3GPP TSG-RAN WG2 Meeting #119bis Electronic R2-220xxxx

Elbonia, 10 – 19 November 2022

**Agenda item: 8.4.2.2**

**Source: Nokia (Rapporteur)**

**Title: Report of [AT119bis-e][023][feMob] Terminology (Nokia)**

**WID/SID: NR\_Mob\_enh2-Core - Release 18**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the report of the following email discussion:

* [AT119bis-e][023][feMob] Terminology (Nokia)

Scope: continue discussion on a better name for L1L2 centric mobility. Other terminology could also be addressed, e.g. the naming of the part of the procedure when serving cell change happens could be improved, e.g.: cell change, L1L2 cell switch, LLM cell change etc.

Intended outcome: Agreeable proposal(s)

Deadline: CB W2 Monday

# 2 Contact Points

Respondents to the email discussion are kindly asked to fill in the following table.

|  |  |  |
| --- | --- | --- |
| Company | Name | Email Address |
| Nokia (Rapporteur) | Tero Henttonen | tero.henttonen@nokia.com |
| Lenovo | Prateek | [pmallick@lenovo.com](mailto:pmallick@lenovo.com) |
| Huawei, HiSilicon | Yulong | shiyulong5@huawei.com |
| Futurewei | Jialin Zou | Jialinzou88@yahoo.com |
| MediaTek | Li-Chuan TSENG | li-chuan.tseng@mediatek.com |
| Qualcomm | Ozcan Ozturk | oozturk@qti.qualcomm.com |
| CATT | Rui Zhou | zhourui@catt.cn |
| vivo | Chenli | Chenli5g@vivo.com |
| OPPO | Xin You | youxin@oppo.com |
| Sharp | Kyosuke Inoue | kyosuke\_inoue@sharp.co.jp |
| LG Electronics | SeungJune Yi | seungjune.yi@lge.com |
| Xiaomi | Yumin Wu | wuyumin@xiaomi.com |
| ZTE | Mengjie Zhang | zhang.mengjie@zte.com.cn |
| Samsung | Seungri Jin | seungri.jin@samsung.com |
| Ericsson | Antonino Orsino | antonino.orsino@ericsson.com |
| NTT DOCOMO | Souki Watanabe | souki.watanabe.gf@nttdocomo.com |
| InterDigital | Brian Martin | Brian.martin@interdigital.com |
| KDDI | Yoshitaka Takaku | yo-takaku@kddi.com |
| Fujitsu | Meiyi Jia | jiameiyi@fujitsu.com |
| Transsion Holdings | Wen wu | Wen.wu5@transsion.com |
| Vodafone | Chandrika Worrall | Chandrika.worrall@vodafone.com |

# 3 Discussion

3GPP work often requires precise terminology to ensure everyone is talking about the same thing. But terms also often arise haphazardly and at the “spur of the moment”, such as “Node-B” and “LTE”, neither of which was meant to live as long as they have. 3GPP terminology often becomes somewhat clunky because of this, leading to very long strings of words, which can even end up spending excess time due to time spent writing, reading, and pronouncing the terms over and over.

In the email discussion for L1L2 centric mobility (see the report in R2-2210329), Nokia raised the topic of terminology, proposing to use “lower layer mobility” or “LLM” for short. There was no consensus on this and the RAN2#119bis online discussion didn’t converge either, so this email discussion attempts to see what (if anything) can be concluded on the terms. As the discussion scope states, this discussion should aim to have concise terminology for the whole “L1/L2-centric inter-cell mobility”, including the naming of the part of the procedure when serving cell change happens could be improved, e.g.: cell change, L1L2 cell switch, LLM cell change and so on.

The most discussed proposed so far has been the “LLM”, with some of the counter-arguments listed below:

1. LLM was already used in GPRS (where it meant “Logical Link Management”)

* Rapporteur notes that 3GPP does try to avoid having same acronym for two different meanings, but this has unfortunately already been broken several times, as the following examples of some common RAN2 acronyms show:
  + CG = “Configured Grant” (38.300) and “Cell Group” (36.213)
  + RRC = “Radio Resource Control” (3x.331), “Root Raised Cosine” (36.143) and “Range Rate Correction” (37.355)
  + MAC = “Medium Access Control” (3x.321) and “Message Authentication Code” (24.301)
  + RA = “Random Access” (3x.321, 3x.331) and “Registration Area” (23.700)
  + TA = “Timing Advance” (3x.321) and “Tracking Area” (21.905)
  + FR = “Frequency Range” (38.101-1) and “Full Rate” (26.267)

These examples illustrate that acronyms have been reused multiple times in 3GPP where context makes the meaning clear. But it is clear that reuse of acronyms at least within RAN(2) domain and for the same technology should be avoided.

1. What does “lower” mean – we should be more precise since also L3 configuration can be changed

* Rapporteur notes that being precise **is** important, so “lower” is indeed ambiguous but no less than the “L1/L2-centric” in the current term. And triggering mobility via non-RRC signalling (e.g. L1 or L2 signalling) doesn’t mean there couldn’t be changes to L3 (=RRC) configuration. The label only denotes the intent, not all the impacts it has. Conciseness should come before absolute adherence to the full level of Stage-3 details.

1. Pronunciation of “LLM” may be difficult since it’s close to “RRM” (in terms of at least some languages)

* Rapporteur notes that pronunciation is relevant and can make it difficult to use a term – a case in point would be “RLC” and “RRC”. RAN2 should try to avoid confusion with pronunciation where possible.

1. The WI term has to be used since it’s written in the WI

* Rapporteur notes that 3GPP WIs are not written so that they determine the used acronyms: Instead, they convey the **intent** of the WI, not the final outcome. The terms used when writing WI are not always the best ones and this argument cannot be the only reason. Hence, this is not a valid argument except as a “fallback” in case all else fails.

With these, we think it’s probably easiest to just indicate which terms are acceptable, which are NOT acceptable and why. The discussion should consider the feature naming (i.e. the acronym), the procedure naming (i.e. what do we call the cell change using this new mechanism) as well as the definition of the term (similar to e.g. RRC clause 3.1)

**Question 1**: Which term to use for the **feature** of L1/L2-centric inter-cell mobility (i.e. procedure of having pre-configured RRC configuration that is switched via L1/L2 signalling)?

Candidates (please add proposals to the list):

1. L1L2ICM (L1/L2-centric inter-cell mobility)
2. LLM (Lower Layer Mobility)
3. L2M (L2 Mobility)
4. L1M (L1 Mobility)
5. LTM (L1/2 Triggered Mobility)
6. LLM (L1/L2-centric mobility)
7. L1L2M (L1/L2 Mobility)
8. LLCM (L1/L2-Centric Mobility)
9. ICLLM (inter-cell L1/L2 mobility)

|  |  |  |
| --- | --- | --- |
| Answers to Question 1 | | |
| Company | Acceptable candidate(s) | Justification |
| Lenovo | 2) | 1) is very long and difficult to type.  3) or 4) can’t be chosen now since we really don’t know how the LL mobility procedure will look at the end (which layer(s) are involved)  I agree LLM exists as ‘Logical Link Management’ but the two contexts are really non overlapping and therefore there’s hardly any risk of interpreting it differently. There are tons of other existing abbreviations that have even closer expansions e.g., CG (Configured Grant, Carrier Group, Cell Group, Cloud Gaming, Channel Gain and so on).  While talking LLM can be spoken in the full form – is not that long 😊 |
| Huawei, HiSilicon | 5) LTM | We suggest a new term, see 5) LTM short for (L1/2 Triggered Mobility).  Our point is that “Triggered” should be included, otherwise, the term cause the confusion that the R18 mobility only updates the L1/L2 layer parameters.  Actually, “L1/L2 mobility” has two folds of meaning:  1, the mobility decision is triggered by L1 measurement  2, the mobility is triggered by L1/L2 signalling.  So, Both “L1” and “L2” should be there.  The variant of 5) can be “LLTM” of “L1/L2 Triggered Mobility”. Four letters makes less possibility of collision.  LLM is indeed hard to pronounce, and similar to RLM, RRM.  L2M has the confusion as “L2 Measurement”. |
| Futurewei | 6)=1) descrption+2) abbreviation | We think WID description “L1/L2-centric inter-cell mobility” is precise. People talking orally “L1L2 mobility” and understand what it means. Making any change regarding to WID description will cause confusion. “Lower Layer Mobility” also not very precise comparing with WID description. The problem seems with abbreviation for the WID. Since L1/L2 Mobility includes inter-cell and intra-cell is really what we want. Therefore, we suggest to define:  LLM stands for “L1/L2-centric Mobility”. Orally we still say “L1L2 mobility” and in written we could use LLM.  In general, at this stage we prefer to minimize the terminology changes. |
| MediaTek | 2) or 1) | We believe that the original wording of “L1/L2-centric Inter-cell Mobility” describes the new Rel-18 procedures very well. However, we do agree that the name may be too long. If we want to change it, we call it “lower-layer mobility (LLM). If no consensus, we keep (1)  (3) and (4) are not OK since both L1 and L2 are involved  (5) and (6) do not have nice abbreviation (a bit strange to have ‘L’=’L1/L2’) |
| Qualcomm | 2 | This is just a name and we don’t need to spend too much time, especially that 3GPP does not have the greatest names for many important features (note the 3G here) and we are not a marketing group. We have picked the names MBB, DAPS, CHO without much discussion, even though one can easily nitpcik about those as well; but so far it didn’t break anything. What matters of course is the actual specification. 5 or 6 is also acceptable if majority prefers. |
| CATT | 5 | The key difference between R18 mobility and legacy HO is that the mobility is triggered via L1/L2 signalling, so Option 5) seems the most precise one. |
| vivo | 3) | According to the current discussion, it seems the mobility should be triggered by L2 signaling, i.e. MAC CE, so it is quite straightforward to call it L2 Mobility. Although L1 measurement is agreed to trigger mobility decision, we think it is still possible for the serving DU to trigger mobility without L1 measurement, e.g. blind handover. Thus, L1 is not the essential for the mobility we discussed here. In this way, there may be no need to include “L1” in the name.  In addition, we use the term “L3 mobility/HO” before. It is corresponding to use “L2 mobility/HO” here.  Besides, it is still possible to introduce DCI based mobility in the future. At that time, we could use the name of DCI based mobility as “L1 mobility” correspondingly. If we use “lower layer mobility” here, we wonder how to define DCI based mobility (if any) in the future? |
| OPPO | 1 ) or 2) | We share the same view as MTK. 1) seems too long as an abbreviation but it best fit to WID. We are fine to adopt 2) if it is preferred by majority. |
| Sharp | 2) or 7) | 1) is too long to use for term.  3)/4) cannot be used for term now because it is still FFS that whether a MAC CE or a DCI is used for the actual triggering of the mobility.  So we prefer 2), but we also agree that the wording “lower” may be ambiguous. Then we suggest 7) L1L2M (L1/L2 Mobility). This suggestion can also avoid the potential collision by other acronyms.  For 5) and 6), it is also acceptable by modifying L1L2TM (L1/L2 Triggered Mobility) and L1L2CM (L1/L2-Centric Mobility) to handle MTK’s concern. |
| LGE | 8 | We want to use a new terminology “LLCM” considering following requirements:  - The terminology should be short  - The terminology should be easily pronounced  - The terminology should not make any confusion  - The terminology should clearly describe the feature  1) L1L2ICM (L1/L2-centric inter-cell mobility) is too long and difficult to pronounce  2) LLM (Lower Layer Mobility) could be ok but may be confused with RRM  3) L2M (L2 Mobility) does not describe the feature clearly  4) L1M (L1 Mobility) does not describe the feature clearly  5) LTM (L1/2 Triggered Mobility) does not describe the feature clearly  6) LLM (L1/L2-centric mobility) could be ok but may be confused with RRM  7) L1L2M (L1/L2 Mobility) is too long and difficult to pronounce  So, our preference is 8) LLCM, and 2) or 6) LLM is second preference. |
| Xiaomi | 2) or 3) | 1) which is too long should be avoid. Since MAC CE is anyway needed according to the latest RAN2 agreement, 3) seems more accurate for such function. 2) is also ok for us, and we don’t think that “lower layer” needs to be clarified for an abbreviation. |
| ZTE | 1. or 7) | We think it’s more straightforward to use L1/L2 mobility since both L1 measurement and L2 signalling (i.e. MAC CE) are involved. And this name can be easily distinguished from L3 mobility/HO. So 6) or 7) is preferred. 5) or 8) is second preference.   1. is too long and difficult to pronounce.   For 2), we think it may cause some ambiguity which layer does “lower layer” refer to. If both L1 and L2 are involved and included in the lower layer, why not we just use “L1/L2” for clear indication? |
| Samsung | 1 ) or 2) | We share the same view as MTK. 1) seems too long as an abbreviation but it best fit to WID. We are fine to adopt 2) if it is preferred by majority. |
| Ericsson | 9) | In general, we think that the terminology mentioned in the WID captures exactly what this new Rel-18 procedure is about and what we want to achieve. According to this, our preference is to keep the current terminology of “L1/L2 based inter-cell mobility”  However, if an acronymic is really needed for this procedure we would like the meaning to be as close as possible to that mentioned in the WID. For this reason we think ICLLM (inter-cell L1/L2 mobility) is good enough. |
| NTT DDOCOMO | 1. or 8) | ・Since this function involves both L1 and L2, it is easier to understand if both are referred to by name.  ・It should also be as short and easy to pronounce as possible.  ・No duplication with abbreviations already in use.  Considering the above-mentioned points, 7) 8) is considered to be a good choice. |
| InterDigital | 5 | We don’t have a strong opinion but 1, 7, 9 are too verbose, something short would be preferable and L1/2 Triggered Mobility” seems to best describe the mechanism – L1/2/3 are all involved, the main aspect at lower layer is the measurements and triggering. |
| KDDI | 7) | We think 7) is easily distinguished from L3 HO. |
| Nokia, Nokia Shanghai Bell | 2, 3, 4 or 5 (with modifications) | RAN2 already agreed on the following:   * RAN2 assumes L1/2 mobility trigger information is conveyed in a MAC CE, FFS if the MAC CE or a DCI is used for the actual triggering.   So in any case, MAC will be involved. This points to “L2M” as usage. If in the end DCI ends up being the trigger, “L1M” would be more accurate.  We proposed 2 because it keeps the whole point of which layer triggers the mobility abstract, without needing to have detailed exposed in the name and not pre-empt any decisions. The name having “L1/L2” creates ambiguities at this point when we don’t know what is L1 and what is L2.  Proposal 5 could be a compromise going forward wtiht he intent that once the triggering signalling is decided, it becomes either “L1-Triggered Mobility” or “L2-Triggered Mobility”, but the acronym “LTM” stays the same. |
| Fujitsu | 5) or 8) | 1) and 9) are too long and should be avoided. Lower layer in 2) may be ambiguous. It is FFS if the MAC CE or a DCI is used for the actual triggering, so, 3) or 4) cannot be determined now. 6) may be confused with ‘RRM’ in pronunciation. 7) is hard to pronounce.  5) or 8) is acceptable. |
| Transsion Holdings | 1. Or 5) | We think both 2) or 5) is acceptable. |
| Vodafone | 6) | As the procedure involves many aspects , other tan L1/L2, it is good to indicate L1/L2 centric in the term. This is also closely related to the term used in the WID. |

**Summary 1**: The views are quite mixed, but several companies wish to (somehow) invoke the L1/L2 aspect of the feature, while many are also fine with “lower layer”, and several also consider that “L1/L2-triggered” would convey the right meaning. Rapporteur thinks that the term used should consider all of these points the “LX-triggred mobility” or “LTM” would be used, where the “LX” would become either “L1” or “L2” once RAN2 decides on which layer actually triggers the mobility (i.e. if triggering is done by DCI, “L1” is used and if triggering is done by MAC CE, “L2” is used).

**Proposal 1**: RAN2 to use “LX-triggered mobility” or “LTM” as term for the L1/L2-triggered mobility. LX will become either “L1” or “L2” once it’s known whether the triggering is by L1 (DCI) or L2 (MAC).

**Question 2**: Which term to use for the **procedure of cell change** (i.e. changing serving cell via means related to L1/L2 signalling)?

Candidates (please add proposals to the list):

1. Cell switch
2. Cell change
3. Cell Mobility
4. Cell replace

|  |  |  |
| --- | --- | --- |
| Answers to Question 2 | | |
| Company | Acceptable candidate(s) | Justification |
| Lenovo | All three |  |
| Futurewei | All three | We think all three term could be used. 1) is more specific for HO situation. 2) can be used for DC based mobility. 3) could be used for HO and DC based cell changes. |
| MediaTek | 1) | Actually all three are OK, but if we want a specific term the describe the procedure where UE moves from one cell to another, let’s call it ‘cell switch’. |
| Qualcomm | 1 or 2 | Most people seem to use these terms. 3 is fine is majority prefers. |
| CATT | 1 | Agree with Mediatek |
| vivo | 1) or 2) | We usually use “mobility” or “cell switch/change”, while the later one is more precise. Besides, the term “cell mobility” covers both intra-cell mobility and inter-cell mobility cases. It may cause ambiguity to use the term “cell mobility” for cell change (i.e. inter-cell mobility). |
| OPPO | 1 or 2 | Slightly prefer 1) and 2), but we are also fine with 3 if it is majority. |
| Sharp | 1) | According to the agreements, we assume that candidate (target) configuration is received before L1/L2 Mobility is triggered and the serving cell(s) is switched to the indicated cell(s) upon the triggering of the L1/L2 Mobility. Therefore, it is natural to call it “Cell switch”. 2) or 3) is also fine if majority prefers. |
| LGE | 4 | We want to use a new terminology specific to the new procedure, i.e. changing serving cell via means related to L1/L2 signalling.  We think 2) and 3) are already used in legacy, so should be avoided. |
| Xiaomi | 1) |  |
| ZTE | 1) |  |
| Samsung | 1 or 2 |  |
| Ericsson | 1) |  |
| NTT DOCOMO | 1) or 2) | I think “change/switch” is a good, simple representation of how it works. |
| InterDigital | 2 | Cell change is already used extensively. |
| KDDI | 1 or 2 |  |
| Nokia, Nokia Shanghai Bell | 1 or 4 (but in the end any is fine as long it’s clear) | 1) seems simplest but in the end clarity is the most important point. We have some sympathy with LGE point that having new terminology may help e.g. in specification text writing to disambiguate from existing L3 mobility. |
| Fujitsu | 1) or 2) | We agree with vivo that “cell mobility” covers intra-cell case as well. So, it should be avoided.  In HO case, 1) can be used while 2) can be used for DC case, e.g. PSCell change. |
| Transsion Holdings | 1 or 2 |  |
| Vodafone | 1 or 2 |  |

**Summary 2**: Most companies prefer either “cell change” or “cell switch”, while some companies point out that we need a clear term to distinguish from legacy procedures. Since the “cell switch” has most support (16 companies are fine with that, compared to 10 companies for “cell switch”), rapporteur proposes to use that.

**Proposal 2**: Use the term “cell switch” or “CeS” for the procedure of triggering change of cells via the LTM feature..

Finally, it can be discussed if there are some other terms RAN2 should fix for use with this WI. Companies are requested to provide input on those.

**Question 3**: Are there other terms that RAN2 should discuss adopting for the L1/L2-centric inter-cell mobility?

|  |  |  |
| --- | --- | --- |
| Answers to Question 3 | | |
| Company | Terminology (needed for + proposal) | Justification |
| Huawei, HiSilicon | “Sequential L1/2 Triggered Mobility” or “Successive L1/2 Triggered Mobility”.  *The “L1/2 Triggered Mobility” can be replaced by the agreed term in Q1.* | * RAN2 assumes that sequential L1L2 cell change between Candidates without RRC reconfiguration can be supported.   We need a term to descript the feature for the above agreement. |
| Qualcomm | Fine with either HW suggestions | Sequential may be construed as the involvement of a pre-determined sequence but I won’t agree there 😊 |
| CATT | 1. “PCell/SCell role change” or ”PCell/SCell Switching”, it can be used for the case that target Pcell/SCell is the current SCell/PCell, 2. OK with HW’s suggestion on term for “sequential L1L2 cell change” | * For L1L2 mobility, Target Pcell/SCell can be current SCell/PCell, i.e., current SCell/PCell can be configured as candidates.   We may be a term for the case in the above agreement. |
| Vivo | Either “Sequential” or “Successive” for the agreement above. | Agree with Huawei. |
| OPPO | We are fine with HW’s suggestion to further discuss the term of ‘sequential L1L2 cell change’. | We share the same view as QC that ‘sequential’ may include the meaning of in order. We suggest to select between ‘successive’ and ‘consecutive’. |
| LGE | We are not sure whether a specific terminology is needed in this case, but if needed, we think “consecutive” is usually used in such cases. |  |
| ZTE | We are fine with Huawei’s suggestion. | Agree with Huawei. |
| Ericsson | For the issue reaised by HW, we can call it “subsequent L1/L2 cell change”. | The word “subsequent” is something that comes later in time or “that follows” and does not really specify any order. |
| InterDigital | We are not sure a term is really needed for this but agree with Ericsson that the right word would be “subsequent” | Agree with Ericsson. |
| KDDI | For the issue raised by HW, we tend to agree with Ericsson. | The word “subsequent” is already used in WID objective2. We think it might be better we use a word that companies are familiar with. |
| Nokia, Nokia Shanghai Bell | “Sequential” invokes the meaning that there will be multiple cell changes, which may not be always true. In that sense “successive” may be better (although the difference is perhaps hair-thin in the end). | We prefer “successive” but in the end it’s important just to pick one term and definition. |
| Fujitsu | We are fine to discuss the terminology as HW suggested. “subsequent” is preferred.  Regarding CATT’ suggestion, we are not sure whether it is needed. We think that SpCell/SCell swap can be a candidate to include the potential DC cases. |  |
|  |  |  |
|  |  |  |

**Summary 3**: The terminology for the sequential L1/L2-cell changes was brought up: Some companies state that using “successive” may be more appropriate, whereas some companies prefer to use “subsequent” as that was used in the WID, while some companies point out that RAN2 agreements use “sequential” and two companies support “consecutive”. There is no clear majority for any of these but “successive” and “subsequent” have the highest support, so either could be adopted. Rapporteur also considers that “consecutive” could be a neutral term to choose if no consensus among those two can be achieved.

**Proposal 3a**: Use the term “Successive LTM” or “Subsequent LTM” (both abbreviated as “SLTM”) for the case when cell change between L1/L2 mobility candidates is done without RRC reconfiguration in between.

**Proposal 3b**: If RAN2 cannot agree to P3a, use the term “Consecutive LTM” (CLTM) for the case when cell change between L1/L2 mobility candidates is done without RRC reconfiguration in between.

# 4 Conclusion

**Proposal 1**: RAN2 to use “LX-triggered mobility” or “LTM” as term for the L1/L2-triggered mobility. LX will become either “L1” or “L2” once it’s known whether the triggering is by L1 (DCI) or L2 (MAC).

**Proposal 2**: Use the term “cell switch” or “CeS” for the procedure of triggering change of cells via the LTM feature..

**Proposal 3a**: Use the term “Successive LTM” or “Subsequent LTM” (both abbreviated as “SLTM”) for the case when cell change between L1/L2 mobility candidates is done without RRC reconfiguration in between.

**Proposal 3b**: If RAN2 cannot agree to P3a, use the term “Consecutive LTM” (CLTM) for the case when cell change between L1/L2 mobility candidates is done without RRC reconfiguration in between.