**3GPP TSG-RAN WG4 Meeting # 97-e R4-2017407**

**Electronic Meeting, 2nd – 13th November, 2020**

**Agenda item:** 7.4.3.1

**Source:** Moderator (Nokia)

**Title:** Email discussion summary for [97e][309] NR\_IAB\_Conformance\_Part1

**Document for:** Information

# Introduction

This document summarizes the email discussion covering work plan, general topics and common test issues for NR IAB conformance testing. The discussion is arranged into multiple topics and for each topic the relevant observations and proposals are extracted from contributions. Therefore, same contribution may repeat in multiple topics in case the contribution content covers multiple topics.

In each issue the main views from companies are presented. Therefore, it is also possible to provide additional views on top of the provided options.

# Topic #1: General and work plan

This topic covers .

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2014484 | Qualcomm Incorporated | **Proposal**: Create a new IAB specific conformance test specification.  Contribution also includes work plan:  **RAN4#97-e:**  High level agreements: specification handling, work plan  High level discussion on testing framework, setup, etc  **RAN4#98-e:**  High level agreements on testing: agree testing framework, test setup, test models, test plan(which tests to be defined)  Discuss the specification skeleton  Agree work split on TPs for conformance specifications  **RAN4#98-e Bis:**  Discuss draft TPs for specifications  **RAN4#99-e:**  Approval of TPs |
| R4-2015439 | Nokia, Nokia Shanghai Bell | **Proposal 1:** Create a new conformance specification for IAB-Nodes. |
| R4-2016084 | Huawei | **Observation1:** Due to the potential size of the specification and potential problems with maintenance referencing may be necessary.  **Observation 2:** In most cases IAB-DU and IAB-MT requirements are identical to or very similar to BS. Test procedures can be merged.  **Proposal 1:** Introduce a section in clause 4 on relationship between specifications and the use of referencing  Contribution includes also a draft skeleton for TS. |
| R4-2016245 | Ericsson | **Proposal#1: RAN4 needs to have the reasonable meeting time for IAB conformance testing.**  **Proposal#2: New IAB conformance test specification would be preferred to have a clear structure and easier to maintain.**  **Proposal#3: Consider the new the conducted and OTA conformance testing specification.** |

## Open issues summary

### Sub-topic 1-1: Work plan

This sub-topic covers comments to work plan provided in R4-2014484

*Open issues and candidate options before e-meeting:*

**Issue 1-1: Work plan**

**RAN4#97-e:**

High level agreements: specification handling, work plan

High level discussion on testing framework, setup, etc

**RAN4#98-e:**

High level agreements on testing: agree testing framework, test setup, test models, test plan(which tests to be defined)

Discuss the specification skeleton

Agree work split on TPs for conformance specifications

**RAN4#98-e Bis:**

Discuss draft TPs for specifications

**RAN4#99-e:**

Approval of TPs

Comments to work plan can be provided, and aim is to agree the plan either as is or taking account comments, if those are provided.

* Proposals:
  + Option 1: Agree work plan
  + Option 2: Agree work plan with modifications
* Recommended WF
  + TBA

### Sub-topic 1-2: Conformance specification(s)

This sub-topic covers how to organize conformance specification(s) for IAB.

*Open issues and candidate options before e-meeting:*

**Issue 1-2-1: Number of specifications and how the split is done**

In this issue it will be discussed how many conformance specifications will be needed and how topics are arranged between the specifications. Two clear options have been provided but other opinions are also welcomed.

* Proposals
  + Option 1: Single specification covering conducted and radiated testing for RF, demod and RRM.
  + Option 2: Two specifications, one capturing conducted and the other radiated testing. Each specification captures RF, demod and RRM.
* Recommended WF
  + Option 2

**Issue 1-2-2: Initial views on specification skeleton**

While no explicit proposal for specification skeleton is done, R4-2016084 includes an example skeleton and also other views on how to arrange the content. In this issue free-form comments are invited to be provided on aspects raised in these aspects.

* Recommented WF
  + Gather comments and aim to agree at least guidelines how skeleton is arranged

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 1-1:  Issue 1-2-1:  Issue 1-2-2:  … |
| CATT | **Issue 1-1: Work plan**  The work plan seems reasonable. One minor comment, considering the specification skeleton is very important and the TPs need to be prepared according to it. The skeleton discussion can be initiated in this meeting if the new spec proposal can be agreed quickly. Or some offline discussion can be arranged before next meeting to make the skeleton more stable in the end of next meeting.  **Issue 1-2-1: Number of specifications and how the split is done**  Support the recommended WF to separate conducted and radiated specs.  **Issue 1-2-2: Initial views on specification skeleton**  Generally, we think R4-2016084 is a good starting to discuss the skeleton. We support to separate conducted and radiated specs and also support the idea that Demod and RRM can be arranged following RF principles. We also think the skeleton proposed in 2.5 can be a starting point to discuss and further improve the details. There’re some detail comments on the proposed skeleton from our side. For the new proposed “4.13 Referencing and relation with other specifications”, we would like to understand more on what will be captured in this clause. To our understanding, the references will be captured in every clause. For example, there will be some similar description similar as “The initial conditions and test procedure are the same as those for *BS type 1-H* in TS 38.141-1 [xx] clause 7.2.4” in the Annex of R4-2016084. For the “Annex A – Example of test procedure”, some changes for IAB-MT’s test configuration compared with BS are needed. Because IAB-MT’s signal transmission/reception is according to the scheduling of donor (For UE test, it’s System Simulator) not like BS that can be set to Tx mode or Rx mode. How to arrange that part may need some discussion. |
| Qualcomm | **Issue 1-1:** work plan is presented by QC, discussion on the skeleton TS would be good to start as soon as possible(even in this meeting)  **Issue 1-2-1:** proposal to have separate testing specs for conducted and OTA is good, this is inline with other test specs  **Issue 1-2-2:** The proposal in R4-2016084 is a very good starting point. The document is written under the assumption that the tests for the IAB-MT and BS are largely the same. One thing that we pointed out in our document is that we believe a “normal” bidirectional link is needed for testing the MT. It should be discussed how big of a change this introduces to the testing procedures and whether referencing is still possible or not. Most likely the answer to this question is yes. |
| Ericsson | Issue 1-1: maybe the conformance specification skelenton could be provided on #98?  Issue 1-2-1: option 2  Issue-1-2-2: this will depend on the general discussion on the IAB conformance framework, if BS principle were to be used for both IAB-MT and IAB-DU, adopting the BS conformance specification structure as baseline seems straightforward. Then second level skeleton for IAB-DU and IAB-MT also good to have in the discussion scope. |
| ZTE | **Issue 1-1:** fine with current work plan  **Issue 1-2-1:** fine to have separated TS for conducted and radiated testing.  **Issue 1-2-2:** could start with R4-2016084, Similar as core requirement for IAB-DU and IAB-MT, for the same requirement should be placed in the same clause, if the test procedures could be reused for IAB-DU and IAB-MT, this could simplify the spec description. |
| Huawei | **Issue 1-1:** Work plan seems ok  **Issue 1-2-1:** option 2  **Issue 1-2-2:** We are obviously ok with our draft skeleton as a starting point, the issue raided by CATT about the additional section on referencing is a good point we need to talk about. How to reference (or not) we should try to decide and if necessary we thing a section explaining the principles for the spec user could be useful. |
| Nokia, Nokia Shanghai Bell | **Issue 1-1:** Work plan looks reasonable and gives good guidelines for deadlines. Naturally this should not prevent the work to progress faster in case agreements form with ease. We are also in agreement with other comments that skeleton discussion could start earlier and Issue 1-2-2 already reflects this.  **Issue 1-2-1:** Option 2, separate specifications for conducted and radiated testing.  **Issue 1-2-2:** High-level skeleton in R4-2016084 is a good starting point. We think the second level of skeleton on how IAB-DU and IAB-MT requirements are arranged is useful to include into the discussion. It would be also useful to include Annexes into the skeleton.  For proposed new section 4.13 perhaps sufficient title would be “relationship with other specifications” as this covers also referencing. We would envision that this section could highlight e.g. which aspects of IAB-DU and BS are different even if BS conformance spec is referred in procedures. Some of these differences is NB-IoT support and lack of 5 MHz ChBW.  We also think it would be good to highlight to RRM session that this discussion is taking place, as due to RRM something may possibly need to be adjusted also in chapter 4. |
| Samsung | Issue 1-2-1: Fine with the recommended WF.  Issue 1-2-2: if it is going to include RRM aspect in these conformance testing specification this should be confirmed by RRM session. And the specification skeleton including common/general aspects such as test set up should take RF, RRM and Demo into account. |

### CRs/TPs comments collection

*Major close-to-finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

No CR or TP provided.

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

No CR or TP provided.

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #2: Common test issues

This topic covers common test issues including

* test models
* test configurations
* test environments
* other test issues

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2014750 | Samsung | **Observation**: IAB node conformance testing should follow BS approach as starting point.  In addition, the contribution contains text (not as observations or proposals) stating:   1. As IAB-DU fully reuse the gNB requirement with the same type and class, the MU and TT agreement of gNB should be applied without question. 2. For IAB-MT side the methodology of test configuration generation can be reused, even though the use case for IAB-MT of some NTC is not so clear at current stage. However, more study may be needed to figure out the power allocation especially for requirement different compared with gNB. 3. For IAB-MT the Test model for UL transmission should be analyzed based on physical layer design updated for IAB-MT and existing set-up defined for gNB. 4. The RF channel defined for gNB can be applied for IAB-MT if no additional issue identified. |
| R4-2015439 | Nokia, Nokia Shanghai Bell | **Proposal 2:** Test environments including chamber types specified for gNBs apply also for IAB-DU and IAB-MT testing.  **Proposal 3:** As the test environments are similar, the baseline is that measurement uncertainties and test tolerances should be the same as for gNB, unless a justified need for a change is shown.  **Proposal 4:** IAB-DU can re-use the gNB tests from 38.141 specifications. However, to keep the test burden of IAB-Node reasonable while maintaining sufficient test coverage, the tested channel positions, number of beams and other similar aspects, if any, which account for repeating the same baseline test multiple times shall be considered to be limited compared to 38.141.  **Proposal 5:** Tested channel positions and beam directions, when applicable, for IAB-MT should be reduced compared to gNB.  **Proposal 6:** For implementations sharing the same RF hardware between IAB-MT and IAB-DU, amount of duplicated testing shall be minimized when it does not bring added value.  **Proposal 7:** Aligned with the principles of gNB testing, test modes and test configurations are specified for IAB-MT.  **Proposal 8:** Test setups specified for gNB testing shall be the baseline for IAB-Node testing |
| R4-2016245 | Ericsson | **Proposal#4:** IAB-DU RF conformance testing reuse the BS conformance testing.  **Proposal#5:** DUT can be IAB-MT and IAB-DU separately depending on the implementation or configuration.  **Proposal#6:** IAB-MT test environment should not mention or mandate specific test equipment  **Proposal#7:** Not specify any test function on how to set the IAB-MT beam peak direction.  **Proposal#8:** RAN4 discuss how to treat the different TT &MU definition for BS test environment and UE test environment.  **Proposal#9:** consider to use the BS test configuration and test model principle on IAB-MT to construct the test case. |
| R4-2016138 | ZTE Corporation | **Proposal 1:** test configurations, RF channels, test models, MU/TT and test procedures of NR BS could be reused for IAB-DU.  **Proposal 2:** test frequency, test channel bandwidth, test parameters of IAB-MT should follow the configuration specified in TS 38.508 and TS 38.521.  **Proposal 3:**MU/TT and test procedures of NR BS could be reused for IAB-MT. |
| R4-2014389 | CATT | **Proposal:** For IAB test configuration, BS test configuration is reused for both IAB-DU and IAB-MT. |
| R4-2014485 | Qualcomm Incorporated | **Observation:** the IAB-MT test setup has to be a mix of the BS setup and the UE setup. |
| R4-2015440 | Nokia, Nokia Shanghai Bell | **Observation 1:** The test configurations defined for gNB define scenarios which are relevant also for IAB-MT.  **Observation 2:** Having all the test configurations in place does not mandate supporting all these configurations in the IAB-MT implementation.  **Proposal 1:** Test configurations are specified for both IAB-MT and IAB-DU  **Proposal 2:** Support for various configurations shall be covered by manufacturer declarations.  **Proposal 3:** Adopt the test configuration from TS 38.141-1/2 for both IAB-DU and IAB-MT |
| R4-2016243 | Ericsson | **Proposal#1:** Reusing the BS test configuration for IAB-DU without NB-IoT support.  **Proposal#2:** Reusing the BS test configuration principle for IAB-MT.  **Proposal#3:** Reusing the below declared parameter for IAB-MT relating to the test configuration. |
| R4-2014390 | CATT | **Proposal 1:** BS test models are reused by IAB-DU.  **Proposal 2:** UE test models in TS 38.521 can be the references for IAB-MT.  **Proposal 3:** Simplification of UE RMCs for IAB-MT is discussed case by case. |
| R4-2016244 | Ericsson | **Proposal#1:** Reusing the BS test model for IAB-DU.  **Proposal#2:** Reusing the BS test model principle for IAB-MT.  **Proposal#3:** Start with the BS TM model test requirement under the BS TM model and further discussion of modification if needed.  **Proposal#4:** Reuse the DMRS configuration of UE uplink RMC design.  **Proposal#5:** Align the TDD configuration with Demod discussion.  **Proposal#6:** UE RMC could be reference to the IAB-MT test model physical channel parameter design.  **Observation#1:** Some TM could be merged as uplink TM has no multiple user differentiation.  **Proposal#7:** No need to construct the power boosting PRB for DMRS signal in TM design of IAB-MT. |
| R4-2016242 | Ericsson | **Observation#1:** The UE test temperature is not declared but specified as fixed range. The power supply is based on the batteries which may or may not be used by IAB.  **Observation #2:** The BS declare the temperature, humidity and vibration which applies to the DUT.  **Proposal:** Reuse the BS environment condition for FR1 in annex B in TS 38.141-1 and annex B in TS 38.141-2 for FR2. |
| R4-2016246 | Ericsson | **Observation#1:** Measurement/connection setup in BS and UE both are informative.  **Proposal#2:** Allow the test measurement/connection setup flexibility in the conducted transmitter test procedure.  **Proposal#3**: In test procedure description, there is no need to describe downlink configuration and how to trigger the IAB-MT uplink transmission. The test model/waveform to be transmitted shall be specified.  **Proposal#4:** One option is to reuse the clause of BS interpretation of measurement results for IAB-MT with the modification of adding the UE test system uncertainty if different MU from different test environment would be allowed for IAB-MT testing.  **Proposal#5:** RAN4 discuss if the same TT definition for the different transmitter test setup for the same test case.  **Proposal#6:** RAN4 discuss if it the same MU definition for the different transmitter test setup for the same test case  **Proposal#7**: Use the BS test case structure for test case drafting.  **Proposal#8:** There is no need to specify the message content in test case.  **Proposal#9:** RAN4 discuss the recommendation of TT for IAB-MT test case in the Table 1 and Table 2 above. |
| R4-2016247 | Ericsson | **Observation#1**: Measurement/connection setup in BS and UE both are informative.  **Proposal#2**: Allow the test measurement/connection setup flexibility in the conducted receiver test procedure.  **Proposal#3**: align with performance testing FRC definition.  **Proposal#4:** One option is to reuse the clause of BS interpretation of measurement results for IAB-MT with the modification of adding the UE test system uncertainty if different MU from different test environment would be allowed for IAB-MT testing.  **Proposal#5:** RAN4 discuss if the same TT definition for the different test setup for the same test case.  **Proposal**#6: RAN4 discuss if it the same MU definition for the different test setup for the same test case. |
| R4-2016248 | Ericsson | **Proposal#1**: Reusing the BS type 1-H, 1-O and 2-O test specification for radiated transmitter characteristic for IAB-DU type 1-H, 1-O and 2-O.  **Proposal#2**: RAN4 discuss how to allow the reusing the UE and BS OTA test methodology for IAB-MT.  **Proposal#3:** RAN4 investigate if test time could be further reduce on shared transceiver architecture using the same OTA test methodology.  **Observation#1**: co-location requirement needs to be defined for IAB-MT type 1-O when the UE OTA test methodology is used.  Proposal#4: IAB-MT TX ON/OFF and IAB-MT TX transient period should be classified with co-location requirement for conformance testing.  Proposal#5: RAN4 further discuss the Number of the conformance directions needed for each Tx requirement.  **Observation#2**: Measurement/connection setup in BS and UE both are informative.  **Proposal#2**: Allow the test measurement/connection setup flexibility in the radiated transmitter test procedure.  **Proposal#3:** In test procedure description, one option is that no description of downlink configuration and how to trigger the IAB-MT uplink transmission. Only the test model/waveform to be transmitted shall be specified.  **Proposal#4**: One option is to reuse the clause of BS interpretation of measurement results for IAB-MT with the modification of adding the UE test system uncertainty if different MU from different test environment would be allowed for IAB-MT testing.  **Observation#3**: UE test system uncertainty does not contain the extreme conditions and has several limitation factors (Power class, testing method and quiet zone size).  **Proposal#5:** RAN4 discuss further the extreme condition test system uncertainty for IAB-MT test.  **Proposal#6:** RAN4 discuss if the same TT definition for the different transmitter test setup for the same test case.  **Proposal#7:** RAN4 discuss if it the same MU definition for the different transmitter test setup for the same test case  **Proposal#7:** Use the BS test case structure for test case drafting.  **Proposal#8**: There is no need to specify the message content in test case.  **Observation#4:** UE TS 38.521-2 does not have FR1 OTA testing, thus FR1 OTA testing MU and TT needs to be added in UE test environment.  **Proposal#7:** RAN4 discuss the recommendation of TT for IAB-MT test case in the Table 1 and Table 2 above. |
| R4-2016249 | Ericsson | **Proposal#1**: Reusing the BS type 1-H, 1-O and 2-O test specification for radiated receiver characteristic for IAB-DU type 1-H, 1-O and 2-O.  **Proposal#2**: RAN4 discuss how to allow the reusing the UE and BS OTA test methodology for IAB-MT.  **Observation#1:** Measurement/connection setup in BS and UE both are informative.  **Proposal#5:** Allow the test measurement/connection setup flexibility in the radiated receiver test procedure.  **Proposal#6:** align with performance testing FRC definition.  **Proposal#7:** One option is to reuse the clause of BS interpretation of measurement results for IAB-MT with the modification of adding the UE test system uncertainty if different MU from different test environment would be allowed for IAB-MT testing.  **Proposal#8:** RAN4 discuss if the same TT definition for the different receiver test setup for the same test case.  **Proposal#9:** RAN4 discuss if it the same MU definition for the different receiver test setup for the same test case  **Proposal#11**: There is no need to specify the message content in test case.  **Observation#2:** UE TS 38.521-2 does not have FR1 OTA testing, thus FR1 OTA testing MU and TT needs to be added in UE test environment. |

## Open issues summary

### Sub-topic 2-1: IAB-MT test aspects

This sub-topic covers IAB-MT related proposals and observations.

*Open issues and candidate options before e-meeting:*

**Issue 2-1-1: IAB-MT test setup**

Some individual proposals are also made to confirm the test setup as a starting point. These proposals are gathered below for commenting.

* Proposals
  + BS principles of constructing and configuring the test case using test models and configurations is adopted.
  + In the same test setup, DUT can be either IAB-DU or IAB-MT i.e. different setups are not needed
  + TS descriptions of environments shall not mandate specific equipment and therefore allow flexibility in connection setup
* Recommended WF
  + Agree above proposals

**Issue 2-1-2: IAB-MT test models**

For test models two main views are present. Either BS test models are taken as baseline and the content is modified to reflect UL operation, or UE test models are taken into use either directly or with modifications.

* Proposals
  + Option 1: BS test models are the baseline for IAB-MT test models, content is modified for UL operation. Combining some TMs can be further discussed.
  + Option 2: UE test models are the reference for IAB-MT test models. These models will be further simplified to be used for IAB-MT.
* Recommended WF
  + Discuss above options. Discuss in second round details including proposals for TDD configuration and DM-RS configuration.

**Issue 2-1-3: IAB-MT test configurations**

Majority of the companies express a view that BS test configurations can be re-used for IAB-MT while some details like power allocation may need some modification. One company also raised the option that some test configuration related parameters are adopted from UE test specifications.

* Proposals
  + Option 1: BS test configurations are the baseline to be used for IAB-MT.
  + Option 2: Test frequency, test channel bandwidth and test parameters of IAB-MT should follow the UE configuration
* Recommended WF
  + option 1

**Issue 2-1-4: IAB-MT test environments**

Majority of the companies express that the same test facilities are used for gNB and IAB-Node testing. However, concerns are also raised if there is a need to try to adopt also some UE aspects, which differ from gNB, into the environment discussion.

* Proposals
  + Option 1: IAB-MT uses the same test environments, i.e. chamber types, MU/TT, environmental conditions, as IAB-DU.
  + Option 2: Additional work is needed to see if/how UE test environment aspects can to be accommodated to coexist with option 1. Aspects to be considered include at least MU/TT, temperature, humidity, vibration and power source conditions.
* Recommended WF
  + Option 1

**Issue 2-1-5: IAB-MT receiver testing**

* Proposals:
  + Receiver DL baseband configuration for RF: align with performance testing FRC definition
  + There is no need to specify the message content in receiver test case.
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 2-1:  Issue 2-2-1:  Issue 2-2-2:  … |
| CATT | **Issue 2-1-1: IAB-MT test setup**  We’re not sure of the recommended WF. To my understanding, IAB-MT needs to communicate with system simulator to work correctly. IAB-MT needs to have cell search, demod PSS/SSS, PDSCH, etc then transmit signals. It’s not like BS that can be set to Tx mode then spectrum analyzer can test power, ACLR, etc. The following is copied from TS 38.508. More views from the equipment vendor is needed. A.3.1.2 Transmitter tests using Spectrum Analyser   Figure A.3.1.2.1: Test Equipment connection for TX-tests with additional Spectrum Analyzer  **Issue 2-1-2: IAB-MT test models**  Option 2 is from our side because we think the physical channel difference between DU and MT should first be considered. We support the view that BS principle can be reused as much as possible but it doesn’t mean the same physical channel configuration of BS can be reused.  **Issue 2-1-3: IAB-MT test configurations**  We support the principle of the recommended WF. But we also think some exception should be allowed if any will be identified in future discussion.  **Issue 2-1-4: IAB-MT test environments**  The same comment as 2-1-3.  **Issue 2-1-5: IAB-MT receiver testing**  I’m not very clear with discussion point. To my understanding, IAB-MT needs to communicate with SS (system simulator) to work correctly as commented in Issue 1-2-2. Current IAB-MT REFSENS requirements FRC did some simplification compared with UE, which may need the views from equipment vendor that if they think it sufficient to do the test. |
| Qualcomm | **Issue 2-1-1:** Some clarifications are needed about what exactly is meant by BS principles of constructing and configuring the tests models. WE agree with the CATT comment that a fully operational DL link(parent to IAB-MT) is needed. The chamber and test setup(in terms of layout, connections used(or antennas, etc) from the BS can likely be reused. We agree with the 3rd bullet.  Issue 2-1-2: Option 2 should be the baseline because the IAB-MT functionality is very similar to a UE. A lot of the BS testing principles will have to be adapted to testing DL/UL with a full downlink link(TE will have to emulate the parent). In general we agree with CATT’s comments  Issue 2-1-3: Option 1 can probably be taken as baseline since the IAB-MT will only work in a single network and does not need to support many different configurations because it does not move to different deployments.  Issue 2-1-4: Option 1 can be taken as baseline but this will need confirmation when more IAB-MT testing aspects become clear.  Issue 2-1-5: Proposals need some clarifications. Given we are testing DL channel, the parameters should be aligned with the UE tests. What is meant by the message content? UE tests usually just clarify the number of bits sent, not what the packets contain in terms of upper layer data. |
| Ericsson | Issue 2-1-1: Agree with proposals.  Issue 2-1-2: Option1.  UE RMC has all channel BW and different SCS permutation, as IAB-MT is network node, the testing time reduction should be considered and thus BS test model should be used as baseline to construct the IAB-MT test model.  Issue 2-1-3: Option 1.  Issue 2-1-4: Option 1.  As we illustrated in our papers, to consider the UE testing aspect means additional work need to be scoped in the IAB Rel-16 Conformance work. i.e UE FR1 does not have OTA testing, to use the UE Test equipment together with BS OTA chamber need to be scoped in the Rel-16. On top of that how to align the MU/TT alignments between UE and BS test environment needs to be discussed. The environmental conditions definition is quite different between UE and BS, how to handle this also to be discussed.  Issue 2-1-5: agree with the proposal. |
| ZTE | **Issue 2-1-1:** 1st sub-bullet should be removed as this will discussed in the following sub-topic; also support to reuse BS testup to test both IAB-DU and IAB-MT;  **Issue 2-1-2:** we think IAB-MT at least should be sync with Donor IAB-DU,which is missing in IAB-DU test model which should be very critical for IAB-MT test setup. e.g. Freq error was calculated based on DL received signal, UE test signals for DL should be added for the corresponding access procedure;  **Issue 2-1-3:** BS test configuration might be valid for IAB-MT e.g. 5MHz is not supported for IAB-MT . For the rest part of test configuration e.g. NRTC1-5,it should be generally fine for IAB-MT.  **Issue 2-1-4:** fine with option 1  **Issue 2-1-5:** further discussion are needed. |
| Huawei | **Issue 2-1-1:**  Proposals are ok, the last bullet seems particularly valid when considering some of the other issues. A big difference between BS and UE is 2 way communication is used for many (all?) UE tests and set up. The BS does not specify how the test conditions are set up. The BS approach also allows for the UE approach to be used as well as the BS approach. This would allow both methods to be used as the vendor prefers.  **Issue 2-1-2:** The test models should be appropriate for the signals sued by the IAB-MT. The main issue we think is not the TM but reliance on communication in the DL to set up the IAB-MT in a suitable test condition. If possible test time can be reduced by using BS test signals for IAB-DU/IAB-MT shared hardware then this should be considered (for output power accuracy for example).  **Issue 2-1-3:** As the tests will be carried out in BS test chambers then the calibration will be done based on BS test points, as such it seems expedient to not add any additional cases to this if it can be avoided, so option 1, also if shared hardware tests can be combined then using same configurations makes sense.  **Issue 2-1-4:** option 1 is ok, but the OTA testing principle has always been that any test chamber can be used as long as it meets the MU described in the test spec. A number of chamber types have been assessed so far and documented but this was never intended to be an exhaustive list.  **Issue 2-1-5:** Don’t fully understand the proposals, it seems necessary to specify FRC’s so that test scan be repeatable and comparable between vendors. |
| Nokia, Nokia Shanghai Bell | **Issue 2-1-1:** In high level IAB-MT testing should be as similar as possible to testing of other infrastructure nodes and same high level principles should be followed.  The BS test setup based on specified test models and configurations needs to be enabled. The main principle of BS testing is that it is made very generic: it does not matter how the initial test condition is reached. It can be configured in a proprietary manner or done in other ways.  With this principle in place the test setup can be generic for most if not all tests, i.e. for the setup it does not matter if IAB-MT or IAB-DU is being tested. In such generic setup it is not meaningful to mandate specific test equipment to be used. Therefore, we agree with the proposals, but some individual tests like power control and frequency error for IAB-MT may need minor further adjustments. For example, for frequency error guidelines are needed what test equipment needs to send out, but this does not mean that two-way link needs to be mandated.  **Issue 2-1-2:** We prefer option 1. The same principles of building the test model should apply for IAB-DU and IAB-MT, but naturally the transmitted signal needs to be UL. As long as the UL signal is clearly specified, it is not necessary to specify the test equipment behaviour in detail, i.e. during the DL parts of the TDD frame structure it can be left open whether test equipment is e.g. silent or sends synchronization signals.  **Issue 2-1-3:** We prefer option 1, but are also willing to evaluate if e.g. some test configurations are unnecessary and can be merged.  **Issue 2-1-4:** We prefer option 1. As IAB-MT is physically either similar or the same as base station, the existing test environments should apply. Therefore, same MU/TT applies. When it comes to environmental conditions, they should be aligned with infrastructure nodes. As IAB-MT and IAB-DU may use same HW, they need to have the same environmental conditions.  **Issue 2-1-5:** Some clarifications are needed from the proponent. For receiver DL configuration we agree that same FRC-based principle as used for base station needs to be used for IAB-MT. It is not clear how the second proposal of not specifying message content relates to this. However, it should be sufficient to specify number of bits without detailing anything more. |
| Samsung | **Issue 2-1-1: IAB-MT test setup**  The 1st and 3rd bullets align with our understanding. However, the 2nd bullet may cause confusion. Clarification may be needed. The fundamental thing is that IAB node including IAB-MT should be customized. Even though IAM-MT supports UE functionality that does not mean that it will comply the all detail features to be support by UE. For example at least in this release IAB-MT to be designed for certain operator may not have to support all channel bandwidth to be supported by UE but to be optimized according to frequency span to be used. Under this case the UE test condition could be applied.  Hence the preference is that the IAB conformance testing design should follow the generic way of BS which leave the flexibility space to build the test system. But not target to design with assumption to be tested by common commercialized TE, which is not precluded by this approach.  **Issue 2-1-2: IAB-MT test models**  Option 1 is preferred. This is mainly for transmitter side. The FRC should be finalized as well.  **Issue 2-1-3: IAB-MT test configurations**  Option 1 is preferred. As pointed in issue 2-1-1, test channel bandwidth could be not aligned for IAB-MT case. This is a simple example why the UE approach would be problematic way for IAB-MT which may be designed according to operator request only.  **Issue 2-1-4: IAB-MT test environments**  Not against option 1 if there is majority view, especially for requirements for which IAB-MT refer to BS. However, there are still requirement such as dynamic range, power control and frequency error with potential difference more time needed to make decision. Hence if the principle is going to be agreed the wording improvement needed for clarity.  **Issue 2-1-5: IAB-MT receiver testing**  As mentioned in issue 2-1-3 the FRC for receiver RF requirement should be completed. And even in BS specification the dedicated FRC for RF receiver is defined explicitly. |

### CRs/TPs comments collection

*Major close-to-finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

No CR or TP provided.

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

No CR or TP provided.

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |