**3GPP TSG RAN Meeting #69RP-151278**

**Phoenix, USA, Sep. 14 - 16, 2015**

**Source: NTT DOCOMO, Ericsson, Huawei**

**Title: New Study Item Description: Next generation new radio access - technical study**

**Document for: Discussion**

**Agenda Item:**

3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](http://www.3gpp.org/About/WP.htm), article 39; and [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm).  
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

# Title: Next generation new radio access - technical study

## Acronym: FS\_NextGen\_RAT

## 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** |  |
| **This WID includes a Performance part** |  |

## 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 …

|  |  |
| --- | --- |
| X | Study Item (go to 2.1) |
|  | 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 |
| FS\_NG\_Req | Study on Scenarios and Requirements for the Next Generation New Radio Access Technology |  |
| FS\_CM\_Above6GHz | Study on channel model for frequency spectrum above 6 GHz |  |

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

Work has started in ITU and 3GPP to develop requirements and specifications for next generation wireless systems (“IMT-2020”, SMARTER in SA1). In addition to traditional performance requirements, such as latency, data rates and capacity, an important aspect of the next generation systems is to extend the applicability of IMT to new service categories such as massive and critical machine type applications.

The work in 3GPP RAN to specify a system that will meet the market requirements of 2020 and beyond consists of several study phases (cf SP-150149):

* Identification of key bands of interest above 6 GHz
* Study on channel model for frequency spectrum above 6 GHz
* Study on Usage Scenarios and Requirements for the Next Generation New Radio Access Technology
* **Study on air interface for the Next Generation New Radio Access Technology**
* Study items and work items on specific technology components and features

Even though the continued LTE evolution is able to meet many (if not all) of the requirements for next generation wireless systems, it is necessary to study also a technical realization of new radio access technology for the next generation radio access technology. The next generation radio access technology (RAT) should meet all ITU-R requirements and additional ones identified by 3GPP. The study on the next generation RAT will build on the study on scenarios and requirements for the Next Generation New Radio Access Technology. This study shall be applicable to all relevant frequency bands available or expected to be available for the IMT family of technologies up to and including IMT-2020, and also take into account the output of the study on channel models.

This study will deliver the high-level technology description (technical report) that will serve as a basis for the documents to be submitted as proposal for “IMT-2020” to the ITU-R by June 2019. This study will make recommendations for potential future study items and work items on specific technology components and features that will serve as a basis for the documents to be submitted as specifications for “IMT-2020” to the ITU-R by February 2020.

## 4 Objective

### 4.1 Objective of SI

The objective of the study is to

* Develop technical solutions for next generation new radio access to meet all the usage scenarios and full set of requirements identified by ITU-R and 3GPP. The technical framework should target a single air interface fulfilling all 3GPP requirements for all usage scenarios, applicable in all identified spectrum.

The next generation new radio access should

* support all relevant use cases (e.g. enhanced mobile broadband, massive MTC, critical MTC)
* provide mechanisms for extended forward compatibility that can smoothly evolve to support also new, yet unknown use cases and benefit from future technology advance
* include solutions for tight interworking between LTE and new radio access technology
* enable operation in all frequency bands considered for IMT-2020 in ITU-R
* provide performance analysis for each identified technology component and feature, as well as an analysis of the impact on overall system design.

The studies should be carried out at least in the following areas

* Radio-interface physical layer (downlink and uplink):
* Radio interface layer 2 and 3:
* Related to the radio access network architecture
* RF-related issues

NOTE: The study item should make recommendations for future study items and work items.

### 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

**additional comments to the time budget proposal:** This study is assumed to be handled in separate parallel sessions in RAN1 and in parallel and joint sessions in RAN2. It is assumed that 2-3 days of meeting time are needed initially in both RAN1 and RAN2, increasing to 3-4 days of meeting time during the study. For RAN3 and RAN4 the work in study item phase can probably be handled in existing sessions. Note also that additional meetings and possibly additional ad hoc meetings with limited agenda may be scheduled as needed in any working group.

## 5 Service Aspects

## 6 MMI-Aspects

## 7 Charging Aspects

## 8 Security Aspects

## 9 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others |
| **Yes** |  |  |  |  |  |
| **No** |  |  |  |  |  |
| **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 |
|  | Technical realization of next generation air-interface (“NX”) | RAN1 | RAN2, RAN3, RAN4 |  | RAN#76 (Jun 2017) |  |
|  |  |  |  |  |  |  |

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 |
|  |  |  |  |  |
|  |  |  |  |  |
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|  |  |  |  |  |

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)

N.N.

**Company:**

**Docomo: overall responsibility, and coordination among RAN and WGs**

**Huawei: RAN1 aspects**

**Ericsson: RAN2 aspects**

**Email:**

## 12 Work item leadership

Primary responsibility: RAN WG1, secondary responsibility in RAN2, 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

|  |
| --- |
| Supporting IM name |
| NTT DOCOMO |
| Ericsson |
| Huawei |
|  |

form change history:

2013-12-06 v1.14.1 modified §11 to read: <FamilyName>, <GivenName>, (If the person is new to 3GPP work, give full contact coordinates, in particular, email address.)

2013-10-03 v1.14.0 removal of embedded help text

v1.13.2: adds tdoc header

v1.13.1: minor changes resulting from discussions at CT#41 & SA#41

v1.13.0: mods to enforce linkage amongst stages 1, 2, 3

draft mods Scarrone-Meredith 2008-07 ff

v1.12.1: removes revision marks following approval at SP-29  
v1.12.0: includes provision for Study Items (SP-29)

v1.11.0: includes those changes from v1.8.0 agreed at SP-25.

v1.10.0: full circle

v1.9.0: a clean sheet

v1.8.0: includes comments from SA#24

v1.7.0: includes comments from RAN, CN and T #24; also includes “early implementation” data

v1.6.0: includes comments made during review period prior to TSGs#24

v1.5.0: includes comments made at TSGs#23 (Phoenix)

v1.4.0: offered to SA#23 for approval

v1.3.0: offered to CN#23, RAN#23 and T#23 for comments

DRAFT4 v1.3.0: 2004-03-09: Incorporation of comments from Leaders list

DRAFT3 v1.3.0: 2004-02-19: Incorporation of comments from MCC members

DRAFT2 v1.3.0: 2004-01-29: Complete redraft:

v1.2.0: 2002-07-04: "USIM" box changed to "UICC apps"

2003-05-28: spelling of “rapporteur” corrected

2002-07-04: "USIM" box changed to "UICC apps"