**3GPP TSG RAN Meeting #94e RP-21xxxx**

**Electronic Meeting, Dec. 6 - 17, 2021** (Revision of RP-212718)

**Source: Qualcomm**

**Title: New WID on Mobile IAB**

**Document for: Approval**

**Agenda Item: 8.6.3**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

# Title: **Mobile IAB**

## Acronym: NR\_mobile\_IAB

## Unique identifier: *{A number to be provided by MCC at the plenary}*

NOTE: For new WIs/SIs leave the Unique identifier empty and make a proposal for an Acronym.

 For a revised WI/SI: Take Unique identifier and acronym as shown in 3GPP workplan.

 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:

 Either:

|  |  |
| --- | --- |
| **This WID includes a Core part** | **X** |
| **This WID includes a Performance part** | **X** |

 or:

|  |  |
| --- | --- |
| **This WID includes a Testing part** |  |
| **and it addresses the following 3GPP work area:** | **Radio Access** |  |
| **Core Network** |  |
| **Services** |  |

Potential target Release: Rel-18

Note that this field above indicates the proposed Release at the time of submission of the WID to TSG approval. It can later be changed without a need to revise the WID. The updated target Release is indicated in the Work Plan. NOTE: In case of contradiction with the target dates of clause 5, clause 5 determines the target release.

## 1 Impacts *{ For Normative work, identify the anticipated impacts. For a Study, identify the scope of the study.}*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  |  | X |  |  |
| **No** | X | X |  |  |  |
| **Don't know** |  |  |  | X | X |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a … *{Tick one box. "***Feature** */* **Building Block** */ Work Task" form a hierarchical structure. E.g. no Building Block can be proposed without a corresponding parent Feature. The full structure of all existing Work Items is shown in the 3GPP Work Plan in* *ftp://ftp.3gpp.org/Information/WORK\_PLAN* *}*

|  |  |
| --- | --- |
| X | Feature |
|  | Building Block |
|  | *Work Task* |
|  | Study Item |

NOTE: Normally, Core/Perf./Testing parts in RAN WIDs are Building Blocks. Only if they are under an SA or CT umbrella, they are defined as work tasks. If you are in doubt, please contact MCC.

### 2.2 Parent Work Item

*{"Parent" Work Item refers to the related, earlier Stage, Work Item, e.g. the related Stage 1 Work Item shall be indicated here when a Stage 2 Work Item is presented or e.g. the related Study Item shall be indicated here when a normative-work Work Items is started. List here all parent Work Items of which requirements are either fully or partially covered by the proposed Item. List previous Work Items of earlier releases if relevant.}*

*{This section is mandatory to be filled out by the rapporteur.}*

*{Not applicable for a* **Study Item***}*

*{For a* **Building Block***: list here the parent* **Feature** *}*

*{For a* Work Task*: list here the parent* **Building Block** *}*

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
|  |  |  |  |

NOTE: RAN agreed some time ago, that it describes the feature WI + Core/Perf. part WI or Testing part WI in one WID. Therefore the table above should just include the feature WI data (In case the feature covers Core and Perf. part, please list under Working Group the leading WG of the Core part).

### 2.3 Other related Work Items and dependencies

*{List here other Work Items which relate to the proposed one, such as preceding SI or a preceding WI (e.g. if further enhancing a feature).}*

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
|  |  | *{optional free text}*  |

NOTE: Also related or dependent WIs/SIs in other TSGs should be indicated.

**Dependency on non-3GPP (draft) specification**:

*{This section is to be typically used to identify the IETF dependencies. Delete the header "Dependency on non-3GPP (draft) specification:" if no such dependency.}*

## 3 Justification

The support for Mobile Integrated Access and Backhaul (IAB) builds on the architecture and protocols derived in the Rel-17 WI NR\_IAB\_enh, which provided IAB improvements on various aspects such as robustness, load-balancing, spectral efficiency, and end-to-end performance.

The work on Mobile IAB in Rel-18 should focus on the scenario of mobile-IAB-nodes mounted on vehicles providing 5G coverage/capacity enhancement to onboard and/or surrounding UEs.

In Rel-18, mobile IAB supports the following functionality, applicable to FR1 and FR2:

* In-band and out-of-band backhauling.
* The mobile IAB-node should have no descendent IAB-nodes, i.e., it serves only UEs.
* Solutions should support UE HO and DC.

## 4 Objective

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

The detailed objectives of the WI are listed as follows:

* Define Procedures for migration/topology adaptation to enable IAB-node mobility, including inter-donor migration of the entire mobile IAB-node (full migration) [RAN3, RAN2]
* Enhancements for mobility of an IAB-node together with its served UEs, including aspects related to group mobility. No optimizations for the targeting of surrounding UEs. [RAN3, RAN2]

*Note: Solutions should avoid touching upon topics where Rel-17 discussions already occurred and where the topic was excluded from Rel-17, except for enhancements that are specific to IAB-node mobility.*

* Mitigation of interference due to IAB-node mobility, including the avoidance of potential reference and control signal collisions (e.g. PCI, RACH). [RAN3, RAN2]

The following principles should be respected:

* Mobile IAB-nodes should be able to serve legacy UEs.
* Solutions providing optimization for Mobile IAB may entail Rel-18 UE enhancements, provided that such enhancements are backwards compatible

RAN4 is expected to study impact on RF and RRM requirements:

* Conduct co-existence study to assess the impact of moving cells. Based on the study outcome, specify RF and RRM requirements and mechanisms for the mobile IAB-node to enable co-existence, if needed.
* Specify RRM requirements for the mobile IAB-node to enable IAB-node mobility, if needed.

The involvement of RAN1 may be needed, depending on work progress.

### 4.2 Objective of Performance part WI

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

* Specify RF conformance requirements for the mobile IAB-node, if needed.
* Specify RRM and demodulation performance requirements for the mobile IAB-node by taking into account IAB-node mobility, if needed.

### 4.3 RAN time budget request (not applicable to RAN5 WIs/SIs)

NOTE: For all new RAN related WIs/SIs which are not led by RAN WG5 the WI/SI rapporteur has to fill out the attached Excel table to request time budgets for corresponding RAN WG meetings.
The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI.
One time unit (TU) corresponds to ~ 2 hours in the meeting.
If no TU is needed, then leave the field empty otherwise enter a number >0 in the field.

 For revisions of already approved WI/SI descriptions: Please remove the Excel table from the WID/SID's zip file. The time budgets are already recorded. If you want to modify them, then this has to be done via the status report and not via a revised WID/SID.

 If this WID is covering Core and Performance part, then please fill out one line for each part in the attached Excel table.

**additional comments to the time budget request in the attached Excel table:**

## 5 Expected Output and Time scale

|  |
| --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Remarks |
| *{Possible values:**"TS" or* *"Internal TR" or* *"External TR". See Note 1}* | *{E.g.* *"22.XXX" or actual number if known}* | *{Title of the specification (as per TR 21.801 §6.1.1), to be aligned as much as possible with the WI/SI title}*  | *{E.g.* *"TSG#87"}* | *{E.g.* *"TSG#89"}* | *{e.g. rapporteur: <FamilyName>, <GivenName>, <Company>, <email address>}* |

*{Note 1: Only TSs may contain normative provisions. Study Items shall create or impact only TRs.
"Internal TR" is intended for 3GPP internal use only whereas "External TR" may be transposed by OPs.}*

NOTE: If this is a RAN WI 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 Remarks for each spec.
By default a new specs can only be new for one of both parts.

|  |
| --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| 37.340 | NR; Multi-connectivity; Overall description; Stage-2 | RAN#102 | Core Part |
| 38.174 | NR; Integrated Access and Backhaul (IAB) radio transmission and reception | RAN#102 | Core Part  |
| 38.300 | NR; Overall description; Stage-2 | RAN#102 | Core Part |
| 38.321 | NR; Medium Access Control (MAC) protocol specification | RAN#102 | Core Part |
| 38.331 | NR; Radio Resource Control (RRC); Protocol specification | RAN#102 | Core Part |
| 38.340 | NR; Background for integrated access and backhaul radio transmission and reception | RAN#102 | Core Part |
| 38.401 | NG-RAN; Architecture description | RAN#102 | Core Part |
| 38.413 | NG-RAN; NG Application Protocol (NGAP) | RAN#102 | Core Part |
| 38.423 | NG-RAN; Xn Application Protocol (XnAP) | RAN#102 | Core Part |
| 38.473 | NG-RAN; F1 Application Protocol (F1AP) | RAN#102 | Core Part |
|  |  |  |  |

NOTE: If this is a RAN WI 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 Remarks 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.

## 6 Work item Rapporteur(s)

## **Hampel, Georg,**

## **Qualcomm Incorporated,**

## **ghampel@qti.qualcomm.com**

*{Mandatory: <FamilyName>, <GivenName>, <Company>, <email address>.}*

*{Optional: <FamilyName>, <GivenName>, <Company>, <email address>: Secondary task(s).}*

*{The first listed Rapporteur is the work item primary Rapporteur. The role of a Rapporteur is further described in* [*www.3gpp.org/specifications-groups/delegates-corner/writing-a-new-spec*](http://www.3gpp.org/specifications-groups/delegates-corner/writing-a-new-spec)*. Secondary Rapporteur(s) are possible for specific secondary task(s)}*.

## 7 Work item leadership

**RAN3 (Primary)**

**RAN2/RAN4 (Secondary)**

*{One Working Group, e.g.: "SA4". Exceptionally a TSG.}*

*{Secondary responsible Working Group(s) are possible. In this case, list them here.}*

## 8 Aspects that involve other WGs

*{Specify all the other WG(s) to be involved and, if specific, their task. E.g.: "SA2, SA3, SA5. CT6 for storage, and potentially SA4". If not applicable, indicate "None" or "None identified yet".}*

NOTE: For RAN WIs: Section 8 applies only toWGs outside of TSG RAN because RAN WG aspects have to be covered in section 4.

Alignment and coordination with Rel-18 SA2 work on VMR should be considered, if needed.

## 9 Supporting Individual Members

*{At least 4 supporting Individual Members are needed. There is an expectation that these companies will provide resources to progress the work. Note that having 4 supporting companies is a necessary but not sufficient condition: the usual TSG approval process by consensus is needed for the WID approval.}*

|  |
| --- |
| Supporting IM name |
| Qualcomm |
| Fujitsu |
| Intel |
| Fraunhofer HHI  |
| Fraunhofer IIS |
| AT&T |
| vivo |
| Deutsche Telekom |
| Sharp |
| ZTE |
| Sanechips |
| CATT |
| OPPO |
| LG Electronis |
| Lenovo |
| Samsung |
| Nokia |
| Nokia Shanghai Bell |
| China Mobile |
| Ericsson |
| Futurewei |
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