**3GPP TSG RAN WG2 #118-e R2-220xxxx**

**Electronic Meeting, 9th May – 20th May 2022**

**Source: vivo**

**Title:** **[Post118-e][081][TEI17] Early Measurements for EPS fallback (vivo)**

**Agenda Item:** **6.21.2**

**Document for: Discussion and Decision**

1. Introduction

This contribution is for the following email discussion.

* [Post118-e][081][TEI17] Early Measurements for EPS fallback (vivo)

Scope: Resolve the FFS of the meaning of the bit (if possible) Update and agree CR

Intended outcome: Report if needed, Agreed CR

Deadline: Phase1 Until 18:00(UTC) Thursday

Collect comments from companies and give the summary

Phase2 Until 12:00(UTC) Friday

Discuss the CR and give the final CR

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| --- | --- |
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1. Discussion
   1. **Background**

During RAN2 118 meeting online session, EPS fallback enhancement was discussion.

R2-2206594 [AT118-e][081][TEI17] Early Measurements for EPS fallback (vivo) vivo

DISCUSSION

P1 P2

* BT cannot agree on the compromise. It says it is up to UE impl.
* Apple think we need to compromise, are ok with the proposals. For P1 alone cannot accept that.
* KDDI support these proposal, but think more detailed discussion is needed.
* ZTE think key point of this is up to UE impl, not clear what UE will report.
* Nokia think the most important proposal is P2, which bring change. Think we use it also for blind redirection.
* VDF think we add this note into the section for EMR, so at least the EMR reporting fwk is used, and this is about Idle mode measurements, less accurate etc. and think it is up to UE impl to what ext to measure. VDF think SIB info may not be needed, think the UE can know anyway the frequencies. VDF would like to use the FWK for this, if the network doesn’t trust a UE the network can ignore.
* QC think the measurement for early reporting the performance scales dep on number of freq etc. Need to ensure that this will not degrade perf for other existing cases. LGE wonder how to do this, shall the UE measure more often QC thik yes.
* CMCC support both. Think this will help, will speed up.
* HW are ok with P1, not sure about P2. HW think the UE can know anyway.
* Ericsson think that is we agree P2 we need to work more on the details.
* Nokia are ok with P1 alone.
* MTK think P1 and P2 are ok now.
* BT think for P2, the UE will be choosing the frequencies etc. but for HO we have less. BT think that if we don’t have the SIB the UE doesn’t know that it should measure.
* BT think the UE will anyway fail the handover with this mechanism.

P2

* Apple think the UE doesn’t know the freq. IF the UE may store info, the we don’t need any standards impact.
* CU wonder if UE can attempt EPS fallback by its own. .Chair think that SA2 replied NO.
* VDF doesn’t have so big fear as BT, want to use the EMR fwk to report LTE freqs. Would be used for redirection for volte call.
* KDDI think not all TLE freq support voice call so P2 is useful.

Chair wonder if we can agree to P1 and P2

* BT voices sustained objection for P2.

Chair wonder of we can agree only P1.

* Apple think the UE need to know.
* Chair wonder if we can replace P2 by a single bit (which would tell the UE that he could try, i.e that network support EMR for this purpose.), and then the UE would need to use stored freq info, or freq for IRAT cell reselection.
* Apple think such a single bit is not useful, but are ok if the only objecting company
* P1 : It is up to UE implementation whether reuse EMR reporting framework for early EPS fallback measurement reporting. Capture it as the note in TS 38.331. The wording can be “NOTE: It is up to UE implementation whether to measure and report idle/inactive measurements for EUTRA carrier frequencies even if it does not support NE-DC between the serving carrier and the EUTRA carrier frequencies or if T331 is not running.” Precise wording can be further discussed.
* P2: Assistant information in SIB5 is introduced to help the UE to decide if “early EPS fallback measurement” may be used, a single bit. FFS if the bit means that the UE shall use the indicated frequencies for cell reselection or stored freq info.

* 1. **Precise wording for note**

The note from agreement is “**It is up to UE implementation whether to measure and report idle/inactive measurements for EUTRA carrier frequencies even if it does not support NE-DC between the serving carrier and the EUTRA carrier frequencies or if T331 is not running.**”

I would like to invite you to share your views.

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| **Company** | **What is the precise wording for note? And Why?** |
| **vivo** | We are fine with the wording. |
| **ZTE** | Network does not expect the UE to report a E-UTRAN frequency that was not listed in SIB5, so suggest to add “obtained from SIB5”.  The association with SIB5 indication is missing.  “or if T331 is not running” is a bit misleading, we understand the intention is to perform the measurements irrespective of T331, so how about the below revision.  **When *idleModMeasVoiceFallback* is indicated in SIB5, no matter T331 is running or not, it is up to UE implementation whether to measure and report idle/inactive measurements for EUTRA carrier frequencies obtained from SIB5 even if it does not support NE-DC between the serving carrier and the EUTRA carrier frequencies ~~or if T331 is not running~~.** |
| **Nokia** | We agree with ZTE comments – NOTE has no linkage to SIB5 indication  We are not understanding why we highlight T331 in the NOTE – it is always possible for UE to do whatever measurements it likes regardless of timers. So having T331 mentioned in the NOTE seems totally unnecessary. If we have T331 mentioned in the NOTE why do not we list also parameter that explicitly disallows/allows EUTRA idle/inactive measurements *idleModeMeasurementsEUTRA?* For simplicity we would prefer to remove T331 mentioning – if that is not OK then we need to add all the parameters that allow/disallow reporting/measurements.  And probably it is better to write NOTE in style we specify what is extra allowed behaviour instead of saying it is up to UE implementation. Allowing more clearly highglights this is extra behaviour.  **When *idleModMeasVoiceFallback* is included in SIB5, UE is allowed to measure and report idle/inactive measurements for EUTRA carrier frequencies included in SIB5 even if it does not support NE-DC between the serving carrier and the EUTRA carrier frequencies ~~or if T331 is not running~~.** |
| **Qualcomm Incorporated** | We suggest clarifying the behaivour before going into the discussion on detailed wording. After the online discussion in the meeting, we understand the E-UTRA frequencies that the UE optionally measures for the purpose of EPS fallback is those indicated in CarrierFreqListEUTRA in SIB5, as opposed to those indicated in MeasIdleCarrierEUTRA-r16 in SIB11. In other words the measurement configuration as defined in section 5.7.8.1a does not apply.  Is this correct? If so, we tend to agree with Nokia that it is strange to mention T331 or even NE-DC support because the UE is not really using EMR framework for the “measurement” part.  Then for the “reporting”, our understanding is that the UE can use EMR framework. But then it must be clear that the UE populates *VarMeasIdleReport* according to the measurements based on idleModMeasVoiceFallback in SIB5, so that all the existing EMR reporting mechanisms are triggered properly. |
| **vivo2** | @QC  1 After online discussion, I understanding is that the LTE frequency selection ( SIB5 or SIB 11 or both) for early measurement , store and reporting are also UE implementation because we do not give the explicit LTE frequency list in SIB5 or SIB11.  2 For EMR reporting procedure, it can be reused, i.e., store the measurement result in *VarMeasIdleReport,* sending the measurement result availability indication and the network request the measurement result  3 about the note wording, I think that it is better to give it in early measurement section, because someone may assume there are some restrictions about EMR framework reuse. |
| **Ericsson** | We agree with the proposed wording from Nokia. Our understanding is that after the online session it is still FFS whether UE shall use the E-UTRA frequencies in SIB5 or SIB11. We tend to agree though with Qualcomm that since the indication is added in SIB5, it is better to use the list in SIB5, and not mix with the list in SIB11, which is for CA/DC setup. With this understanding, we also agree the reference to T331 is not needed in the note. Instead, the note shall refer to the SIB5 indication, as in the proposal from Nokia above. |
| **BT** | Our understanding is that E-UTRAN frequencies in SIB5 are the ones used by the UE to perform early measurements since SIB5 contains information that can help the UE to prioritize which frequencies are measured.  Based on the agreement, the solution is completely up to UE implementation but one concern from our side is that UE does not have a similar requirement than it is defined in 38.331 5.7.8.2a. Therefore we propose:  **When *one-bit-name* is included in SIB5, UE is allowed to measure and report idle/inactive measurements for EUTRA carrier frequencies included in SIB5 as long as the requirements in TS 38.133 [14] are met for measurement reporting. ~~even if it does not~~ NE-DC support ~~NE-DC~~ between the serving carrier and the EUTRA carrier frequencies is not required.**  Open question: considering a UE that supports this feature will perfom the measurements without knowing in advance which traffic type will be initiated, do companies consider it is possible to reuse this for any traffic type? |
| **vivo3** | @BT  Now it is assumed that only voice service should use EPS fallback measurement.  For wording, I assume that BT’s version claimed most of concerns from other companies. It may be baseline version.  **“When *idleModMeasVoiceFallback* is included in SIB5, UE is allowed to measure and report idle/inactive measurements for EUTRA carrier frequencies included in SIB5. as long as the requirements in TS 38.133 [14] are met for measurement reporting. NE-DC support between the serving carrier and the EUTRA carrier frequencies is not required.”** |
| **Apple** | The latest version from vivo3 seems fine. It's always good for UE to have a clear understanding which frequencies are the intended ones, and limited to frequencies in SIB5 is reasonable. |
| **MediaTek** | Which frequency to measure (SIB5, SIB11, or both) is still not decided during the online discussion. Giving the comment above, we are fine to assume LTE frequency in SIB5 are used.  We prefer the wording form Nokia as below.  **When *idleModMeasVoiceFallback* is included in SIB5, UE is allowed to measure and report idle/inactive measurements for EUTRA carrier frequencies included in SIB5 even if it does not support NE-DC between the serving carrier and the EUTRA carrier frequencies ~~or if T331 is not running~~.**  We should NOT mention **RAN4 requirements** as TEI-17 shouldn’t impact RAN4. If we want to discuss RAN4 requirement, we should postpone the feature. Adding **RAN4 requirement** as the wording in viov3 does not help. It is completely unclear which requirement we are talking about. |
| **KDDI** | 1. RAN4 requirement: We have some sympathy with BT, we share the consern on that UE does not have a similar requirement. But at the same time if we add some wording relate to RAN4 specification, we think we need RAN4 view. We are supportive but it may not be acceptable to opponents. 2. SIB5 or SIB11 : We don’t want to completely preclude UE implementation using SIB11. So propose to add a sentence like below(purple highlited)   **When *idleModMeasVoiceFallback* is included in SIB5, UE is allowed to measure and report idle/inactive measurements for EUTRA carrier frequencies included in SIB5 even if it does not support NE-DC between the serving carrier and the EUTRA carrier frequencies ~~or if T331 is not running~~.** It’s up to UE implemenation whether to use *measIdleConfigSIB* in SIB11 additionaly for the measurements. |

* 1. **One bit in SIB5**

We need to discuss the meaning of one bit in SIB5 as the agreement.

**FFS if the bit means that the UE shall use the indicated frequencies for cell reselection or stored freq info**

From email rapporteur point of view, the network may enable Case1-3 operations as shown in[1].

* Case 1 If the network wants to have measurement report. It can configure normal connected mode measurement on the target frequency.
* Case 2 If the network wants to use blind redirection. It can just redirect the UE to the target frequency.
* Case 3 it is up to UE implementation whether reuse EMR reporting framework for early EPS fallback measurement reporting,

We can categorize them as measurement reporting and cell reselection, the wording may be like the below highlighted in Yellow. However I would like to invite you to share your views.

***earlyMeasVoiceFallback***

indicate UE shall store the latest idle measurement results on EUTRA carrier frequencies for potential measurement reporting and cell reselection.

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| **Company** | **Indicated frequencies for cell reselection or stored freq info? What is the wording you suggest?** |
| **Huawei, HiSilicon** | **No, this is optional for UE anyway via implementation, why now the wording indicates a mandatory behaviour? In addition we understand this is to indicate to the UE the intention from the NW side. Therefore we suggest the below:**  Indicate the network may use early measurements even if NE-DC is not configured. |
| **vivo** | The sentence highlight in yellow is to cover all three cases i.e., RRM connection state measurement for Handover, idle measurement for blind redirection and early EPS fallback measurement and report.  It may be changed to optional description for early measurement part, i.e., However if UE has done the early measurement **(optional)**, the UE shall store the measurement.  “indicate UE shall store the latest idle measurement results on EUTRA carrier frequencies, if UE has done early measurement for potential measurement reporting and cell reselection.” |
| **ZTE** | The above revision from Vivo seems incorrect. Even if this flag is absent, the UE shall store the results if the UE has done EMR, right?  The indication is to inform the UE whether the network can process the report sent by the UE to speed up EPS fallback. The UE behaviour is already captured in the Note, no need to repeat UE behaviour in field description.  And sugest to align the parameter name with other early measurement parameters.  ***idleModeMeasVoiceFallback***  Indicates whether the cell supports to use E-UTRA idle/inactive measurements for EPS fallback. |
| **Nokia** | We specify from UE point of view – Why we need to indicate something network supports. We specify what is allowed to be done by the UE. Thus field description shall not have indicate something network supports but what UE is allowed to do e.g. something like this (btw agree with ZTE naming):  ***idleModeMeasVoiceFallback***  Indicates whether the UE may do E-UTRA idle/inactive measurements and reporting for EPS fallback.  In fact we would prefer to put whole note in the field description as it seems unnecessary duplication of UE behavour to have both field description and NOTE. |
| **vivo2** | We also think it is better to say from UE point of view. |
| **Ericsson** | We agree with the proposed wording from Nokia as baseline, but we think it would also be good to link this indication to the reporting using the EMR framework. One way could be a reference to section 5.7.8.2a for the reporting part, as indicated below in blue.  ***idleModeMeasVoiceFallback***  Indicates whether the UE may do E-UTRA idle/inactive measurements and reporting for EPS fallback as described in section 5.7.8.2a. |
| **BT** | Align with our Q2.2 answer, we agree with Ericsson proposal to make a reference to 38.331 5.7.8.2a.  The description should refer the section where the above note is captured. That will remove any doubt about which frequencies are included for E-UTRA idle/inactive measurements.  ***idleModeMeasVoiceFallback***  Indicates whether the UE may do E-UTRA idle/inactive measurements and reporting for EPS fallback as described in section 5.7.8.2a (and section x.x.x in case the note above is not captured in 5.7.8.2a).  We have an open question in Q2.2. If companies consider this is possible, ***EarlyIdleModeMeas*** looks more appropriate. Othercase, we are fine with ***idleModeMeasVoiceFallback***. |
| **vivo3** | @ BT  In history, Some companies wanted to use early measurement also for load balance. It should be discussed further. Now we just discuss early measurement for EPS fallback. We also add the note in 5.7.8.2a, so the last sentence from your suggestion is not needed.  For wording, I assume that Ericsson’s version claimed most of concerns from other companies. It may be baseline version.  ***idleModeMeasVoiceFallback***  Indicates whether the UE may do E-UTRA idle/inactive measurements and reporting for EPS fallback as described in section 5.7.8.2a. |
| **Apple** | First, we agree “shall” should not be used. This is not a mandatory feature. And it’s fine to specify it from UE perspective.  And, do we really need refer to section 5.7.8.2a? In that section, there are a bunch of parameters mentioned, like *idleModeMeasurementsEUTRA* in SIB1*,* *reportQuantitiesEUTRA, measCellListEUTRA, maxCellMeasIdle, qualityThresholdEUTRA*, etc. Referring to this section leads to a big confusion if UE should follow the exact procedure defined in 5.7.8.2a. For example, should UE check the configuration in SIB11 to figure out which quantiy to report, and how many LTE cells to report? If NW does not configure SIB11, how should UE handle it? Thus, we suggest to remove “as described in section 5.7.8.2a”. |
| **MediaTek** | No. We prefer ZTE’s wording as below.  ***idleModeMeasVoiceFallback***  Indicates whether the cell supports to use E-UTRA idle/inactive measurements for EPS fallback.  We don’t understand why an SIB indicator cannot indicate that the cell support something. We have example as below. The UE behavior (UE may do something) is already capture in the NOTE. No need to repeat that in field description.  ***eCallOverIMS-Support***  Indicates whether the cell supports eCall over IMS services as defined in TS 23.501 [32]. If absent, eCall over IMS is not supported by the network in the cell. |
| **KDDI** | Tend to agree with Apple, We should keep it simple so as not to create confusion.  ***idleModeMeasVoiceFallback***  Indicates whether the UE may do E-UTRA idle/inactive measurements and reporting for EPS fallback. |

1. Conclusion

For Precise wording for note, most companies think the indication in SIB5 should be mentioned. all companies agree the frequencies in SIB5 should be followed, one operator still does not want to exclude SIB11. One company has the concern to say something about RAN4 requirement.

The email discussion rapporteur suggests the below proposal.

**Proposal 1: Capture the note “Note: When idleModMeasVoiceFallback is included in SIB5, UE is allowed to measure and report idle/inactive measurements for EUTRA carrier frequencies included in SIB5 even if it does not support NE-DC between the serving carrier and the EUTRA carrier frequencies.” in section 5.7.8.2a of TS 38.331.**

**Proposal 2:It can be discussed whether frequencies in SIB11 shall be included in above note next meeting.**

For one bit in SIB5, most companies prefer Nokia’s version. Some companies want to describe it from the network point of view some companies want to describe it from UE point of view. MTK gave an existing example. The email discussion rapporteur think that we can describe it from network point of view because we have the example, and if the network wants to indicate it, it should give clear information, otherwise the network can indicate nothing anyway.

The email discussion rapporteur suggests the below proposal.

**Proposal 2: One bit “ idleModeMeasVoiceFallback” is broadcasted in SIB5 and indicates whether the cell supports to use E-UTRA idle/inactive measurements and reporting for EPS fallback.**

1. Reference

[1] R2-2206594 [AT118-e][081][TEI17] Early Measurements for EPS fallback (vivo) vivo