href="#">CT3 part of IMS Signalling Activated Trace</a>	ISAT	2	C3	Mar-14	Dec-15	0%	CP-150091	
630307	<a href="#">CT4 part of IMS Signalling Activated Trace</a>	ISAT	2	C4	Mar-14	Dec-15	90%	CP-150091	

### 3GPP TSG CT Meeting #67

**CP-150091**

Shanghai, P.R. China; 9<sup>th</sup> – 10<sup>th</sup> March 2015

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### 3GPP TSG CT Meeting #63

**CP-140195**

Fukuoka, JAPAN; 4<sup>th</sup> – 5<sup>th</sup> March 2014

was CP-140107

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

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Title: **IMS Signalling Activated Trace**

Acronym: **ISAT**

Unique identifier: **630007**

### 1 3GPP Work Area

	<b>Radio Access</b>
x	<b>Core Network</b>
	<b>Services</b>

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
x	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
340066	Trace Management 8 (acronym: OAM8-Trace)	This is a further development of the WID in CP-080315

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Subscriber and Equipment Trace provide very detailed information at call level on one or more specific mobile(s) or subscribers. This data is an additional source of information to Performance Measurements and allows going further in monitoring and optimisation operations.

The intentions of signalling activated tracing are to improve and simplify end-to-end service diagnostics and to enhance the Mobile Operator's ability to manage their complex services. Signalling activated tracing is aimed at end-to-end service-level diagnostics, rather than per node tracing. By definition, signalling activated tracing is the ability to capture and log all relevant information at each component within a service chain, associated with a specific service that is initiated either by an end user or a component [see OMA-RD-OSPE-V1\_0-20050614-C.pdf].

The following tasks for CT groups result from the stage 2 requirements:

- CT1 on trace activation/deactivation over SIP between IMS entities;

- CT4 on trace activation/deactivation over Cx, Sh; and
- CT1, CT3, and CT4 on End-to-end tracing for IMS.

## 4 Objective

The main objective of this work item is to update the above mentioned interface protocols to include the procedures defined in SA5 TS 32.422 "Trace Control and Configuration Management". Protocol updates are needed for trace activation, and for conveying a signalling activated tracing indicator. Updates need to incorporate into 3GPP IMS the SIP support for signalling activated trace being specified in the insipid working group in the IETF.

## 5 Service Aspects

None, covered by the parent feature.

## 6 MMI-Aspects

No such aspects identified for the stage 3 work.

## 7 Charging Aspects

No such aspects identified for the stage 3 work.

## 8 Security Aspects

No such aspects identified for the stage 3 work.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		x		x	
No	x		x		
Don't know					x

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

Affected existing specifications [None in the case of Study Items]					
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments	
24.229		Procedures for adding, reading and removing an indicator that SIP signalling should be logged.	CT#70 (Dec. 2015)	CT1 responsibility	
24.323		Trace Management Object (MO)	CT#70 (Dec. 2015)	CT1 responsibility	
23.008		Adding IMS signalling activated trace configuration Information to IMS Subscriber Data	CT#70 (Dec. 2015)	CT4 responsibility	
29.228		For Cx interface, UML Schema and XML added for the IMS signalling activated trace configuration information according to the XML schema in TS 24.323, "Trace Management Object (MO)".	CT#70 (Dec. 2015)	CT4 responsibility	
29.229		Add the IMS service level trace to the Diameter application for Cx	CT#70 (Dec. 2015)	CT4 responsibility	
29.328		For Sh interface, UML Schema and XML added for the IMS service level trace configuration information according to the XML schema in TS 24.323, "Trace Management Object (MO)".	CT#70 (Dec. 2015)	CT4 responsibility	
29.329		Add the IMS service level trace to the data-reference AVP	CT#70 (Dec. 2015)	CT4 responsibility	
29.165		Add indicator that SIP signalling should be logged to the inter-IMS Network to Network Interface (NNI).	CT#70 (Dec. 2015)	CT3 responsibility	
24.292		no reference. In Rel-13, 24.292 will need a description of adding IMS signalling activated trace configuration of MSC Server enhanced for ICS providing the UA role	CT#70 (Dec. 2015)	CT1 responsibility	
24.237		no reference. In Rel-13, 24.237 will need a description of adding IMS signalling activated trace configuration of EATF, ATCF providing the UA role	CT#70 (Dec. 2015)	CT1 responsibility	

## 11 Work item rapporteur(s)

Vodafone, Peter Dawes, peter(dot)dawes(at)vodafone(dot)com

## 12 Work item leadership

CT1

## 13 Supporting Individual Members

Supporting IM name
Vodafone
Telecom Italia
Ericsson
Huawei

## Retry restriction for Improving System Efficiency

670013	Retry restriction for Improving System Efficiency	RISE	1	C1	Mar-15	Dec-15	70%	CP-150092
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3GPP TSG CT Meeting #67  
Shanghai, P.R. China; 9<sup>th</sup> – 10<sup>th</sup> March 2015

CP-150092

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

Title: Retry restriction for Improving System Efficiency

Acronym: RISE

Unique identifier: 670013

### 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
620006	Signalling Improvements for Network Efficiency(SINE)	This WID mainly covers the remaining UE retry restriction issues unresolved in Rel-12 SINE WID.

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

<b>Stage 1 (go to 2.3.1)</b>
<b>Stage 2 (go to 2.3.2)</b>
<b>Stage 3 (go to 2.3.3)</b>
<b>Test spec (go to 2.3.4)</b>
<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

In Release 12, Signalling Improvements for Network Efficiency (SINE) work was produced in order to improve the performance of existing stage 3 protocols for effective handling of device's behaviour.

The retry restriction on device's behaviour was a main part of SINE work. The aggressive and unlimited retry from devices (especially, e.g. from smart phones) will severely wastes the network resources as well as drains the battery of devices. However, not all raised retry restriction issues have been agreed and implemented due to lack of time. Notably, the solution suffers from, for example, the following limitations:

- The retry restriction issues were indentified in cases of rejection happened when the UE registers to a new PLMN which is in the list of equivalent PLMN.
- The retry restriction issues were indentified in cases of rejection happened when the UE registers to a new PLMN which is not in the list of equivalent PLMN.

## 4 Objective

The scope of this work item includes:

4. To analyze identified retry restriction issues not resolved in Rel-12, including retry restriction issues happened when the UE registers to a new PLMN which is in the list of equivalent PLMN, or not in the list of equivalent PLMN.
5. To provide potential solutions to above identified retry restriction issues.

Stage 3 changes that require stage 2 changes are out of scope of this work item. The enhancements on network congestion control and CS fallback are also out of scope of this work item.

For retry restriction issues happened when the UE registers to a new PLMN which is not in the list of equivalent PLMN, if the solution evaluated as impact other stage 3 WGs, then the objective needs to be re-assessed.

## 5 Service Aspects

The proposed work will not impact specific services but is anticipated to have positive impact on service delivery.

## 6 MMI-Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

N/A

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X		X	
No			X		X
Don't know	X				

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
24.008		Specify the missing MS behaviour for some NAS reject cause values to limit the unnecessary retries; Enhance the existing MS behaviour to avoid signalling loops or to limit the repeated number of attempts.	CT#69 (September 2015)	CT1 responsibility
24.301		Specify the missing UE behaviour for some NAS reject cause values to limit the unnecessary retries; Enhance the existing UE behaviour to avoid signalling loops or to limit the repeated number of attempts.	CT#69 (September 2015)	CT1 responsibility

## 11 Work item rapporteur(s)

Lin Shu (shulin@huawei.com)

## 12 Work item leadership

CT1

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Huawei
China Mobile
China Unicom
HiSilicon
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
LG Electronics



## H.248 Aspects of WebRTC Data Channel on IMS Access Gateway

670020	<a href="#">H.248 Aspects of WebRTC Data Channel on IMS Access Gateway</a>	WebRTC H248DC	1	C4	Mar-15	Dec-15	20%	CP-150185
670001	CT4 Aspect of H.248 Aspects of WebRTC Data Channel on IMS Access Gateway	WebRTC H248DC	2	C4	Mar-15	Dec-15	20%	CP-150185

**3GPP TSG CT Meeting #67**  
**Shanghai, P.R. China; 9<sup>th</sup> – 10<sup>th</sup> March 2015**

**CP-150185**  
*Revision of CP-150014(C4-150216)*

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<b>Source:</b>	<b>3GPP TSG CT WG4</b>
<b>Title:</b>	<b>New WID on H.248 Aspects of WebRTC Data Channel on IMS Access Gateway</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>13.1</b>

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

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## Title: **H.248 Aspects of WebRTC Data Channel on IMS Access Gateway**

Acronym:            WebRTCH248DC

Unique identifier: 670020

### 1    3GPP Work Area

	<b>Radio Access</b>
X	<b>Core Network</b>
	<b>Services</b>

### 2    Classification of WI and linked work items

#### 2.0    Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1    Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
580062	Web Real Time Communication access to IMS	WebRTC on IMS Access Gateway aspects covered in previous Release

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

<b>Stage 1 (go to 2.3.1)</b>
<b>Stage 2 (go to 2.3.2)</b>
<b>Stage 3 (go to 2.3.3)</b>
<b>Test spec (go to 2.3.4)</b>
<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The RTCWEB group in the IETF and the WEBRTC group in W3C are specifying a browser based client to support communication services. The work may be summarised as in this extract from the IETF RTCWEB charter:

There are a number of proprietary implementations that provide direct interactive rich communication using audio, video, collaboration, games, etc. between two peers' web-browsers. These are not interoperable, as they require non-standard extensions or plugins to work. There is a desire to standardize the basis for such communication so that interoperable communication can be established between any compatible browsers. The goal is to enable innovation on top of a set of basic components. One core component is to enable real-time media like audio and video, a second is to enable data transfer directly between clients.

In order for WebRTC client to have access to 3GPP IMS, interoperability between IMS and the WebRTC client is needed. Therefore, IMS enhancements are needed to support this interoperability.

NOTE: The terms WebRTC and RTCWEB tend to be used fairly interchangeably in the industry. For the purposes of this document we are using WebRTC.

The Release 12 IMS\_WebRTC work item has specified the protocol aspects for WebRTC client access to IMS services to fulfil the stage 2 requirements over W2, W3 and Iq reference points. The gateway control of IMS WebRTC data channels for Release 12 has not been specified due to the dependency on work that is needed in other standardisation bodies (ITU-T and IETF).

## 4 Objective

The objective is to specify the gateway control of IMS WebRTC data channels on IMS-ALG/IMS-AGW, including:

- handling of SCTP association for multiple data channels;
- binding of multiple WebRTC data applications (e.g. MSRP, BFCP, etc), multiple SCTP streams (data channels) and consequently multiple H.248 Streams;
- DCEP (Data Channel Establishment Protocol) support; and
- transport interworking of data channels between WebRTC client and IMS.

## 5 Service Aspects

None.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

None.

## 8 Security Aspects

None.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #Comments

Affected existing specifications [None in the case of Study Items]			
Spec No	CR	Subject of the CR	Approved at plenary #Comments
23.334		IMS-ALG/IMS-AGW procedures to support WebRTC data channel	CT#70 (Dec 2015) CT4 responsibility
29.334		IMS-ALG/IMS-AGW procedures to support WebRTC data channel	CT#70 (Dec 2015) CT4 responsibility

## 11 Work item rapporteur(s)

China Mobile, Xiaoning Du, [duxiaoning@chinamobile.com](mailto:duxiaoning@chinamobile.com)

## 12 Work item leadership

CT4

## 13 Supporting Individual Members

Supporting IM name
China Mobile
Huawei
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Nokia Networks

2013-10-03 version 1.14.0

Continuation of the Overload Control for PCC based Diameter applications

670021	Continuation of the Overload Control for PCC based Diameter applications	cDOCME_PCC	1	C3	Mar-15	Dec-15	100%	CP-150194
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**3GPP TSG CT Meeting #67**  
**Shanghai, P. R. China, 11 - 13 March 2015**

**CP-150194**  
**Revision of CP-150137**

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**3GPP TSG-CT WG3 Meeting #80**  
**Sorrento, Italy, 2 - 6 February 2015**

**C3-150402**

revision of tg-yynnnn

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**Source:** ZTE, ChinaTelecom  
**Title:** New WID: Continuation of the Overload Control for PCC based Diameter applications  
**Document for:** Approval  
**Agenda Item:** 13.10

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Continuation of the Overload Control for PCC based Diameter applications

**Acronym:** cDOCME\_PCC

**Unique identifier:** 670021

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
580026	Study on Diameter overload control mechanism	TR 29.809

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Potential enhancement of Diameter based protocols and existing Diameter applications have been investigated to support the overload control mechanism in 3GPP core networks. The study on Diameter Overload Control mechanisms (FS\_DOCME, 3GPP TR 29.809) has recommended using the solution (Diameter Overload Indication Conveyance) as defined in the IETF Draft draft-ietf-dime-ovli-02 as the basis of overload control for 3GPP Diameter applications. Specific complements will be defined per Diameter application. The conclusion of the study FS\_DOCME has an impact on Policy and Charging Control (PCC), for which CT3 is responsible. In Rel-12, Gx, Gxx, Sd and Rx interfaces have been enhanced to support the overload control and the impacts on Diameter Routing Agent (DRA) routing were also considered in the overload control mechanism. Currently, the S15, S9, S9a, Sy and Np interfaces have not been specified to support the overload control yet.

NOTE: Based on the operator policy, the overload control can be applied for the roaming case.

## 4 Objective

The objective of this work item is to specify overload control mechanisms for S15, S9, S9a, Sy and Np interfaces based on the conclusion of the Study Item FS\_DOCME.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

Affected existing specifications [None in the case of Study Items]			
Spec No	CR	Subject of the CR	Approved at plenary#
29.212		Specify Diameter Overload Control functionality over S15 reference point	CT#70 (Dec 2015) CT3 Responsibility
29.215		Specify Diameter Overload Control functionality over S9, S9a reference point	CT#70 (Dec 2015) CT3 Responsibility
29.219		Specify Diameter Overload Control functionality over Sy reference point	CT#70 (Dec 2015) CT3 Responsibility
29.217		Specify Diameter Overload Control functionality over Np reference point	CT#70 (Dec 2015) CT3 Responsibility

## 11 Work item rapporteur(s)

Zhou Xiaoyun (ZTE) [zhou.xiaoyun@zte.com.cn](mailto:zhou.xiaoyun@zte.com.cn)

## 12 Work item leadership

CT3

## 13 Supporting Individual Members

<b>Supporting IM name</b>
ZTE
ZTE Mobile
China Telecom
Orange
Telecom Italia
Oracle
Ericsson
Nokia Networks
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell

2013-10-03 version 1.14.0

## Review of dedicated 3GPP UICC features

670026	Review of dedicated 3GPP UICC features	Red_UCe	1	C6	Mar-15	Dec-15	75%	CP-150152
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**3GPP TSG CT Meeting #67**

**CP-150152**

**Shanghai, P. R. China, 09 - 10 March 2015**

**3GPP TSG-CT WG6 Meeting #75**

**C6-150087**

**Sorrento (Italy), 2-6 February 2015**

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**Source:** BlackBerry UK Ltd  
**Title:** Review of dedicated 3GPP UICC features  
**Document for:** Approval  
**Agenda Item:**

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

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**Title \* : Review of dedicated 3GPP UICC features**

**Acronym \* : Red\_UCe**

**Unique identifier \* [REDACTED]**

### 1 3GPP Work Area \*

	Radio Access
	Core Network
X	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
590010	Review of dedicated 3GPP UICC features	Study item to identify UICC features, their use in the market place and if they should be optional or not and on what criteria. Made recommendations for normative work.

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

Stage 1 (go to 2.3.1)
Stage 2 (go to 2.3.2)
Stage 3 (go to 2.3.3)
Test spec (go to 2.3.4)
Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

#### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

Claiming support for a given release of 3GPP translates into the requirement to support all the mandatory features specified for that release. This requirement is often found to be a superset of the requirements actually expressed by the customers for 3GPP devices. This relates in particular to some of the mandatory features specified for USIM, ISIM and the related Toolkit aspects (respectively found in TS 31.102, TS 31.103 and TS 31.111), as it appears that there is no intent to use some of those mandatory features in the field. With a view to best address their customer's requirements, the ME manufacturers tailor their implementation to the actual requirements expressed and to their understanding of which features are found to be used in the field. The current set of CT6 specifications does not allow for such profiling of features.

A review of the features and their mandatory/optional support in the light of actual use or demand in the field was conducted, and the technical report in 3GPP TR 31.901 was approved at CT#66. The TR reported the justification for the support of features identified as not being implemented or required (e.g. from SA1 requirements) based on input from PTCRB, GCF and member contributions. The report recommended that the features identified in the report be made optional.

## 4 Objective \*.

Define the technical solutions based on the recommendations listed in 3GPP TR 31.901.

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No			X	X	X
Don't know	X				

## 10 Expected Output and Time scale \*

New specifications *						
[If Study Item, one TR is anticipated]						
Spec No.	Title	Prime rsp WG	2ndary rsp WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
Affected existing specifications *						
[None in the case of Study Items]						
Spec No.	CR	Subject	Approved at plenary#		Comments	
31.102		Characteristics of the Universal Subscriber Identity Module (USIM) application	CT#70 (Dec. 2015)			
31.111		Universal Subscriber Identity Module (USIM) Application Toolkit (USAT)	CT#70 (Dec. 2015)			
31.121		Universal Subscriber Identity Module (USIM) application test specification	CT#70 (Dec. 2015)			
31.124		Universal Subscriber Identity Module Application Toolkit (USAT) conformance test specification	CT#70 (Dec. 2015)			

**11 Work item rapporteur(s) \***

**Adrian Buckley**

**(abuckley@blackberry.com)**

**12 Work item leadership \***

**CT6**

**13 Supporting Individual Members \***

<b>Supporting IM name</b>
BlackBerry UK Limited
LG Electronics
Microsoft Corporation
Qualcomm Incorporated



## Controlling IMS Media Plane with SDP Capability

680014	<a href="#">Controlling IMS Media Plane with SDP Capability</a>	SDPCN_I MS	1	C4	Jun-15	Dec-15	2%	CP-150238
680042	<a href="#">CT3 aspects of Controlling IMS Media Plane with SDP Capability</a>	SDPCN_I MS	2	C3	Jun-15	Dec-15	0%	CP-150238
680043	<a href="#">CT4 aspects of Controlling IMS Media Plane with SDP Capability</a>	SDPCN_I MS	2	C4	Jun-15	Dec-15	5%	CP-150238

**3GPP TSG CT Meeting #68**  
**Malmö, SWEDEN; 15<sup>th</sup> – 16<sup>th</sup> June 2015**

**CP-150238**

revision of C4-150625

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**Source:** TSG CT WG4  
**Title:** New WID on Controlling IMS Media Plane with SDP Capability Negotiation  
**Document for:** Approval  
**Agenda Item:** 13.1

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Controlling IMS Media Plane with SDP Capability Negotiation

**Acronym:** SDPCN\_IMS

**Unique identifier:**

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The SDP capability negotiation, as defined in IETF RFC 5939, enables SDP to provide limited support for indicating capabilities and their associated potential configurations, and negotiate the use of those potential configurations as actual configurations. The SDP media capabilities negotiation, as defined in IETF RFC 6871, extends the SDP capabilities negotiation mechanism by defining media capabilities that can be used to negotiate media types and their associated parameters.

Support of SDP capability negotiation has been added in 3GPP specifications of TS 24.229 (v8.4.0 on), TS 26.114 (v7.6.0 on) and TS 24.292 (release 8 on), and support of SDP media capabilities negotiation has been added in 3GPP TS 24.229 (v8.11.0 on), for ICS and other features when negotiating capabilities in SDP is needed, e.g. what RTP profile (RTP/AVP or RTP/AVPF) is used. In 3GPP TS 26.114, the procedures for MTSI MGW, e.g. MRFP and IM-MGW, are described.

However, these requirements have not been addressed in any of the 3GPP profiles for IMS media plane entities (such as Ix profile for IBCF and TrGW, and Iq profile for IMS-ALG and IMS-AGW) up to now.

It is expected that ITU-T H.248.80 "Gateway control protocol: Usage of the revised SDP offer / answer model with H.248" can be used to support SDP capability negotiation.

## 4 Objective

The objective is to specify the controlling procedures for IMS media plane when using SDP capability negotiation and/or SDP media capabilities negotiation in accordance with related procedures defined in TS 24.229, TS 26.114 and TS 24.292.

## 5 Service Aspects

None.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

None.

## 8 Security Aspects

None.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				x	
No	x	x	x		x
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WC	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
23.334		Stage 2 Iq procedures to support SDP Capability Negotiation	CT#70 (Dec 2015)	CT4 responsibility
29.334		Potential affected Stage 3 Iq procedures to support SDP Capability Negotiation	CT#70 (Dec 2015)	CT4 responsibility
29.162		Stage 2 Ix procedures to support SDP Capability Negotiation	CT#70 (Dec 2015)	CT3 responsibility
29.238		Potential affected Stage 3 Ix procedures to support SDP Capability Negotiation	CT#70 (Dec 2015)	CT4 responsibility
23.333		Stage 2 Mp procedures to support SDP Capability Negotiation	CT#70 (Dec 2015)	CT4 responsibility
29.333		Potential affected Stage 3 Mp procedures to support SDP Capability Negotiation	CT#70 (Dec 2015)	CT4 responsibility
29.163		Stage 2 Mn procedures to support SDP Capability Negotiation	CT#70 (Dec 2015)	CT3 responsibility
29.332		Potential affected Stage 3 Mn procedures to support SDP Capability Negotiation	CT#70 (Dec 2015)	CT4 responsibility
29.292		Stage 2 Mc procedures to support SDP Capability Negotiation	CT#70 (Dec 2015)	CT3 responsibility
29.232		Potential affected Stage 3 Mc procedures to support SDP Capability Negotiation (for MSC Server enhanced for ICS)	CT#70 (Dec 2015)	CT4 responsibility
29.235		Stage 2 Ix procedures for CS-IBCF and TrGW to support SDP Capability Negotiation	CT#70 (Dec 2015)	CT3 responsibility

## 11 Work item rapporteur(s)

Huawei, Weiwei(Tommy) Yang ([tommy@huawei.com](mailto:tommy@huawei.com))

## 12 Work item leadership

CT4

## 13 Supporting Individual Members

Supporting IM name
Huawei
Hisilicon
China Mobile
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell

2013-10-03 version 1.14.0

(SA66: on hold) Co-ordinated packet data network gateway (P-GW) change for SIPTO

640044	(SA66: on hold) Co-ordinated packet data network gateway (P-GW) change for SIPTO	CSIPTO	1	S1	Jun-14	Sep-14	100%	SP-140509
660012	Stage 1 for Co-ordinated packet data network gateway (P-GW) change for SIPTO	CSIPTO-ST1	2	S1	Jun-14	Sep-14	100%	SP-140509

**3GPP TSG SA Meeting #65**

**TD SP-140509**

**Edinburgh, GB, 15 – 17 September 2014**

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**Source:** TSG SA WG1

**Title:** Revised WID on Co-ordinated P-GW change for SIPTO (CSIPTO)

**Document for:** APPROVAL

**Agenda Item:** 13.7

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

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**Title \* : Co-ordinated P-GW change for SIPTO**

**Acronym \* : CSIPTO**

**Unique identifier \***

### 1 3GPP Work Area \*

	Radio Access
X	Core Network
X	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

-	<a href="#">Study Item (go to 2.1)</a>
X	<a href="#">Feature (go to 2.2)</a>
	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
450035	Rel-10 Feature: Local IP Access and Selected IP Traffic Offload (LIPA_SIPTO)	Defines the basic Selective IP Traffic Offload (SIPTO) feature a.k.a. "SIPTO above RAN".
500028	Rel-12 Feature: LIPA Mobility and SIPTO at the Local Network	Extends the basic SIPTO feature to address traffic offload when using Home (e)NodeBs and small cells.
610033	Rel-13 Study on Co-ordinated P-GW change for SIPTO	TR 22.828 (Predecessor Study Item)

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

x	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)		
Unique ID	Title	Nature of relationship
		TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

Small cells (such as Home eNB) are gaining momentum in the marketplace. SIPTO is a key feature to enable local breakout of traffic from a small cell.

The Selective IP Traffic Offload (SIPTO) feature defined in 3GPP Rel-10 specifications allows the operator to streamline an established PDN connection by re-assigning a new PDN Gateway that is geographically closer to the current UE location. P-GW relocation implies a change in IP address, which means that performing SIPTO may disrupt any ongoing services. This is acknowledged in a NOTE in TS 23.401 ("If either of the above procedures for GW relocation are initiated while the UE has active applications, it may cause disruption of services that are affected if the IP address changes.").

A recently agreed CR (23.401 CR2584 in S2-132879) attempted to correct this issue by basically recommending that the SIPTO operation should not be performed for UEs in Connected mode (“*It shall be possible to configure the MME to deactivate a PDN connection, for P-GW relocation due to SIPTO above RAN, only when UE is in ECM-IDLE mode or during a Tracking Area Update procedure without established RAB(s).*”). While this CR is certainly an improvement compared to the previous situation of blindly performed SIPTO, it still does not address the real issue – namely – smooth PDN gateway relocation for UEs with IP flows that require IP address preservation (e.g. long conference call, large file transfers, etc.).

With the introduction of SIPTO at the Local Network (SIPTO@LN) feature, the PDN Gateway (alias Local Gateway) is moved even further towards the network edge and in the extreme case can even be collocated with the eNodeB. While this leads to an extremely “flat” architecture, in the sense that IP traffic can be broken out as close to the network edge as possible, the frequency of service disruptions due to SIPTO is likely to increase because of the much smaller “coverage” of the Local Gateway.

Effect of IP address change on a flow depends on whether the flow requires IP address preservation or not:

- For flows that do not require IP address preservation (e.g. web browsing) the user may not notice anything, or in the worst-case may have to briefly interact with the user interface (e.g. by clicking again on the web page link following a “network connection lost” error);
- It is for flows that require IP address preservation, the effect can be detrimental (e.g. the user, ejected from the conference, has to re-dial the bridge number, enter password, etc.; similar applies to VPN traffic).

In order to avoid service disruption, coordination between the UE and the network before the SIPTO execution may be desirable. For example, for supporting applications requiring IP address preservation, the UE may be able to proactively move the flow to a new IP address (i.e. on a new PDN connection) before the previous IP address (i.e. old PDN connection) is removed.

Based on end-user preferences and to benefit from the UE knowledge of established IP flow type, the network could consider the end-user expectation regarding local P-GW change in case of SIPTO use.

## 4 Objective \*

The SA1 objective is to define system requirements for coordinated selective IP traffic offload that minimises service disruption by taking into account UE’s knowledge of the IP flow characteristics (e.g. requiring IP address preservation or not). This includes:

- the ability to establish a second PDN connection to the same PDN, without releasing the existing PDN connection, and temporarily keep both PDN connections until all traffic is consolidated on only one PDN connection.
- the ability to establish and simultaneously use two PDN connections with the same PDN, one with and one without IP address preservation, so that IP flows can be bound to matching PDN connections based on their characteristics.

The security of the network shall not be compromised by the introduction of such feature.

This feature should aim at minimizing impact on existing system entities.

This feature should aim at re-using existing standardized functionality as much as possible.

## 5 Service Aspects

Service aspects will be included.

## 6 MMI-Aspects

There is no MMI impact.

## 7 Charging Aspects

Mechanisms for the provision of accounting/usage information may be included.

## 8 Security Aspects

To be addressed with SA3.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		x		x	
No	x				x
Don't know			x		

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp WG(s)	Presented for information at plenary#	Approved at plenary#
Affected existing specifications * [None in the case of Study Items]					
Spec No.	CR	Subject	Approved at plenary#		Comments
TS 22.101		Service Aspects; Service Principles	SA#65		CSIPTO is an enhancement to SIPTO and SIPTO@LN. Proposed CR will add normative requirements to Section 4.3.5 of TS 22.101

## 11 Work item rapporteur(s) \*

Intel, eric.siow@intel.com

## 12 Work item leadership \*

SA1

## 13 Supporting Individual Members \*

Supporting IM name
Intel
SONY Mobile Communications
InterDigital
Samsung
T-Mobile USA
KPN
ACER
China Mobile
China Telecom
Orange
Mediatek
Sprint



(SA66: on hold) Enhanced CS Fallback (CSFB)

640051	<a href="#">(SA66: on hold) Enhanced CS Fallback (CSFB)</a>	eCSFB	1	S2, S3	Jun-14	Mar-15	34%	SP-140579
640151	TR for Enhanced CS Fallback (CSFB)	eCSFB	2	S2	Jun-14	Dec-14	85%	SP-140579
640251	Stage 2 for Enhanced CS Fallback (CSFB)	eCSFB	2	S2	Jun-14	Mar-15	0%	SP-140579
650024	Security for Enhanced CS Fallback (CSFB)	eCSFB	2	S3	Sep-14	Sep-14	0%	SP-140579

### 3GPP TSG SA Meeting #65

TD SP-140579

Edinburgh, Scotland, 15-17 September, 2014

### 3GPP TSG SA WG3 (Security) Meeting #76

S3-142264

25 – 29 August 2014 Sophia Antipolis (France)

revise version of S3-142038

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**Source:** China Unicom, BT, ZTE Corporation, Huawei, HiSilicon, CATR CATT

**Title:** Update of SA2's WID SP-140285 on enhanced CSFB

**Document for:** Approval

**Agenda Item:** 7.17

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Updated of SA#64 (Jun 2014) approved WID SP-140285 to add the SA3 aspects.

### 3GPP TSG SA Meeting #64

TD SP-140285

Sophia Antipolis, France, 16 - 18 June, 2014

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**Source:** SA WG2

**Title:** New WID: Enhanced CSFB {eCSFB}

**Presented for:** Approval

**Agenda Item:** 15

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### 3GPP TSG SA WG2 Meeting #103

TD S2-142265

Phoenix, USA, 19-23 April, 2014

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**Source:** China Unicom, Qualcomm Incorporated, Deutsche Telekom, ZTE, Huawei, HiSilicon, CATR, CATT, Mediatek, ILL, Broadcom Corporation, Telefonica

**Title:** New WID on enhanced CSFB

**Document for:** Approval

**Agenda Item:** 8.1

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

Title \* : Enhanced CS Fallback

Acronym \* : eCSFB

Unique identifier \*: 640051

## 1 3GPP Work Area \*

X	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
350030	Single Radio Voice Call Continuity for 3GPP (SAES-SRVCC)	Rel-8 WI on SRVCC
390036	CS Fallback in EPS (SAES-CSFB)	Rel-8 WI on CSFB

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: See the Justification section

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block	
Unique ID	Title
	TS

## 3 Justification \*\*

CS Fallback (CSFB) plays still an important role in deployed LTE networks. Compared to a native call starting in 2G or 3G CS domain, CSFB has longer call setup times. Increased call setup times can be observed in both LTE->UMTS and LTE->GSM CSFB, especially if the already standardized solutions (e.g. RIM) to optimize the call setup times are not possible to deploy, e.g., due to impact on both GERAN and E-UTRAN.

Since some operators expect that CSFB will continue to play an important role for some time to come, there is interest in reducing the CSFB call setup times.

It is SA3's responsibility to evaluate if the proposed optimizations are acceptable from security point of view.

## 4 Objective \*

### **SA2 objectives:**

Investigate and describe how the CSFB procedures can be enhanced or improved for shortening CSFB call setup time (e.g., by reusing existing operations, it may be possible to enhance CSFB call setup delay for SRVCC capable devices ).

Any adopted enhancements from this WID shall not affect CSFB for UEs to which the enhancements are not applicable.

Normative work will proceed only based on agreement conclusion during the TR phase.

CSFB enhancements must be designed using existing UE operations.

### **SA3 objectives:**

Evaluate the alternative solutions of eCSFB from security perspective and ensure acceptable level of security.

## 5 Service Aspects

None identified

## 6 MMI-Aspects

N/A

## 7 Charging Aspects

N/A

## 8 Security Aspects

Any necessary security analysis will be undertaken by SA3 to support SA2.

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			X
Don't know					

## 10 Expected Output and Time scale \*

New specifications * [If Study Item, one TR is anticipated]					
Spec No	Title	Prime rsp. WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
23.772	Analysis of enhanced CSFB	SA2		SA#65 Sep 2014	SA#66 Dec 2014
Affected existing specifications * [None in the case of Study Items]					
Spec No	CR	Subject		Approved at plenary#	Comments
23.272		Stage 2 CRs describing an enhanced CSFB procedure		SA#67 Mar 2015	

## 11 Work item rapporteur(s) \*

SA2: Yang Xu, China Unicom, xuyang49@chinaunicom.cn

SA3: Feng Gao, China Unicom, gaofeng149@chinaunicom.cn

## 12 Work item leadership \*

SA2

## 13 Supporting Individual Members \*

Supporting IM name
China Unicom
Deutsche Telekom
Qualcomm Incorporated
CATR
Huawei
Hisilicon
ZTE
CATT
Mediatek
III
Broadcom Corporation
Telefonica
CeWIT
IIT
ITRI

(SA66: on hold) SRVCC Enhancements for Transcoding Avoidance

650025	<a href="#">(SA66: on hold) SRVCC Enhancements for Transcoding Avoidance</a>	SETA	1	S2	Sep-14	Jun-15	28%	SP-140436
650125	<a href="#">TR for SRVCC Enhancements for Transcoding Avoidance</a>	SETA-SA2TR	2	S2	Sep-14	Mar-15	70%	SP-140436
650225	<a href="#">Stage 2 for SRVCC Enhancements for Transcoding Avoidance</a>	SETA-SA2	2	S2	Sep-14	Jun-15	0%	SP-140436

## 3GPP TSG SA Meeting #65

TD SP-140436

Edinburgh, Scotland, UK, 15 - 17 September 2014

Source: Ericsson

Title: New WID for SRVCC Enhancements for Transcoding Avoidance

Document for: Approval

Agenda Item: 15

3GPP TSG SA2 Meeting #104  
Dublin, Ireland, 7-11 July 2014

SA2-142912  
revision of S2-142721

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

Title: SRVCC Enhancements for Transcoding  
Avoidance

Acronym: SETA

Unique identifier:

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The SRVCC procedure as specified may cause additional transcoding between target radio leg and ATGW even though in theory it would be possible to avoid it. As a result, the SRVCC procedures may add one more transcoding point for the call, and thereby degrade the quality of the ongoing call

Transcoder free operation (TrFO) is always desirable to achieve good voice quality. Furthermore (TrFO) preserves network resources.

Transcoder free Operation is especially important for HD Voice.

And while it is possible for the ATCF to renegotiate with the remote end any random Target RAN Codec selected by the CS network at call transfer based on the current procedure, this may extend the perceived time it will take to conclude the call transfer and the speech interruption that might result due to the time the negotiation will take.

## 4 Objective

The objectives of this work item is to enhance the chances for an end-to-end transcoder free operation (TrFo) where possible, and/ or ensure that the proper CS radio resources are reserved for optimal RAN codec.

The above objective should minimize the impact on set-up delays.

The work will first provide use cases/scenarios to be addressed and then conclusion is to be reached from the study regarding normative work.

This work should also address the transcoder free operations of EVS codecs during SRVCC that are not covered by Rel-12.

## 5 Service Aspects

none

## 6 MMI-Aspects

none

## 7 Charging Aspects

Any charging impacts will be undertaken by SA5

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
TR 23.xxx	Enabling Transcoder Free Operation During SRVCC (PS to CS)	SA2		SA#66 (Dec 2014)	SA#67 (March 2015)	TR may be used for capturing solution alternatives and evaluations.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
TS 23.216		SRVCC PS to CS MSC Server Enhancements in support of Transcoder Free operations	SA2#108	SA2 responsibility
TS 23.237		IP Multimedia Subsystem (IMS) Service Continuity	SA2#108	SA2 responsibility

## **11 Work item rapporteur(s)**

Foti George (George.Foti@ericsson.com)

## **12 Work item leadership**

SA WG2

## **13 Supporting Individual Members**

<b>Supporting IM name</b>
Ericsson
ATT
DT
Orange
Rogers
CMCC
Qualcomm
Samsung
T-Mobile USA INC
ZTE

Development of super-wideband and fullband P.835

680050	Development of super-wideband and fullband P.835	DESUDAPS	1	S4	Jun-15	Jun-16	20%	SP-150215
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**Technical Specification Group Services and System Aspects**

**TSGS#68(15)0215**

**3GPP TSG SA Meeting #68**

**Agenda Item: 16**

**Malmö, Sweden, 17-19 June 2015**

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3GPP TSG SA WG4 Meeting #83

□ S4-150564

Bratislava, Slovakia 13 – 17 April 2015

<b>Sources:</b>	Audience, Inc., HEAD acoustics GmbH, SPRINT Corporation, Qualcomm Incorporated, Sony Mobile Communications
<b>Title:</b>	New work item on development of super-wideband and fullband P.835 test framework, databases, and performance specification (DESADUPS)
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	17

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

**Title \* : Development of super-wideband and fullband P.835 test framework, databases, and performance specification**

**Acronym \* : DESUDAPS**

**Unique identifier \***

### 1 3GPP Work Area \*

	Radio Access
	Core Network
X	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any) *</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any) *</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2 \*

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

Recent standardization activities within TSG SA WG4 have produced the Enhanced Voice Services (EVS) codec with super-wideband (SWB) and fullband (FB) operating modes. Additional work has updated most acoustic requirements in 3GPP TS 26.131 and test methods in TS 26.132 for SWB and FB mode. However, there is currently no P.835 objective predictor suitable for evaluation of SWB or FB speech performance in the presence of background noise. Consequently, associated UE requirements or performance objectives and test methods in SWB or FB are not yet available in 26.131 and 26.132.

While work to develop SWB and FB predictors for P.835 is in progress in other organizations, there is a need to develop P.835 SWB and FB training and validation databases providing data representative of 3GPP UE use scenarios. In addition, suitable test methods and performance specifications of SWB and FB UEs in the presence of background noise must be developed. It is anticipated that this work item will

provide interested companies with a framework to collect subjective databases to be used for the purposes of developing and validating a P.835 predictor covering SWB and FB.

## 4 Objective \*

- Define appropriate noise types, levels, and background noise simulation methods for database development.
- Develop a suitable P.835 subjective test plan framework, including reference signals and appropriate codec operating modes for training and validation of objective predictors.
- Define minimum performance requirements for the objective predictor model handling FB and SWB.
- Develop appropriate UE test methods and set SWB and FB performance objectives in the presence of background noise, considering ES 202 396-1 as a background noise simulation method for testing. It is expected that performance requirements will eventually be defined, when terminals supporting FB or SWB are commercially available to provide a quantitative basis for such requirements.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X	X	X
Don't know					

## 10 Expected Output and Time scale \*

New specifications *					
[If Study Item, one TR is anticipated]					
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#
Affected existing specifications *					
[None in the case of Study Items]					
Spec No.	CR	Subject		Approved at plenary#	Comments
26.132		Speech and video telephony terminal acoustic test specification		SA#70	
26.131		Terminal acoustic characteristics for telephony; Requirements		SA#70	

## 11 Work item rapporteur(s) \*

Scott Isabelle (Audience, Inc.) [sisabelle@audience.com](mailto:sisabelle@audience.com), Andre Schevciw (QUALCOMM UK Ltd).  
[aschevciw@qti.qualcomm.com](mailto:aschevciw@qti.qualcomm.com)

## 12 Work item leadership \*

TSG SA WG4

## 13 Supporting Individual Members \*

Supporting IM name
Audience, Inc.
HEAD acoustics GmbH
Qualcomm Incorporated
SPRINT Corporation
Sony Mobile Communications

## Base Station (BS) RF requirements for Active Antenna System (AAS)

590030	<a href="#">Base Station (BS) RF requirements for Active Antenna System (AAS)</a>	AAS_BS_L TE_UTRA	1	R4	Mar-13	Jun-16	45%	RP-130373
590130	Core part: Base Station (BS) RF requirements for Active Antenna System (AAS)	AAS_BS_L TE_UTRA -Core	2	R4	Mar-13	Dec-15	75%	RP-142235
590230	Perf. part: Base Station (BS) RF requirements for Active Antenna System (AAS)	AAS_BS_L TE_UTRA -Perf	2	R4	Mar-13	Jun-16	20%	RP-142235

**3GPP TSG-RAN Meeting #59**  
**Vienna, Austria, 26 February – 1 March 2013**

**RP-130373**

**Source:** Huawei

**Title:** New work item proposal: Base Station (BS) RF requirements for Active Antenna System (AAS)

**Agenda item:** 13.1

**Document for:** Approval

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

**Title \* : Base Station (BS) RF requirements for Active Antenna System (AAS) core part**

**Acronym \* : AAS\_BS\_LTE\_UTRA\_core**

**Unique identifier \***

### 1 3GPP Work Area \*

X	Radio Access
	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

X	<a href="#">Study Item (go to 2.1)</a>
	<a href="#">Feature (go to 2.2)</a>
X	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship
		Rel-12

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
530056	Base Station (BS) RF requirements for Active Antenna System (AAS)	

This work item is ... \*

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

See the justifications in the feature work item.

## 4 Objective \*

This is the core work item to specify the BS core RF requirements for AAS.

The work item will develop and specify the core requirements for AAS Base Stations according to the following steps:

In the first step:

- Further evaluation of the spatial effects of multiple-column AAS BS on coexistence performance.

- Further evaluation of the spatial variation of other RF characteristics which may be impacted by antenna characteristics. It may be necessary to evaluate these characteristics on a requirement by requirement basis.
- Defining a set of representative deployment scenarios, as necessary to support the evaluations.
- Specifying each of the core requirements by means of either radiated requirements or requirements at the transceiver array boundary to ensure necessary coexistence.. A decision on the requirement reference point shall be based on concluding that radiated spatial effects that are understood to have impact on core requirements can be captured at that particular reference point.
- Defining transformations from the requirement point to the test point where necessary and possible.
- In the secondary step, based on and using the outputs of the first step above:
- Development of application independent core requirements which ensure co-existence in generic applications. It may be necessary to evaluate detailed approaches on a requirement by requirement basis.

All the existing features and the on-going features, such as carrier aggregation, operations in non-contiguous, operations in multiple-band, will be covered in the specifications for AAS BS.

Existing BS core RF specifications will remain and be applicable within their current scope.

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes			X		
No	X	X		X	X
Don't know					

## 10 Expected Output and Time scale \*

New specifications *						
[If Study Item, one TR is anticipated]						
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
3x.1xx	Active Antenna System (AAS) Base Station (BS) transmission and reception	RAN4		RAN #64 (Mar 2014)	RAN #65 (Jun 2014)	New technical specification for AAS BS.
37.8xx	E-UTRA, UTRA and GSM/EDGE; RF background for Active Antenna System (AAS) Base Station (BS)	RAN4		RAN #63 (Mar 2014)	RAN #64 (Jun 2014)	Technical report for the RF background of AAS BS.

Affected existing specifications *						
[None in the case of Study Items]						
Spec No.	CR	Subject	Approved at plenary#		Comments	

NOTE: The specifications for single RAT capable BS supporting UTRA or E-UTRA and MSR BS will be determined later with reference to the agreements in the ongoing Study Item for BS specification structure.

NOTE: TR37.840 could be updated if necessary.

## 11 Work item rapporteur(s) \*

Wu Rong (Ronnie) Zhang: ronnie.zhang@huawei.com

## 12 Work item leadership \*

RAN4: primary responsible WG

## 13 Supporting Individual Members \*

Supporting IM name
See Feature part

**3GPP TSG RAN Meeting #66**  
**Maui, USA, 8 - 11 December 2014**

**RP-142235**  
revision of RP-130373

---

<b>Source:</b>	Huawei
<b>Title:</b>	Revised work item proposal: Base Station (BS) RF requirements for Active Antenna System (AAS)
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	11.6.2

---

# 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Base Station (BS) RF requirements for Active Antenna System (AAS) core part

**Acronym:** AAS\_BS\_LTE\_UTRA\_core

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	x
<b>This WID includes a Performance part</b>	x

## 1 3GPP Work Area

x	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

x	Study Item (go to 2.1)
x	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
530056	Study of RF and EMC Requirements for Active Antenna Array System (AAS) Base Station	Feasibility study for the present Work Item proposal

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

<b>Stage 1 (go to 2.3.1)</b>
<b>Stage 2 (go to 2.3.2)</b>
<b>Stage 3 (go to 2.3.3)</b>
<b>Test spec (go to 2.3.4)</b>
<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The feasibility study of specifying the necessary BS requirements for AAS was completed in RAN #59. The study resulted in the following findings:

- An examination of relevant international regulations revealed little guidance regarding the specifications that are explicitly applicable to AAS.
- An analysis of AAS RF transmission observes that undesired emissions from different transmitters will not be perfectly correlated. The uncorrelated parts of the undesired emissions will not be radiated in the same pattern as emissions which are correlated between different transmitters. This effect was studied in simulations of the spatial distribution of the Adjacent Channel Leakage Ratio (ACLR). Simulation results indicated that for the specific scenarios (an application with fixed beam pattern by a single column AAS) studied, ACLR of 45dB per transceiver is sufficient to fulfil the co-existence studies as detailed in TR36.942 and TR25.942. These simulations estimate the mean and 5th percentile throughput impact, while future simulations may consider and study the impact of the spatial distribution of ACLR on the spatial distribution of throughput.
- As an example of receiver impacts, the in-band blocking was simulated and analyzed for AAS BS. The results of a single column AAS model observed that the power level presented for each individual receiver of an AAS system was similar to the in-band blocking power level presented to a conventional BS receiver as a result of the difference in antenna gain and directivity between an antenna array and a single element or sub-array of the AAS antenna array.
- Existing RF requirements (in which some of the requirements are derived based the reference antennas) may be inadequate to ensure coexistence for unique AAS applications which may be difficult or impossible to support by conventional base stations. Examples of such applications include beam steering in elevation, azimuth or combinations of both.
- Two potential approaches for reference point definition were identified for requirements: radiated requirements and requirements at the transceiver array boundary. Requirements should be specified at only one reference point. The SI did not reach consensus on the default reference point.

- The point of testing may differ from the requirement reference point; one example is a requirement may be specified in the far field but tested at the transceiver array boundary with an appropriate transformation, and vice versa.

Based on the study results of the AAS study item, it is necessary and feasible to specify the RF requirements for AAS BS.

## 4 Objective

This is a parent work item to specify the BS RF requirements for AAS BS covering single RAT capable BS supporting UTRA or E-UTRA, and multi-RAT capable BS operating in Band Category 1 and Band Category 3 for Wide Area and Medium Range, and Local Area coverage to ensure necessary coexistence.

NOTE: Wide Area BS will be prioritized.

The new specification for AAS will take a similar approach as in line with outcome of the on-going Study Item on new Base Station specification structure, taking into account the regulatory framework in different regions.

It is composed of the following work tasks:

- Core RF requirements in newly created AAS BS specifications.
- Conformance testing requirements in newly created AAS BS specifications, derived from the core RF requirements, and demodulation testing requirements.

### 4.1 Objective of Core part WI

This is the core work item to specify the BS core RF requirements for AAS.

The work item will develop and specify the core requirements for AAS Base Stations according to the following steps:

In the first step:

- Further evaluation of the spatial effects of multiple-column AAS BS on coexistence performance.
- Further evaluation of the spatial variation of other RF characteristics which may be impacted by antenna characteristics. It may be necessary to evaluate these characteristics on a requirement by requirement basis. Defining a set of representative deployment scenarios, as necessary to support the evaluations.
- Specifying each of the core requirements by means of either radiated requirements or requirements at the transceiver array boundary to ensure necessary coexistence.. A decision on the requirement reference point shall be based on concluding that radiated spatial effects that are understood to have impact on core requirements can be captured at that particular reference point.
- Defining transformations from the requirement point to the test point where necessary and possible.

In the secondary step, based on and using the outputs of the first step above:

- Development of application independent core requirements which ensure co-existence in generic applications. It may be necessary to evaluate detailed approaches on a requirement by requirement basis.

All the existing features and the on-going features, such as carrier aggregation, operations in non-contiguous, operations in multiple-band, will be covered in the specifications for AAS BS.

Existing BS core RF specifications will remain and be applicable within their current scope.

## 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

The objective is to develop AAS base station test configurations and specification of the conformance test requirements corresponding to the core requirements. Meeting this objective may include development of demodulation test requirements for AAS base station.

Multiple testing approaches may be developed where necessary and possible to support AAS implementations with access to the transceiver array boundary, as well as AAS implementations without access to the transceiver array boundary. At least one measurement setup will be developed for each requirement. Measurement approaches must demonstrate that they are able to verify the specified core requirements and capture radiated spatial aspects identified as relevant.

Test methodologies are to be discussed in parallel with core requirements to guide the decision on the requirement point and of transformations from requirement point to testing point as needed.

## 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #66		Q1/2015										RAN			
#67		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
80	80	89	89		89	87		74	74	74	74				
							1.5			0.5					

RAN #67		Q2/2015										RAN									
#68		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75	75	75
						1.5		0.5									1.5		0.5		

RAN #68		Q3/2015										RAN									
#69		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82	82	91	91		91		91		89		76		76		76		76		76		76
										1.5							1.5		0.5		

RAN #69		Q4/2015										RAN									
#70		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77	77	77
						1.5		0.5									1.5		0.5		

RAN #70					Q1/2016					RAN								
#71		R1L		R1U	R2L		R2U	R2J		R3		R4RF Core	R4RD Core		R4RF Perf	R4RD Perf		
		84		84		93		93		93		91		78		78		78
															1			

RAN #71					Q2/2016					RAN								
#72		R1L		R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf		
84bis	84bis	93bis	93bis	93bis	93bis	91bis	78bis	78bis	78bis	78bis	85	85	94	94	94	92	79	79
									1								1	

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

#### additional comments to the time budget proposal:

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X		
No	X	X		X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
37.105	E-UTRA, UTRA, Active Antenna System (AAS) Base Station (BS) transmission and reception	RAN4		RAN #69 (Sept 2015)	RAN #70 (Dec 2015)	New technical specification for AAS BS core requirements. Core part
37.842	E-UTRA, UTRA; RF background for Active Antenna System (AAS) Base Station (BS)	RAN4		RAN #71 (Mar 2016)	RAN #72 (June 2016)	Technical report for the RF background of AAS BS. Core part and Perf. part
37.145	E-UTRA, UTRA, Active Antenna System (AAS) Base Station (BS) conformance testing	RAN4		RAN #71 (Mar 2016)	RAN #72 (June 2016)	New technical specification for AAS BS conformance testing Perf. part

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new spec can only be new for one of both parts.

<b>Affected existing specifications</b> [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Richard Kybett: richard.kybett @huawei.com

## 12 Work item leadership

RAN4: primary responsible WG

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Huawei
AT&T
CATR
CMCC
China Telecom
China Unicom
Deutsche Telekom
Ericsson
HiSilicon
KDDI
NII
NTT DoCoMo
Orange
T-Mobile USA
Telus
US Cellular
Clearwire
Vodafone
NEC
Nokia Networks
Telefonica
Samsung
Alcatel-Lucent

LTE UE Total Radiated Power (TRP) and Total Radiated Sensitivity (TRS) and UTRA Hand Phantom related UE TRP and TRS Requirements

580037	<b>LTE UE Total Radiated Power (TRP) and Total Radiated Sensitivity (TRS) and UTRA Hand Phantom related UE TRP and TRS Requirements</b>	LTE_UTR_A_TRP_T_RS	1	R4, R5	Dec-12	Jun-16	33%	RP-130703
580137	<b>Core part: LTE UE TRP and TRS and UTRA Hand Phantom related UE TRP and TRS Requirements</b>	LTE_UTR_A_TRP_T_RS-Core	2	R4	Dec-12	Dec-15	40%	RP-141966
630011	<b>Test part: LTE UE TRP and TRS and UTRA Hand Phantom</b>	LTE_UTR_A_TRP_T_RS-UEConTest	2	R5	Mar-14	Jun-16	25%	RP-150070

**3GPP TSG RAN Meeting #60**  
**Oranjestad, Aruba, June 11<sup>th</sup> – 14<sup>th</sup>, 2013**

**RP-130703**

---

<b>Source:</b>	<b>Nokia Corporation</b>
<b>Title:</b>	<b>Revised WID: LTE UE TRP and TRS and UTRA Hand Phantom related UE TRP and TRS Requirements</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>11.5.3</b>

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

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**Title \* : LTE UE TRP and TRS and UTRA Hand Phantom related UE TRP and TRS Requirements**

**Acronym \* : LTE\_UTRA\_TRP\_TRS-Core**

**Unique identifier \***

### 1 3GPP Work Area \*

X	Radio Access
	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
X	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any) *</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

This work item is ... \*

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any) *</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2 \*

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3.

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS

## 3 Justification \*

LTE UE Total Radiated Power (TRP) and Total Radiated Sensitivity (TRS) test methodology was finalized in TR 37.902 in RAN#57 in September 2012. Number of commercial LTE network deployments and commercial LTE devices is already quite significant and these numbers are increasing. Therefore, the need for UE requirements for LTE TRP and TRS is also becoming important in order to ensure good LTE system and device performance when the number of devices in the networks are increasing.

Also UTRA UE OTA test methodology with hand phantoms (including test method for speech mode with head and hand phantoms and test method for data mode with hand phantoms) was finalized in RAN#57. The UTRA UE OTA TRP and TRS requirements for these newly added test methods are still missing.

## 4 Objective \*

The objective is to define UE LTE TRP and TRS minimum requirements both for LTE FDD and TDD UEs based on the TRP and TRS test methodology defined in TR 37.902 and update UTRA TRP and TRS requirements for hand phantom based test methods defined in TR 25.914.

Detailed work tasks include:

### LTE (Phase 1, Until RAN4#69)

1. Until RAN4#66: Discuss and agree a plan for LTE TRP and TRS measurements including test set up, device type etc.
  - o The requirement development is initiated for different devices types in the following order for ensuring focus for the work:
    - Smartphone type of devices
    - LEE (Laptop Embedded Equipment) (Start of discussion in RAN4#68bis)
    - LME (Laptop Mounted Equipment) (Start of discussion in RAN4#68bis)
  - o The requirement development is addressed for different test methods in case of smartphones
    - Head and Hand phantom based test method for speech mode
    - Hand phantom only based test method for data browsing
  - o It is also recommended that the work is started for frequency bands for which there are commercial devices in order to enable measurements
2. Until RAN4#68: Present LTE TRP and TRS measurement data
3. Until RAN4#68: Address principles for setting LTE TRP and TRS UE requirements
4. Until RAN4#69: Define LTE TRP and TRS requirements for LTE FDD and TDD UEs

### UTRA (Phase 2, until RAN4#71)

1. Until RAN4#69: Discuss and agree a plan for UTRA UE TRP and TRS measurements with head and hand phantoms including test set up, device type etc.
  - o Smartphones (Start of discussion in RAN4#69)
  - o Head and Hand phantom based test method for speech mode (Start of discussion in RAN4#69)
2. Until RAN4#70: Present UTRA TRP and TRS measurement data with hand phantoms test methods
3. Until RAN4#70: Address principles for setting UTRA TRP and TRS UE requirements with the head and hand phantom test method.
4. Until RAN4#71: Define UTRA TRP and TRS UE requirements with the head and hand phantom for speech mode test methods

5 Service Aspects

6 MMI-Aspects

7 Charging Aspects

8 Security Aspects

9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X	X	X
Don't know					

## 10 Expected Output and Time scale \*

## 11 Work item rapporteur(s) \*

Petri Vasenkari, Nokia Corporation

## 12 Work item leadership \*

RAN WG4

## 13 Supporting Individual Members \*

---

<b>Source:</b>	<b>Nokia Corporation</b>
<b>Title:</b>	<b>Revised WID: LTE UE TRP and TRS and UTRA Hand Phantom related UE TRP and TRS Requirements</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>11.6.1</b>

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** LTE UE TRP and TRS and UTRA Hand Phantom related UE TRP and TRS Requirements

**Acronym:** LTE\_UTRA\_TRP\_TRS-Core

**Unique identifier:** 580037

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	<input checked="" type="checkbox"/>
<b>This WID includes a Performance part</b>	

## 1 3GPP Work Area

X	<b>Radio Access</b>
	<b>Core Network</b>
	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
X	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

LTE UE Total Radiated Power (TRP) and Total Radiated Sensitivity (TRS) test methodology was finalized in TR 37.902 in RAN#57 in September 2012. Number of commercial LTE network deployments and commercial LTE devices is already quite significant and these numbers are increasing. Therefore, the need for UE requirements for LTE TRP and TRS is also becoming important in order to ensure good LTE system and device performance when the number of devices in the networks are increasing.

Also UTRA UE OTA test methodology with hand phantoms (including test method for speech mode with head and hand phantoms and test method for data mode with hand phantoms) was finalized in RAN#57. The UTRA UE OTA TRP and TRS requirements for these newly added test methods are still missing.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective is to define UE LTE TRP and TRS minimum requirements both for LTE FDD and TDD UEs based on the TRP and TRS test methodology defined in TR 37.902 and update UTRA TRP and TRS requirements for hand phantom based test methods defined in TR 25.914.

Detailed work tasks include:

UTRA and E-UTRA

5. Until RAN4#77:

- o The requirement development is initiated for different devices:
  - Smartphone type of devices
  - LEE (Laptop Embedded Equipment)
  - LME (Laptop Mounted Equipment)
- o The requirement development is addressed for different test methods in case of smartphones
  - Head and Hand phantom based test method for speech mode
  - Hand phantom only based test method for data browsing
  - Free space for LEE
  - Laptop ground plane phantom for LME

It is also recommended that the work is started for frequency bands for which there are commercial devices in order to enable measurements

## 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

## 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #66 #67		Q1/2015										RAN			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf						
80	80	89	89	89	87	74	74	74	74						
						0.5									

RAN #67 #68		Q2/2015										RAN							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75
					0.5										0.5				

RAN #68					Q3/2015					RAN				
#69		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf			
82	82	91	91	91	91	89	76	76	76	76	76			
						0.5								

RAN #69					Q4/2015					RAN					
#70		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	90
						0.5								0.5	

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

#### additional comments to the time budget proposal:

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X	X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
TS 37.144	User Equipment (UE) and Mobile Station (MS) over the air performance requirements	WG4			RAN#77 Dec 2015	UTRA and E-UTRA TRP and TRS requirements with the head and hand phantom for speech mode and data browsing mode test methods for handheld UEs and MSs. LME and LEE UTRA and E-UTRA TRP and TRS requirements.
TR 37.844	User Equipment (UE) and Mobile Station (MS) over the air performance requirements	WG4			RAN#77 Dec 2015	To capture the background information relating to the UTRA and E-UTRA head and hand phantom for speech mode and data browsing mode test methods requirement setting.

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]					
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments	
TS 25.144		User Equipment (UE) and Mobile Station (MS) over the air performance requirements	RAN#77 Dec 2015	LTE TRP and TRS requirements with the head and hand phantom for speech mode and data browsing mode test methods	
TS 25.144		User Equipment (UE) and Mobile Station (MS) over the air performance requirements	RAN#77 Dec 2015	UTRA TRP and TRS requirements with the head and hand phantom for speech mode and data browsing mode test methods	

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Vasenkari, Petri

**Company:** Nokia Corporation

**Email:** petri.j.vasenkari@nokia.com

## 12 Work item leadership

RAN WG4

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
AT&T
CATR
China Mobile
Deutsche Telekom
Nokia Corporation
NTT Docomo
Telefonica
TeliaSonera
Verizon Wireless
ZTE
<u>BlackBerry UK Ltd</u>
Motorola Solutions
Motorola Mobility
Sprint

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<b>Source:</b>	<b>ZTE</b>
<b>Title:</b>	<b>Revised WID: UE Conformance Test Aspects - LTE UE TRP and TRS and UTRA Hand Phantom</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>9.4.1</b>

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** UE Conformance Test Aspects - LTE UE TRP and TRS and UTRA Hand Phantom

**Acronym:** LTE\_UTRA\_TRPTRS-UEConTest

**Unique identifier:** 580037

### 1 3GPP Work Area

x	Radio Access
	Core Network
	Services

### 2 Classification of WI and linked work items

#### 2.0 Primary classification

This work item is a ...

x	Study Item (go to 2.1)
	Feature (go to 2.2)
	Building Block (go to 2.3)
x	Work Task (go to 2.4)

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS
580037	LTE UE TRP and TRS and UTRA Hand Phantom related UE TRP and TRS Requirements	TS 25.144, TS 37.144, TR 37.902, TR 37.844

## 3 Justification

LTE UE Total Radiated Power (TRP) and Total Radiated Sensitivity (TRS) test methodology was finalized in TR 37.902 in RAN#57 in September 2012. Number of commercial LTE network deployments and commercial LTE devices is already quite significant and these numbers are increasing. Therefore, the need for UE requirements for LTE TRP and TRS is also becoming important in order to ensure good LTE system and device performance when the number of devices in the networks are increasing.

Also UTRA UE OTA test methodology with hand phantoms (including test method for speech mode with head and hand phantoms and test method for data mode with hand phantoms) was finalized in RAN#57. The UTRA UE OTA TRP and TRS requirements for these newly added test methods need to be tested based on the performance requirements associated with Rel-12 specifications in RAN4.

## 4 Objective

The technical objective of this work item is to provide conformance test specifications to ensure LTE UE TRP and TRS and UTRA Hand Phantom related UE TRP and TRS requirements are tested in depth. More specifically, the WI covers the following conformance areas pertaining to Handheld UE, LEE (Laptop Embedded Equipment) and LME (Laptop Mounted Equipment):

- A. TRP/TRS for handheld UE

- a. Using Beside the Head and Hand Phantom for speech mode: UTRA FDD, UTRA LCR TDD, E-UTRA FDD, E-UTRA TDD
  - b. Using Hand Phantom for browsing mode: UTRA FDD, UTRA LCR TDD, E-UTRA FDD, E-UTRA TDD
- B. TRP/TRS for LME
- a. Using Laptop Ground Plane Phantom: UTRA FDD, UTRA LCR TDD, E-UTRA FDD, E-UTRA TDD
- C. TRP/TRS for LEE
- a. Using Free Space: UTRA FDD, UTRA LCR TDD, E-UTRA FDD, E-UTRA TDD

## 5 Service Aspects

Not applicable

## 6 MMI-Aspects

Not applicable

## 7 Charging Aspects

Not applicable

## 8 Security Aspects

Not applicable

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes					
No	X	X	X	X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
TS 37.544	Universal Terrestrial Radio Access (UTRA) and Evolved UTRA (E-UTRA); User Equipment (UE) Over The Air (OTA) performance; Conformance testing	WG5			RAN#72 June 2016	<p>TRP/TRS for handheld UE</p> <ul style="list-style-type: none"> <li>Using Beside the Head and Hand phantom for speech mode: UTRA FDD, UTRA LCR TDD, E-UTRA FDD, E-UTRA TDD</li> <li>Using Hand phantom for browsing mode: UTRA FDD, UTRA LCR TDD, E-UTRA FDD, E-UTRA</li> </ul> <p>TRP/TRS for LME</p> <ul style="list-style-type: none"> <li>Using Laptop Ground Plane phantom: UTRA FDD, UTRA LCR TDD, E-UTRA FDD, E-UTRA TDD</li> </ul> <p>TRP/TRS for LME</p> <ul style="list-style-type: none"> <li>Using Free Space: UTRA FDD, UTRA LCR TDD, E-UTRA FDD, E-UTRA TDD</li> </ul>

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

TAYLOR, Carolyn

Company: ZTE Corporation

Email: [carolyn.tayl@zte.com.cn](mailto:carolyn.tayl@zte.com.cn)

## 12 Work item leadership

RAN WG5

## 13 Supporting Individual Members

<b>Supporting IM name</b>
ZTE Corporation
Telecom Italia
Intel Corp.
Orange
Sporton International
CMCC

## Enhanced LTE Device to Device Proximity Services

660074	<b>Enhanced LTE Device to Device Proximity Services</b>	LTE_eD2 D_Prox	1	R2	Dec-14	Jun-16	6%	RP-142311
660174	<b>Core part: Enhanced LTE Device to Device Proximity Services</b>	LTE_eD2 D_Prox- Core	2	R2, R1, R3	Aug-15	Dec-15	32%	RP-150441
660274	<b>Perf. part: Enhanced LTE Device to Device Proximity Services</b>	LTE_eD2 D_Prox- Perf	2	R4	Dec-14	Jun-16	0%	RP-150441

**3GPP TSG RAN Meeting #66**  
**Maui, USA, 8-11 December 2014**

**RP-142311**

---

**Source:** Qualcomm Incorporated  
**Title:** Work Item Proposal for Enhanced LTE Device to Device Proximity Services  
**Document for:** Approval  
**Agenda Item:** 14.1.1  
**Work Item / Release:** New WID/Rel.13

---

*Abstract of the contribution: This contribution proposes an new RAN WID to support remaining ProSe device to device requirements in Release13 .*

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

### Title \*: Enhanced LTE Device to Device Proximity Services

Acronym \* : LTE\_eD2D\_Prox

Unique identifier \*

NOTE: If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	X

## 1 3GPP Work Area \*

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	Study Item (go to 2.1)
	Feature (go to 2.2)
	Building Block (go to 2.3)
X	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

#### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

#### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS
630130	Core part: LTE Device to Device Proximity Services	
630230	Perf. part: LTE Device to Device Proximity Services	

## 3 Justification \*

The Feasibility Study on Proximity-based Services (FS\_ProSe, TR 22.803) has identified valuable services that could be provided by the 3GPP system based on UEs being in proximity to each other. The identified areas include Public Safety and non-Public-Safety services that would be of interest to operators and users. The corresponding service requirements have been documented in TS 22.278.

LTE Device to Device ProSe in Release 12 has standardized support for a subset of these features. More specifically support for the following was standardized.

- ProSe device to device discovery in network coverage.
- ProSe device to device broadcast communication.
- Higher layer (AS layer) support to enable groupcast and unicast over physical layer broadcast communication.

This proposed work item aims to standardize the remaining features in Release 13.

This work item also aims to enhance the support for D2D in presence of multiple carriers and PLMNs. For example, currently D2D transmissions by a UE is limited to its camped cell. This can force UEs that are engaged in D2D signalling among themselves to be on the same cell, which in turn can cause load imbalance among carriers of a deployment. Allowing UEs to transmit on non-serving carrier can alleviate this issue.

Additionally in Release 13, both SA1 (SP-140386) and SA2 (SP-140385) started the work to enhance the ProSe system with additional features. SA1 completed the work in August 2014. This work item also aims to standardize the corresponding additional ProSe Device to Device (D2D) RAN features in Release 13.

## 4 Objective \*

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of this work item is to enhance LTE device to device, both for discovery and communication.

The work item will cover enhancements to LTE device to device communications and discovery meeting requirements for public safety for:

- in network coverage (intra-cell and inter-cell),
- partial network coverage, and
- outside network coverage scenarios

For non-public safety discovery, the work item will cover enhancements to LTE device to device for:

- in network coverage (intra-cell and inter-cell)

In particular, this work item will cover the following objectives:

- 1) Define enhancements (if needed) to D2D discovery to enable the following features:
  - a) Type 1 discovery for the partial and outside network coverage scenarios targeting public safety use [RAN1].
- 2) Define enhancements to D2D communication to enable the following features:
  - a) Support the extension of network coverage using L3-based UE-to-Network Relays, including service continuity (if needed), based on Release 12 D2D communication, considering applicability to voice, video. [RAN2, RAN1, RAN3]. (RAN3 involvement pending on progress in the other groups)
  - b) Priority of different groups support [RAN2, RAN1, RAN3]. (RAN3 involvement pending on progress in the other groups)
- 3) Enhance D2D discovery support in the presence of multiple carriers and PLMNs:

- a) Allow D2D transmissions in a non-serving carrier and/or secondary cell belonging to the same and possibly different PLMN as the serving cell [RAN2, RAN1, RAN3].
  - 4) Consider enhancements and specify if needed to support ProSe related MCPTT requirements identified through SA1 work and embraced by SA2 and SA6 ProSe work (e.g. performance of call-set-up) [RAN2].
  - 5) Study additional co-existence issues with adjacent carrier frequencies that may arise due to the new mechanisms being defined [RAN4].
    - a) If a need is identified by RAN4, specify potential means to mitigate interference [RAN1].
  - 6) Define additional (if needed) Tx and Rx RF requirements for the UE [RAN4].
  - 7) Define additional (if needed) RRM core requirements [RAN4].

The impact of D2D on cellular traffic, spectrum and on the QoS of other services from the same operator should be studied and minimized. The proposed solutions should enable D2D services on the same or on different carrier(s) than that used for LTE WAN communication by the UE. The solutions should apply to both FDD and TDD.

#### 4.2 Objective of Performance part WI

Define additional (if needed) demod requirements and RRM performance for the UE [RAN4]

#### 4.3 RAN time budget proposal

RAN #67										Q2/2015					RAN				
#68																			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75
2	4									2		3			1				

RAN #68 #69	Q3/2015							RAN	
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82	82	91	91	91	89	76	76	76	76
		3			1	1	1.5		

RAN #69										Q4/2015								RAN					
#70																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77				
		3			1	1	15					3				15	15						

RAN #70 Q1/2016 RAN  
#71

R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84	84	93	93	93	91	78	78	78	78

RAN #71					Q2/2016					RAN #72									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84bis	84bis	93bis	93bis	93bis	91bis	78bis	78bis	78bis	78bis	85	85	94	94	94	92	79	79	79	79
										1.5									1.5

## 5 Service Aspects

No impact.

## 6 MMI-Aspects

No impact.

## 7 Charging Aspects

No impact.

## 8 Security Aspects

National/regional requirements (e.g. lawful intercept) shall be considered

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	
Don't know					X

## 10 Expected Output and Time scale \*

New specifications *						
[If Study Item, one TR is anticipated]						
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
Affected existing specifications *						
[None in the case of Study Items]						
Spec No.	CR	Subject		Approved at plenary#	Comments	
36.211		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation		RAN #70	Core part	
36.212		Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding		RAN #70	Core part	
36.213		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures		RAN #70	Core part	
36.214		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements		RAN #70	Core part	
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2		RAN #70	Core part	
36.302		Evolved Universal Terrestrial Radio Access (E-UTRA); Services provided by the physical layer		RAN #70	Core part	
36.304		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode		RAN #70	Core part	
36.306		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities		RAN #70	Core part	
36.321		Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification		RAN #70	Core part	
36.322		Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Link Control (RLC) protocol specification		RAN #70	Core part Only for communication	
36.323		Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) specification		RAN #70	Core part	
36.331		Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification		RAN #70	Core part	
36.423		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 application protocol (X2AP)		RAN #70	Core part	
36.413		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)		RAN #70	Core part	
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception		RAN #70	Core part	
36.133		Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management		RAN #70	Core part	
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception		RAN #72	Performance part	

36.133	Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management	RAN #72	Performance part
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## 11 Work item rapporteur(s) \*

Shailesh Patil, Qualcomm Incorporated  
 (patil@qti.qualcomm.com)

## 12 Work item leadership \*

Primary: RAN2

Secondary: RAN1, RAN3, RAN4

## 13 Supporting Individual Members \*

<b>Supporting IM name</b>
Qualcomm Incorporated
US Department of Commerce
III
UK Home Office
ITRI
General Dynamics
CEWiT
Panasonic
Kyocera
Telefonica
IAESI
Sharp
Thales
Sony
KDDI
ETRI
Blackberry
ITL
Ericsson
Interdigital
NEC
Huawei
HiSilicon
Samsung
LG Electronics
Orange

**3GPP TSG RAN Meeting #67**  
**Shanghai, China, 9<sup>th</sup> - 12<sup>th</sup> March 2014**

**RP-150441**

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<b>Source:</b>	<b>Qualcomm Incorporated</b>
<b>Title:</b>	<b>Revised WI: Enhanced LTE Device to Device Proximity Services</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>11.3.5</b>

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# 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

---

## Title \*: Enhanced LTE Device to Device Proximity Services

Acronym \* : LTE\_eD2D\_Prox

Unique identifier \*

NOTE: If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	X

## 1 3GPP Work Area \*

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification \*

This work item is a ... \*

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
X	<b>Work Task (go to 2.4)</b>

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any) *		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ... \*

Stage 1 (go to 2.3.1)
Stage 2 (go to 2.3.2)
Stage 3 (go to 2.3.3)
Test spec (go to 2.3.4)
Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any) *		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2 \*

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify: \*

Go to §3.

### 2.3.3 Stage 3 \*

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) Or external document	Clause	Remarks

If no identified source of stage 2 information, justify: \*

Go to §3

### 2.3.4 Test spec \*

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other \*

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task \*

Parent Building Block		
Unique ID	Title	TS
630130	Core part: LTE Device to Device Proximity Services	
630230	Perf. part: LTE Device to Device Proximity Services	

## 3 Justification \*

The Feasibility Study on Proximity-based Services (FS\_ProSe, TR 22.803) has identified valuable services that could be provided by the 3GPP system based on UEs being in proximity to each other. The identified areas include Public Safety and non-Public-Safety services that would be of interest to operators and users. The corresponding service requirements have been documented in TS 22.278.

LTE Device to Device ProSe in Release 12 has standardized support for a subset of these features. More specifically support for the following was standardized.

- ProSe device to device discovery in network coverage.
- ProSe device to device broadcast communication.
- Higher layer (AS layer) support to enable groupcast and unicast over physical layer broadcast communication.

This proposed work item aims to standardize the remaining features in Release 13.

This work item also aims to enhance the support for D2D in presence of multiple carriers and PLMNs. For example, currently D2D transmissions by a UE is limited to its camped cell. This can force UEs that are engaged in D2D signalling among themselves to be on the same cell, which in turn can cause load imbalance among carriers of a deployment. Allowing UEs to transmit on non-serving carrier can alleviate this issue.

Additionally in Release 13, both SA1 (SP-140386) and SA2 (SP-140385) started the work to enhance the ProSe system with additional features. SA1 completed the work in August 2014. This work item also aims to standardize the corresponding additional ProSe Device to Device (D2D) RAN features in Release 13.

## 4 Objective \*

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of this work item is to enhance LTE device to device, both for discovery and communication.

The work item will cover enhancements to LTE device to device communications and discovery meeting requirements for public safety for:

- in network coverage (intra-cell and inter-cell),
- partial network coverage, and
- outside network coverage scenarios

For non-public safety discovery, the work item will cover enhancements to LTE device to device for:

- in network coverage (intra-cell and inter-cell)

In particular, this work item will cover the following objectives:

- 8) Define enhancements (if needed) to D2D discovery to enable the following features:
  - a) Type 1 discovery for the partial and outside network coverage scenarios targeting public safety use [RAN1].
- 9) Define enhancements to D2D communication to enable the following features:
  - a) Support the extension of network coverage using L3-based UE-to-Network Relays, including service continuity (if needed), based on Release 12 D2D communication, considering applicability to voice, video. [RAN2, RAN1, RAN3]. (RAN3 involvement pending on progress in the other groups)
  - b) Priority of different groups support [RAN2, RAN1, RAN3]. (RAN3 involvement pending on progress in the other groups)
- 10) Enhance D2D discovery support in the presence of multiple carriers and PLMNs:
  - a) Allow D2D transmissions in a non-serving carrier and/or secondary cell belonging to the same and possibly different PLMN as the serving cell [RAN2, RAN1, RAN3, RAN4].
- 11) Define Tx and Rx RF requirements for D2D communication support in the presence of multiple carriers, including D2D transmission and reception in a non-serving carrier and/or secondary cell [RAN4].
- 12) Consider enhancements and specify if needed to support ProSe related MCPTT requirements identified through SA1 work and embraced by SA2 and SA6 ProSe work (e.g. performance of call-set-up) [RAN2].
- 13) Study additional co-existence issues with adjacent carrier frequencies that may arise due to the new mechanisms being defined [RAN4].
  - a) If a need is identified by RAN4, specify potential means to mitigate interference [RAN1].
- 14) Define additional (if needed) Tx and Rx RF requirements for the UE [RAN4].
- 15) Define additional (if needed) RRM core requirements [RAN4].

The impact of D2D on cellular traffic, spectrum and on the QoS of other services from the same operator should be studied and minimized. The proposed solutions should enable D2D services on the same or on different carrier(s) than that used for LTE WAN communication by the UE. The solutions should apply to both FDD and TDD.

## 4.2 Objective of Performance part WI

Define additional (if needed) demod requirements and RRM performance for the UE [RAN4]

## 4.3 RAN time budget proposal

RAN #66		Q1/2015										RAN	
#67		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf		
80	80	89	89	89	89	89	87	74	74	74	74		

RAN #67		Q2/2015										RAN									
#68		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
80bis	80bis	89bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75
2		4										2		3			1				

RAN #68		Q3/2015										RAN									
#69		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82		82		91		91		91		89		76		76		76		76		76	
				3						1		1		1		1.5					

RAN #69		Q4/2015										RAN									
#70		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77
		3				1	1	1.5				3					1.5	1.5			

RAN #70		Q1/2016										RAN									
#71		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84		84		93		93		93		91		78		78		78		78		78	
																				1.5	

RAN #71		Q2/2016										RAN									
#72		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84bis	84bis	93bis	93bis	93bis	93bis	91bis	78bis	78bis	78bis	78bis	78bis	85	85	94	94	94	92	79	79	79	79
												1.5									1.5

## 5 Service Aspects

No impact.

## 6 MMI-Aspects

No impact.

## 7 Charging Aspects

No impact.

## 8 Security Aspects

National/regional requirements (e.g. lawful intercept) shall be considered

## 9 Impacts \*

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	
Don't know					X

## 10 Expected Output and Time scale \*

New specifications *						
[If Study Item, one TR is anticipated]						
Spec No.	Title	Prime rsp WG	2ndary rsp. WG(s)	Presented for information at plenary#	Approved at plenary#	Comments
Affected existing specifications *						
[None in the case of Study Items]						
Spec No.	CR	Subject		Approved at plenary#	Comments	
36.211		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation		RAN #70	Core part	
36.212		Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding		RAN #70	Core part	
36.213		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures		RAN #70	Core part	
36.214		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements		RAN #70	Core part	
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2		RAN #70	Core part	
36.302		Evolved Universal Terrestrial Radio Access (E-UTRA); Services provided by the physical layer		RAN #70	Core part	
36.304		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode		RAN #70	Core part	
36.306		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities		RAN #70	Core part	
36.321		Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification		RAN #70	Core part	
36.322		Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Link Control (RLC) protocol specification		RAN #70	Core part Only for communication	
36.323		Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) specification		RAN #70	Core part	
36.331		Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification		RAN #70	Core part	
36.423		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 application protocol (X2AP)		RAN #70	Core part	
36.413		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)		RAN #70	Core part	
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception		RAN #70	Core part	
36.133		Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management		RAN #70	Core part	
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception		RAN #72	Performance part	

36.133		Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management	RAN #72	Performance part
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## 11 Work item rapporteur(s) \*

Shailesh Patil, Qualcomm Incorporated  
 (patil@qti.qualcomm.com)

## 12 Work item leadership \*

Primary: RAN2

Secondary: RAN1, RAN3, RAN4

## 13 Supporting Individual Members \*

<b>Supporting IM name</b>
Qualcomm Incorporated
US Department of Commerce
III
UK Home Office
ITRI
General Dynamics
CEWiT
Panasonic
Kyocera
Telefonica
IAESI
Sharp
Thales
Sony
KDDI
ETRI
Blackberry
ITL
Ericsson
Interdigital
NEC
Huawei
HiSilicon
Samsung
LG Electronics
Orange

Radiated requirements for the verification of multi-antenna reception performance of UEs

660076	<b>Radiated requirements for the verification of multi-antenna reception performance of UEs</b>	UTRA_LT_E_MIMO_OTA	1	R4	Dec-14	Dec-15	15%	RP-142221
660176	<b>Core part: Radiated requirements for the verification of multi-antenna reception performance of UEs</b>	UTRA_LT_E_MIMO_OTA-Core	2	R4	Dec-14	Dec-15	15%	RP-150261

3GPP TSG-RAN Meeting #66

RP-142221

Maui, USA, December 8<sup>th</sup> - 11<sup>th</sup>

---

**Source:** Intel Corporation

**Title:** New WI proposal: Radiated requirements for the verification of multi-antenna reception performance of UEs

**Document for:** Approval

**Agenda Item:** 14.1.4

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Radiated requirements for the verification of multi-antenna reception performance of UEs

**Acronym:** LTE\_MIMO\_OTA-Core

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	<input checked="" type="checkbox"/>
<b>This WID includes a Performance part</b>	

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.2 Feature

<b>Related Study Item or Feature (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

## 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>
550116	Verification of radiated multi-antenna reception performance of UEs in LTE/UMTS	

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any)</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

# 3 Justification

RAN WG4 has completed the work item “Verification of radiated multi-antenna reception performance of UEs in LTE/HSPA” by defining four testing methodologies (specified below), describing DUT testing conditions, listing the associated channel models, and validating these methodologies in a round-robin measurement campaign with three reference antenna devices:

- Anechoic Chamber Multi-Probe
- Reverberation Chamber
- Reverberation Chamber + Channel Emulator

- 2-stage method (radiated)

All of this work has been captured in TR 37.977. In its final way forward of the work item RAN WG4 recommended the following follow-up work:

- Develop measurement uncertainty for the methods validated and specified in TR 37.977 (Clause 12)
- Development of performance requirements for specific environments that belong to the methodologies that have been validated and specified in TR 37.977 (Clause 12)
- After requirements based on an acceptable sufficient range of devices are set, a single and unique set of requirements shall be selected for applicable test conditions, which shall be applicable to at least one methodology
- Separate WI may need to be created if validation of additional methodologies not validated and specified in TR 37.977 is required. This depends on the work load of this activity

Therefore, the need to develop measurement uncertainty budgets and test tolerances for each method and to define the performance requirements for UEs motivates the proposed core work item.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of this Work Item is to define multi-antenna over-the-air (OTA) downlink performance requirements, uncertainty budgets, and related tolerances for UEs based on the testing methodologies included in Clause 12 of TR 37.977. A harmonization framework shall be defined across all the methodologies included in Clause 12 of TR 37.977 such that the same results within measurement uncertainty are obtained independently from devices, potentially by means of applying a mapping function across test cases to one method. The performance requirements shall be captured in TS 37.144. All aspects associated with testing methodologies as well as the measurement uncertainty and related test tolerances shall be captured via updates to TR 37.977. A conformance testing specification (captured in a separate RAN5 Technical Specification document) led by a RAN WG5 conformance specification may follow.

The possibility of introducing test points that are suitable for HSPA and developing the associated performance requirements and measurement uncertainty should be investigated. LTE MIMO OTA should be used as the priority for harmonization. Harmonization should be confirmed with HSPA if required.

The MIMO OTA performance requirements shall enable OTA performance verification within the following scope:

- For FDD and TDD handheld devices, laptop mounted equipment (LME) and laptop embedded equipment (LEE).
- Considering device types and DUT positioning as defined in TR 37.977.
- Operating in spatial multiplexing (MIMO); the reference measurement channels shall be based on the settings in Clause 7 of TR 37.977. Operation in single spatial layer modes may be considered.
- Utilizing testing methodologies that are approved in Clause 12 of TR 37.977. If additional methodologies are defined in Clause 12 of TR 37.977 as part of a separate Work Item, then they shall be considered as part of the scope of this work

- The possibility of extending the signal to noise ratio (SNR) control definition in Clause 5.1.2 of TR 37.977 and the possibility of introducing test points with SNR control should be investigated. Harmonization should be confirmed with SNR control if required.

The first defined figure of merit (FoM) shall be based on the definition in Clause 5 of TR 37.977 and shall represent the downlink power level (RS EPRE) necessary to achieve a specified percentage of peak throughput for a given reference measurement channel and testing condition. The specified percentage value and associated derivations of the FoM will be defined as part of the work. Other FoMs can be considered and defined during the work if they are shown to be useful.

The device type, as utilized by test case applicability, will be defined as:

- Handset
  - 40mm < Width <= 56mm
  - 56mm < Width <= 72mm
- LME
- LEE
  - Notebook
  - Tablet

Commercially available devices will be used for testing.

The outcome of the Work Item will be such that

- When harmonization of two or more methods is achieved for a device type:
  - All the harmonized methods shall be normative.
  - Any one of the harmonized methods shall be sufficient to verify compliance to all minimum requirements applicable to that device type.
  - It is desired that the above outcome is achieved for all device types as a result of harmonization across all methods.
- When harmonization of two or more methods is not achieved for a device type:
  - A choice shall be made as to which method is normative.
- It is a consequence of the above that there shall be at least one method defined as normative for each device type
- The basis of GCF certification is harmonised test method(s), with a single performance requirement only. Therefore, the present WI has as objective to harmonize the currently considered valid test methodologies towards a single OTA performance requirement.

With the understanding that the development of the measurement uncertainty budgets and test tolerances associated with each methodology is a task of significant complexity, coordination and collaboration with 3GPP RAN WG5 and cooperation with CTIA OTA Working Group (MOSG and MUSG) is recommended. RAN WG4 owns the complete package of measurement uncertainty, test tolerances, and minimum requirements. However, with RAN WG5 having secondary responsibility this enables RAN WG5 to have a MIMO OTA agenda item on specific topics upon RAN WG4 indication in future meetings for the purpose of assisting with the work as directed by RAN WG4 through LS, status reports, sharing of Tdocs etc. The areas currently identified for consultation (not decision making) from RAN WG5 are:

- Measurement uncertainty of test methods
- Test case development as it relates to the completion of the RAN WG4 work (i.e. not the conformance test spec which is in a later RAN WG5 work item)
- Advice on use of ICS for managing test applicability

During the course of this Work Item, ongoing communication with 3GPP RAN WG5, CTIA OTA Working Group (MOSG and MUSG), CCSA TC9, and COST IC1004 TWGO shall be maintained to ensure industry coordination on this topic and to distribute tasks according to expertise or resource availability.

## 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

## 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
 For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
 Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

The following time plan is proposed:

- By RAN #67: reach agreement on the figure of merit, finalize scope with respect to items such as HSPA and SNR control, and make initial progress on measurement uncertainty development
- By RAN #68: make progress on the harmonization framework among methodologies with a view toward agreement if harmonization is possible by end of RAN4 #76
- By RAN #69: complete test case definitions and measurement uncertainty budgets; start discussion on performance requirements and corresponding test tolerances
- By RAN #70: define performance requirements and corresponding test tolerances

Q1/2015										RAN #67
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	
80	80	89	89	89	87	74	74	74	74	

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RAN #67						Q2/2015						RAN #68													
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf						
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	71	90	90	90	88	75	75	75	75						
						0.1T U										0.1T U									
RAN #68						Q3/2015						RAN #69													
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf																
82	82	91	91	91	89	76	76	76	76																
						0.1T U																			
RAN #69						Q4/2015						RAN #70													
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf						
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77						
						0.1T U										0.1T U									

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

#### additional comments to the time budget proposal:

Evening adhoc sessions are to handle most of technical discussions. Main sessions are to approve documents and agreements. To improve the time efficiency of this project, RAN WG5 can start the conformance testing specification Work Item with an overlap as early as RAN #68 when some of the test procedures may be developed based on the associated RAN WG4 drafts.

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		x			

No	x		x	x	x
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
TS37.144		User Equipment (UE) and Mobile Station (MS) over the air performance requirements	RAN #70	Core Part
TR37.977		Universal Terrestrial Radio Access (UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRA); Verification of radiated multi-antenna reception performance of User Equipment (UE)	RAN #70	

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Ioffe, Anatoliy

**Company:** Intel Corporation

**Email:** anatoliy.ioffe@intel.com

## 12 Work item leadership

RAN WG4

Secondary responsibility: RAN WG5

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Intel Corporation
Keysight Technologies
LightSquared
ATR
ZTE
CATR
CMCC
Nokia Corporation
SATIMO
Verizon
Anite
AAU
ETS-Lindgren
Elektrobit
Chunghwa Telecom
Spirent Communications
Qualcomm
CTTC
Orange
SGS
Sporton International
Vodafone
NTT DOCOMO
Microsoft Corporation
Samsung
Blackberry
Bluetest

3GPP TSG-RAN Meeting #67

RP-150261

Shanghai, China, March 9<sup>th</sup> – 12<sup>th</sup>, 2015

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<b>Source:</b>	<b>Intel Corporation</b>
<b>Title:</b>	<b>Revised WID: Radiated requirements for the verification of multi-antenna reception performance of UEs</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>11.2.4</b>

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### 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Radiated requirements for the verification of multi-antenna reception performance of UEs

**Acronym:** UTRA\_LTE\_MIMO\_OTA-Core

**Unique identifier:** 660176

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<a href="#">This WID includes a Core part</a>	x
<a href="#">This WID includes a Performance part</a>	

## 1 3GPP Work Area

x	<a href="#">Radio Access</a>
	<a href="#">Core Network</a>
	<a href="#">Services</a>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<a href="#">Study Item (go to 2.1)</a>
	<a href="#">Feature (go to 2.2)</a>
x	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
660076	Radiated requirements for the verification of multi-antenna reception performance of UEs	

Note: This WI is related to REL-13 WI "Core part: LTE UE TRP and TRS and UTRA Hand Phantom related UE TRP and TRS Requirements" (580137, LTE\_UTRA\_TRP\_TRS-Core, TS 37.144) and REL-12 WI "Perf. part: Verification of radiated multi-antenna reception performance of UEs in LTE/UMTS" (550116, HSPA\_LTE\_measRP\_MIMO-Perf, TR 37.977).

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

<b>Source of external requirements (if any)</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2

<b>Corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other source of stage 1 information</b>		
<b>TS or CR(s)</b>	<b>Clause</b>	<b>Remarks</b>

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

<b>Corresponding stage 2 work item (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Else, corresponding stage 1 work item</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

<b>Other justification</b>		
<b>TS or CR(s) or external document</b>	<b>Clause</b>	<b>Remarks</b>
TR 37.977		This TR defines testing methodologies and its way forward justifies the work of this WI.

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

<b>Related Work Item(s)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

RAN WG4 has completed the work item “Verification of radiated multi-antenna reception performance of UEs in LTE/HSPA” by defining four testing methodologies (specified below), describing DUT testing conditions, listing the associated channel models, and validating these methodologies in a round-robin measurement campaign with three reference antenna devices:

- Anechoic Chamber Multi-Probe
- Reverberation Chamber
- Reverberation Chamber + Channel Emulator
- 2-stage method (radiated)

All of this work has been captured in TR 37.977. In its final way forward of the work item RAN WG4 recommended the following follow-up work:

- Develop measurement uncertainty for the methods validated and specified in TR 37.977 (Clause 12)
- Development of performance requirements for specific environments that belong to the methodologies that have been validated and specified in TR 37.977 (Clause 12)
- After requirements based on an acceptable sufficient range of devices are set, a single and unique set of requirements shall be selected for applicable test conditions, which shall be applicable to at least one methodology
- Separate WI may need to be created if validation of additional methodologies not validated and specified in TR 37.977 is required. This depends on the work load of this activity

Therefore, the need to develop measurement uncertainty budgets and test tolerances for each method and to define the performance requirements for UEs motivates the proposed core work item.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of this Work Item is to define multi-antenna over-the-air (OTA) downlink performance requirements, uncertainty budgets, and related tolerances for UEs based on the testing methodologies included in Clause 12 of TR 37.977. A harmonization framework shall be defined across all the methodologies included in Clause 12 of TR 37.977 such that the same results within measurement uncertainty are obtained independently from devices, potentially by means of applying a mapping function

across test cases to one method. The performance requirements shall be captured in TS 37.144. All aspects associated with testing methodologies as well as the measurement uncertainty and related test tolerances shall be captured via updates to TR 37.977. A conformance testing specification (captured in a separate RAN5 Technical Specification document) led by a RAN WG5 conformance specification may follow.

The possibility of introducing test points that are suitable for HSPA and developing the associated performance requirements and measurement uncertainty should be investigated. LTE MIMO OTA should be used as the priority for harmonization. Harmonization should be confirmed with HSPA if required.

The MIMO OTA performance requirements shall enable OTA performance verification within the following scope:

- For FDD and TDD handheld devices, laptop mounted equipment (LME) and laptop embedded equipment (LEE).
- Considering device types and DUT positioning as defined in TR 37.977.
- Operating in spatial multiplexing (MIMO); the reference measurement channels shall be based on the settings in Clause 7 of TR 37.977. Operation in single spatial layer modes may be considered.
- Utilizing testing methodologies that are approved in Clause 12 of TR 37.977. If additional methodologies are defined in Clause 12 of TR 37.977 as part of a separate Work Item, then they shall be considered as part of the scope of this work
- The possibility of extending the signal to noise ratio (SNR) control definition in Clause 5.1.2 of TR 37.977 and the possibility of introducing test points with SNR control should be investigated. Harmonization should be confirmed with SNR control if required.

The first defined figure of merit (FoM) shall be based on the definition in Clause 5 of TR 37.977 and shall represent the downlink power level (RS EPRE) necessary to achieve a specified percentage of peak throughput for a given reference measurement channel and testing condition. The specified percentage value and associated derivations of the FoM will be defined as part of the work. Other FoMs can be considered and defined during the work if they are shown to be useful.

The device type, as utilized by test case applicability, will be defined as:

- Handset
  - 40mm < Width <= 56mm
  - 56mm < Width <= 72mm
- LME
- LEE
  - Notebook
  - Tablet

Commercially available devices will be used for testing.

The outcome of the Work Item will be such that

- When harmonization of two or more methods is achieved for a device type:
  - All the harmonized methods shall be normative.
  - Any one of the harmonized methods shall be sufficient to verify compliance to all minimum requirements applicable to that device type.
  - It is desired that the above outcome is achieved for all device types as a result of harmonization across all methods.
- When harmonization of two or more methods is not achieved for a device type:
  - A choice shall be made as to which method is normative.
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With the understanding that the development of the measurement uncertainty budgets and test tolerances associated with each methodology is a task of significant complexity, coordination and collaboration with 3GPP RAN WG5 and cooperation with CTIA OTA Working Group (MOSG and MUSG) is recommended. RAN WG4 owns the complete package of measurement uncertainty, test tolerances, and minimum requirements. However, with RAN WG5 having secondary responsibility this enables RAN WG5 to have a MIMO OTA agenda item on specific topics upon RAN WG4 indication in future meetings for the purpose of assisting with the work as directed by RAN WG4 through LS, status reports, sharing of Tdocs etc. The areas currently identified for consultation (not decision making) from RAN WG5 are:

- Measurement uncertainty of test methods
- Test case development as it relates to the completion of the RAN WG4 work (i.e. not the conformance test spec which is in a later RAN WG5 work item)
- Advice on use of ICS for managing test applicability

During the course of this Work Item, ongoing communication with 3GPP RAN WG5, CTIA OTA Working Group (MOSG and MUSG), CCSA TC9, and COST IC1004 TWGO shall be maintained to ensure industry coordination on this topic and to distribute tasks according to expertise or resource availability.

## 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

## 4.3 RAN time budget proposal

**NOTE:** For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

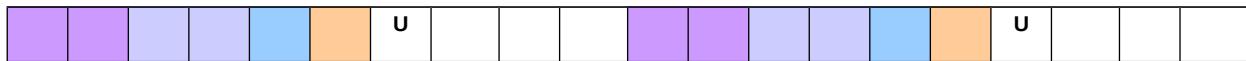
For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

The following time plan is proposed:

- By RAN #67: reach agreement on the figure of merit, finalize scope with respect to items such as HSPA and SNR control, and make initial progress on measurement uncertainty development
  - By RAN #68: make progress on the harmonization framework among methodologies with a view toward agreement if harmonization is possible by end of RAN4 #76
  - By RAN #69: complete test case definitions and measurement uncertainty budgets; start discussion on performance requirements and corresponding test tolerances
  - By RAN #70: define performance requirements and corresponding test tolerances

RAN #66										Q1/2015								RAN #67					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf														
80	80	89	89	89	87	74	74	74	74														
						0.1T U																	
RAN #67										Q2/2015								RAN #68					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	71	90	90	90	88	75	75	75	75				
						0.1T U											0.1T U						
RAN #68										Q3/2015								RAN #69					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf														
82	82	91	91	91	89	76	76	76	76														
						0.1T U																	
RAN #69										Q4/2015								RAN #70					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77				
						0.1T											0.1T						



L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

**NOTE:** In case further explanation of the time budget proposal is needed, then please explain this below.

#### **additional comments to the time budget proposal:**

Evening adhoc sessions are to handle most of technical discussions. Main sessions are to approve documents and agreements. To improve the time efficiency of this project, RAN WG5 can start the conformance testing specification Work Item with an overlap as early as RAN #68 when some of the test procedures may be developed based on the associated RAN WG4 drafts.

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		x			
No	x		x	x	x
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

<b>Affected existing specifications</b> [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
TS 37.144		User Equipment (UE) and Mobile Station (MS) over the air performance requirements	RAN #70	Core Part; note: This TS is created by REL-13 WI LTE_UTRA_TRP_TRS
TR 37.977		Universal Terrestrial Radio Access (UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRA); Verification of radiated multi-antenna reception performance of User Equipment (UE)	RAN #70	Core Part; note: This TR was created by REL-12 WI HSPA_LTE_measRP_MIMO-Perf

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Ioffe, Anatoliy

**Company:** Intel Corporation

**Email:** [anatoliy.ioffe@intel.com](mailto:anatoliy.ioffe@intel.com)

## 12 Work item leadership

RAN WG4

Secondary responsibility: RAN WG5

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Intel Corporation
Keysight Technologies
LightSquared
ATR
ZTE
CATR
CMCC
Nokia Corporation
SATIMO
Verizon
Anite
Aalborg University
ETS-Lindgren
Elektrobit
CHTTL (Chunghwa Telecommunication Laboratories)
Spirent Communications
Qualcomm
CTTC
Orange
SGS
Sporton International
Vodafone
NTT DOCOMO
Microsoft Corporation
Samsung
Blackberry
Bluetest
AT&T

## UE core requirements for uplink 64 QAM

660077	<a href="#">UE core requirements for uplink 64 QAM</a>	LTE_UL64 QAM	1	R4	Dec-14	Sep-15	90%	RP-142222
660177	<a href="#">Core part: UE core requirements for uplink 64 QAM</a>	LTE_UL64 QAM- Core	2	R4	Dec-14	Sep-15	90%	RP-150691

**3GPP TSG RAN Meeting #66**  
**Maui, USA, 8 - 11 December 2014**

**RP-142222**

revision of [RP-141280](#)

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<b>Source:</b>	<b>Huawei, HiSilicon</b>
<b>Title:</b>	<b>New Work Item proposal: UE core requirements for uplink 64 QAM</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>14.1.4</b>

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** UE core requirements for uplink 64 QAM

**Acronym:** LTE\_UL\_64QAM

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<a href="#">This WID includes a Core part</a>	X
<a href="#">This WID includes a Performance part</a>	

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<a href="#">Study Item (go to 2.1)</a>
	<a href="#">Feature (go to 2.2)</a>
X	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Recently clear market needs are observed to push the UL peak data rate to 75Mbps across Asia, European and North America. Utilization of 64QAM would be one of the efficient and robust ways to achieve that goal. Unfortunately that feature is coupled with the certain UE categories, i.e., UE category 5 and 8, which restricts its usage. So decoupling UL 64QAM from UE categories was proposed and discussed in RAN2 and RAN. In RAN2 it was agreed that it is feasible to decouple 64QAM from categories 5 and 8 and introduce a separate capability.

It is also known that UL 64QAM requirements are missing in current RAN4 specifications. Therefore, in order to introduce UL 64QAM in the practical network, we propose a new work item to specify the UL 64QAM requirements in RAN4.

## 4 Objective

#### 4.1 Objective of SI or Core part WI or Testing part WI

The objectives of the work item are the following:

- Specify UE RF requirements for uplink 64QAM for single carrier with and without UL MIMO and for carrier aggregation without UL MIMO e.g.
    - MPR requirements for uplink 64QAM.
    - A-MPR requirements for uplink 64QAM, if needed.
      - For single carrier A-MPR, evaluate whether the existing single carrier A-MPR requirements can be re-used for 64QAM.
      - For intra-band contiguous CA, RAN4 should focus the work on existing CA band combinations. As long as one CA combination is completed, the WI can be closed and work on the remaining CA combination can continue.
    - EVM requirement for uplink 64QAM.

#### 4.2 Objective of Performance part WI

**NOTE:** Leave empty if the WI proposal does not contain a RAN performance part.

## 4.3 RAN time budget proposal

**NOTE:** For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

**For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI** (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #66 #67	Q1/2015							RAN	
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
80	80	89	89	89	87	74	74	74	74
						0.5			

RAN #67												Q2/2015						RAN #68					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75				
						0.5										0.5							

RAN #68 #69	Q3/2015							RAN	
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82	82	91	91	91	89	76	76	76	76
						0.5			

RAN #69										Q4/2015										RAN			
#70																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77				

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

#### additional comments to the time budget proposal:

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X	X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
TR36.8xx	Introducing UL 64QAM	RAN4		RAN#68 (June 2015)	RAN#69 (Sept. 2015)	RAN4 core part

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.101		User Equipment (UE) radio transmission and reception	RAN #69 (Sept. 2015)	RAN4 core part

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

DAI, XIZENG

**Company:** Huawei

**Email:** daixizeng@huawei.com

## 12 Work item leadership

RAN WG4

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Huawei
HiSilicon
CMCC
Deutsche Telekom
Telecom Italia
Telia Sonera
Broadcom Corporation
Verizon
Samsung
CATT
KDDI
Qualcomm Incorporated
China Unicom
China Telecom
SOFTBANK MOBILE Corp.
eAccess Ltd
AT&T
Sprint
NEC
Nokia Networks
Nokia
ZTE
Dish Network
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell

**3GPP TSG RAN Meeting #68**  
**Malmö, Sweden, June 15 - 18, 2015**

**RP-150691**

revision of RP-142222

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<b>Source:</b>	<b>Huawei, HiSilicon</b>
<b>Title:</b>	<b>Revised Work Item proposal: UE core requirements for uplink 64 QAM</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>11.3.6</b>

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

Title: UE core requirements for uplink 64 QAM

Acronym: LTE\_UL\_64QAM

Unique identifier:

NOTE: If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Recently clear market needs are observed to push the UL peak data rate to 75Mbps across Asia, European and North America. Utilization of 64QAM would be one of the efficient and robust ways to achieve that goal. Unfortunately that feature is coupled with the certain UE categories, i.e., UE category 5 and 8, which restricts its usage. So decoupling UL 64QAM from UE categories was proposed and discussed in RAN2 and RAN. In RAN2 it was agreed that it is feasible to decouple 64QAM from categories 5 and 8 and introduce a separate capability.

It is also known that UL 64QAM requirements are missing in current RAN4 specifications. Therefore, in order to introduce UL 64QAM in the practical network, we propose a new work item to specify the UL 64QAM requirements in RAN4.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objectives of the work item are the following:

- Specify UE RF requirements for uplink 64QAM for single carrier with and without UL MIMO and for carrier aggregation without UL MIMO e.g.
  - MPR requirements for uplink 64QAM.
  - A-MPR requirements for uplink 64QAM, if needed.
    - For single carrier A-MPR, evaluate whether the existing single carrier A-MPR requirements can be re-used for 64QAM.
    - For intra-band contiguous CA, RAN4 should focus the work on existing CA band combinations. As long as one CA combination is completed, the WI can be closed and work on the remaining CA combination can continue.
  - EVM requirement for uplink 64QAM.

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.



### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
 For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
 For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #68		Q3/2015								RAN	
#69		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82		82	91	91	91	91	89	76	76	76	76
							0.5				

RAN #69		Q4/2015												RAN							
#70		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X	X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
TR36.883	UE core requirements for uplink 64 QAM	RAN4		RAN#68 (June 2015)	RAN#69 (Sept. 2015)	RAN4 core part

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.101		User Equipment (UE) radio transmission and reception	RAN #69 (Sept. 2015)	RAN4 core part

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

DAI, XIZENG

Company: Huawei

Email: daixizeng@huawei.com

## 12 Work item leadership

RAN WG4

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Huawei
HiSilicon
CMCC
Deutsche Telekom
Telecom Italia
Telia Sonera
Broadcom Corporation
Verizon
Samsung
CATT
KDDI
Qualcomm Incorporated
China Unicom
China Telecom
SOFTBANK MOBILE Corp.
eAccess Ltd
AT&T
Sprint
NEC
Nokia Networks
Nokia
ZTE
Dish Network
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell



## UE Conformance Test Aspects - Core Requirements for Uplink 64QAM for E-UTRA

680069	UE Conformance Test Aspects - Core Requirements for Uplink 64QAM for E-UTRA	LTE_UL64 QAM- UEConTe st	1	R5	Jun-15	Dec-15	0%	RP-150812
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**3GPP TSG-RAN Meeting #68**

**R5-150812**

**Malmö, Sweden, 15-18 June 2015**

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**Source:** CMCC

**Title:** New WID Proposal: UE Conformance Test Aspects – Core Requirements for Uplink 64QAM for E-UTRA

**Document for:** Approval

**Agenda Item:** 13.3

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

**Title:** UE Conformance Test Aspects - Core Requirements for Uplink 64QAM for E-UTRA

**Acronym:** LTE\_UL\_64QAM-UEConTest

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	<input type="checkbox"/>
<b>This WID includes a Performance part</b>	<input type="checkbox"/>

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
X	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS
660177	Core part: UE core requirements for uplink 64 QAM	36.101

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

UL 64QAM is a Rel-13 feature which can be used to improve UL peak data rate. Recently clear market needs of utilizing UL 64QAM are observed across Asia, Europe and North America. In RAN#66 (December 2014), a RAN4 WI LTE\_UL\_64QAM was approved to specify UE UL 64QAM RF requirements. This WI was planned to be complete in RAN#69 (September 2015). The objectives are "Specify UE RF requirements for UL 64QAM for single carrier with and without UL MIMO and for CA without UL MIMO. The specific requirements include MRP, A-MPR and EVM."

The completion status of this WI will up to about 60% after RAN4#75 in May and will achieve 100% after RAN4#76 in August. Considering the urgent market deploying needs, it is now necessary for RAN5 to initiate a corresponding UE conformance testing work item.

## 4 Objective

The technical objective of this work item is to provide conformance test specifications for the Release 13 UL 64QAM for EUTRA to ensure the requirements are tested in depth. More specifically, the WI covers the following conformance areas:

- MRP, A-MPR and EVM requirements for UL 64QAM for single carrier with and without UL MIMO
- MRP, A-MPR and EVM requirements for UL 64QAM for CA without UL MIMO

## 5 Service Aspects

Not applicable

## 6 MMI-Aspects

Not applicable

## 7 Charging Aspects

Not applicable

## 8 Security Aspects

Not applicable

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes					
No	X	X	X	X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.508		E-UTRA and EPC; Common test environments for UE conformance testing	TSG RAN#70 (December 2015)	Definition of common test environment for the UL 64QAM testing.
36.521-1		E-UTRA; UE conformance specification; Radio transmission and reception; Part 1: Conformance Testing	TSG RAN#70 (December 2015)	Introduction of new UL 64QAM specific RF requirements.
36.521-2		E-UTRA; UE conformance specification; Radio transmission and reception; Part 2: ICS	TSG RAN#70 (December 2015)	Applicability statements of the new UL 64QAM test cases.
36.523-1		E-UTRA and EPC; UE conformance specification; Part 1: Protocol conformance specification	TSG RAN#70 (December 2015)	Update of legacy protocol test cases for UL 64QAM (e.g. 7.1.7.2.1)
36.523-2		UE conformance specification; Part 2: Implementation Conformance Statement (ICS) proforma specification	TSG RAN#70 (December 2015)	Applicability statements of the new UL 64QAM test cases.
36.523-3		E-UTRA and EPC; UE conformance specification Part 3: Test Suites	TSG RAN#70 (December 2015)	Update of test model for UL 64QAM. Note: Progress of TTCN development is tracked in MCC TF160 reports to RAN5/RAN.

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec.

If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Jinqiang Xing

**Company:** CMCC

**Email:** [xingjinqiang@chinamobile.com](mailto:xingjinqiang@chinamobile.com)

## 12 Work item leadership

TSG RAN5

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
CMCC
CATR
CATT
CGC
China Unicom
Ericsson
Huawei
HiSilicon
KDDI
MediaTek
Qualcomm
Sporton
Telecom Italia
ZTE
Samsung

## Performance requirements of MMSE-IRC receiver for LTE BS

660078	<a href="#">Performance requirements of MMSE-IRC receiver for LTE BS</a>	LTE_MM SE_IRC_BS	1	R4	Dec-14	Jun-16	35%	RP-142223
660278	Perf. part: Performance requirements of MMSE-IRC receiver for LTE BS	LTE_MM SE_IRC_BS-Perf	2	R4	Dec-14	Jun-16	35%	RP-150206

## 3GPP TSG RAN Meeting #66

**RP-142223**

Maui, USA, Dec. 8 - 11, 2014

**Source:** China Telecom  
**Title:** New WI on performance requirements of MMSE-IRC receiver for LTE BS  
**Document for:** Approval  
**Agenda Item:** 14.1.4

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

**Title:** Performance requirements of MMSE-IRC receiver for LTE BS

**Acronym:** LTE\_MMSE\_IRC\_BS-Perf

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	
<b>This WID includes a Performance part</b>	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

X	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
X	<b>Work Task (go to 2.4)</b>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

With the wider usage of mobile applications like social networking and point-to-point video/file sharing, uplink traffic load is becoming much heavier, and LTE uplink spectral efficiency improvement tends to be an essential and practical requirement for operators.

In typical LTE homogenous network, frequency reuse factor of one is utilized, and inter-cell interference has a substantial impact on uplink performance. For heterogeneous network with co-channel deployment of macro and low power base stations (BSs), the interference is even stronger due to a large number of low power BSs deployed. In both cases, BS MMSE-IRC ([Minimum mean square error](#) - interference rejection combining) receiver is considered as a promising approach for spatial domain interference handling. The MMSE-IRC receiver can suppress inter-cell interference as well as intra-cell interference, and thus achieve cell-edge and cell-average spectral efficiency gain over MMSE receiver. Moreover, the implementation complexity increase is moderate, since this kind of baseband processing technique is relatively mature nowadays.

Currently in RAN4 BS demodulation tests, the inter-cell interference is not explicitly modelled, and thus BS receiver's ability of inter-cell interference suppression cannot be verified. Therefore, it is proposed to specify new demodulation performance requirements of MMSE-IRC receiver for LTE BS.

## 4 Objective

#### 4.1 Objective of SI or Core part WI or Testing part WI

None

#### 4.2 Objective of Performance part WI

The work should fulfil the following objectives:

- Phase I
    - Identify target deployment scenarios and agree on relevant network parameters. Both homogeneous deployment (macro cell only) and heterogeneous deployment (co-channel between macro cell and low power node) should be considered.
    - Conduct system-level simulation to determine the inter-cell interference modelling methodology and other side conditions needed for link-level simulation, and link-level simulation to evaluate gain of MMSE-IRC over baseline receiver (MMSE receiver)
  - Phase II
    - LTE BS MMSE-IRC receiver shall be assumed as the reference receiver structure for specifying the requirements.
      - o Demodulation RS based MMSE-IRC receiver can be considered as baseline, and practical and realizable implementation should be taken into account.
    - Specify the enhanced demodulation performance requirements for verification of BS receiver's ability on inter-cell interference suppression.
      - o For PUSCH, specify enhanced demodulation performance requirements based on the reference receiver.
      - o For PUCCH, with lower priority, determine whether to specify enhanced demodulation performance requirements based on the reference receiver.
    - Specify the enhanced conformance test requirements.

Note: The enhanced demodulation performance requirements only apply to the base station capable of MMSE-IRC receiver.

#### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #68		Q3/2015					RAN				
#69		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82	82	91	91	91	89	76	76	76	76	1	

RAN #69		Q4/2015										RAN									
#70		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	1	83	83	92	92	92	90	77	77	77	77
																					1

RAN #70		Q1/2016					RAN				
#71		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84	84	93	93	93	93	91	78	78	78	78	1

RAN #71		Q2/2016										RAN									
#72		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84bis	84bis	93bis	93bis	93bis	93bis	91bis	78bis	78bis	78bis	78bis	1	85	85	94	94	94	92	79	79	79	79

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X		
No	X	X		X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.104		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception	RAN#72 (Jun 2016)	Perf. part: Performance requirements
36.141		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing	RAN#72 (Jun 2016)	Perf. part: Performance requirements relevant test cases

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

YANG Shan  
Company: China Telecom  
Email: yangshan@ctbri.com.cn

## 12 Work item leadership

RAN WG4

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
China Telecom
Huawei
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
CHTTL
Telecom Italia
ZTE
China Unicom
CATT
Samsung
Potevio
Ericsson
Nokia Networks
TeliaSonera
SK Telecom
CMCC
CATR
KT

**3GPP TSG RAN Meeting #67**  
**Shanghai, China, 9 - 12 March 2015**

**RP-150206**

revision of RP-142223

---

<b>Source:</b>	<b>China Telecom</b>
<b>Title:</b>	<b>Revised WID: Performance requirements of MMSE-IRC receiver for LTE BS</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>11.3.7</b>

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Performance requirements of MMSE-IRC receiver for LTE BS

**Acronym:** LTE\_MMSE\_IRC\_BS-Perf

**Unique identifier:** 660278

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	
<b>This WID includes a Performance part</b>	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
X	<b>Work Task (go to 2.4)</b>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

#### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

#### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

With the wider usage of mobile applications like social networking and point-to-point video/file sharing, uplink traffic load is becoming much heavier, and LTE uplink spectral efficiency improvement tends to be an essential and practical requirement for operators.

In typical LTE homogenous network, frequency reuse factor of one is utilized, and inter-cell interference has a substantial impact on uplink performance. For heterogeneous network with co-channel deployment of macro and low power base stations (BSs), the interference is even stronger due to a large number of low power BSs deployed. In both cases, BS MMSE-IRC ([Minimum mean square error](#) - interference rejection combining) receiver is considered as a promising approach for spatial domain interference handling. The MMSE-IRC receiver can suppress inter-cell interference as well as intra-cell interference, and thus achieve cell-edge and cell-average spectral efficiency gain over MMSE receiver. Moreover, the implementation complexity increase is moderate,

since this kind of baseband processing technique is relatively mature nowadays.

Currently in RAN4 BS demodulation tests, the inter-cell interference is not explicitly modelled, and thus BS receiver's ability of inter-cell interference suppression cannot be verified. Therefore, it is proposed to specify new demodulation performance requirements of MMSE-IRC receiver for LTE BS.

## 4 Objective

#### 4.1 Objective of SI or Core part WI or Testing part WI

None

#### 4.2 Objective of Performance part WI

The work should fulfil the following objectives:

- Phase I
    - Identify target deployment scenarios and agree on relevant network parameters. Both homogeneous deployment (macro cell only) and heterogeneous deployment (co-channel between macro cell and low power node) should be considered.
    - Conduct system-level simulation to determine the inter-cell interference modelling methodology and other side conditions needed for link-level simulation, and link-level simulation to evaluate gain of MMSE-IRC over baseline receiver (MMSE receiver)
  - Phase II
    - LTE BS MMSE-IRC receiver shall be assumed as the reference receiver structure for specifying the requirements.
      - o Demodulation RS based MMSE-IRC receiver can be considered as baseline, and practical and realizable implementation should be taken into account.
    - Specify the enhanced demodulation performance requirements for verification of BS receiver's ability on inter-cell interference suppression.
      - o For PUSCH, specify enhanced demodulation performance requirements based on the reference receiver.
      - o For PUCCH, with lower priority, determine whether to specify enhanced demodulation performance requirements based on the reference receiver.
    - Specify the enhanced conformance test requirements.

Note: The enhanced demodulation performance requirements only apply to the base station capable of MMSE-IRC receiver.

#### 4.3 RAN time budget proposal

**NOTE:** For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #67										Q2/2015										RAN			
#68																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75				
										0.5													1

RAN #68										Q3/2015										RAN			
#69																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82	82	91	91	91	89	76	76	76	76						1								

RAN #69										Q4/2015										RAN			
#70																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77				
										1													1

RAN #70										Q1/2016										RAN			
#71																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
84	84	93	93	93	91	78	78	78	78						1								

RAN #71										Q2/2016										RAN			
#72																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
84bis	84bis	93bis	93bis	93bis	91bis	78bis	78bis	78bis	78bis	85	85	94	94	94	92	79	79	79	79				
										1													

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X	X	X

Don't know					
------------	--	--	--	--	--

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
TR 36.8xx	Performance requirements of MMSE-IRC receiver for LTE BS	RAN4		RAN#71 (Mar 2016)	RAN#72 (Jun 2016)	

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.104		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception	RAN#72 (Jun 2016)	Perf. part: Performance requirements
36.141		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing	RAN#72 (Jun 2016)	Perf. part: Performance requirements relevant test cases

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

YANG Shan  
 Company: China Telecom  
 Email: yangshan@ctbri.com.cn

## 12 Work item leadership

RAN WG4

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
China Telecom
Huawei
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
CHTTL
Telecom Italia
ZTE
China Unicom
CATT
Samsung
Potevio
Ericsson
Nokia Networks
TeliaSonera
SK Telecom
CMCC
CATR
KT

## CRS Interference Mitigation for LTE Homogenous Deployments

660079	<a href="#">CRS Interference Mitigation for LTE Homogenous Deployments</a>	LTE_CRSIM	1	R4	Dec-14	Mar-16	20%	RP-142263
660279	Perf. part: CRS Interference Mitigation for LTE Homogenous Deployments	LTE_CRSIM-Perf	2	R4	Dec-14	Mar-16	20%	RP-142263

**3GPP TSG RAN Meeting #66**  
**Maui, Hawaii, USA, Dec. 8 - 11, 2014**

**RP-142263**

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<b>Source:</b>	Ericsson
<b>Title:</b>	New Work Item proposal: Perf. Part: CRS Interference Mitigation for LTE Homogenous Deployments
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	14.1.4

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** CRS Interference Mitigation for LTE Homogenous Deployments

**Acronym:** LTE\_CRSIM-Perf

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<a href="#">This WID includes a Core part</a>	
<a href="#">This WID includes a Performance part</a>	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<a href="#">Study Item (go to 2.1)</a>
X	<a href="#">Feature (go to 2.2)</a>
	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
590017	Study on CRS Interference Cancellation for Homogenous Deployments for LTE	Feasibility study that lead to Work item

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Interference Mitigation (IM) of Cell-Specific Reference Signals (CRS) has been studied in the Rel-11 Work Item on FeICIC. Due to its benefits under the condition where interference from CRS dominates but is negligible from data assuming data RE muting, the CRS interference mitigation (CRS IM) has been standardized under the above operation conditions for heterogeneous deployments and the corresponding requirements were specified in Release 11. At the same time, the enhanced performance requirements in homogeneous network deployment for MMSE interference rejection combining (MMSE-IRC) receiver were extensively studied and specified in Release 11. The MMSE-IRC receiver can suppress both data and CRS interference without the need to differentiate them.

A study item (SI), "CRS interference mitigation for homogeneous deployment" was approved at the 3GPP RAN #59 meeting in RP-130393 to study the feasibility of using CRS IM also in a synchronized homogenous network. Under this study item RAN4 developed interference models comprising of the number of interfering eNodeBs to consider and their powers relative to the noise plus the total other cell interference

power excluding the considered dominant interference cells. Receiver structures based on MMSE-IRC detector combined with a CRS-IM receiver were also defined in this study item. The CRS assistance information, as specified for Release 11, is available for the UE. The performances for this receiver were simulated at both link and system level. The system study concluded that there is an indeed increase in user perceived throughput (UPT) when the traffic load is low at the interfering cells. The link level study during the study item showed that significant throughput gain can be obtained for cell-edge UE by CRS-IM receiver in LTE homogeneous network under low traffic loading. With regard to UE implementation issues, the CRS-IM receiver is based upon well-defined receivers already used for meeting the existing MMSE-IRC and FeICIC performance requirements. The reuse of these receivers' structure minimizes the UE complexity. Therefore it is beneficial to specify enhanced performance requirements for this type of receiver i.e. combination of MMSE-IRC and CRS-IM receivers.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

The objectives of this work Items are:

- Specify the UE performance requirements for demodulation tests and CSI to verify that gains with the combined MMSE-IRC and CRS-IM are achieved by practical implementations.
- Specify the baseline receiver and conformance test conditions to mitigate Cell-specific Reference signals in a synchronized homogeneous network following the conclusion of study item phase:
  - o The reference receiver defined in study item in TR 36.863, shall be considered as baseline receiver
    - The CRS assistance information, as specified for Release 11, is available for the UE.
  - o Network deployment scenarios and interference modeling should be considered according to the conclusion and evaluation results of study item, e.g., the number of interfering eNodeBs to be considered, the interference model/profiles, low traffic load scenarios and synchronous network deployments.
  - o Both CRS- and DM-RS based transmission modes (including TM9 and TM10) should be covered on both serving and interfering cells for the CRS-IM based receiver. The detailed modes should be specified with test conditions.
  - o RAN4 is to prioritize and initiate the work for non-colliding CRS:
    - In the case of non-colliding CRS, the CRS between serving and dominant aggressor/interfering cell as well as CRS between dominant aggressor/interfering cells are assumed to be non-colliding.
  - o The case of colliding CRS should be studied, prior to decide to introduce associated requirement scenarios
    - In the case of colliding CRS, the CRS between the serving and dominant aggressor/interfering cells and/or CRS between dominant aggressor/interfering cells are assumed to be colliding.
  - o The feasibility of CSI requirements, including the UE interference estimation behavior, should be studied prior to introducing associated requirement scenarios.

Note 1: Interference from neighboring cells' PDSCH is not the focus of this study item. Any interference from data, which varies according to the traffic loading level, is assumed to be suppressed in the same way as in Rel-11 with the baseline MMSE-IRC receivers.

## Work Task Breakdown for RAN4:

- TSG RAN4 #74 (Feb. 2015): Framework discussion and simulation assumption discussion
  - TSG RAN4 #74 bis (Apr.. 2015): Framework and simulation assumption agreed
  - TSG RAN4 #75 (May. 2015): Review of initial simulation results, agreements on further simulations, framework finalized
  - TSG RAN4 #76 (Aug. 2015): Review of simulation results and simulation results alignment
  - TSG RAN4 #76bis (Oct. 2015): Review of simulation results with implementation margin and draft CRs
  - TSG RAN4 #77 ( Nov. 2015): Review of additional results, finalization of requirements scenarios
  - TSG RAN4 #78 (Feb. 2016): Agreement of CRs, conclusion of new performance requirements

A work item on conformance test aspects will follow this work item.

#### 4.3 RAN time budget proposal

**NOTE:** For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

i.e. one value for each session field. If no time limit is needed, leave the field empty.  
Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #68 Q2/2015 RAN  
#69

R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82	82	91	91	91	89	76	76	76	76	82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis
									0.5										0.5

RAN #69					Q3/2015										RAN				
#70																			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
83	83	92	92	92	90	77	77	77	77	84	84	93	93	93	91	78	78	78	78
									0.5										0.5

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X	X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

<b>Affected existing specifications</b> [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.101		User Equipment (UE) radio transmission and reception	RAN #68	RAN4 responsibility

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Li, Shaohua

**Company:** Ericsson

**Email:** Shaohua.li@ericsson.com

## 12 Work item leadership

RAN WG4

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Ericsson
VERIZON WIRELESS
China Unicom
Orange
Intel
NEC
SoftBank Mobile
eAccess
NSN
Alcatel-Lucent
Huawei
HiSilicon
Mediatek
Sony
US Cellular
AT&T
China Telecom
Samsung
Deutsche Telekom
TeliaSonera
KPN



## Dual Connectivity enhancements for LTE

670055	<a href="#">Dual Connectivity enhancements for LTE</a>	LTE_dual C_enh	1	R2	Mar-15	Jun-16	9%	RP-150490
670155	<a href="#">Core part: Dual Connectivity enhancements for LTE</a>	LTE_dual C_enh- Core	2	R2	Mar-15	Dec-15	25%	RP-150490
670255	<a href="#">Perf. part: Dual Connectivity enhancements for LTE</a>	LTE_dual C_enh- Perf	2	R4	Mar-15	Jun-16	0%	RP-150490

**3GPP TSG RAN Meeting #67**  
**Shanghai, China, March 9 – 12, 2015**

**RP-150490**

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**Source:** NTT DOCOMO, INC.  
**Title:** New WI proposal: Dual Connectivity enhancements for LTE  
**Document for:** Approval  
**Agenda Item:** 13.1.2

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Dual Connectivity enhancements for LTE

**Acronym:** LTE\_dualC\_enh

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
580044	Study on Small Cell Enhancements for E-UTRA and E-UTRAN – Higher-layer aspects (FS_LTE_SC_enh_hilayer)	TR 36.842

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS
	Dual Connectivity for LTE	

## 3 Justification

To fulfil the market demands on the need of enhanced LTE technologies for small cell deployments, Dual Connectivity was introduced in Rel-12. Dual Connectivity was developed to address the following challenges identified in the Study Item Phase:

1. Per-user throughput enhancements
2. Mobility robustness
3. Increased signalling load due to frequent handover

Due to the tight schedule in Rel-12, some of the features aimed at the above challenges were not supported. Among them, uplink bearer split can be a viable feature for the throughput enhancement in uplink.

In addition, Rel-12 Dual Connectivity assumes network based determination of the SFN and subframe offset between MeNB and SeNB via OAM in the unsynchronised network. The UE reporting method on the timing difference was not specified due to the lack of time. It is also worthwhile introducing into the standard to facilitate multi-vendor deployments of Dual Connectivity.

Furthermore, Rel-12 RRM and RF requirements only cover the 2DL and 2UL component carriers in the operation of Dual Connectivity. In addition, due to lack of time Rel-12 RRM enhancements related to enabling robust mobility (with dual connectivity) without compromising UE power consumption were not covered in RAN4. For example, due to independent DRX UE will independently measure MeNB and SeNB cells. This can cause UE to measure PCell (in MeNB) according to PCell DRX requirements even though UE is actively scheduled in SeNB, which may deteriorate the PCell mobility robustness. Therefore, the follow-up work is deemed as necessary.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

This work is conducted to specify the following features for Dual Connectivity:

- Uplink bearer split (RAN2).
- UE reporting method on the SFN and subframe offset between MeNB and SeNB (RAN2/4).
- Maximum uplink transmission time difference (RAN4).
- E-UTRAN CGI requirements (RAN4).
- Enhancement of intra-frequency/inter-frequency/inter-RAT measurement requirements in DRX (RAN4).
- RAN4 requirements to support more than 2 component carriers in the operation of Dual Connectivity (RAN4).
  - RAN4 will treat this objective after the work on 3DL/2UL CA is completed.

NOTE: RAN3 may be involved to work on specification of network protocol aspects on request from RAN2, if any.

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

Study (and specify if necessary) performance requirements for Dual Connectivity operation addressed in RAN2 specifications and the core part of RAN4 specifications.

### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #67																Q2/2015								RAN			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf								
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75								
		Main: 0				0.5						Main: 0						0.5									

		UP:1										UP:1							
--	--	------	--	--	--	--	--	--	--	--	--	------	--	--	--	--	--	--	--

RAN #68 Q3/2015 RAN #69									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82	82	91	91	91	89	76	76	76	76
		Main: 0 UP:1				0.75			

RAN #69 Q4/2015 RAN #70									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis
		Main: 0.25 UP:1			TBD( NOT E1)	0.75			
		Main: 0.25 UP:1							
					TBD( NOT E1)	0.75			

RAN #70 Q1/2016 RAN #71									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84	84	93	93	93	91	78	78	78	78
									0.5

RAN #71 Q2/2016 RAN #72									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84bis	84bis	93bis	93bis	93bis	91bis	78bis	78bis	78bis	78bis
									0.5
									0.5

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

#### additional comments to the time budget proposal:

NOTE 1: The TUs required for R4 RF Core will be discussed after RAN4 completes the work on 3DL/2UL CA.

## 5 Service Aspects

None

## 6 MMI-Aspects

None

## 7 Charging Aspects

None

## 8 Security Aspects

None

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		

No	X			X	
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2	RAN #70	Core part
36.306		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities	RAN #70	Core part
36.321		Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification	RAN #70	Core part
36.323		Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) specification	RAN #70	Core part
36.331		Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC);	RAN #70	Core part
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception	RAN #70	Core part
36.133		Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management	RAN #70	Core part
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception	RAN #72	Performance part
36.133		Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management	RAN #72	Performance part

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Uchino, Toru

**Company:** NTT DOCOMO, INC.

**Email:** tooru.uchino.fv@nttdocomo.com

## 12 Work item leadership

RAN2

2<sup>nd</sup> responsible: RAN4

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Acer
Anritsu
ASUSTeK
ATR
Black Berry
CATT
China Unicom
CHTTL
CMCC
Coolpad
Deutsche Telekom
ETRI
Fujitsu
HiSilicon
Hitachi
Huawei
IAESI
Institute for Infocomm research
Institute for Information Industry
Interdigital
ITL
Keysight Technologies
Kyocera
LG Electronics
LG Uplus
LightSquared
MediaTek
Mitsubishi Electric
NEC
Nokia Corporation
Nokia Networks
NTC
NTT
NTT DOCOMO, INC.
Panasonic
Potevio
Sharp
SKT
SoftBank Mobile
Telecom Italia
Telefonica
T-Mobile USA
US Cellular



## Multicarrier Load Distribution of UEs in LTE

670056	<a href="#">Multicarrier Load Distribution of UEs in LTE</a>	LTE_MC_Load	1	R2	Mar-15	Dec-15	20%	RP-150491
670156	<a href="#">Core part: Multicarrier Load Distribution of UEs in LTE</a>	LTE_MC_Load-Core	2	R2	Mar-15	Dec-15	40%	RP-150611
670256	<a href="#">Perf. part: Multicarrier Load Distribution of UEs in LTE</a>	LTE_MC_Load-Perf	2	R4	Mar-15	Dec-15	0%	RP-150611

**3GPP TSG RAN Meeting #67**  
**Shanghai, China 9-12 March 2015**

**RP-150491**

revision of RP-150446, RP-150200

**Source:** Verizon, China Telecom, NTT DOCOMO Inc, ZTE, Alcatel-Lucent  
**Title:** New WI proposal for Multicarrier Load Distribution of UEs in LTE  
**Document for:** Approval  
**Agenda Item:** 14.1.2

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

**Title:** Multicarrier Load Distribution of UEs in LTE

**Acronym:** LTE\_MC\_Load

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<a href="#">This WID includes a Core part</a>	x
<a href="#">This WID includes a Performance part</a>	x

## 1 3GPP Work Area

x	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

x	<a href="#">Study Item (go to 2.1)</a>
x	<a href="#">Feature (go to 2.2)</a>
	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
x	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Deploying multiple carriers is one of the most common solutions to address the ever increasing capacity needed in cellular networks, especially at traffic hotspots. This requires a balanced load among the multiple LTE carriers for efficient operation and optimal resources utilization. Load balancing across multiple carriers should consider a variety of deployment scenarios arising due to different capacities and the different numbers of the carriers available in a given area, especially when non-contiguous spectrum with multi-carriers of different bandwidths of different bands is involved, resulting in different number of carriers with different capacities in different areas.

For idle mode, it is observed that there is a strong correlation between the idle mode UE density and the active UE traffic load in a EUTRAN cell. Hence, control of the idle mode UE distribution is an essential element for traffic load balancing. However, it is difficult to conduct idle-mode load balancing by the current

specified mechanisms such as adjusting the reselection measurement threshold, broadcast or dedicated priorities. Furthermore, the deficiency in the current idle mode load balancing mechanisms has led to the partial reliance on redirection or handover (HO) after call establishment for load balancing. This has led to many more active redirections/HOs, increasing signaling load and HO failure rates. Additionally, even if load balance is achieved by HO and redirection, the situation will only last for a short period of time since UE will eventually follow idle mode cell reselection rules. The situation is worse in HetNet scenarios where the load in the different small cells at same frequency layers might be different leading to ping-pongs and uneven idle UEs distribution.

On the other hand, for connected mode, an ideal load balanced network should try to minimize active traffic overload probability while maximizing user throughput. However, current RSRQ based measurements as the HO and reselection metric may not be a good representation of the achievable throughput. Other measurements such as SINR may be more appropriate for load-balancing active traffic so as to achieve optimal throughput for the user, while simultaneously avoiding unnecessary HO or redirections.

In summary, load balancing should preferably be achieved already at RRC connection setup to minimize the need for load-triggered HO or redirection during connected mode, implying that pro-active control of the UE distribution in both idle and connected modes is of utmost importance. Additional efforts need to be made to addressing heterogeneous network scenarios. Other measurement quantities could be considered for better representation of the achievable throughput.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of the WI is to look at solutions providing better distribution of idle UEs amongst multiple LTE carriers so as to minimize the need for load-triggered HO or redirection of UE during connected mode. HetNet deployment scenarios should be considered. Additional measurement quantities for evaluation of achievable cell throughput can be evaluated.

The WI should first have a study phase to look at:

- Limitations of the current mechanisms and measurement quantities for redistribution of UEs amongst multiple LTE carriers.

Based on the analysis of the study phase, the WI should provide solution(s) for:

- To redistribute RRC Idle UEs amongst LTE carriers that minimize the need for load triggered HO or redirection of UE during connected mode
- Carriers with different cell load, bandwidth and capabilities should be considered.
- Both homogeneous and heterogeneous deployment scenarios should be considered
- New measurement quantities, e.g. SINR, for better estimation of user throughput should be evaluated and introduced, if needed

The solutions should not adversely impact UE power consumption and should avoid increasing ping-pongs for high speed UEs between carriers.

Work plan of this WI:

**Q2/2015:**

RAN2#89bis and RAN2#90 meeting:

Study the limitations of the current mechanisms and measurement quantities, for redistribution of UEs amongst multiple LTE carriers

Provide input to RAN1/4 on the new measurement quantity.

**Q3/2015:**

RAN2#91:

Provide solution(s), based on the study phase, to redistribute RRC Idle UEs amongst LTE carriers that minimize the need for load triggered HO or redirection of UE during connected mode considering following aspects:

1. Carriers with different cell load, bandwidth and capabilities
2. Homogeneous and heterogeneous deployment scenarios
3. New required measurement quantity as concluded in previous meetings, if any.

RAN4#76:

Based on input from RAN2, evaluate the details of core requirements for the new measurement quantity.

**Q4/2015:**

RAN2#91bis:

Specify the concluded solution(s) and approve the corresponding CR(s).

RAN4#76bis:

Introduction of the core requirements for the new measurement quantity.

RAN1#83:

Capture the definition of the new measurement quantity in RAN1 specifications.

## 4.2 Objective of Performance part WI

**Q4/2015:**

RAN#77:

Define the needed performance requirements for the new measurement quantity.

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #67		Q2/2015												RAN					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75
		1										1							

RAN #68		Q3/2015												RAN			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf								
82		82		91		91		91		89		76		76		76	
		1										0.5					

RAN #69		Q4/2015												RAN					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77
		1				0.5												0.5	

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.300		Overall description	RAN#70	
36.133		Requirements for support of radio resource management	RAN#70	
36.214		Physical layer – Measurements	RAN#70	
36.304		UE procedures in idle mode	RAN#70	
36.331		Radio Resource Control protocol specification	RAN#70	

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

DU, Zhongda

Company: ZTE

Email: du.zhongda@zte.com.cn

## 12 Work item leadership

Primary: RAN WG2

Secondary: RAN WG4, RAN WG1

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Verizon
China Telecom
Alcatel Lucent
Alcatel Lucent Shanghai Bell
NTT DOCOMO, Inc.
CMCC
CHTTL
KDDI
HTC
MediaTek Inc.
Intel
T-Mobile USA
ZTE
CATT
III
US Cellular
ITRI
Acer
KT Corp.
Softbank Mobile
China Unicom
Motorola Mobility
CATR
Samsung
AsusTek
Shanghai Tejet Com Technology
NEC
Lenovo
LG Electronics
DISH Network
Telecom Italia
Potevio
Fujitsu
TELUS
Lightsquared
Kyocera
IAESI
Sequans
Qualcomm Incorporated
InterDigital

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**Source:** ZTE  
**Title:** Revised WID: Multicarrier Load Distribution of UEs in LTE  
**Document for:** Approval  
**Agenda Item:** 11.3.10

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Multicarrier Load Distribution of UEs in LTE

**Acronym:** LTE\_MC\_Load

**Unique identifier:** 670056

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	x
<b>This WID includes a Performance part</b>	x

## 1 3GPP Work Area

x	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

x	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
x	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Deploying multiple carriers is one of the most common solutions to address the ever increasing capacity needed in cellular networks, especially at traffic hotspots. This requires a balanced load among the multiple LTE carriers for efficient operation and optimal resources utilization. Load balancing across multiple carriers should consider a variety of deployment scenarios arising due to different capacities and the different numbers of the carriers available in a given area, especially when non-contiguous spectrum with multi-carriers of different bandwidths of different bands is involved, resulting in different number of carriers with different capacities in different areas.

For idle mode, it is observed that there is a strong correlation between the idle mode UE density and the active UE traffic load in a EUTRAN cell. Hence, control of the idle mode UE distribution is an essential element for traffic load balancing. However, it is difficult to conduct idle-mode load balancing by the current specified mechanisms such as adjusting the reselection measurement threshold, broadcast or dedicated priorities. Furthermore, the deficiency in the current idle mode load balancing mechanisms has led to the partial reliance on redirection or handover (HO) after call establishment for load balancing. This has led to many more active redirections/HOs, increasing signaling load and HO failure rates. Additionally, even if load balance is achieved by HO and redirection, the situation will only last for a short period of time since UE will eventually follow idle mode cell reselection rules. The situation is worse in HetNet scenarios where the load in the different small cells at same frequency layers might be different leading to ping-pongs and uneven idle UEs distribution.

On the other hand, for connected mode, an ideal load balanced network should try to minimize active traffic overload probability while maximizing user throughput. However, current RSRQ based measurements as the HO and reselection metric may not be a good representation of the achievable throughput. Other measurements such as SINR may be more appropriate for load-balancing active traffic so as to achieve optimal throughput for the user, while simultaneously avoiding unnecessary HO or redirections.

In summary, load balancing should preferably be achieved already at RRC connection setup to minimize the need for load-triggered HO or redirection during connected mode, implying that pro-active control of the UE distribution in both idle and connected modes is of utmost importance. Additional efforts need to be made to addressing heterogeneous network scenarios. Other measurement quantities could be considered for better representation of the achievable throughput.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of the WI is to look at solutions providing better distribution of idle UEs amongst multiple LTE carriers so as to minimize the need for load-triggered HO or redirection of UE during connected mode. HetNet deployment scenarios should be considered. Additional measurement quantities for evaluation of achievable cell throughput can be evaluated.

The WI should first have a study phase to look at:

- Limitations of the current mechanisms and measurement quantities for redistribution of UEs amongst multiple LTE carriers.

Based on the analysis of the study phase, the WI should provide solution(s) for:

- To redistribute RRC Idle UEs amongst LTE carriers that minimize the need for load triggered HO or redirection of UE during connected mode
- Carriers with different cell load, bandwidth and capabilities should be considered.
- Both homogeneous and heterogeneous deployment scenarios should be considered
- New measurement quantities, e.g. SINR, for better estimation of user throughput should be evaluated and introduced, if needed

The solutions should not adversely impact UE power consumption and should avoid increasing ping-pongs for high speed UEs between carriers.

Work plan of this WI:

**Q2/2015:**

RAN2#89bis and RAN2#90 meeting:

Study the limitations of the current mechanisms and measurement quantities, for redistribution of UEs amongst multiple LTE carriers

Provide input to RAN1/4 on the new measurement quantity.

**Q3/2015:**

RAN2#91:

Provide solution(s), based on the study phase, to redistribute RRC Idle UEs amongst LTE carriers that minimize the need for load triggered HO or redirection of UE during connected mode considering following aspects:

4. Carriers with different cell load, bandwidth and capabilities
5. Homogeneous and heterogeneous deployment scenarios
6. New required measurement quantity as concluded in previous meetings, if any.

RAN4#76:

Based on input from RAN2, evaluate the details of core requirements for the new measurement quantity.

**Q4/2015:**

RAN2#91bis:

Specify the concluded solution(s) and approve the corresponding CR(s).

RAN4#76bis:

Introduction of the core requirements for the new measurement quantity.

RAN1#83:

Capture the definition of the new measurement quantity in RAN1 specifications.

## 4.2 Objective of Performance part WI

**Q4/2015:**

RAN#77:

Define the needed performance requirements for the new measurement quantity.

**NOTE:** Leave empty if the WI proposal does not contain a RAN performance part.

### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #67						Q2/2015								RAN					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75
		1									1								

RAN #68						Q3/2015								RAN					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82	82	91	91	91	89			76		76	76	76	76	76	0.5			76	
		1																	

RAN #69						Q4/2015								RAN					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77
		1				0.5												0.5	

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.300		Overall description	RAN#70	Core part
36.133		Requirements for support of radio resource management	RAN#70	Core part
36.214		Physical layer – Measurements	RAN#70	Core part
36.304		UE procedures in idle mode	RAN#70	Core part
36.331		Radio Resource Control protocol specification	RAN#70	Core part
36.133		Requirements for support of radio resource management	RAN#70	Perf. part

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

DU, Zhongda

Company: ZTE

Email: du.zhongda@zte.com.cn

## 12 Work item leadership

Primary: RAN WG2

Secondary: RAN WG4, RAN WG1

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Verizon
China Telecom
Alcatel Lucent
Alcatel Lucent Shanghai Bell
NTT DOCOMO, Inc.
CMCC
CHTTL
KDDI
HTC
MediaTek Inc.
Intel
T-Mobile USA
ZTE
CATT
III
US Cellular
ITRI
Acer
KT Corp.
Softbank Mobile
China Unicom
Motorola Mobility
CATR
Samsung
AsusTek
Shanghai Tejet Com Technology
NEC
Lenovo
LG Electronics
DISH Network
Telecom Italia
Potevio
Fujitsu
TELUS
Lightsquared
Kyocera
IAESI
Sequans
Qualcomm Incorporated
InterDigital

## LTE-WLAN Radio Level Integration and Interworking Enhancement

670058	<a href="#">LTE-WLAN Radio Level Integration and Interworking Enhancement</a>	LTE_WLA_N_radio	1	R2	Mar-15	Dec-15	15%	RP-150510
670158	<a href="#">Core part: LTE-WLAN Radio Level Integration and Interworking Enhancement</a>	LTE_WLA_N_radio-Core	2	R2	Mar-15	Dec-15	30%	RP-151114
670258	<a href="#">Perf. part: LTE-WLAN Radio Level Integration and Interworking Enhancement</a>	LTE_WLA_N_radio-Perf	2	R4	Mar-15	Dec-15	0%	RP-151114

**3GPP TSG RAN Meeting #67**  
**Shanghai, China, 9 - 12 March 2015**

**RP-150510**

revision of RP-yynnnn

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<b>Source:</b>	Intel Corporation, China Telecom, Qualcomm Incorporated
<b>Title:</b>	New WI Proposal: LTE-WLAN Radio Level Integration and Interworking Enhancement
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	13.1.2

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** LTE-WLAN Radio Level Integration and Interworking Enhancement

**Acronym:** LTE\_WLAN\_radio

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<a href="#">This WID includes a Core part</a>	x
<a href="#">This WID includes a Performance part</a>	x

## 1 3GPP Work Area

x	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

x	<a href="#">Study Item (go to 2.1)</a>
x	<a href="#">Feature (go to 2.2)</a>
	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
580045	Study on WLAN/3GPP Radio Interworking	
580044	Study on Small Cell Enhancements for E-UTRA and E-UTRAN – Higher-layer aspects	

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

Stage 1 (go to 2.3.1)
Stage 2 (go to 2.3.2)
Stage 3 (go to 2.3.3)
Test spec (go to 2.3.4)
Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification			
TS or CR(s) or external document	Clause	Remarks	

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

3GPP/WLAN radio interworking Release-12 solution enhances CN-based WLAN offload by improving user QoE and network utilization and providing more control to operators. These improvements can be further enhanced by LTE/WLAN aggregation and further LTE/WLAN inter-working enhancements relevant to both co-located and non-co-located deployment scenarios.

The benefits of the LTE/WLAN aggregation are:

1. WLAN access network becomes transparent to CN in the sense that it should not require WLAN-specific CN nodes and CN interfaces. This provides the operator unified control and management of both 3GPP and WLAN networks as opposed to separately managing them.
2. Aggregation and tight integration at radio level allows for real-time channel and load aware radio resource management across WLAN and LTE to provide significant capacity and QoE improvements.

3. The reliable LTE network can be used as a control and mobility anchor to provide QoE improvements, minimize service interruption, and increase operator control.
4. No new WLAN-related CN signalling is needed, thus reducing CN load.

The benefits of LTE/WLAN aggregation can be realized in both co-located and non-co-located deployments. For the collocated case, corresponding to the small cell deployment, LTE eNB and WLAN AP/AC are physically integrated and connected via an internal interface. This scenario is similar to LTE carrier aggregation. For the non-co-located case, LTE eNB and WLAN are connected via an external interface. This scenario is similar to LTE dual connectivity. In both collocated and non-collocated cases, the WLAN link behaves as second access for data while the control is managed by eNB via RRC.

LTE/WLAN aggregation can build upon the Release-12 Dual Connectivity (DC) solutions. The user plane can be reused with minimal changes where a PDCP PDU can be delivered by either LTE or WLAN links. The interface between eNB and WLAN can also use the similar user plane solution of DC (i.e. X2-U). The same solution without this interface can be used for the collocated scenario.

For inter-working in the non-co-located scenario, this work item shall introduce network-controlled WLAN/3GPP radio mechanisms based on solutions identified in Release 12 (identified as “solution-3” in the TR 37.834). These should lead to efficient RAN controlled traffic steering between LTE and WLAN deployed and controlled by operators and their partners for UEs to improve user experience, power efficiency and system efficiency.

In particular, the traffic steering for UEs in RRC CONNECTED may be controlled by the network using dedicated traffic steering commands, based also on WLAN measurements (reported by the UE or obtained via interface from WLAN infrastructure if found needed by the study).

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objectives of this work item are to define LTE-WLAN aggregation and interworking enhancement solutions addressing the co-located and non-co-located scenarios where aggregation solution is based on the Release-12 Dual Connectivity solutions 2C and 3C and interworking enhancement is based on solution-3 in the Release-12 SI on 3GPP/WLAN Radio Interworking. In the co-located scenario, the RAN logical node has both LTE eNB and WLAN AP functionality while a new interface between eNB and WLAN is needed for the non-located scenario.

Solutions for aggregation / interworking enhancement should address the following requirements:

1. Co-exist with other 3GPP/WLAN interworking solutions
2. Avoid IEEE 802.11 specification impacts
3. Solutions for aggregation should not require WLAN-specific CN nodes and CN interfaces, i.e. WLAN aggregation should be transparent to EPC. Solutions for interworking enhancement should not require additional WLAN-specific CN nodes and CN interfaces and additional CN signalling.
4. Solutions for aggregation should not prevent discovery and use of other WLAN networks based on user preferences

5. Solutions shall consider only WLAN nodes deployed and controlled by operators and their partners
6. Solutions for aggregation should build upon Release-12 LTE dual connectivity architecture
7. Solutions for inter-working enhancement should build upon LTE/WLAN interworking studied in Release-12
8. Improve mobility to/from WLAN while minimizing the core network signalling
9. Improve network control of WLAN offload
10. Improve overall UE throughput by using both cellular and WLAN access

For RAN2, the objectives of the work item are:

1. Specify RAN and WLAN protocol architecture of LTE-WLAN aggregation at the UE and network side based on Release-12 LTE Dual Connectivity solutions 2C and 3C.
2. Specify solution for user plane aggregation at the PDCP layer based on Release-12 LTE Dual Connectivity allowing both per packet (i.e. per PDCP PDU as in Dual Connectivity split bearer) and per bearer offloading.
  - a. For the case of per packet offloading, downlink should be specified with higher priority than uplink
3. Specify RRC enhancements for network-controlled activation and de-activation for aggregation based on Release-12 LTE Dual Connectivity and traffic steering indication for inter working enhancements based on Release-12 SI on 3GPP/WLAN Radio Interworking
4. Specify solutions for addition, removal, and change of WLAN links while being connected to the same eNB
5. Specify UE WLAN measurement reporting for aggregation and inter-working enhancements

For RAN3, the objective of the work item are:

1. Specify the required signalling and interface between eNB and WLAN termination point for non-co-located deployment of LTE-WLAN aggregation based on Release-12 Dual Connectivity solutions 2C and 3C.
2. Consistency between the eNB-WLAN signalling which is being studied in the Rel-13 Multi-RAT Joint Coordination (MRJC) SI and the signalling for LTE-WLAN interworking solution of this WI should be ensured to avoid redundant work.

Coordinate with SA working groups in order for SA groups to investigate the impacts of aggregation and interworking enhancement solutions on the existing WLAN/3GPP interworking solutions along with related system aspects.

## 4.2 Objective of Performance part WI

**NOTE:** Leave empty if the WI proposal does not contain a RAN performance part.

Specify UE performance requirements for LTE/WLAN aggregation and inter working enhancements operation for the scenarios addressed in RAN2 specifications.



### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
 For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
 For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #67										Q2/2015								RAN			
#68																					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf		
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75		
		1.5										1.5									

RAN #68										Q3/2015								RAN			
#69																					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf		
82	82	91	91	91	91	76bis	76bis	76bis	76bis	89	89	76	76	76	76	76	76	76	76	76	
		1.5										1					0				

RAN #69										Q4/2015								RAN			
#70																					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf		
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77	77	
		1.5			1			0.5				1.5				1			0.5		

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		x	x		
No	x				
Don't know			x	x	

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.331		Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification	RAN#70	Core part
36.304		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode	RAN#70	Core part
36.306		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities	RAN#70	Core part
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2	RAN#70	Core part
36.133		Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management	RAN#70	Perf. part

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

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## 12 Work item leadership

Primary: RAN2

Secondary: RAN3, RAN4

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Intel Corporation
DISH Network
Ip.access
US Cellular
Sprint
Sony
BlackBerry UK Limited
MediaTek
IIT Bombay
ASUSTeK
Qualcomm Incorporated
Microsoft
KDDI
KT Corp.
Orange
ZTE
CMCC
Chunghwa Telecom
HTC
KPN
CEWiT
Cisco
Ruckus
Kyocera
Lenovo
ITRI
Fujitsu
Panasonic
NEC
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Broadcom Corporation
KCCS Mobile Engineering Co. Ltd.
Sumitomo Electric
China Telecom
Nokia Networks
Nokia Corporation
Coolpad
Hitachi
ATR
CATT
Interdigital Communications
AT&T
MStar Semiconductor Inc.
Huawei
HiSilicon

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<b>Source:</b>	Intel Corporation
<b>Title:</b>	Revised WID: LTE-WLAN Radio Level Integration and Interworking Enhancement
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	11.3.12

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

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**Title:** LTE-WLAN Radio Level Integration and Interworking Enhancement

**Acronym:** LTE\_WLAN\_radio

**Unique identifier:** 670158

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	x
<b>This WID includes a Performance part</b>	x

## 1 3GPP Work Area

x	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
x	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
580045	Study on WLAN/3GPP Radio Interworking	
580044	Study on Small Cell Enhancements for E-UTRA and E-UTRAN – Higher-layer aspects	

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

3GPP/WLAN radio interworking Release-12 solution enhances CN-based WLAN offload by improving user QoE and network utilization and providing more control to operators. These improvements can be further enhanced by LTE-WLAN aggregation and further LTE-WLAN interworking enhancement relevant to both co-located and non-co-located deployment scenarios.

The benefits of the LTE-WLAN aggregation are:

5. WLAN access network becomes transparent to CN in the sense that it should not require WLAN-specific CN nodes and CN interfaces. This provides the operator unified control and management of both 3GPP and WLAN networks as opposed to separately managing them.
6. Aggregation and tight integration at radio level allows for real-time channel and load aware radio resource management across WLAN and LTE to provide significant capacity and QoE improvements.

7. The reliable LTE network can be used as a control and mobility anchor to provide QoE improvements, minimize service interruption, and increase operator control.
8. No new WLAN-related CN signalling is needed, thus reducing CN load.

The benefits of LTE-WLAN aggregation can be realized in both co-located and non-co-located deployments. For the collocated case, corresponding to the small cell deployment, LTE eNB and WLAN AP/AC are physically integrated and connected via an internal interface. This scenario is similar to LTE carrier aggregation. For the non-co-located case, LTE eNB and WLAN are connected via an external interface. This scenario is similar to LTE dual connectivity. In both collocated and non-collocated cases, the WLAN link behaves as second access for data while the control is managed by eNB via RRC.

LTE-WLAN aggregation can build upon the Release-12 Dual Connectivity (DC) solutions. The user plane can be reused with minimal changes where a PDCP PDU can be delivered by either LTE or WLAN links. The interface between eNB and WLAN can also use the similar user plane solution of DC (i.e. X2-U). The same solution without this interface can be used for the collocated scenario.

For interworking in the non-co-located scenario, this work item shall introduce network-controlled WLAN/3GPP radio mechanisms based on solutions identified in Release 12 (identified as “solution-3” in the TR 37.834). These should lead to efficient RAN controlled traffic steering between LTE and WLAN deployed and controlled by operators and their partners for UEs to improve user experience, power efficiency and system efficiency.

In particular, the traffic steering for UEs in RRC CONNECTED may be controlled by the network using dedicated traffic steering commands, based also on WLAN measurements (reported by the UE or obtained via interface from WLAN infrastructure if found needed).

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objectives of this work item are to define LTE-WLAN Aggregation and Interworking Enhancement solutions addressing the co-located and non-co-located scenarios where Aggregation solution is based on the Release-12 Dual Connectivity solutions 2C and 3C and Interworking Enhancement is based on solution-3 in the Release-12 SI on 3GPP/WLAN Radio Interworking. In the co-located scenario, the RAN logical node has both LTE eNB and WLAN AP functionality while a new interface between eNB and WLAN is needed for the non-located scenario.

Solutions for Aggregation and Interworking Enhancement should address the following requirements:

11. Co-exist with other 3GPP/WLAN interworking solutions
12. Avoid IEEE 802.11 specification impacts
13. Solutions for Aggregation should not require WLAN-specific CN nodes and CN interfaces, i.e. LTE-WLAN Aggregation should be transparent to EPC. Solutions for Interworking Enhancement should not require additional WLAN-specific CN nodes and CN interfaces and additional CN signalling.
14. Solutions for Aggregation should not prevent discovery and use of other WLAN networks based on user preferences

15. Solutions shall consider only WLAN nodes deployed and controlled by operators and their partners
16. Solutions for Aggregation should build upon Release-12 LTE Dual Connectivity architecture
17. Solutions for Interworking Enhancement should build upon WLAN/3GPP Radio Interworking studied in Release-12
18. Improve mobility to/from WLAN while minimizing the core network signalling
19. Improve network control of WLAN offload
20. Improve overall UE throughput by using both cellular and WLAN access

For RAN2, the objectives of the work item are:

6. Specify RAN and WLAN protocol architecture of LTE-WLAN Aggregation at the UE and network side based on Release-12 LTE Dual Connectivity solutions 2C and 3C.
7. Specify solution for user plane Aggregation at the PDCP layer based on Release-12 LTE Dual Connectivity allowing both per packet (i.e. per PDCP PDU as in Dual Connectivity split bearer) and per bearer offloading.
  - a. For the case of per packet offloading, downlink should be specified with higher priority than uplink
8. Specify RRC enhancements for network-controlled activation and de-activation for Aggregation based on Release-12 LTE Dual Connectivity and traffic steering indication for Interworking Enhancement based on Release-12 SI on WLAN/3GPP Radio Interworking
9. Specify solutions for addition, removal, and change of WLAN links while being connected to the same eNB
10. Specify UE WLAN measurement reporting for Aggregation and Interworking Enhancement

For RAN3, the objective of the work item are:

3. Specify the required control plane and user plane signalling and interface between eNB and WLAN termination point for non-co-located deployment of LTE-WLAN Aggregation based on Release-12 Dual Connectivity solutions 2C and 3C.
4. Specify procedures and signalling for the exchange of parameters (e.g., parameters that were considered beneficial in TR 37.870 and that may be found beneficial for Aggregation and Interworking Enhancement).

Coordination with SA working groups will happen in order for SA groups to investigate the impacts of aggregation and interworking enhancement solutions on the existing WLAN/3GPP interworking solutions along with related system aspects.

## 4.2 Objective of Performance part WI

**NOTE:** Leave empty if the WI proposal does not contain a RAN performance part.

Specify UE performance requirements for LTE-WLAN Aggregation and Interworking Enhancement operation for the scenarios addressed in RAN2 specifications.



### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
 For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
 For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #67										Q2/2015										RAN			
#68																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75				
		1.5										1.5											

RAN #68										Q3/2015										RAN			
#69																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82	82	91	91	91	91	76bis	76bis	76bis	76bis	89	89	76	76	76	76	76	76	76	76				
		1.5										1								0			

RAN #69										Q4/2015										RAN			
#70																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82bis	82bis	91bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77				
		1.5				1				0.5		1.5				1				0.5			

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		x	x		
No	x				
Don't know				x	x

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
37.XXA	Evolved Universal Terrestrial Radio Access Network (E-UTRAN) and Wireless LAN (WLAN); Xw general aspects and principles	RAN3		RAN#69	RAN#70	Core part; rapporteur: Kimba Dit Adamou, Boubacar, CMCC (email: jinba@chinamobile.com)
37.XXB	Evolved Universal Terrestrial Radio Access Network (E-UTRAN) and Wireless LAN (WLAN); Xw layer 1	RAN3		RAN#69	RAN#70	Core part; rapporteur: Wei Hong, China Telecom (hongwei@ctbri.com.cn)
37.XXC	Evolved Universal Terrestrial Radio Access Network (E-UTRAN) and Wireless LAN (WLAN); Xw signalling support	RAN3		RAN#69	RAN#70	Core part; rapporteur: Kimba Dit Adamou, Boubacar, CMCC (email: jinba@chinamobile.com)
37.XXD	Evolved Universal Terrestrial Radio Access Network (E-UTRAN) and Wireless LAN (WLAN); Xw application protocol (XwAP)	RAN3		RAN#69	RAN#70	Core part; rapporteur: Ozcan Ozturk, Qualcomm Incorporated (email: oozturk@qti.qualcomm.com)
37.XXE	Evolved Universal Terrestrial Radio Access Network (E-UTRAN) and Wireless LAN (WLAN); Xw data transport	RAN3		RAN#69	RAN#70	Core part; rapporteur: Sasha Sirotkin, Intel Corporation (email: sasha.sirotkin@intel.com)
37.XXF	Evolved Universal Terrestrial Radio Access Network (E-UTRAN) and Wireless LAN (WLAN); Xw interface user plane protocol	RAN3		RAN#69	RAN#70	Core part; rapporteur: Sasha Sirotkin, Intel Corporation (email: sasha.sirotkin@intel.com)

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.331		Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification	RAN#70	Core part
36.304		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode	RAN#70	Core part
36.306		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities	RAN#70	Core part
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2	RAN#70	Core part
36.133		Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management	RAN#70	Perf. part

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

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## 12 Work item leadership

Primary: RAN2

Secondary: RAN3, RAN4

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Intel Corporation
DISH Network
Ip.access
US Cellular
Sprint
Sony
BlackBerry UK Limited
MediaTek
IIT Bombay
ASUSTeK
Qualcomm Incorporated
Microsoft
KDDI
KT Corp.
Orange
ZTE
CMCC
Chunghwa Telecom
HTC
KPN
CEWiT
Cisco
Ruckus
Kyocera
Lenovo
ITRI
Fujitsu
Panasonic
NEC
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Broadcom Corporation
KCCS Mobile Engineering Co. Ltd.
Sumitomo Electric
China Telecom
Nokia Networks
Nokia Corporation
Coolpad
Hitachi
ATR
CATT
Interdigital Communications
AT&T
MStar Semiconductor Inc.
Huawei
HiSilicon



## RAN aspects for improvements to CS/PS coordination in UTRAN Shared Network

670060	<b>RAN aspects for improvements to CS/PS coordination in UTRAN Shared Network</b>	CSPS_Co ord-UTRA	1	R3	Mar-15	Sep-15	45%	RP-150500
670160	Core part: RAN aspects for improvements to CS/PS coordination in UTRAN Shared Network	CSPS_Co ord- UTRA- Core	2	R3	Mar-15	Sep-15	45%	RP-150500

**3GPP TSG RAN Meeting #67**  
**Shanghai, China, 9 - 12 March 2015**

**RP-150500**

revision of RP-150304

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<b>Source:</b>	Ericsson
<b>Title:</b>	New WI: RAN aspects for improvements to CS/PS coordination in UTRAN Shared Network
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	13.1.3

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

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**Title:** RAN aspects for improvements to CS/PS coordination in UTRAN Shared Network

**Acronym:** CSPS\_Coord-UTRAN

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	

## 1 3GPP Work Area

X	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
630016	Improvements to CS/PS coordination in UTRAN/GERAN Shared Networks	

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
X	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS
630216	Stage 2 for Improvements to CS/PS coordination in UTRAN/GERAN Shared Networks	23.251

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

There is support of Network Sharing in UTRAN specifications where radio access and core network can be shared between operators without this being known to the UEs. One challenge in the context of this functionality is to ensure that the registration of a given UE to the CS and PS domain is coordinated, i.e. a subscriber is registered to the same PLMN in both domains.

TSG SA WG2 have investigated all mobility scenarios and identified issues with CS/PS coordination in the case of network-controlled mobility into UTRAN shared networks i.e. CS/PS coordination may fail resulting in the UE ending up registered to different operators in the CS and PS domains.

Enhancements to prevent CS/PS coordination failure have been specified in stage 2 TS 23.251 Release-13 by SA WG2.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective is to enhance UTRAN specifications according to the CS/PS coordination solutions as specified in TS 23.251 to ensure that CS/PS coordination can be achieved for mobility scenarios into UTRAN shared networks.

To achieve this, the Iu-interface needs to be updated with the functionality applicable for MOCN from the following solutions described in 23.251:

- Possibility for the SRNC in case a registration attempt in the PS domain to query the MSC(s) whether the UE is served by any of the sharing operators in the CS domain.
- Possibility for the SRNC in case a registration attempt in the CS domain to query the SGSN(s) whether the UE is served by any of the sharing operators in the PS domain.
- Possibility to transfer Old LAI/RAI, CS/PS-NRI and indication if UE is attaching in the Redirection Indication IE,

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
 For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
 For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #67										Q2/2015										RAN			
#68																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75				
															0.5								

RAN #68										Q3/2015										RAN			
#69																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82	82	91	91	91	89bis	76bis	76bis	76bis	76bis	89	89	76	76	76	76	76	76	76	76				
										0.5													

RAN #69										Q4/2015										RAN			
#70																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77				

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
25.413		UTRAN Iu interface Radio Access Network Application Part (RANAP) signalling	RAN#69 Sep, 2015	

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Israelsson, Martin

**Company:** Ericsson

**Email:** martin.israelsson@ericsson.com

## 12 Work item leadership

RAN WG3

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Ericsson
TeliaSonera
Orange
Nokia Networks



## LTE DL 4 Rx antenna ports

670061	<b>LTE DL 4 Rx antenna ports</b>	LTE_4Rx_AP_DL	1	R4	Jan-00	Jun-16	15%	RP-150427
670161	<b>Core part: LTE DL 4 Rx antenna ports</b>	LTE_4Rx_AP_DL-Core	2	R4	Mar-15	Dec-15	25%	RP-150427
670261	<b>Perf. part: LTE DL 4 Rx antenna ports</b>	LTE_4Rx_AP_DL-Perf	2	R4	Jan-00	Jun-16	15%	RP-150427

**3GPP TSG RAN Meeting #67  
Shanghai, China, 9 - 12 March 2015**

**RP-150427**

revision of RP-150142

---

<b>Source:</b>	Ericsson
<b>Title:</b>	New Work Item: LTE DL 4 Rx antenna ports
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	13.1.4

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** LTE DL 4 Rx antenna ports

**Acronym:** LTE\_4Rx\_AP\_DL

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
	LTE_4Rx_AP_DL	

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

Multiple antennas for transmission and reception are used for improving both the user- and cell throughput and are key factors behind the high performance offered by 3GPP LTE standard. Starting from Rel-10 up to 8 layers is supported. However, the UE performance requirements are still based on the use of 2 receive antenna ports (AP); there are no requirements for a UE that can be equipped with more than two ports for achieving additional diversity gain and/or multiplexing gain.

With 4 Rx a 4x4 MIMO system supports up to four layer spatial multiplexing. With 4 Rx AP an 8x4 MIMO system with four layer spatial multiplexing is capable of utilizing both beam forming and diversity gain in maximum level. These layers can be combined through dynamic beamforming and MIMO receiver processing to increase reliability and range. From a performance point of view the use of 4 Rx AP allows higher UE data rates in a wide range of scenarios and improved receiver sensitivity in general. Depending on the target SNR region, the transmission scheme used in the eNodeB and the channel conditions, the peak

throughput can be doubled compared to dual-layer multiplexing by virtue of additional diversity gain and/or multiplexing gain.

With the above expectation, in order to enhance the end user experience it's proposed to start a new WI to define core and UE performance requirement for LTE with 4 Rx AP in Rel-13 in RAN4.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

#### 4.1.1 RF core requirement with 4 Rx AP

The objectives for RF core requirements for 4 Rx AP are the following

- Scope for non-CA operation
  - No changes anticipated for RF Tx requirements
  - All RF Rx requirements are in the scope of the work item
    - specification of requirements in sub-clauses 7.1-7.10 of 36.101 applicable to 4Rx
  - For each band the RF requirements are verified according to the number of Rx ports supported by the UE
- Objectives for test coverage
  - 2 Rx performance needs to be guaranteed if the 4 Rx operates with 2 Rx chains. 2 Rx test in addition to 4 Rx needs to be considered during the work item phase, if 2 Rx operations would not meet 2 Rx requirements when 4 Rx requirements are met.
- Scope for CA operation
  - Specify 4 Rx RF requirements for CA after the non-CA requirements have been completed. The non-CA must be agreed and included in 36.101.

#### 4.1.2 RRM core requirement with 4 Rx AP

The objectives for RRM core requirements for 4 Rx AP are the following

- Study feasibility of RLM requirements with 4 Rx antenna
- The outcome of the feasibility study is decision on whether RLM requirements need to be specified.
- Specify RLM requirements based on the outcome of the above feasibility of using 4 Rx for RLM requirements

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

#### 4.2.1 General

- Define proper antenna configuration, MIMO channel correlation matrices, propagation channel condition for 4 Rx AP based MIMO in order to support UE performance and CSI requirement
- The demodulation requirements should be defined in scenarios where 4 Rx APs are verified with substantial gains. Fallback to 2 Rx AP in other scenarios should be allowed.

#### 4.2.2 UE demodulation requirement with 4 Rx AP

The objectives for demodulation requirements of PDSCH for 4 Rx AP are the following

- Specify UE performance requirements with 4 Rx antenna including
  - Demodulation of PDSCH (Cell-Specific Reference Symbols)
  - Demodulation of PDSCH (User-Specific Reference Symbols)
- PDSCH demodulation requirements support up to 4 layers.
- No prioritization on number of layers.
- MMSE-MRC/IRC, RML and CWIC receivers will be investigated as candidate reference receivers.

The objectives for demodulation requirements of control channels for 4 Rx AP are the following

- Study feasibility of control channels demodulation with 4 Rx antenna with respect to
  - Impact on UE power performance
  - System benefit
  - UE behavior in network
- The outcome of the feasibility study is decision on whether control channel demodulation performance needs to be specified and which control channel needs to be specified.
- Specify control channels demodulation performance based on the outcome of the above feasibility of using 4 Rx for control channels.

#### 4.2.3 UE CSI requirement with 4 Rx AP

The objectives for CSI requirements for 4 Rx AP are the following

- WI scope includes CSI requirements for 4 Rx antenna including
  - CQI
  - PMI
  - RI
- CSI requirements support up to 4 layers.
- No prioritization on number of layers.
- MMSE-MRC/IRC, RML and CWIC receivers will be investigated as candidate reference receivers.

#### 4.1.2 RRM performance requirement with 4 Rx AP

The objectives for RRM performance requirements for 4 Rx AP are the following

- Specify RLM performance requirements based on the conclusion of RLM core requirement part

### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
 For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
 For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #67												Q2/2015												RAN			
#68																											
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf								
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75								
						0.5	0.25		1							0.5	0.25		1								

RAN #68												Q3/2015												RAN			
#69																											
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf								
82	82	91	91	91	91	76bis	76bis	76bis	76bis	89	89	76	76	76	76	76	76	76	76	76	76	76	1.5				
						0.5	0.5		1.5						0.5	0.5											

RAN #69												Q4/2015												RAN			
#70																											
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf								
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77	77	77	77	77	0.5	.5	1.5	
						0.5	0.5		1.5							0.5	0.5										

RAN #70												Q1/2016												RAN				
#71																												
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf									
84	84	92	92	92	92	78bis	78bis	78bis	78bis	91	91	78	78	78	78	78	78	78	78	78	78	78	1.5					

RAN #71												Q2/2016												RAN				
#72																												
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf									
84bis	84bis	92bis	92bis	92bis	91bis	78bis	78bis	78bis	78bis	85	85	93	93	93	92	79	79	79	79	79	79	79	79	1.5				

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

### 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X	X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception	RAN#70	Core part for RF requirement from clause 7
36.133		Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management	As above	Core part for RRM requirement
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception	RAN#72	Performance part for UE demodulation and CSI requirements from clause 8 and 9
36.307		E-UTRA; Requirements on User Equipments (UEs) supporting a release-independent frequency band	As above	Performance part for UE demodulation and CSI requirements

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Chen, Maomao

**Company:** Ericsson

**Email:** maomao.chen@ericsson.com

## 12 Work item leadership

RAN 4

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
AT&T
CATT
China Unicom
CMCC
Deutsche Telekom
Dish Network
Ericsson
Huawei
Hisilicon
Intel
KDDI
KPN
KT
Lightsquared
LG
MediaTek
Nokia Network
Nokia Corporations
Orange
Qualcomm
Samsung
SoftBank Mobile
Sony
Sprint
Telefonica
Verizon



## AWS-Extension Band for LTE

670062	<b>AWS-Extension Band for LTE</b>	LTE_AWS_EXT	1	R4	Mar-15	Dec-15	10%	RP-150428
670162	<b>Core part: AWS-Extension Band for LTE</b>	LTE_AWS_EXT-Core	2	R4	Mar-15	Dec-15	20%	RP-150800
670262	<b>Perf. part: AWS-Extension Band for LTE</b>	LTE_AWS_EXT-Perf	2	R4	Mar-15	Dec-15	0%	RP-150800

**3GPP TSG WG-RAN Meeting #67**  
**Shanghai, China, 9 – 12 March 2015**

**RP-150428**

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**Source:** Ericsson  
**Title:** New WI: AWS-Extension Band for LTE  
**Document for:** Approval  
**Agenda Item:** 13.2

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** AWS-Extension Band for LTE

**Acronym:** LTE\_AWS\_EXT

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

A band plan was agreed as the outcome of the SI on AWS-Extension band for LTE and is documented in TR 36.849.

- 70+90 (1710 - 1780 MHz / 2110 - 2200 MHz, fixed duplex with downlink intra-band CA across 90 MHz span)

Interoperability within the band was also discussed during the SI, following the FCC expectations in [3], It was agreed and documented in [2] that “if during the WI for the above band plan it is concluded that interoperability across any part of the band cannot be achieved, then RAN4 agrees to address those interoperability issues”. To this end, it is expected that support of CA will be specified for the band.

## 4 Objective

### 4.1 Objective of Core part WI

1. Specify a new operating band with UL 1710 - 1780 MHz and DL 2110 - 2200 MHz with:
  - o Fixed duplex spacing of 400MHz
  - o Support for 5, 10, 15 and 20MHz bandwidths
2. Support interoperability across the complete band (1710-1780/2110-2200MHz) by means of intra-band CA
  - o Specification of intra-band CA shall be completed as part of the WI
3. Interoperability shall be met by intra band carrier aggregation, and if it is determined that interoperability cannot be met by intra band CA, the means by which interoperability will be achieved shall be specified and the WID shall be modified.

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

The objectives of the Performance part work item are to add in the relevant RAN4 specifications the performance requirements for the new band.

### 4.3 RAN time budget proposal

RAN #67										Q2/2015								RAN					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75				
					0.25										0.25								

RAN #68										Q3/2015								RAN					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82	82	91	91	91	89	76	76	76	76														
					0.25																		

RAN #69										Q4/2015								RAN					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77				
					0.125			0.125								0.125		0.125					

**NOTE:** For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
 For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
 Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

**NOTE:** In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		x	x		
No	x			x	x
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
TR 36.8xx	AWS-extension band	RAN4		RAN#70	RAN#70	Core part

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
TS 36.101		E-UTRA; UE Radio transmission and reception	RAN#70	Core part
TS 36.104		E-UTRA; BS Radio transmission and reception	RAN#70	Core part
TS 36.307		E-UTRA; Requirements on User Equipments (UEs) supporting a release-independent frequency band	RAN#70	Perf part
TS 36.113		E-UTRA; BS and repeater EMC	RAN#70	Core part
TS 36.124		E-UTRA; EMC requirements for mobile terminals and ancillary equipment	RAN#70	Core part
TS 36.133		E-UTRA; Requirements for support of RRM	RAN#70	Perf.part
TS 36.141		E-UTRA; BS conformance testing	RAN#70	Perf. part
TS 37.104		E-UTRA, UTRA and GSM/EDGE; Multi-Standard Radio (MSR) Base Station (BS) radio transmission and reception	RAN#70	Core part
TS 37.141		E-UTRA, UTRA and GSM/EDGE; Multi-Standard Radio (MSR) Base Station (BS) conformance testing	RAN#70	Perf. part
TS 37.113		E-UTRA, UTRA and GSM/EDGE; Multi-Standard Radio (MSR) Base Station (BS) Electromagnetic Compatibility (EMC)	RAN#70	Core part
TS 25.461		UTRAN IuANT interface: Layer 1	RAN#70	Core part
TS 25.466		UTRAN IuANT interface: Application part	RAN#70	Core part

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Erika Tejedor

**Company:** Ericsson

**Email:** [erika.tejedor@ericsson.com](mailto:erika.tejedor@ericsson.com)

## 12 Work item leadership

RAN4

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Ericsson
Nokia Networks
Verizon Wireless
AT&T
DISH Network
Rogers
Telus
Samsung
Huawei
HiSilicon
Alcatel-Lucent
LG Electronics
Nokia Corporation
Intel
T-Mobile
US Cellular

## References

- [1] TR 36.849, "Study on Advanced Wireless Services (AWS) extension band for LTE"
- [2] RP-141037, "Study on Advanced Wireless Services (AWS) - Extension band for LTE", Qualcomm
- [3] Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands, GN Docket No. 13-185, Report and Order, 29 FCC Rcd 4610 (2014) (AWS-3 R&O).FCC 14-31 Report and Order.

**3GPP TSG RAN Meeting #68**  
**Malmö, Sweden, 15 - 18 June 2015**

**RP-150800**

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**Source:** Ericsson  
**Title:** Revised WI: AWS-Extension Band for LTE  
**Document for:** Approval  
**Agenda Item:** 13.2

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** AWS-Extension Band for LTE

**Acronym:** LTE\_AWS\_EXT

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<a href="#">This WID includes a Core part</a>	X
<a href="#">This WID includes a Performance part</a>	X

# 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

### 3 Justification

A band plan was agreed as the outcome of the SI on AWS-Extension band for LTE and is documented in TR 36.849.

- 70+90 (1710 - 1780 MHz / 2110 - 2200 MHz, fixed duplex with downlink intra-band CA across 90 MHz span)

Interoperability within the band was also discussed during the SI, following the FCC expectations in [3]. It was agreed and documented in [2] that “if during the WI for the above band plan it is concluded that interoperability across any part of the band cannot be achieved, then RAN4 agrees to address those interoperability issues”. To this end, it is expected that support of CA will be specified for the band.

## 4 Objective

#### 4.1 Objective of Core part WI

4. Specify a new operating band with UL 1710 - 1780 MHz and DL 2110 - 2200 MHz with:
    - o Fixed duplex spacing of 400MHz
    - o Support for 5, 10, 15 and 20MHz bandwidths
  5. Support interoperability across the complete band (1710-1780/2110-2200MHz) by means of intra-band CA
    - o Specification of intra-band CA shall be completed as part of the WI
  6. Interoperability shall be met by intra band carrier aggregation, and if it is determined that interoperability cannot be met by intra band CA, the means by which interoperability will be achieved shall be specified and the WID shall be modified.

#### 4.2 Objective of Performance part WI

**NOTE:** Leave empty if the WI proposal does not contain a RAN performance part.

The objectives of the Performance part work item are to add in the relevant RAN4 specifications the performance requirements for the new band.

### 4.3 RAN time budget proposal

RAN #67												Q2/2015						RAN #68					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75				
						0.25										0.25							

RAN #68 Q3/2015 RAN

#69																		
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf									
82	82	91	91	91	89	76	76	76	76									
						0.25												

RAN #69																			Q4/2015				RAN			
#70																										
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf							
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77							
						0.125		0.125								0.125		0.125								

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

#### additional comments to the time budget proposal:

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		x	X		
No	x			x	x
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
TR 36.869	AWS-extension band	RAN4		RAN#70	RAN#70	Core part

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
TS 36.101		E-UTRA; UE Radio transmission and reception	RAN#70	Core part
TS 36.104		E-UTRA; BS Radio transmission and reception	RAN#70	Core part
TS 36.307		E-UTRA; Requirements on User Equipments (UEs) supporting a release-independent frequency band	RAN#70	Perf part
TS 36.113		E-UTRA; BS and repeater EMC	RAN#70	Core part
TS 36.124		E-UTRA; EMC requirements for mobile terminals and ancillary equipment	RAN#70	Core part
TS 36.133		E-UTRA; Requirements for support of RRM	RAN#70	Perf.part
TS 36.141		E-UTRA; BS conformance testing	RAN#70	Perf. Part
TS 37.104		E-UTRA, UTRA and GSM/EDGE; Multi-Standard Radio (MSR) Base Station (BS) radio transmission and reception	RAN#70	Core part
TS 37.141		E-UTRA, UTRA and GSM/EDGE; Multi-Standard Radio (MSR) Base Station (BS) conformance testing	RAN#70	Perf. Part
TS 37.113		E-UTRA, UTRA and GSM/EDGE; Multi-Standard Radio (MSR) Base Station (BS) Electromagnetic Compatibility (EMC)	RAN#70	Core part
TS 25.101		User Equipment (UE) radio transmission and reception (FDD)	RAN#70	Core part Note: only co-existence requirements to protect AWS extension needed
TS 25.104		Base Station (BS) radio transmission and reception (FDD)	RAN#70	Core part Note: only co-existence requirements to protect AWS extension needed
TS 25.123		Requirements for support of radio resource management (TDD)	RAN#70	Perf.part
TS 25.133		Requirements for support of radio resource management (FDD)	RAN#70	Perf.part
TS 25.141		Base Station (BS) conformance testing (FDD)	RAN#70	Perf. part Note: only co-existence requirements to protect AWS extension needed
TS 25.461		UTRAN Iuant interface: Layer 1	RAN#70	Core part
TS 25.466		UTRAN Iuant interface: Application part	RAN#70	Core part

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Erika Tejedor

**Company:** Ericsson

**Email:** erika.tejedor@ericsson.com

## 12 Work item leadership

RAN4

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Ericsson
Nokia Networks
Verizon Wireless
AT&T
DISH Network
Rogers
Telus
Samsung
Huawei
HiSilicon
Alcatel-Lucent
LG Electronics
Nokia Corporation
Intel
T-Mobile
US Cellular

## References

- [1] TR 36.849, "Study on Advanced Wireless Services (AWS) extension band for LTE"
- [2] RP-141037, "Study on Advanced Wireless Services (AWS) - Extension band for LTE", Qualcomm
- [3] Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands, GN Docket No. 13-185, Report and Order, 29 FCC Rcd 4610 (2014) (AWS-3 R&O).FCC 14-31 Report and Order.

Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 5 and Band 7

670063	<b>Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 5 and Band 7</b>	LTE_CA_B5_B7_B_Wset	1	R4	Mar-15	Jun-15	100%	RP-150171
670163	<b>Core part: Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 5 and Band 7</b>	LTE_CA_B5_B7_B_Wset-Core	2	R4	Mar-15	Jun-15	100%	RP-150602
670263	<b>Perf. part: Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 5 and Band 7</b>	LTE_CA_B5_B7_B_Wset-Perf	2	R4	Mar-15	Jun-15	100%	RP-150602

**3GPP TSG RAN Meeting #67**  
**Shanghai, China, 9 – 12 March 2015**

**RP-150171**  
revision of RP-yynnnn

---

**Source:** Nokia Networks  
**Title:** New WID: Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 5 and Band 7  
**Document for:** Approval  
**Agenda Item:** 13.2

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 5 and Band 7 (Core)

**Acronym:** LTE\_CA\_B5\_B7\_BWset

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	X

## 1 3GPP Work Area

X	<b>Radio Access</b>
	<b>Core Network</b>
	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
	Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 5 and Band 7	

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

##### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

##### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

CA\_1A-5A-7A does not require 1.4 and 3 MHz channel bandwidths in Band 5, however, the corresponding fallback CA\_5A-7A was not defined and only one bandwidth combination set including both 1.4 and 3 MHz channel bandwidths exists due to the earlier WI for CA\_5A-7A. A new bandwidth combination set without 1.4 and 3MHz should be introduced for CA\_5A-7A to avoid mandatory support of 1.4 and 3MHz channel bandwidths in fallback CA.

## 4 Objective

### 4.1 Objective of Core part WI

Introduce a new bandwidth combination set 1 to the channel bandwidth combination table of B5+B7 CA.

E-UTRA CA configuration / Bandwidth combination set									
E-UTRA CA Configuration	E-UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_5A-7A	5	Yes	Yes	Yes	Yes			30	0
	7				Yes	Yes	Yes		
	5			Yes	Yes			30	1
	7				Yes	Yes	Yes		

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

Same as section 4.1.

### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #67										Q2/2015										RAN			
#68																							
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75				
					0.125											0.125		0.125					

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary# Comments
36.852-13	LTE Advanced inter-band Carrier Aggregation (2DL/1UL); Release 13	RAN4		RAN#68 (June 2015)	RAN#68 (June 2015)

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR	Subject of the CR	Approved at plenary# Comments
36.101		E-UTRA; UE Radio transmission and reception	RAN#68 (June 2015) Core Part
36.307		E-UTRA; Requirements on User Equipments (UEs) supporting a release-independent frequency band	As above Perf Part

## 11 Work item rapporteur(s)

Hisashi Onozawa

Company: Nokia Networks  
Email: [hisashi.onozawa@nokia.com](mailto:hisashi.onozawa@nokia.com)

## 12 Work item leadership

RAN 4

## 13 Supporting Individual Members

Supporting IM name
Nokia Networks
Nokia Corporation
Qualcomm Incorporated
Ericsson
Intel Corporation

---

<b>Source:</b>	<b>Nokia Networks</b>
<b>Title:</b>	<b>Revised WID: Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 5 and Band 7</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>11.4.1.9</b>

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 5 and Band 7 (Core)

**Acronym:** **LTE\_CA\_B5\_B7\_BWset**

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
X	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
	Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 5 and Band 7	

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

CA\_1A-5A-7A does not require 1.4 and 3 MHz channel bandwidths in Band 5, however, the corresponding fallback CA\_5A-7A was not defined and only one bandwidth combination set including both 1.4 and 3 MHz channel bandwidths exists due to the earlier WI for CA\_5A-7A. A new bandwidth combination set without 1.4 and 3MHz should be introduced for CA\_5A-7A to avoid mandatory support of 1.4 and 3MHz channel bandwidths in fallback CA.

## 4 Objective

### 4.1 Objective of Core part WI

Introduce a new bandwidth combination set 1 to the channel bandwidth combination table of B5+B7 CA.

E-UTRA CA configuration / Bandwidth combination set									
E-UTRA CA Configuration	E-UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_5A-7A	5	Yes	Yes	Yes	Yes			30	0
	7				Yes	Yes	Yes		
	5			Yes	Yes			30	1
	7			Yes	Yes	Yes	Yes		

## 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

Same as section 4.1.

## 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #67																Q2/2015								RAN			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf								
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75								
					0.125										0.125		0.125										

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X

Don't know				
------------	--	--	--	--

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR	Subject of the CR	Approved at plenary#
36.101		E-UTRA; UE Radio transmission and reception	RAN#68 (June 2015)
36.307		E-UTRA; Requirements on User Equipments (UEs) supporting a release-independent frequency band	As above
36.852-13		LTE Advanced inter-band Carrier Aggregation (2DL/1UL); Release 13	As above
			Core Part
			Perf Part

## 11 Work item rapporteur(s)

Hisashi Onozawa

Company: Nokia Networks  
Email: [hisashi.onozawa@nokia.com](mailto:hisashi.onozawa@nokia.com)

## 12 Work item leadership

RAN 4

## 13 Supporting Individual Members

Supporting IM name
Nokia Networks
Nokia Corporation
Qualcomm Incorporated
Ericsson
Intel Corporation



Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 3 and Band 5

670064	<b>Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 3 and Band 5</b>	LTE_CA_B3_B5_B_Wset	1	R4	Mar-15	Jun-15	100%	RP-150425
670164	<b>Core part: Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 3 and Band 5</b>	LTE_CA_B3_B5_B_Wset-Core	2	R4	Mar-15	Jun-15	100%	RP-150425
670264	<b>Perf. part: Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 3 and Band 5</b>	LTE_CA_B3_B5_B_Wset-Perf	2	R4	Mar-15	Jun-15	100%	RP-150425

**3GPP TSG RAN Meeting #67**  
**Shanghai, China, 9 - 13 March 2015**

**RP-150425**

revision of RP-yynnnn

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<b>Source:</b>	<b>Samsung</b>
<b>Title:</b>	<b>New WID: Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 3 and Band 5</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>13.2</b>

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Additional bandwidth combination set for LTE Advanced inter-band Carrier Aggregation of Band 3 and Band 5

**Acronym:** LTE\_CA\_B3\_B5\_BWset

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	X
<b>This WID includes a Performance part</b>	X

## 1 3GPP Work Area

X	<b>Radio Access</b>
	<b>Core Network</b>
	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
X	<b>Work Task (go to 2.4)</b>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
	LTE Advanced dual uplink inter-band Carrier Aggregation	

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

#### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

### 3 Justification

The CA of Band 3 and Band 5 has been specified in the specification without bandwidth combination set including 3MHz channel bandwidth in Band 5. According to market request, this work item is proposed to add 3MHz channel bandwidth in Band 5 as new bandwidth combination set.

### 4 Objective

#### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of this work item is the following

Add a bandwidth combination set 3 to the channel bandwidth combination table of B3 + B5 CA for 2DL/1UL, as indicated in the table below

E-UTRA CA configuration / Bandwidth combination set												
E-UTRA CA Configuration	Uplink CA configurations (NOTE 4)		E-UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum aggregated bandwidth [MHz]	Bandwidth combination set	Dual uplink CA capability
CA_3A-5A	-		3				Yes	Yes	Yes	30	0	Yes
			5			Yes	Yes			20	1	Yes
			3			Yes				30	2	Yes
			5			Yes	Yes			30	3	Yes
			3			Yes	Yes	Yes	Yes			
			5			Yes	Yes					
			3			Yes	Yes	Yes	Yes			
			5	Yes	Yes	Yes						

#### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

#### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #67												Q2/2015												RAN			
#68																											
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf								
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75								
					0.1											0.1											

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments
						.

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
TR 36.8xxx		E-UTRA; Inter-band Carrier Aggregation Technical Report	RAN#68 June 2015)	Core part for 1UL/2DL, band combinations and bandwidth options as described in the WID.
36.101		E-UTRA; User equipment (UE) radio transmission and reception	RAN#68 June 2015)	Core part for 1UL/2DL, band combinations and bandwidth options as described in the WID.
36.307		E-UTRA; Requirements on UE's supporting a release-independent frequency band	RAN#68 June 2015)	Perf. part for 1UL/2DL, band combinations and bandwidth options as described in the WID.

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Xutao Zhou

Samsung

[xutao.zhou@samsung.com](mailto:xutao.zhou@samsung.com)

## 12 Work item leadership

[RAN WG4](#)

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Samsung
SK Telecom
LG Uplus
Intel

## Multiflow Enhancements for UTRA

670054	<a href="#">Multiflow Enhancements for UTRA</a>	HSDPA_MFTX_enh	1	R2	Mar-15	Sep-15	80%	RP-150288
670154	<a href="#">Core part: Multiflow Enhancements for UTRA</a>	HSDPA_MFTX_enh-Core	2	R2	Mar-15	Sep-15	80%	RP-151021

**3GPP TSG RAN Meeting #67  
Shanghai, China, 9 – 12 March 2015**

**RP-150288**

revision of RP-14xxxx

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<b>Source:</b>	<b>Nokia Networks</b>
<b>Title:</b>	<b>New WI proposal: Multiflow Enhancements for UTRA</b>
<b>Document for:</b>	<b>Approval Information Discussion</b>
<b>Agenda Item:</b>	<b>14.1.2</b>

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Multiflow Enhancements for UTRA

**Acronym:** HSDPA\_MFTX\_enh

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<a href="#">This WID includes a Core part</a>	X
<a href="#">This WID includes a Performance part</a>	

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<a href="#">Study Item (go to 2.1)</a>
X	<a href="#">Feature (go to 2.2)</a>
	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

Stage 1 (go to 2.3.1)
Stage 2 (go to 2.3.2)
Stage 3 (go to 2.3.3)
Test spec (go to 2.3.4)
Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

3GPP has been continuously working on evolution of the HSPA data aggregation features, which started in Rel-8 with introduction of dual-carrier HSPA and culminated with adoption of 8C-HSPDA and Multiflow data transmission in Rel-11. Some of the HSDPA aggregation features have been already commercially deployed proving to provide noticeable gains in terms higher throughput and lower transmission delays.

With introduction of Multiflow in Rel-11, an operator can utilize better available spectrum resources as several cells could be configured on the same frequency. In particular, 3GPP adopted the following scenarios: two cells on one frequency (SF-DC), three cells on two frequencies (DF-3C), four cells on two frequencies (DF-4C). The aforementioned scenarios cater for one or two frequencies, whereas some operators have up to three frequencies (either in the same or different bands). Thus, it becomes a logical extension to consider further Multiflow scenarios for such deployment cases.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

It is proposed to introduce a new Multiflow scenario, four cells on three frequencies (3F-4C), with the following general objectives:

- The three frequencies can be distributed on up to two frequency bands
- Reuse as much as possible existing L1 functionality (specified by RAN WG1) by adopting existing principles and channel formats.
- Reuse as much as possible existing L2/L3 functionality (specified by RAN WG2) by adopting existing signalling.
- No or limited impact to RAN WG3.
- This feature will reuse the existing band combinations defined for dual band 4C-HSDPA configurations

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

- Specify UE performance requirements for the Multiflow functionality

In case of dual band operation, the requirements shall be defined for up to three frequencies **if required**

### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #66										Q1/2015						RAN #67				
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	
80	80	89	89	89	87	74	74	74	74											

RAN #67										Q2/2015						RAN #68				
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75	
		0.5		0.5				0.1		0.5		0.5			0.5				0.1	

RAN #68										Q3/2015						RAN #69				
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	
82	82	91	91	91	89	76	76	76	76	83	83	92	92	92	90	77	77	77	77	
	0.5		0.5					0.1										0.1		

RAN #69										Q4/2015						RAN #70				
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77	

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
25.308		High Speed Downlink Packet Access (HSDPA); Overall description; Stage 2	RAN #69 (Sep '15)	Core
25.212		Multiplexing and channel coding (FDD)	RAN #69 (Sep '15)	Core
25.306		UE Radio Access capabilities	RAN #69 (Sep '15)	Core
25.302		Services provided by the physical layer	RAN #69 (Sep '15)	Core
25.331		Radio Resource Control (RRC); Protocol specification	RAN #69 (Sep '15)	Core
25.101		User Equipment (UE) radio transmission and reception (FDD)	RAN #69 (Sep '15)	Core

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Sayenko, Alexander

**Company:** Nokia Networks

**Email:** alexander.sayenko@nokia.com

## 12 Work item leadership

RAN WG2

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Nokia Networks
Nokia Corporation
Huawei
HiSilicon
China Unicom

---

**Source:** Nokia Networks  
**Title:** Revised WID: Multiflow Enhancements for UTRA  
**Document for:** Approval|Information|Discussion  
**Agenda Item:** 11.1.3

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Multiflow Enhancements for UTRA

**Acronym:** HSDPA\_MFTX\_enh

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

This WID includes a Core part	X
This WID includes a Performance part	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

3GPP has been continuously working on evolution of the HSPA data aggregation features, which started in Rel-8 with introduction of dual-carrier HSPA and culminated with adoption of 8C-HSPDA and Multiflow data transmission in Rel-11. Some of the HSDPA aggregation features have been already commercially deployed proving to provide noticeable gains in terms higher throughput and lower transmission delays.

With introduction of Multiflow in Rel-11, an operator can utilize better available spectrum resources as several cells could be configured on the same frequency. In particular, 3GPP adopted the following scenarios: two cells on one frequency (SF-DC), three cells on two frequencies (DF-3C), four cells on two frequencies (DF-4C). The aforementioned scenarios cater for one or two frequencies, whereas some operators have up to three frequencies (either in the same or different bands). Thus, it becomes a logical extension to consider further Multiflow scenarios for such deployment cases.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

It is proposed to introduce a new Multiflow scenario, four cells on three frequencies (3F-4C), with the following general objectives:

- The three frequencies can be distributed on up to two frequency bands
- Reuse as much as possible existing L1 functionality (specified by RAN WG1) by adopting existing principles and channel formats.

- Reuse as much as possible existing L2/L3 functionality (specified by RAN WG2) by adopting existing signalling.
- No or limited impact to RAN WG3.
- This feature will reuse the existing band combinations defined for dual band 4C-HSDPA configurations

## 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

- Specify UE performance requirements for the Multiflow functionality

In case of dual band operation, the requirements shall be defined for up to three frequencies if required

## 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #66 Q1/2015										RAN #67									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
80	80	89	89	89	87	74	74	74	74										

RAN #67 Q2/2015										RAN #68									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
80bis	80bis	89bis	89bis	89bis	87bis	74bis	74bis	74bis	74bis	81	81	90	90	90	88	75	75	75	75
										0.1		0.5		0.5		0.5			0.1

RAN #68 Q3/2015										RAN #69									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82	82	91	91	91	89	76	76	76	76	83	83	92	92	92	90	77	77	77	77
	0.5		0.5							0.1								0.1	

RAN #69 Q4/2015										RAN #70									
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
25.308		High Speed Downlink Packet Access (HSDPA); Overall description; Stage 2	RAN #69 (Sep '15)	Core
25.212		Multiplexing and channel coding (FDD)	RAN #69 (Sep '15)	Core
25.302		Services provided by the physical layer	RAN #69 (Sep '15)	Core
25.321		Medium Access Control (MAC) protocol specification	RAN #69 (Sep '15)	Core
25.331		Radio Resource Control (RRC); Protocol specification	RAN #69 (Sep '15)	Core
25.101		User Equipment (UE) radio transmission and reception (FDD)	RAN #69 (Sep '15) Perf	
25.104		Base Station (BS) radio transmission and reception (FDD)	RAN #69 (Sep '15)	Perf
25.141		Base Station (BS) conformance testing (FDD)	RAN #69 (Sep '15)	Perf

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Sayenko, Alexander

**Company:** Nokia Networks

**Email:** alexander.sayenko@nokia.com

## 12 Work item leadership

RAN WG2

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Nokia Networks
Nokia Corporation
Huawei
HiSilicon
China Unicom



## Message interworking during PS to CS SRVCC

680044	Message interworking during PS to CS SRVCC	mSRVCC	1	C1	Jun-15	Sep-15	47%	CP-150401
680045	CT1 aspects of Message interworking during PS to CS SRVCC	mSRVCC	2	C1	Jun-15	Sep-15	25%	CP-150401
680046	CT3 aspects of Message interworking during PS to CS SRVCC	mSRVCC	2	C3	Jun-15	Sep-15	70%	CP-150401

**3GPP TSG CT Meeting #68**  
**Malmö, SWEDEN; 15<sup>th</sup> – 16<sup>th</sup> June 2015**

**CP-150401**

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

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### Title: **Message interworking during PS to CS SRVCC**

Acronym: mSRVCC

Unique identifier: 680044

## 1 3GPP Work Area

	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	Study Item (go to 2.1)
X	Feature (go to 2.2)
	Building Block (go to 2.3)
	Work Task (go to 2.4)

### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

Stage 1 (go to 2.3.1)
Stage 2 (go to 2.3.2)
Stage 3 (go to 2.3.3)
Test spec (go to 2.3.4)
Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

PS to CS SRVCC for originating calls in pre-alerting and PS to CS SRVCC for calls in alerting phase are based on assumption that the remote UE supports the PRACK request, preconditions and the UPDATE request, i.e. the UA role procedures defined in IETF RFC 3262, IETF RFC 3311, IETF RFC 3312 and IETF RFC 4032.

Real life test has shown that there are many remote UEs supporting none or only a subset of the above RFCs. The lack of support or limited support of the above RFCs in such remote UE results in PS to CS SRVCC access transfer failure when the call is in alerting phase or pre-alerting phase.

Furthermore, at the moment it is not clearly stated how and when the MSC server enhanced for SRVCC using SIP interface which is not enhanced for ICS, shall interwork CC messages (defined in 3GPP TS 24.008) with SIP messages (as profiled in 3GPP TS 24.229) on calls transferred during the PS to CS SRVCC access transfer.

Moreover, the behaviour with regards to handling SIP in-dialog messages unrelated to the actual PS to CS SRVCC access transfer, received from the SC UE or from the MSC server or the remote UE during PS to CS SRVCC access transfer are at the moment under specified.

Finally, there are stage-2 requirements in 3GPP TS 23.292 and 3GPP TS 23.237 for the MSC server serving a conference initiator of a conference with conference focus in IMS, to use the conference event package and interwork the conference event package information to CC messages.

## 4 Objective

The objective with this work item is to:

- analyse the issues when the remote UE supports none or subset of IETF RFC 3262, IETF RFC 3311, IETF RFC 3312 and IETF RFC 4032 during PS to CS SRVCC access transfer for a call in the pre-alerting or alerting phase and based on the result of the analysis, specify the interworking with the remote UE when PS to CS SRVCC access transfer occurs for a call in the pre-alerting or alerting phase;
- describe the interworking in MSC enhanced for SRVCC using SIP interface which is not enhanced for ICS between the CC messages (defined in 3GPP TS 24.008) and SIP messages (as profiled in 3GPP TS 24.229) on

calls transferred during the PS to CS SRVCC access transfer, by referencing the applicable section in 3GPP TS 29.292.

- specify the handling of SIP in-dialog messages unrelated to the actual PS to CS SRVCC access transfer, received on the source access leg or received on the target access leg or received from the remote UE during PS to CS SRVCC access transfer.
- specify stage-3 for stage-2 requirements for the MSC server serving a conference initiator of a conference with conference focus in IMS, to use the conference event package and interwork the conference event package information to CC messages.

## 5 Service Aspects

None.

## 6 MMI-Aspects

None.

## 7 Charging Aspects

None.

## 8 Security Aspects

None.

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes				X	
No	X	X	X		X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1 <sup>st</sup> rsp. WG	2 <sup>nd</sup> rsp. WG(s)	Presented for information at plenary#	Approved at plenary

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
24.237	Interworking aspects when the remote ue is a non-3GPP UE		CT#69 (Sept. 2015)	CT1 responsibility
24.292	MSC server serving a conference initiator of a conference with conference focus in IMS, supporting for the conference event package		CT#69 (Sept. 2015)	CT1 responsibility
29.292	MSC server serving a conference initiator of a conference with conference focus in IMS, interworking for the conference event package		CT#69 (Sept. 2015)	CT3 responsibility

## 11 Work item rapporteur(s)

Ivo Sedlacek, (ivo.sedlacek@ericsson.com)

## 12 Work item leadership

CT1

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Ericsson
AT&T
Huawei
Samsung

2013-10-03 version 1.14.0

## Support of Emergency services over WLAN – phase 1

690008	<b>Support of Emergency services over WLAN – phase 1</b>	SEW1	1	S2	Jun-15	Dec-15	39%	SP-150253
680051	<b>Stage 2 of Support of Emergency services over WLAN - phase 1</b>	SEW1	2	S2	Jun-15	Sep-15	100%	SP-150253
690009	<b>CT aspects of Support of Emergency services over WLAN - phase 1</b>	SEW1-CT	2	ct	Sep-15	Dec-15	20%	SP-150253
690022	1 CT1 aspects of Support of Emergency services over WLAN – phase	SEW1-CT	3	C1	Sep-15	Dec-15	60%	SP-150253
690025	1 CT3 aspects of Support of Emergency services over WLAN – phase	SEW1-CT	3	C3	Sep-15	Dec-15	0%	SP-150253
690023	1 CT4 aspects of Support of Emergency services over WLAN – phase	SEW1-CT	3	C4	Sep-15	Dec-15	0%	SP-150253

## 3GPP TSG SA Meeting #68

**TD SP-150253**

**Malmö, Sweden, 17 - 19 June 2015**

**Source:** SA WG2

**Title:** **New WID on Support of Emergency services over WLAN - Phase 1**

**Document for:** Approval

**Agenda Item:** 15.2.34

**Work Item / Release:** SEW1 / Rel-13

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**SA WG2 Meeting #109**  
25 - 29 May 2015, Fukuoka, Japan

S2-152132

(e-mail revision 7 of S2-151875)

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Work item on Support of Emergency services over WLAN – phase 1

**Acronym:** SEW1

**Unique identifier:**

## 1 3GPP Work Area

	<b>Radio Access</b>
X	<b>Core Network</b>
X	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

### 2.1 Study Item

<b>Related Work Item(s) (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>

Go to §3.

### 2.2 Feature

<b>Related Study Item or Feature (if any)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>Nature of relationship</b>
670087	FS_SEW: Feasibility study on the Support of Emergency services over WLAN	Predecessor study item

Go to §3.

### 2.3 Building Block

<b>Parent Feature (or Study Item)</b>		
<b>Unique ID</b>	<b>Title</b>	<b>TS</b>

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
X	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

#### 2.3.1 Stage 1

<b>Source of external requirements (if any)</b>		
<b>Organization</b>	<b>Document</b>	<b>Remarks</b>

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks
TS 22.101	10.4	Only a limited set of the requirements will be supported in phase 1

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

### **3 Justification**

GSMA Networks Group (NG) RILTE has recently concluded the work on creating the VoWiFi profile (IR.51). In conjunction with that work, the RILTE group has discussed scenarios pertaining to IMS Emergency Session support over WLAN and has sent a LS (S2-150566) to 3GPP noting the lack of 3GPP specifications on this topic and asking questions.

TS 22.101 § 10.4.1 states that “If a UE supports IMS Multimedia Telephony service with speech media as specified in TS 22.173 via an access network, then it shall also support IMS emergency calls via that access network”. This means the willingness for 3GPP specifications to support IMS emergency calls over WLAN when supporting IMS Multimedia Telephony service with speech media over WLAN.

Thus it is needed to identify how to meet the existing stage 1 requirements and essentially provide for emergency calls over WLAN access to EPC the same level of functionality than for emergency calls over 3GPP access.

A corresponding FS\_SEW study has been defined with 2 phases. Phase 1 of the study is concluded with recommendations for normative work.

### **4 Objective**

Objective of this feature is to specify a solution for the Support of Emergency calls over WLAN based on conclusions reached in TR 23.771 for the phase 1 of the FS\_SEW study (Study on the Support of Emergency services over WLAN).

This WID will consider the following simple deployment case:

- support an emergency session only in case of “Valid” UEs as in the case 1 in § 4.3.12.1 of 23.401: the support of emergency session is only addressed for UEs which (a) have valid credentials to access EPC over WLAN and (b) are authorized to connect to EPC over WLAN in the location where they initiate an emergency session.
- Only existing location determination mechanisms are considered in this phase.
- No Roaming cases (user not in his / her home country).
- No Support of session continuity of emergency sessions at inter-access mobility.
- No solutions that imply specification activities in other SDO(s)

SA1 and GSMA will be notified on the subset of requirements within 22.101 § 10.4 that can actually be supported in Rel13.

### **5 Service Aspects**

Not applicable.

### **6 MMI-Aspects**

Not applicable.

### **7 Charging Aspects**

Any necessary normative charging aspects will be undertaken by SA5 with support from SA2.

### **8 Security Aspects**

Any necessary normative security aspects will be undertaken by SA3 with support from SA2.

### **9 Impacts**

Affects:	UICC apps	ME	AN	CN	Others
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Yes		X	X	
No			X	
Don't know	X			X

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

Affected existing specifications [None in the case of Study Items]			
Spec No.	CR	Subject of the CR	Approved at plenary#
TS 23.402		Introducing Support of Emergency services over WLAN	SA#69 (September 2015)
TS 23.167		Introducing Support of Emergency services over WLAN	SA#69 (September 2015)
TS 23.271		Introducing Support of Emergency services over WLAN	SA#69 (September 2015)
TS 23.203		Introducing Support of Emergency services over WLAN	SA#69 (September 2015)
TS 23.228		Introducing Support of Emergency services over WLAN	SA#69 (September 2015)

## 11 Work item rapporteur(s)

[Laurent.thiebaut@alcatel-lucent.com](mailto:Laurent.thiebaut@alcatel-lucent.com)

## 12 Work item leadership

SA2

## 13 Supporting Individual Members

Supporting IM name
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
Verizon
AT&T
T-Mobile USA
Sprint
Qualcomm Incorporated
Orange
Nokia Networks
III (Institute for Information Industry)
Hewlett-Packard
Broadcom Corporation
Intel
TCS
Rogers Communications
ZTE
Motorola Mobility
Deutsche Telecom
LG Electronics
Huawei
BlackBerry UK Ltd
Ericsson

## Downlink TPC Enhancements for UMTS

680059	<a href="#">Downlink TPC Enhancements for UMTS</a>	UTRA_ED_L_TPC	1	R1	Jun-15	Mar-16	0%	RP-151044
680159	<a href="#">Core part: Downlink TPC Enhancements for UMTS</a>	UTRA_ED_L_TPC-Core	2	R1	Jun-15	Dec-15	0%	RP-151044
680259	<a href="#">Perf. part: Downlink TPC Enhancements for UMTS</a>	UTRA_ED_L_TPC-Perf	2	R4	Jun-15	Mar-16	0%	RP-151044

**3GPP TSG RAN Meeting #68**  
**Malmö, Sweden, June 15 - 18, 2015**

**RP-151044**

revision of RP-150786

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**Source:** Huawei, HiSilicon  
**Title:** New work item proposal: Downlink TPC enhancements for UMTS  
**Document for:** Approval  
**Agenda Item:** 13.1.1

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

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**Title:** Downlink TPC enhancements for UMTS

**Acronym:** UTRA\_EDL\_TPC

**Unique identifier:** TBD

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<a href="#">This WID includes a Core part</a>	X
<a href="#">This WID includes a Performance part</a>	X

## 1 3GPP Work Area

	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<a href="#">Study Item (go to 2.1)</a>
	<a href="#">Feature (go to 2.2)</a>
X	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

WCDMA currently serves as the dominant mobile broadband technique. The number of connections for WCDMA users and the average user date rate have continued to increase in the past years and will further increase in the coming years, which requires WCDMA to evolve further from both uplink and downlink perspective.

A Rel-12 WI on Further EUL Enhancements has been standardized to enhance uplink performance. The WCDMA specifications should be also further evolved to enhance the downlink performance in various aspects. One aspect is the reduction of DL control channel overhead, especially in case of a large number of DL connections which may result in a significant control channel overhead.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The work shall consider DL enhancements for UMTS and focus on the RAN1 aspects already studied as part of the "Study on DL Enhancements for UMTS". The objective of this work item is the specification of

- Mechanisms for downlink control channel performance improvements. Identified solutions:  
repetition of TPC commands and DTX of TPC commands (RAN1)
  - UE capability (RAN2)
  - Potential signaling between NodeB and RNC (RAN3)

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

- Potential impact to demodulation performance of DL TPC commands (RAN4)

### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
 For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
 For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #68		Q3/2015						RAN			
#69		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82		82	91	91	91	91	89	76	76	76	76
2											

RAN #69		Q4/2015												RAN							
#70		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77
	2		.5							.5		1		.5							.5

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
25.211		Physical channels and mapping of transport channels onto physical channels (FDD)	RAN#70 (Dec 2015)	Core part
25.212		Multiplexing and channel coding (FDD)	RAN#70 (Dec 2015)	Core part
25.214		Physical layer procedures (FDD)	RAN#70 (Dec 2015)	Core part
25.306		UE Radio Access capabilities	RAN#70 (Dec 2015)	Core part
25.101		User Equipment (UE) radio transmission and reception	RAN#71 (Mar 2016)	Performance part
25.104		Base Station (BS) radio transmission and reception	RAN#71 (Mar 2016)	Performance part

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Zhang, Peng

**Company:** Huawei

**Email:** [peter.zhangpeng@huawei.com](mailto:peter.zhangpeng@huawei.com)

## 12 Work item leadership

RAN WG1, RAN WG2/3/4 (secondary)

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Huawei
HiSilicon
Qualcomm
China Unicom
Ericsson



## Licensed-Assisted Access using LTE

680060	<a href="#">Licensed-Assisted Access using LTE</a>	LTE_LAA	1	R1	Jun-15	Jun-16	0%	RP-151045
680160	<a href="#">Core part: Licensed-Assisted Access using LTE</a>	LTE_LAA-Core	2	R1	Jun-15	Dec-15	0%	RP-151045
680260	<a href="#">Perf. part: Licensed-Assisted Access using LTE</a>	LTE_LAA-Perf	2	R4	Jun-15	Jun-16	0%	RP-151045

**3GPP TSG RAN Meeting #68**  
**Malmö, Sweden, June 15 - 18, 2015**

**RP-151045**

revision of RP-150981

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**Source:** Ericsson, Huawei, Qualcomm, Alcatel-Lucent  
**Title:** New Work Item on Licensed-Assisted Access to Unlicensed Spectrum  
**Document for:** Approval  
**Agenda Item:** 13.1.1

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Work Item on Licensed-Assisted Access to Unlicensed Spectrum

**Acronym:** LTE\_LAA

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<a href="#">This WID includes a Core part</a>	X
<a href="#">This WID includes a Performance part</a>	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<a href="#">Study Item (go to 2.1)</a>
X	<a href="#">Feature (go to 2.2)</a>
	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

NOTE: Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
650016	Study on Licensed-Assisted Access to Unlicensed Spectrum	Corresponding SI

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The fast uptake of LTE in different regions of the world shows both that demand for wireless broadband data is increasing and that LTE is an extremely successful platform to meet that demand.

For IMT systems, existing and new spectrum licensed for exclusive use by IMT technologies will remain fundamentally critical for providing seamless coverage, achieving the highest spectral efficiency, and ensuring the highest reliability of cellular networks through careful planning and deployment of high-quality network equipment and devices. All of these cannot be achieved by unlicensed spectrum which can never match the qualities of the licensed regime.

However, use of unlicensed spectrum is increasingly considered by cellular operators as a complementary tool to augment their service offering and solutions. Efficient use of unlicensed spectrum as a complement to licensed spectrum has the potential to bring great value to service providers, and, ultimately, to the wireless industry as a whole. Given the widespread deployment and usage of other technologies in

unlicensed spectrum for wireless communications in our society, it is necessary that LTE has to coexist with existing and future uses of unlicensed spectrum.

Complementing the LTE platform with unlicensed spectrum is a natural choice under these considerations, as it would enable operators and vendors to leverage the existing and planned investments in LTE/EPC, i.e., hardware and software in the radio and core network. This is especially true for “Licensed-Assisted Access” (LAA), where the access to unlicensed spectrum via a Secondary Component Carrier (SCell) is assisted by a Primary Component Carrier (Pcell) on licensed spectrum using the Carrier Aggregation Framework of LTE.

3GPP has studied the use of unlicensed spectrum in combination with licensed spectrum [1]. The outcome of the study is captured in [2]. The study has shown that it is possible to adapt LTE to operate SCells in unlicensed spectrum while coexisting in a fair manner with Wi-Fi as well as with other LAA networks. Furthermore, the study highlights recommendations and design options for an LAA design that enables a single global solution framework for LAA operation that achieves fair coexistence with other Wi-Fi and LAA networks.

Further the applicable working groups should provide a minimum set of mandatory features/parameters that enables effective and fair coexistence between Wi-Fi and LAA to be able to provide input to applicable regulatory discussions, e.g. ETSI BRAN.

- [1] RP-141817 Study on Licensed-Assisted Access to Unlicensed Spectrum
- [2] TR [36.89](#) Feasibility Study on Licensed-Assisted Access to Unlicensed Spectrum V13.0.0

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

This work item will specify LTE enhancements for a single global solution framework for licensed-assisted access to unlicensed spectrum which enables operation of LTE in the 5GHz unlicensed spectrum for low power secondary cells based on regional regulatory power limits using carrier aggregation. Support for Dual Connectivity and standalone operation on unlicensed spectrum is therefore not included\*. The core technology should be as much as possible band agnostic. The LAA design should allow fair coexistence between Wi-Fi and LAA and fair coexistence between different LAA systems. This shall be ensured by following the recommendations and conclusions from the TR on LAA and continuing to consider coexistence for the specification work [2]. In addition a minimum set of mandatory features/parameters that enables effective and fair coexistence between Wi-Fi and LAA and effective and fair coexistence between different LAA systems should be identified. To allow an effective design, the enhancements should reuse the features of LTE as much as possible. Duplication of work done in other LTE work items should be avoided.

The work item should only specify support for LAA SCells operating with only DL transmissions. When specifying support for LAA SCells with only DL transmission, the following for the UL should be agreed (but not specified): the principles of UL channel access and the necessary forward compatibility mechanism so that the UL for LAA SCells can be added in future release without modifications to the DL design.

The detailed objectives of the work item are to specify support for the following functionalities:

- Channel access framework including clear channel assessment (RAN1, RAN2, RAN4)
- Discontinuous transmission with limited maximum transmission duration (RAN1, RAN4)
- UE support for carrier selection (RAN1, RAN2)
- UE support for RRM measurements including cell identification (RAN1, RAN2, RAN4)
- AGC, coarse and fine time and frequency synchronization (RAN1, RAN4)

- Channel-State Information (CSI) measurement, including channel and interference (RAN1, RAN4)

The work item should also specify base station and UE core requirements of 5GHz spectrum (based on regulatory limits) including applicable band/bands definition and a limited set of example band combinations. The 5 GHz band/bands definition should include DL only and UL/DL operations (without UL requirements being defined in Rel-13). The 5GHz unlicensed band/bands definition(s) should not introduce new frame structure(s) (if any) and/or new TDD UL/DL configurations (if any) for the licensed bands. (RAN4)

\* For the LAA SCell, there is no support in BS or UE for transmission/reception of any current broadcasted system information, random access responses and paging (following LTE Carrier Aggregation procedure), including no corresponding rate matching.

Note: In Device Coexistence based on Release 11 is to be applied.

## 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

Specify the necessary UE and base station performance requirements to support LAA SCell operations.

### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
 For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
 For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #68		Q3/2015										RAN	
#69		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf		
82		82	91	91	91	91	89	76	76	76	76		
5			1.5					1	1				

RAN #69		Q4/2015										RAN									
#70		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77
5		1.5					1.5	1.5				5		1.5				1.5	1.5		

RAN #70		Q1/2016										RAN									
#71		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84		84		93		93		93		91		78		78		78		78		1	1

RAN #71		Q2/2016										RAN									
#72		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84bis	84bis	93bis	93bis	93bis	93bis	91bis	78bis	78bis	78bis	78bis	78bis	84	84	94	94	94	91	79	79	79	79
												1	1						1	1	

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.211		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation	RAN#70	Core Part
36.212		Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding	RAN#70	Core Part
36.213		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures	RAN#70	Core Part
36.214		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements	RAN#70	Core Part
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2	RAN#70	Core Part
36.306		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities	RAN#70	Core Part
36.321		Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification	RAN#70	Core Part
36.331		Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification	RAN#70	Core Part
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception	RAN#70	Core Part
36.133		Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management	RAN#70	Core Part
36.104		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception	RAN#70	Core Part
36.141		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing	RAN#70	Core Part
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception	RAN#72	Performance Part
36.133		Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management	RAN#72	Performance Part
36.104		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception	RAN#72	Performance Part
36.141		Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing	RAN#72	Performance Part

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Koorapaty, Havish

Ericsson

Havish (dot) Koorapaty (at) Ericsson (dot) com

David Mazzarese  
Huawei  
David (dot) Mazzarese (at) Huawei (dot) com

## 12 Work item leadership

Primary: RAN WG1

Secondary: RAN WG2, RAN WG4

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Ericsson
Huawei
Qualcomm Incorporated
Institute for Information Industry
NTT DOCOMO
Fujitsu
Vodafone
Sharp
Nokia Networks
NEC
InterDigital
TeliaSonera
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
KDDI
HiSilicon
Verizon
Telstra
Panasonic
CATT
Intel Corporation
LG Electronics
ZTE
KT
Sony
Telenor
Deutsche Telekom
<a href="#">Motorola Mobility</a>
AT&T
ITL
IAESI
MediaTek
BlackBerry
China Unicom
LGUplus
ASUSTek
Mitsubishi Electric Corporation
CMCC
Samsung



## Elevation Beamforming/Full-Dimension (FD) MIMO for LTE

680061	<a href="#">Elevation Beamforming/Full-Dimension (FD) MIMO for LTE</a>	LTE_EBF_FDMIMO	1	R1	Jun-15	Jun-16	0%	RP-151085
680161	Core part: Elevation Beamforming/Full-Dimension (FD) MIMO for LTE	LTE_EBF_FDMIMO-Core	2	R1	Jun-15	Dec-15	0%	RP-151085
680261	Perf. part: Elevation Beamforming/Full-Dimension (FD) MIMO for LTE	LTE_EBF_FDMIMO-Perf	2	R4	Jun-15	Jun-16	0%	RP-151085

**3GPP TSG RAN Meeting #68**  
**Malmö, Sweden, 15 - 18 June 2015**

**RP-151085**

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<b>Source:</b>	Samsung
<b>Title:</b>	New WID Proposal: Elevation Beamforming/Full-Dimension (FD) MIMO for LTE
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	13.1.1

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).

Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Elevation Beamforming/Full-Dimension (FD) MIMO for LTE

**Acronym:** LTE\_EBF\_FD\_MIMO

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<a href="#">This WID includes a Core part</a>	X
<a href="#">This WID includes a Performance part</a>	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

X	<a href="#">Study Item (go to 2.1)</a>
X	<a href="#">Feature (go to 2.2)</a>
	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
650015	Study on Elevation Beamforming/Full-Dimension (FD) MIMO for LTE	Corresponding SI

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The recent popularity of various smart phone multimedia applications led to dramatic increase of wireless data traffic in carriers' networks across the world. In LTE and LTE-Advanced, MIMO (with 2, 4, or 8 antenna ports) was identified as one of the key technologies to address these capacity demands. While these MIMO systems mostly consider only the azimuth dimension to achieve the MIMO benefits, a two-dimensional active antenna array can exploit the elevation dimension inherent in a MIMO wireless system as well as the azimuth dimension, with which further system performance improvement is achieved to accommodate the increasing capacity demand.

3GPP has studied performance and feasibility of EB/FD-MIMO and the study drew the following conclusion in TR 36.897:

- Non-precoded, beamformed, and hybrid CSI-RS based schemes demonstrate significant throughput gain in realistic non-full buffer traffic models over the best baseline using implementation based enhancements in many scenarios

- o The best choice between these schemes may depend on factors including the number of TXRUs
- Non-codebook based CSI reporting is beneficial for EB/FD-MIMO compared to the best baseline using implementation based enhancements.
- SRS enhancement is beneficial for EB/FD-MIMO compared to the best baseline using implementation based enhancements.
- From the performance perspective, DMRS enhancements are beneficial for EB/FD-MIMO.

The conclusion captured in TR 36.897 justifies the need for creating a work item for specifying the identified enhancements.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The work item aims to specify the enhancements identified for utilizing both elevation and azimuth domains with 2D antenna array with cross-poles at eNBs. The detailed objectives are as follows.

- Specify enhancements on reference signal in the following areas [RAN1]
  - Non-precoded CSI-RS, extending the existing numbers {1,2,4,8} of CSI-RS antenna ports for support of 12 and 16 CSI-RS ports, using full-port mapping
  - Beamformed CSI-RS
  - SRS capacity improvement
    - o Support for SRS transmission with 4TX antennas as a second priority
  - Support of additional ports for DMRS targeting higher dimensional MU-MIMO
    - o The maximum number of DMRS ports that a UE may be able to receive is kept as 8
- Specify enhancements on CSI reporting in the following areas [RAN1]
  - For non-precoded CSI-RS, codebook for 2D antenna arrays for support of {8,12,16} CSI-RS ports and associated necessary channel state information.
    - o If there is not significant gain shown for new codebook for 8 CSI-RS ports, the current codebook for 8 CSI-RS ports is retained.
  - Necessary channel state information for beamformed CSI-RS
  - Extension of Rel-12 CSI reporting mechanism for both periodic and aperiodic CSI reports
- Specify higher layer support of enhancements listed above [RAN2]
- Specify the necessary UE (if any) core requirements [RAN4]

Impact on UE and eNB complexity should be taken into account.

eNB core requirements for EBF/FD-MIMO with active antennas will be specified in the AAS WI [AAS\_BS\_LTE\_UTRA]. RAN4 should identify until RAN#69 whether there is a need for additional eNB core requirements that are not addressed in the AAS WI.

## 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

Specify the necessary UE performance requirements to utilize both elevation and azimuth domains with 2D antenna array at eNBs.

## 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:

For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.

Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #68		Q3/2015										RAN	
#69		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf		
82		82	82	91	91	91	89	76	76	76	76		
5													

RAN #69		Q4/2015										RAN										
#70		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	
82bis	82bis	91bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77	
5		0.5										5		1					1			

RAN #70		Q1/2016										RAN									
#71		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84		84		93		93		93		91		78		78		78		78		78	
																			2		

RAN #71		Q2/2016										RAN									
#72		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84bis	84bis	93bis	93bis	93bis	93bis	91bis	78bis	78bis	78bis	78bis	78bis	85	85	94	94	94	92	79	79	79	79
												2								2	

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. Part, then all new Core part specs have to be listed first and then all new Perf. Part specs. Indicate "Core part" or "Perf. Part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.211		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation	RAN#70	Core Part
36.212		Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding	RAN#70	Core Part
36.213		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures	RAN#70	Core Part
36.214		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements	RAN#70	Core Part
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2	RAN#70	Core Part
36.306		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities	RAN#70	Core Part
36.331		Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification	RAN#70	Core Part
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception	RAN#70	Core Part
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception	RAN#72	Performance Part

**NOTE:** If this is a RAN WID including Core and Perf. Part, then all new Core part specs have to be listed first and then all new Perf. Part specs. Indicate “Core part” or “Perf. Part” under Comments for each spec. If an existing spec is affected by both (Core part and Perf. Part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Onggosanusi, Eko

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## 12 Work item leadership

RAN WG1

**NOTE:** If this is a RAN WID including Core and Perf. Part, then this WG specifies the WG leading the Core part. RAN WG4 is by default leading the Perf. Part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Samsung
Nokia Networks
Alcatel-Lucent
Alcatel-Lucent Shanghai Bell
AT&T
CATR
CATT
China Telecom
CHTTL
CMCC
Dish Network
Ericsson
ETRI
HiSilicon
Huawei
Intel
InterDigital
ITL
KDDI
KT Corp.
LG Electronics
MediaTek
Mitsubishi Electric Corporation
NEC
NTT DOCOMO, INC.
SK Telecom
Orange
Panasonic
Qualcomm
Telecom Italia
Verizon

## L2/L3 Downlink enhancements for UMTS

680062	<a href="#">L2/L3 Downlink enhancements for UMTS</a>	UTRA_ED_L_L23	1	R2	Jun-15	Dec-15	0%	RP-151043
680162	<a href="#">Core part: L2/L3 Downlink enhancements for UMTS</a>	UTRA_ED_L_L23-Core	2	R2	Jun-15	Dec-15	0%	RP-151043

**3GPP TSG RAN Meeting #68**  
**Malmö, Sweden, June 15 - 18, 2015**

**RP-151043**

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**Source:** Huawei  
**Title:** New work item proposal: L2/L3 Downlink enhancements for UMTS  
**Document for:** Approval  
**Agenda Item:** 13.1.2

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** L2/L3 Downlink enhancements for UMTS

**Acronym:** UTRA\_EDL\_L23

**Unique identifier:** TBD

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<a href="#">This WID includes a Core part</a>	X
<a href="#">This WID includes a Performance part</a>	

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<a href="#">Study Item (go to 2.1)</a>
	<a href="#">Feature (go to 2.2)</a>
X	<a href="#">Building Block (go to 2.3)</a>
	<a href="#">Work Task (go to 2.4)</a>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

#### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

#### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

### 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

WCDMA currently serves as the dominant mobile broadband technique. The number of connections for WCDMA users and the average user date rate have continued to increase in the past years and will further increase in the coming years, which requires WCDMA to evolve further from both uplink and downlink perspective.

A Rel-12 WI on Further EUL Enhancements has been standardized to enhance uplink performance. The WCDMA specifications should be further evolved to enhance the downlink performance in various aspects, including:

- Improvements to signaling transmission, e.g. signaling optimization for RRC state transition, etc.
- Enhanced SRB over HSPA performance, especially from SRB coverage perspective.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The work shall consider DL enhancements for UMTS and focus on the aspects already studied as part of the "Study on DL Enhancements for UMTS".

The detailed objectives of this work item are

- Specify mechanisms for downlink signalling performance enhancements (RAN2)
  - (1) Enhanced signalling on RRC parameters configuration. Identified solution aims at the introduction of retrievable configurations
  - (2) URA\_PCH state (transition) enhancements. Identified solution is based on seamless transition from URA\_PCH to CELL\_FACH.
  - (3) Mechanism on extending RNTI spaces so that more UEs can be configured in CELL\_PCH, URA\_PCH and CELL\_FACH state. Identified solution is based on extended RNTI
  - (4) Optimization from IDLE to CONNECTED state. Identified solution is based on E-DCH acquisition/release indication (RAN3)
- Consider mechanisms to optimize UE state transition and synchronous RRC reconfiguration. Solutions for this objective should only be standardized if consensus can be reached, and the WID revised by RAN#69. Enhancements to be considered are:
  - (5) State transition enhancements. Identified solutions include:
    - solution of MAC layer handshake
    - solution of MAC layer handshake with network control
    - solution of RRC layer handshake
  - (6) Improved RRC synchronized procedures. Identified solutions include:
    - solution of MAC layer handshake
    - solution of RRC layer handshake
- Consider further the identified solution based on improved HARQ retransmission (RAN2).

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

### 4.3 RAN time budget proposal

NOTE: For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
 For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
 For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #68 #69		Q3/2015										RAN	
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf				
82	82	91	91	91	89	76	76	76	76				
			4		1								

RAN #69 #70		Q4/2015												RAN					
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77
			4		2							4		2					

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X		
No	X			X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
25.300		Universal Terrestrial Radio Access Network (UTRAN); General description; Stage 2	RAN#70 (Dec 2015)	Core part
25.306		UE Radio Access capabilities	RAN#70 (Dec 2015)	Core part
25.308		High Speed Downlink Packet Access (HSDPA); Overall description; Stage 2	RAN#70 (Dec 2015)	Core part
25.321		Medium Access Control (MAC) protocol specification	RAN#70 (Dec 2015)	Core part
25.331		Radio Resource Control (RRC); Protocol specification	RAN#70 (Dec 2015)	Core part
25.423		UTRAN Iur interface Radio Network Subsystem Application Part (RNSAP) signalling	RAN#70 (Dec 2015)	Core part
25.425		UTRAN Iur interface user plane protocols for Common Transport Channel data streams	RAN#70 (Dec 2015)	Core part
25.433		UTRAN Iub interface Node B Application Part (NBAP) signalling	RAN#70 (Dec 2015)	Core part
25.435		UTRAN Iub interface user plane protocols for Common Transport Channel data streams	RAN#70 (Dec 2015)	Core part

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

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Email: jun.chen@huawei.com

## 12 Work item leadership

RAN WG2, RAN WG3 (secondary)

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Huawei
HiSilicon
Nokia Networks
Qualcomm
China Unicom
Ericsson



## Support of single-cell point-to-multipoint transmission in LTE

680064	<a href="#">Support of single-cell point-to-multipoint transmission in LTE</a>	LTE_SC_P TM	1	R2	Jun-15	Jun-16	0%	RP-151110
680164	Core part: Support of single-cell point-to-multipoint transmission in LTE	LTE_SC_P TM-Core	2	R2	Jun-15	Dec-15	0%	RP-151110
680264	Perf. part: Support of single-cell point-to-multipoint transmission in LTE	LTE_SC_P TM-Perf	2	R4	Jun-15	Jun-16	0%	RP-151110

**3GPP TSG RAN Meeting #68**  
**Malmö, Sweden, 15 - 18 June 2015**

**RP-151110**

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<b>Source:</b>	Huawei, HiSilicon
<b>Title:</b>	New WI proposal: Support of single-cell point-to-multipoint transmission in LTE
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	13.1.2

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** Support of single-cell point-to-multipoint transmission in LTE

**Acronym:** LTE\_SC\_PTM

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

This WID includes a Core part	X
This WID includes a Performance part	X

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
660066	Study on Support of single-cell point-to-multipoint transmission in LTE	Corresponding SI

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

To position LTE as technology for critical communications such as Public Safety, Group Communication System Enablers for LTE (GCSE\_LTE) were introduced in Rel-12, where group communication was specified over MBSFN.

As observed in the FS\_LTE\_SC\_PTM study, SC-PTM transmission can consume fewer resources than MBSFN transmission if a service needs to be provided in a limited geographical area (i.e. when users receiving a service are all in 1, 2 or 3 cells, or when the MBSFN area is pre-defined and contains a number of cells with no user receiving the service). SC-PTM transmission with UL feedback, which spectral efficiency depends on the number of receiving UEs, tends to provide better spectral efficiency than MBSFN transmission for small number of receiving UEs. With SC-PTM, the broadcast area can be dynamically adjusted cell by cell to fit the dynamically defined geographic area (e.g. incident's physical location) for a group call, using the cell list provided by the Core Network, without the need to pre-establish the MBMS bearers over a pre-defined geographic area like for MBSFN. Further more, SC-PTM transmission can provide more flexible resource allocation (due to dynamic scheduling via PDCCH) and it can be multiplexed with unicast transmission in frequency domain, which can improve the spectral efficiency for certain services (e.g. bursty traffic).

SC-PTM transmission is considered by cellular operators as a complementary tool over which to provide critical communications. SC-PTM transmission is also considered beneficial by cellular operators who have unsynchronized networks due to e.g. cost or other reasons.

In addition to critical communications, SC-PTM transmission could also be used as a multicast technology for other commercial use cases, e.g. over-the-top videos or popular apps download, mobile advertising, traffic information for cars, etc.

## 4 Objective

### 4.1 Objective of Core part WI

This work item will specify LTE enhancements to support the single-cell point-to-multipoint (SC-PTM) transmission. SC-PTM transfers the MBMS session data over a single cell using PDSCH, and it is scheduled using a common RNTI (Group-RNTI) on PDCCH. A UE performing the SC-PTM reception might be either in RRC\_IDLE or in RRC\_CONNECTED. The detailed objectives are as follows:

16) Specify air interface aspects to support the SC-PTM operation. In particular, specify: [RAN2]

a) SC-PTM configuration:

- Use one Group-RNTI per TMGI.
  - Provisioning of the SC-PTM configuration using a SC-PTM specific MCCH.
- b) Support transmission schemes associated with Transmission Mode 1, 2 and 3 for SC-PTM transmission.
- 17) Specify necessary changes to the existing MBMS interfaces in order to support the SC-PTM operation. MCE is the node to make the decision on whether to use SC-PTM or MBSFN for the transfer of a particular MBMS service. In particular, specify: [RAN3]
- a) CN provides necessary information (including the list of cell identities) to the MCE.
  - b) MCE provides the necessary information received from the CN to the eNB (including the list of cell identities and QoS information), so that the eNB knows for which MBMS service(s) in which of its cell(s) it should provide the SC-PTM transmission.
- 18) Specify necessary solutions to support service continuity when the UE moves between the cells where SC-PTM transmission is available or when the UE moves from the cell where SC-PTM transmission is available to the cell where it is not (i.e. via unicast), if the solution doesn't significantly impact the radio efficiency and signaling overhead. Afterwards, as a second priority if time permits, solution to support service continuity for UEs in RRC\_IDLE may be identified and considered for specification. [RAN2, RAN3]

Coordination with SA2 on the architecture and network interface aspects for SC-PTM operation, and the outcome of SA2 WI "MBMS Enhancements" on the establishment of MBMS bearers using target area information will be taken into account.

This work item will follow the design targets and recommendations of the FS\_LTE\_SC\_PTM study as documented in TR 36.890.

## 4.2 Objective of Performance part WI

**NOTE:** Leave empty if the WI proposal does not contain a RAN performance part.

Specify necessary performance requirements to support the SC-PTM operation, if needed.

## 4.3 RAN time budget proposal

**NOTE:** For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
 For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
 Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #68					Q3/2015					RAN				
#69		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf			
82	82	91	91	91	91	89	76	76	76	76	76			
		1				1								

RAN #69					Q4/2015					RAN				
#70		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf			
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	92	92	92	90
		1			1					1				77
														77

RAN #70					Q1/2016					RAN				
#71		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf			
84	84	93	93	93	93	91	78	78	78	78	78			
														0.5

RAN #71					Q2/2016					RAN				
#72		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf			
84bis	84bis	93bis	93bis	93bis	93bis	91bis	78bis	78bis	78bis	85	94	94	94	92
										0.5				79
														0.5

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

**Additional comments to the time budget proposal:**

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X	X	X	
No	X				X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

Affected existing specifications [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.211		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation	RAN#70	Core Part Potentially impacted
36.212		Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding	RAN#70	Core Part Potentially impacted
36.213		Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures	RAN#70	Core Part
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2	RAN#70	Core Part
36.306		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities	RAN#70	Core Part
36.321		Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification	RAN#70	Core Part
36.331		Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification	RAN#70	Core Part
36.443		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); M2 Application Protocol (M2AP)	RAN#70	Core Part
36.444		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); M3 Application Protocol (M3AP)	RAN#70	Core Part
36.423		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 application protocol (X2AP)	RAN#70	Core Part
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception	RAN#72	Perf Part Potentially impacted
36.104		E-UTRA; BS Radio transmission and reception	RAN#72	Perf Part Potentially impacted
36.141		Base Station (BS) conformance testing	RAN#72	Perf Part Potentially impacted

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

Jeff GAO

Company: Huawei

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## 12 Work item leadership

Primary: RAN WG2

Secondary: RAN WG3

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

Supporting IM name
Huawei
HiSilicon
CATR
CMCC
UK Home Office
UK Broadband
Airbus
Harris
SouthernLINC Wireless
Telefonica
KT Corp.
CHTTL
China Unicom
China Telecom
III
Potevio
TD Tech
ChengDu TD Tech
Lenovo
ASUSTeK
Starpoint
Neul
SRTC
DISH Network
Orange
French Ministry of the Interior
Elektrobit
NEC
Vodafone
Telecom Italia
Nokia Networks
A.S.T.R.I.D. S.A.
BlackBerry



## Extension of Dual Connectivity in E-UTRAN

680065	<a href="#">Extension of Dual Connectivity in E-UTRAN</a>	LTE_dual C_ext	1	R3	Jun-15	Dec-15	0%	RP-151008
680165	<a href="#">Core part: Extension of Dual Connectivity in E-UTRAN</a>	LTE_dual C_ext- Core	2	R3	Jun-15	Dec-15	0%	RP-151008

**3GPP TSG RAN Meeting #68**  
**Malmö, Sweden, June 15 - 18, 2015**  
 ynnnnn

**RP-151008**

revision of RP-

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<b>Source:</b>	Samsung, ZTE, China Telecom, Alcatel-Lucent
<b>Title:</b>	New Work Item Proposal on Dual Connectivity Extension in E-UTRAN
<b>Document for:</b>	Approval
<b>Agenda Item:</b>	13.1.3

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
 Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

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**Title: New Work Item Proposal on Dual Connectivity Extension in E-UTRAN**

**Acronym:** LTE\_dualC\_ext

**Unique identifier:**

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<a href="#">This WID includes a Core part</a>	X
<a href="#">This WID includes a Performance part</a>	

## 1 3GPP Work Area

X	Radio Access
X	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
	<b>Feature (go to 2.2)</b>
	<b>Building Block (go to 2.3)</b>
x	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

As the outcome of the Study on Extension of Dual Connectivity in EUTRAN, the following enhancements were identified for future normative work.

- SIPTO support in dual connectivity. Support of MeNB and SeNB in the same local home network (stand-alone case) and support of the LGW being co-located with the MeNB or the SeNB (co-located case, SIPTO bearer = SCG bearer) were seen as feasible solutions that could be further pursued in normative work.
- Handover with SeNB addition and inter-MeNB handover without SeNB change. For supporting e.g. inter-MeNB handover without SeNB change, it was agreed to investigate possibilities to extend the range of the UE X2AP ID as well as other possible solutions during future normative work.
- CSG support for hybrid access HeNBs acting as SeNBs.
- UE-AMBR coordination over X2. In order to optimize the overall throughputs for the UE and avoid restricting the bitrate unnecessary, UE-AMBR coordination over X2 is feasible in Release 13. Two solutions have been identified. The selection of the solution should be performed in normative work, if any.
- Handling of User Inactivity. In order to enable the setting of an optimum connection time in the SeNB, it could be considered to provide the *Expected UE Behaviour* information to the SeNB in the SeNB Addition Request message. Other methods could be investigated during the work item phase, if any.

Use cases for LIPA are covered by use cases for SIPTO with co-located L-GW. The same conclusion for SIPTO with co-located L-GW can be used for LIPA as well.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

Taking the conclusions of the Study Item (36.875) as starting point, the work item should fulfil the following objectives:

- o Support SIPTO in dual connectivity
  - The following architectures should be supported:
    - ◆ Stand-alone case, support of MeNB and SeNB in the same local home network
    - ◆ Co-located case, LGW co-located with the MeNB

- ◆ Co-located case, LGW co-located with the SeNB (SIPTO bearer = SCG bearer)
  - Introduce functions and procedures to support above architectures in the dual connectivity
  - o Support LIPA in dual connectivity
    - The following architecture should be supported:
      - ◆ LGW co-located with the SeNB in hybrid access mode (LIPA bearer = SCG bearer)
    - Introduce functions and procedures to support above architecture in the dual connectivity
  - o Support inter-MeNB handover without SeNB change and handover with SeNB addition. Investigate possibilities to extend the range of the UE X2AP ID as well as other possible solutions.
  - o Support UE-AMBR coordination over X2.
  - o Define a solution to enable the setting of an optimum connection time in the SeNB.
  - o Define the solution to support hybrid access HeNBs acting as SeNBs for dual connectivity.
  - o Stage 2 and stage 3 work for above functionalities.

#### 4.2 Objective of Performance part WI

**NOTE:** Leave empty if the WI proposal does not contain a RAN performance part.

### 4.3 RAN time budget proposal

**NOTE:** For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
Once the WI/SI is approved, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #69 Q4/2015 RAN  
#70

R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
					89bis										90				
					1.5										1.5				

RAN #70					Q1/2016										RAN				
#71																			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
					91														

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

#### additional comments to the time budget proposal:

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X	X	
No	X	X			
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

<b>Affected existing specifications</b> [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.300		Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2	RAN#70 Dec, 2015	
36.413		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)	RAN#70 Dec, 2015	
36.423		Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 Application Protocol (X2AP)	RAN#70 Dec, 2015	

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

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## 12 Work item leadership

RAN 3

NOTE: If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
Alcatel-Lucent
CATT
China Telecom
China Unicom
CMCC
Ericsson
Huawei
Intel Corporation
LG Electronics
KDDI
NEC
Potevio
Qualcomm Incorporated
Samsung
ZTE

## RAN sharing enhancements for UMTS

680067	<a href="#">RAN sharing enhancements for UMTS</a>	RSE_UTR A_GUSH	1	R3	Jun-15	Dec-15	0%	RP-151086
680167	<a href="#">Core part: RAN sharing enhancements for UMTS</a>	RSE_UTR A_GUSH- Core	2	R3	Jun-15	Dec-15	0%	RP-151086

**3GPP TSG RAN Meeting #68**  
**Malmo, Sweden, 15 - 18 June 2015**

**RP-151086**

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**Source:** Huawei, HiSilicon  
**Title:** New work item proposal: RAN sharing enhancements for UMTS  
**Document for:** Approval  
**Agenda Item:** 13.1.3

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## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

**Title:** RAN Sharing Enhancements for UMTS

**Acronym:** RSE\_UTRA\_GUSH

**Unique identifier:**

## 1 3GPP Work Area

X	Radio Access
	Core Network
	Services

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

X	Study Item (go to 2.1)
	Feature (go to 2.2)
X	Building Block (go to 2.3)
	Work Task (go to 2.4)

## 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

## 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS
660069	Study on RAN Sharing Enhancements for UMTS	TR 25.756

This work item is ...

	Stage 1 (go to 2.3.1)
	Stage 2 (go to 2.3.2)
X	Stage 3 (go to 2.3.3)
	Test spec (go to 2.3.4)
	Other (go to 2.3.5)

### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS
650020	GERAN UTRAN Sharing Enhancements	Stage 1 work item (TS 22.101)

Other justification			
TS or CR(s) or external document	Clause	Remarks	

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

It has been discussed and identified in the SI phase that the enhancements of some aspects may need to be considered for UTRAN RAN Sharing.

In case of load balancing, Hosting RAN Operator may need to balance the user traffic load individually for each Participating Operator within a shared UTRAN, while the principal objective to maximize throughput is not impacted. Three possible solutions have been listed in TR 25.756, which include the

legacy mechanism, Enhancements to RADIO LINK SETUP message, and the Common Measurement solution. However, only the first two were proven to respect the throughput maximisation principle.

For the purpose of delivering the measurements of network resource usage per participating CN operator in the shared UTRAN, the solution on monitoring CS connection time and PS data volume per operator needs to be standardized and there is possible interaction with other groups.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of this work item is to complete the normative work to support RAN Sharing enhancements based on the agreements in study phase.

- Enhance the load information exchange procedure by considering the complement to legacy mechanism.
- Introduce a solution to meet the requirement for measurement of traffic volume per participating CN operator.

Additionally, RAN3 should consider whether co-operation with other groups will be needed or not.

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

### 4.3 RAN time budget proposal

RAN #68 #69		Q3/2015										RAN			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf						
82	82	91	91	91	89	76	76	76	76						
					1										

RAN #69 #70		Q4/2015																RAN			
R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf		
82bis	82bis	91bis	91bis	91bis	89bis	76bis	76bis	76bis	76bis	83	83	92	92	92	90	77	77	77	77		
					1										1						

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes			X		
No	X	X		X	X
Don't know					

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]					
Spec No	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #Comments

Affected existing specifications [None in the case of Study Items]			
Spec No	CR	Subject of the CR	Approved at plenary #Comments
25.300		Universal Terrestrial Radio Access Network (UTRAN); General description; Stage 2	RAN #70
25.423		UTRAN Iur interface Radio Network Subsystem Application Part (RNSAP) signalling	RAN #70

## 11 Work item rapporteur(s)

QIU, Liwei

**Company:** Huawei

**Email:** [liwei.qiu@huawei.com](mailto:liwei.qiu@huawei.com)

## 12 Work item leadership

RAN WG3

## 13 Supporting Individual Members

Supporting IM name
Huawei
HiSilicon
TeliaSonera
NEC
Orange
Telefonica

## Interference mitigation for downlink control channels of LTE

680071	<a href="#">Interference mitigation for downlink control channels of LTE</a>	LTE_IM_DLCCH	1	R4	Jun-15	Mar-16	0%	RP-151107
680271	Perf. part: Interference mitigation for downlink control channels of LTE	LTE_IM_DLCCH-Perf	2	R4	Jun-15	Mar-16	0%	RP-151107

**3GPP TSG RAN Meeting #68**  
**Malmö, Sweden, June 15 - 18, 2015**  
151089

**RP-151107**

revision of RP-

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<b>Source:</b>	<b>Intel Corporation, ZTE</b>
<b>Title:</b>	<b>New WI proposal: Interference mitigation for downlink control channels of LTE</b>
<b>Document for:</b>	<b>Approval</b>
<b>Agenda Item:</b>	<b>13.1.4</b>

---

## 3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](#), article 39; and [3GPP TR 21.900](#).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

---

## Title: **Interference Mitigation for Downlink Control Channels of LTE**

Acronym: **LTE\_IM\_DLCCH**

Unique identifier:

**NOTE:** If this is a RAN WID including Core and Perf. part, then Title, Acronym and Unique identifier refer to the feature WI. Please tick (X) the applicable box(es) in the table below:

<b>This WID includes a Core part</b>	
<b>This WID includes a Performance part</b>	X

## 1 3GPP Work Area

x	<b>Radio Access</b>
	<b>Core Network</b>
	<b>Services</b>

## 2 Classification of WI and linked work items

### 2.0 Primary classification

This work item is a ...

	<b>Study Item (go to 2.1)</b>
X	<b>Feature (go to 2.2)</b>
-	<b>Building Block (go to 2.3)</b>
	<b>Work Task (go to 2.4)</b>

**NOTE:** Core, Performance and Testing parts of RAN WIs are usually Building Blocks.  
If you are in doubt, please contact MCC.

#### 2.1 Study Item

Related Work Item(s) (if any)		
Unique ID	Title	Nature of relationship

Go to §3.

#### 2.2 Feature

Related Study Item or Feature (if any)		
Unique ID	Title	Nature of relationship
	Interference Mitigation for Downlink Control Channels of LTE	

Go to §3.

#### 2.3 Building Block

Parent Feature (or Study Item)		
Unique ID	Title	TS

This work item is ...

	<b>Stage 1 (go to 2.3.1)</b>
	<b>Stage 2 (go to 2.3.2)</b>
	<b>Stage 3 (go to 2.3.3)</b>
	<b>Test spec (go to 2.3.4)</b>
	<b>Other (go to 2.3.5)</b>

##### 2.3.1 Stage 1

Source of external requirements (if any)		
Organization	Document	Remarks

Go to §3.

### 2.3.2 Stage 2

Corresponding stage 1 work item		
Unique ID	Title	TS

Other source of stage 1 information		
TS or CR(s)	Clause	Remarks

If no identified source of stage 1 information, justify:

Go to §3.

### 2.3.3 Stage 3

Corresponding stage 2 work item (if any)		
Unique ID	Title	TS

Else, corresponding stage 1 work item		
Unique ID	Title	TS

Other justification		
TS or CR(s) or external document	Clause	Remarks

If no identified source of stage 2 information, justify:

Go to §3.

### 2.3.4 Test spec

Related Work Item(s)		
Unique ID	Title	TS

Go to §3.

### 2.3.5 Other

Related Work Item(s)			
Unique ID	Title	Nature of relationship	TS / TR

Go to §3.

## 2.4 Work task

Parent Building Block		
Unique ID	Title	TS

## 3 Justification

The demands for higher capacity and improved performance for data and control channels keep increasing. The capacity and performance issues are typically addressed by considering the corresponding receiver enhancements with interference cancellation and suppression capability. In the previous LTE releases, the receiver enhancement has been mainly focused on data channels and inter-cell interference scenarios. However the receiver enhancements for the downlink control channels were not addressed.

To address the capacity and performance issue for downlink control channels, the advanced receivers with interference cancellation and suppression capability may be used. In addition to the increased capacity and improved performance, the considered techniques potentially offer other system-level advantages such as balanced performance of control channels with PDSCH, reduced control signalling overhead, robust receiver operation in the interference limited cases (including handover scenarios or scenarios with cell range extension), improved link adaptation for PDCCH/EPDCCH, reduced PDCCH/EPDCCH blocking probability, etc.

Therefore, new performance requirements of using advanced receiver structures capable of inter-cell interference mitigation for the downlink control channels as means to improve the control channel capacity and performance are required.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

### 4.2 Objective of Performance part WI

NOTE: Leave empty if the WI proposal does not contain a RAN performance part.

The general objectives for this WI are to specify UE demodulation requirements for control channels with practical interference aware receivers that can be used for inter-cell interference cancellation and suppression. The detailed objectives of the work item include:

- The candidate advanced receivers to be considered for demodulation requirements are the existing PDSCH receiver structures defined in Rel-11/Rel-12, with capability of
  - Linear suppression of control channel interference of interfering cells such as
    - MMSE-IRC
    - E-MMSE-IRC

And

- o Cancellation of CRS interference of interfering cell
  - Identify the scenarios and evaluation assumptions (including the reference receiver(s) for defining performance requirements depending on the gain for each of the control channels listed below) during the works
  - Specify requirements on demodulation of PCFICH/PDCCH with above identified advanced receivers
  - Specify requirements on demodulation of EPDCCH with above identified advanced receiver with capability of MMSE-IRC and CRS-IC
  - Specify requirements on demodulation of PHICH with above identified advanced receivers
  - Realistic interference models for the downlink control channels should be considered.
  - CRS assistant information (CRS-AssistanceInfo IE) from Rel-11 can be reused for this WI without additional signalling and network restriction.

The work for E-MMSE-IRC is prioritized over that for MMSE-IRC.

## 4.3 RAN time budget proposal

**NOTE:** For WIs/SIs under RAN WG5 leadership this section is not filled out. Otherwise:  
For a not yet approved WI/SI the rapporteur has to fill out the last row of the table(s) below up to the target date of the WI/SI (if necessary add further tables): Indicate the number of time units (1 TU ~ 2h), i.e. one value for each session/field. If no time unit is needed, leave the field empty.  
For WI/SI already approved in the past, the tables below will no longer be updated in the WI/SI description (i.e. the tables reflect the status of the initial approval). But changes can be proposed in the status report of the WI/SI.

RAN #70		Q1/2016								RAN	
#71		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84	84	92	92	92	92	91	78	78	78	78	0.5

RAN #71		Q2/2016												RAN							
#72		R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf	R1L	R1U	R2L	R2U	R2J	R3	R4RF Core	R4RD Core	R4RF Perf	R4RD Perf
84bis	84bis	92bis	92bis	92bis	92bis	91bis	78bis	78bis	78bis	78bis	85	85	93	93	93	92	79	79	79	79	0.5

L: LTE, U: UMTS, J: Joint, RD: RRM/demodulation

NOTE: In case further explanation of the time budget proposal is needed, then please explain this below.

#### additional comments to the time budget proposal:

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

Affects:	UICC apps	ME	AN	CN	Others
Yes		X			
No	X		X	X	
Don't know					X

## 10 Expected Output and Time scale

New specifications [If Study Item, one TR is anticipated]						
Spec No.	Title	1st rsp. WG	2nd rsp. WG(s)	Presented for information at plenary#	Approved at plenary #	Comments

NOTE: If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. By default a new specs can only be new for one of both parts.

<b>Affected existing specifications</b> [None in the case of Study Items]				
Spec No.	CR	Subject of the CR	Approved at plenary#	Comments
36.101		Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception	RAN#71	

**NOTE:** If this is a RAN WID including Core and Perf. part, then all new Core part specs have to be listed first and then all new Perf. part specs. Indicate "Core part" or "Perf. part" under Comments for each spec. If an existing spec is affected by both (Core part and Perf. part), then it has to be listed twice with appropriate approval dates.

## 11 Work item rapporteur(s)

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**Qian Yang**

**Company:** ZTE Corporation

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## 12 Work item leadership

**RAN WG4**

**NOTE:** If this is a RAN WID including Core and Perf. part, then this WG specifies the WG leading the Core part.  
RAN WG4 is by default leading the Perf. part.

## 13 Supporting Individual Members

<b>Supporting IM name</b>
ASUSTek
AT&T
ATR
CATR
CATT
CEWiT
CMCC
CHTTL
China Telecom
China Unicom
Coolpad
Deutsche Telekom
Dish Network
Ericsson
Fraunhofer IIS
IAESI
III
Intel Corporation
ITL Inc.
ITRI
KDDI
KT Corp.
LightSquared
NVIDIA
Shanghai Tejet Com Technology
SoftBank Mobile
SK Telecom
Sprint
Telecom Italia
Telefonica
TeliaSonera
T-Mobile USA
US Cellular
Verizon Wireless
ZTE



## EPC Signalling Improvements for race scenarios

690002	<a href="#"><b>EPC Signalling Improvements for race scenarios</b></a>	EPC_SIG_RACE	1	C4	Sep-15	Dec-15	47%	CP-150424
690026	<a href="#"><b>CT3 aspects for EPC Signalling Improvements for race scenarios</b></a>	EPC_SIG_RACE	2	C4	Sep-15	Dec-15	0%	CP-150424
690027	<a href="#"><b>CT4 aspects for EPC Signalling Improvements for race scenarios</b></a>	EPC_SIG_RACE	2	C4	Sep-15	Dec-15	95%	CP-150424



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