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**Variant of [97e-02-DevCompliance] Version 0.0.4**  
**RAN**

**3GPP TSG RAN meeting #97e RP-222562**

**Electronic Meeting, September 12-16, 2022**

Source: Nan Hu, RAN VC(Moderator)

Title: [97e-02-DevCompliance]

Agenda Item: 5.2

Document for: Discussion and Decision

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## 1 Introduction

This is the kick-off of the following email discussion

**Table 1:**

Email Thread Title	Related Documents	Moderator	Agenda	Use of NWM?
[97e-02-DevCompliance]	RP-222163	Nan Hu, RAN VC	5.2	Yes

Company contact information for further follow up comments.

**Table 2:**

Company	Contact Name	Contact email
CMCC	Nan Hu	hunan@CHINAMOBILE.COM

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## 2 Background

The following background and proposal are provided in RP-222163:

### **Background**

- UE not conformant to the 3GPP specifications are currently produced and commercialised
- Devices not supporting mandatory features

- Mandatory features are not signalled by the UE, therefore the network has no general means to identify and reject non-conformant devices
- Tests specified by RAN5 are not applicable to non-conformant devices and therefore they cannot be certified (e.g., by GCF)

**Proposal:** It is requested that 3GPP RAN mandates RAN2 to define a solution to identify devices not supporting mandatory UE features so to make the network aware of the presence of these UEs non-conformant to 3GPP specifications and take proper actions.

This NWM discussion will focus on how to handle this issue above mentioned.

## 3 Discussion

### 3.1 Initial round discussion

For further understanding issue:

**Feedback Form 1: Question1: Do companies have any comment or further information on the background provided in RP-222163?**

<p><b>1 – China Mobile Com. Corporation</b></p> <p>Yes!</p>
<p><b>2 – VODAFONE Group Plc</b></p> <p>Such cases might exist, but in my view it is always case by case issue. It is operator depended if such devices need to be rejected even not standard compliant or operator might decide still to allow them to operate in the NW. We can discuss the issue on a particular example if companies provide it, but not in general.</p>
<p><b>3 – TELECOM ITALIA S.p.A.</b></p> <p>As a proponent of 2163, I would like to stress the importance to be able to react not in a case by case basis with specific solutions (which we know there are) but with addressing the problem with a general solution.</p>
<p><b>4 – T-Mobile USA Inc.</b></p> <p>T-Mobile USA thinks this is an interesting idea and we welcome the discussion. Knowing the features in a UE could help an operator create a policy to reject the mobile, but it should also be free to create a policy to allow the mobile device too.</p>
<p><b>5 – China Mobile Com. Corporation</b></p> <p>Please ignore the first test message. CMCC is also interested in this topic and would like to see some general solutions.</p>

## **6 – Apple Hungary Kft.**

This is indeed an interesting topic. As Vodafone has also pointed out, it is usually viewed as a case-by-case issue, and is operator depended. Operators do co-ordinate with the vendors on particular aspects. However, we would like to provide some views on this topic:

It appears a bit strange to bring a proposal to task RAN2 to observe/mandate compliance. 3GPP provides specifications, including mandatory and optional features and corresponding requirements and tests, and expects UEs to be fully compliant. This is how interoperability is ensured, which is key to the success of 3GPP-compliant ecosystem. We are not sure what RAN(2) can do - adding any additional signaling does not force non-compliant UEs to actually use that signalling, if the UEs have already not followed the legacy spec. Infact adding anything from RAN kind of “legalizes” or rather lends to a tone where the spec allows device to not strictly follow the requirements.

Any sort of identification of the UE by the operator can be (is already) done outside of 3GPP and in our view, we would like to view 3GPP as specification/requirement setting entity with the assumption that all device would comply. We prefer to keep it that way.

## **7 – Intel Corporation (UK) Ltd**

### **Intel:**

We have some question to better understand what is expected:

Q1: We would like to understand whether the intention is for the network to know whether a UE supports all mandatory features or not. or whether the intention is the network to know on a per feature granularity?

Q2: We would like to understand what is the anticipated network behaviour if it would know that the UE doesn't support all mandatory features. E.g. connection released, UE directed to LTE, registration rejected, etc. While this is obviously down to network implementation, it would be useful for this email discussion to understand the intention from the proponent's perspective.

## **8 – Fujitsu Limited**

We think the questions from Intel are very important. It is not easy for us to decide Yes or No before understanding the problem, the exact solution and spec impact. However, generally speaking, we (as a network vendor) have a concern to introduce a complicated solution for gNB to save UEs with bad implementation.

## **9 – ZTE Corporation**

We had similar questions as Intel. Our assumption is that the problem is that it is not possible to define test cases for every mandatory feature. However, if the intention is to identify such UEs, then if we define one mechanism to identify the UE then such feature could be mandated (of course from a specific release) and the UEs should be tested for this feature. We think any solution then relies on all the UEs implementing this feature from a given point in time.

If the above assumption is correct then what is necessary is to identify the UEs and we think we could reuse the “*manufacturer-assigned UE radio capability ID*” for this purpose. We could mandate the UEs to signal the “*manufacturer-assigned UE radio capability ID*” and this can be used to identify the UEs (and test the UEs to make sure that this is signalled).

## 10 – Orange

We co-sourced the contribution and are open to proposals on the best methodology to adopt. The main goal is for the network to have explicit knowledge of non compliant UE (with information on which element is non compliant) to allow network control (which can be rejection, redirection to another band,...)

## 11 – vivo Communication Technology

Before we decide any 3GPP based solution to address this issue, it is better to understand more detailed information about this issue. At least the motivation of producing the non-3GPP-conformed devices and reason of certificating such commercialized devices shall be discussed. If it is a commercial demand of such devices, 3GPP shall consider solution to address such commercial demand as usual including introducing the proper singling for the mandatory features once 3GPP identify such operator demand as well as the benefit to the eco-system. From this perspective, we think either we open the discussions with more detailed informations or we shall keep the specification as it is. Before 3GPP provide the guideline or solutions, producing non-3GPP-conformed devices shall NOT be encouraged from standard as well as certification perspective.

## 12 – Spreadtrum Communications

We have similar questions as Intel. We think the UE not conformant to the 3GPP may send a fake message to network according to the proposed solution in RAN2 and the problem will not be resolved.

## 13 – TELECOM ITALIA S.p.A.

to Vivo: clearly the scope is not to encourage the commercialization of not compliant devices!!

And it is not an operator request to have non compliant devices. In the case behind the contribution, it appears that a 3GPP mandatory feature (specified in Rel 15) was voluntarily not implemented. Since the feature is not signaled, the network may not have knowled of the presence of such devices (unless we adopt a case by case solution)

## 14 – NTT DOCOMO INC.

We have similar questions as vivo and spreadtrum.

We are interested in this topic and open to discussion. And if it is possible, we think it would be beneficial to have a general solution to identify unexpected UEs.

However, we are concerned that solutions can be very complex if we also take into account that the information notified by UEs may not reliable.

## 15 – Deutsche Telekom AG

**Deutsche Telekom encourages all 3GPP eco-system players to comply to 3GPP specifics relevant for their products.** We do not support proprietary extensions or that products leave out support of mandatory features defined by the 3GPP standards.

The rest of the discussion is not related to 3GPP and should not be handled here, as this is a commercial topic between seller and buyer. IMEI-SV is a concept to identify, especially terminal products, and network/operators can make use of this information to device if particular devices are allowed to use the network of an operator or not. We also fail to understand how an process inside 3GPP could look like ...

**16 – Nokia Corporation**

This is an important area to discuss, especially it is important to better understand cases where the network needs to know UE feature support or lack of it for network's own actions. It would be good to understand specific cases better.

**17 – HUAWEI TECHNOLOGIES Co. Ltd.**

[Huawei] we welcome more details and more discussion on this topic, to understand better what could or could not be done in 3GPP and where else/how else the problems could be handled. Many questions have been raised above and needs to be answered.

**18 – CHTTL**

We think it is an important topic from the commercial point of view for sure, and we are also interested in this topic and open to discuss and what can be done in 3GPP to improve the situation.

**19 – Ericsson LM**

Like Huawei we also think we should understand the exact problems and answers to presented questions. One additional question is that whether the observed problematic devices have been certified or not? From the background it seems they are not certified, as otherwise we would have issues with RAN4/5 tests if devices which do not conform to the specs would pass those tests. Otherwise, if such devices pass the 3GPP defined tests, then it seems we have issue with those tests.

Also, it is not very clear what kind of solution is expected. If a solution is based on UE signaling, it cannot work from Rel-18 onwards as the existing UEs would not use such signaling and as pointed out, non-conforming UEs could pretend to be pre-R18. All new features should have capability signaling in any case, so we assume the discussion is about mandatory features specified in Rel-15 (without capability signaling). Because of this, it also sounds like this discussion is something we should keep in mind for future generations and it seems it might be difficult to solve in middle of a generation.

We are open to continue the discussion but it seems premature to task any WG-specific objectives at this point.

**20 – TELECOM ITALIA S.p.A.**

to Ericsson: the device which originated the issue is not certified and cannot be certified, since the RAN5 test indicates the test must be carried out by assuming that the feature is implemented. My RAN5 experts indicated that the result would be "the device cannot be tested", since the test requirements are not met

For figuring out the necessity to solve the issue:

**Feedback Form 2: Question 2: Do companies think this issue should be solved in 3GPP?**

**1 – VODAFONE Group Plc**

The issue can be solved to a certain extent already today. e.g. based on IMEI SV or based on capability provided the operator could introduce a different behaviour.

**2 – TELECOM ITALIA S.p.A.**

As a proponent of 2163, I would like to stress the importance to be able to react not in a case by case basis with specific solutions (which we know there are) but with addressing the problem with a general solution.

**3 – T-Mobile USA Inc.**

Yes

**4 – China Mobile Com. Corporation**

3GPP is hoped to resolve the issue.

**5 – Apple Hungary Kft.**

Pls see our response to Q1. We do not think anything needs to be done. We share somewhat similar view as Vodafone.

**6 – VODAFONE Group Plc**

Probably we could re-formulate it a different way: 3GPP cannot be responsible to find compliant or not compliant UEs.

This is not a task of 3GPP, but a task of corresponding testing groups providing e.g. certification, but 3GPP can for sure develop mechanisms, so that operator can find any UEs, it knows or believe are not compliant.

The system behavior in case such UEs are found has to be operator specific as it is a commercial relation between operator and such a vendor how to treat such UEs, so just rejecting a UE which e.g. does not support mandatory feature, which operator has not even introduced is not a way to go. Just as pure example as it is now under discussion in 97e-31-IODT-RedCap: If NCD-SSB becomes mandatory for all bands, but no UE vendor implements it in lower bands as e.g. most operators do not have more than 20 MHz spectrum there, I doubt it is a good way to reject such UEs from the access to the NW.

**7 – Intel Corporation (UK) Ltd**

At this stage of the discussion, it is not clear to us that the addition of new signalling can help to resolve this issues. It seems that the device concerned is deliberately non-compliant to the specifications, and has not been tested and certified by a certification body. Given this, it is not clear how new signalling defined by RAN2 will help the problem as the UE may not comply to the new signalling requirements. E.g. if the new signalling were to be added from R18, then the non-compliant UEs can simply claim to be an earlier release and not implement this signalling

**8 – TELECOM ITALIA S.p.A.**

The point raised by Intel is a valid one and when preparing the contribution we did not have a general solution in mind (that was the reason behind tasking RAN2).

However, it is clear that some devices deliberately do not implement mandatory features (which are not signaled) and this should somehow made known. A possible solution would be to create a database in the

3GPP website where non-compliant devices are listed. In such a way there would be a common repository where to find the information.

**9 – ZTE Corporation**

If we agree that the intention is to provide tools to identify the UE, then 3GPP can develop such tools, but we think we can reuse existing mechanisms (as an example mandate the RACS ID to report the *manufacturer-assigned UE radio capability ID*).

**10 – vivo Communication Technology**

As we respond in Q1, further discussion in 3GPP is needed to form view on whether a 3GPP solution is required or not.

**11 – Orange**

We believe 3GPP is the best place to define a method to identify non compliant UEs and define associated network control mechanisms.

**12 – Spreadtrum Communications**

We think further discussion about questions and solution is needed.

**13 – NTT DOCOMO INC.**

Same view as Intel and Spreadtrum. intel and Spreadtrum.

**14 – NTT DOCOMO INC.**

(Sorry. Something is wrong with my post above (#13), so I'm reposting it.)  
Same view as Intel and Spreadtrum.

**15 – Deutsche Telekom AG**

No (as it is already solved - see also VF comment above: IMEI-SV, potentially combined with RACS)

**16 – Nokia Corporation**

Especially cases, where the network needs to know UE feature support or lack of support for taking right actions, should be discussed and in some cases also solved in 3GPP. Like mentioned by Vodafone we probably need to reformulate the question a bit as 3GPP cannot be responsible of finding compliant or not compliant UEs but 3GPP can develop tools to better understand UE's feature support.

**17 – HUAWEI TECHNOLOGIES Co. Ltd.**

[Huawei] at this point in time we are not sure that the solution to this problem can be found in 3GPP. More discussion is needed

**18 – CHTTL**

We hope 3GPP can help to resolve the issue.

**19 – Ericsson LM**

Please see our previous reply, we think further discussion is needed

**Feedback Form 3: Question 3: If the answer of Q2 is yes, which working group is preferred to handle this?**

**1 – TELECOM ITALIA S.p.A.**

We think the right group is RAN2

**2 – T-Mobile USA Inc.**

RAN2 and SA2 working together

**3 – China Mobile Com. Corporation**

RAN2 is the leading group, and SA2 maybe involved.

**4 – ZTE Corporation**

The WG depends on the solution. For instance if we reuse the RACS ID (*manufacturer-assigned UE radio capability ID*), then may be CT1 and RAN5 may be involved but may be not RAN2.

**5 – vivo Communication Technology**

RAN shall firstly identify the issues and task corresponding WG, e.g., RAN2, if RAN agree to introduce the signalling

**6 – Orange**

we believe it should be RAN2

**7 – Nokia Corporation**

Due to heavy workload in working group, it might be best to continue discussion on RAN plenary level first so that the situation and these cases become clear. In a later phase the RAN plenary could task working groups like RAN2 develop suitable solutions if found necessary.

**8 – HUAWEI TECHNOLOGIES Co. Ltd.**

[Huawei] Given the comments in all the sections above, it is too early to give this task to RAN2. We can continue the discussion at RAN level first, and clarify a few things. We already know that at most RAN2 could try to define some capability bits for some mandatory features that now do not have it, so not sure what ELSE can RAN2 discuss. But this is not the point to discuss. The discussion should be at RAN level, as it is related to aspects even beyond 3GPP.

## 3.2 Intermediate round discussion

19 companies have joined the initial round discussion. Most of the companies indicate the interest on this issue and try to have a further understanding.

Through discussion for Q1, further clarification is provided.

**Clarification 1:** The main goal is for the network to have explicit knowledge of non compliant UE (with information on which element is non compliant) to allow network control (which can be rejection, redirection to another band,...).

**Clarification 2:** The non compliant UEs are not certified and cannot be certified, since the test requirements are not met.

**Clarification 3:** One example is that a 3GPP mandatory feature (specified in Rel 15) was voluntarily not implemented in such non compliant UE.

Some companies think it would be good to understand specific cases better. Therefore if company has more specific information on specific cases, please indicate in Question 4.

### **Feedback Form 4: Question 4: Could company provide more specific cases for better understanding?**

#### **1 – Apple Hungary Kft.**

Operators should know already the type of UEs that are allowed in their NWs. The goal from clarification 1 is already present/achieved... otherwise how would the proponents know that such UEs exist?! The proponent should also know that the UEs are not certified...

So what is being achieved by this question? What further understanding is needed for the three clarifications? Are the clarifications not clear?

#### **2 – Deutsche Telekom AG**

We are still puzzled what we discuss here ?

- Do we discuss how non-standard compliant UEs are identified initially (e.g. the process of fault disclosure) ?
- Do we discuss how non-standard compliant UEs are listed in an "entity" ?
- Do we discuss how non-standard compliant UEs are identified in the network ?
- Do we discuss something else ?

For those of you who still remember a very successful 30y old ETSI/3GPP technology called GSM: There was an network element in the architecture called "EIR" (Equipment Identity Register) where IMEIs of faulty UEs (MS at that time) were stored. Lists were maintained by GSMA\*\* ... (is this a potential concept we discuss?) .. I also remember a UMTS TR which was intended to list non-compliant/faults of UEs (not the IMEI, but the fault ..) .. is this what we seek ?

Could proponents of RP-222163 please clarify ?

Thanks.

\* [https://en.wikipedia.org/wiki/Central\\_Equipment\\_Identity\\_Register](https://en.wikipedia.org/wiki/Central_Equipment_Identity_Register)

\*\* <https://www.gsma.com/latinamerica/wp-content/uploads/2014/11/IMEI-Database-Overview.pdf>

### **3 – Beijing Xiaomi Mobile Software**

We are wondering if the intention is for 3GPP to design a solution to help identifying whether UEs are certified or not. If so, we are wondering whether network can already acquire this information based on IMEI by database provided by certification organization? If the intention is to let UE to report whether it is certified or not, how to prevent non-compliant from cheating the network?

### **4 – Beijing Xiaomi Mobile Software**

We are wondering if the intention is for 3GPP to design a solution to help identifying whether UEs are certified or not. If so, we are wondering whether network can already acquire this information based on IMEI by database provided by certification organization? If the intention is to let UE to report whether it is certified or not, how to prevent non-compliant from cheating the network?

### **5 – Beijing Xiaomi Mobile Software**

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### **6 – TELECOM ITALIA S.p.A.**

to DT: I agree there is no easy way forward, since the industry knows about some models not 3GPP-compliant. However, this information may not be known to all MNOs with uncertain impact on the network. A solution like the Equipment Identity Register, hosted by GSMA, could be a good way forward

### **7 – CATT**

It is an interesting topic. It seems we need to face the problems caused by non-compliant UEs. As a network equipment vendor, we would like to emphasize that NR-RAN nodes want to know if a UE is a non-compliant UE and its real capabilities including (non-)support of mandatory features. So that the network could have a good behaviour on the UE. Currently, perhaps we can further check if EIR can work and can be used in 5G.

Regrading Question 2 and 3, based on the discussion so far, most companies think that although 3GPP cannot be responsible of finding compliant or not compliant UEs but 3GPP can develop tools to better understand UE's feature support. Therefore moderator would like to reformulate the question as suggested by some companies. The Question 5 is listed as follows:

Question 5: Do we 3GPP need to investigate mechanism(s), to better understand UE's feature support (i.e., help operator to find non compliant UE).

It should be noted that the mechanism maybe already exist (e.g., IMEI-SV ). Maybe the existing method can be reused (as an example mandate the RACS ID to report the manufacturer-assigned UE radio capability ID). Maybe new method can be developed (e.g., network asks R18 and beyond UEs to report certification information).

For Q5, our focus should be necessity rather than solution direction.

**Feedback Form 5: Question 5: Do we 3GPP need to investigate mechanism(s), to better understand UE's feature support (i.e., help operator to find non compliant UE).**

**1 – Apple Hungary Kft.**

In our view, 3GPP is **not in the business of enforcing compliance**. If the proponents are concerned about this, they should co-ordinate with the testing/conformance/regulatory authorities in terms of understanding the device's abilities in terms of what the it supports and what it does not. If the proponents are not happy about the process, we think the proponents should consult with their regulatory/conformance certification authorities and not bring this to 3GPP as 3GPP is not the place for this.

**2 – VODAFONE Group Plc**

We also believe that if someone believe IMEISV or other existing mechanisms are not enough, it is always possible to open a new SI or WI with a concrete proposal. In general, I feel some sympoty to the proposal to discuss if e.g. 3GPP could creat a list where companies could provide an information about non compliant features...

**3 – TELECOM ITALIA S.p.A.**

to Vodafone: I agree the IMEISV or other solutions can solve the issue when the issue is known. The problem is that the non-conformance may be unknown to the network and looking for a general solution was the scope of the contribution. A possible way forward could be the creation of something like Equipment Identity Register (for GSM devices) hosted by GSMA

**4 – Intel Corporation (UK) Ltd**

As mentioned by others, there are mechanisms such as IMEISV that can help operators manage such devices. From the information received so far it is not yet clear anything more needs to be done in 3GPP. But we are always open to consider new information or proposals.

In general, 3GPP standards rely on UEs complying to certain mandatory features and requirements and we should be very cautious before taking action that might make it easier for vendors to produce non-compliant devices, or even having the unintended consequence of encouraging non-compliant devices.

If the answer of Q5 is yes, moderator provides two options to go.

**Option 1:** Continue the discussion in RAN to figure out which working group should lead the responsibility for further investigation on mechanism.

**Option 2:** Task RAN2 to do technical investigation on the feasibility and figure the corresponding working groups to complete the work.

**Feedback Form 6: Question 6: Which option do you prefer if your answer to Q5 is yes?**

**1 – Nokia Corporation**

In our view working groups like RAN2 should not be tasked to work on this until the goal of this effort is clear and all the companies have the same understanding of the goal. This does not seem to be the case at the moment.

**2 – Intel Corporation (UK) Ltd**

Agree with Nokia comment that at the moment nothing should be tasked to RAN2 or indeed any other WG.

If the answer of Q5 is no, no action will be taken except closing the discussion...

### 3.3 Final round discussion

Based on two rounds of discussion. Companies, who are interested in this topic, already clearly know what happened and fully understand the issue proposed in RP-222163. However regarding where and how to cope with this issue (i.e., UEs not complying with 3GPP specs are commercialized), the opinions are diverse. Moderator thinks the consensus cannot be achieved in this meeting to trigger some certain action. Therefore the flowing proposal is given to complete the discussion for this meeting.

**Proposal:** RP-222163 is noted in chair notes and the related discussion can be continued and driven by contributions with more details of solutions.

**Feedback Form 7: Do company agree with this proposal?**

**1 – VODAFONE Group Plc**

agree

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## 4 Conclusion

**Proposal:** RP-222163 is noted in chair notes and the related discussion can be continued and driven by contributions with more details of solutions.



