**3GPP TSG RAN2 #115-e R2-21xxxxx**

**Online, 16 – 27 August 2021**

**Agenda Item:**  **8.13.2.1 Handover related SON aspects**

**Source: Huawei (email rapporteur)**

**Title:** **Report of [AT115e][852][SONMDT] Procedures and Modeling of successful HO (Huawei)**

**Document for: Discussion and Decision**

### 1 Introduction

This is the email report of [AT115e][852] SONMDT:

* [AT115e][852][SON/MDT] Procedures and Modeling of successful HO (Huawei)

**Scope:** Focus on the agreeable proposals in R2-2108564

**Intended outcome**: Report with Agreements

**Deadline**: 11:00 UTC, Wednesday August 25th

The company contact list is the same as the list in R2-2108564 [1].

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email Address** |
| Qualcomm | Rajeev Kumar | rkum@qti.qualcomm.com |
| OPPO | Liu yang | liuyangbj@oppo.com |
| Lenovo | Lianhai | Wulh5@lenovo.com |
| Samsung | Sangbum Kim | Sb07.kim@samsung.com |
| Huawei, HiSilicon | Jun Chen | jun.chen@huawei.com |
| NEC | Wangda | wang\_da@nec.cn |
| Sharp | Ningjuan Chang | Ningjuan.chang@cn.sharp-world.com |
| CATT | Erlin Zeng | erlin.zeng@catt.cn |
| vivo | Wen-Ming | ming.wen@vivo.com |
| Ericsson | Marco Belleschi | Marco.belleschi@ericsson.com |
| Nokia, Nokia Shanghai Bell | Malgorzata Tomala | malgorzata.tomala@nokia.com |
| LGE | SangWon Kim | sangwon7.kim@lge.com |
| ZTE | Zhihong-QIU | qiu.zhihong@zte.com.cn |
| ITRI | Nai-Lun Huang | NellenHuang@itri.org.tw |

### 2 Discussion

The agreeable proposals in R2-2108564 are listed as below:

**Proposal 2: For the thresholds of T310/T312 in the source cell, the source cell configures the values.**

**Proposal 3: Introduce a UE capability indication for SHR.**

**Proposal 4: The UE may discard the SHR, i.e. release the UE variable VarSuccHO-Report, 48 hours after the SHR is stored.**

Q1: which of the above proposals are acceptable?

|  |  |  |
| --- | --- | --- |
| **Company** | **All or some** | **Comments** |
| vivo | all |  |
| Qualcomm | All |  |
| Ericsson | All |  |
| Sharp | All |  |
| Huawei, HiSilicon | All |  |
| OPPO | All |  |
| Lenovo | All |  |
| Nokia | All |  |
| Samsung | All |  |
| NTTDOCOMO | All |  |
| CATT | All |  |
| NEC | All |  |
| ZTE | All |  |
| ITRI | All |  |

**Summary:**

All companies are fine with Proposal 2, 3 and 4.

P1 is also an agreeable proposal in R2-2108564. In addition, some alternatives on ASN.1 definition are also provided (see section 5), so it is proposed to collect companies’ opinions on the alternatives.

**Proposal 1: Defines new values or mix of existing values and new values for the threshold, and explicit values or percentages are candidate solutions.**

Q2: Do you agree with P1? In addition, which of the alternatives (shown in section 5) are preferred?

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Yes/No for P1** | **Alt1, Alt2, Alt2a, or others** | **Comments** |
| vivo | Yes | Either Alt2 or Alt2a is fine to us | We prefer to adopt the options where percentage is used. This offers a cleaner and minimal signalling overheaded compared to the use of explicit values. |
| Qualcomm | Yes | Any alternative seems okay. | However, the threshold should be set properly. 20% seems quite low. In alternatives 2, 2a, we should remove 20%. similarly, in alternative 1, we should avoid setting a quite low value as a threshold. |
| Ericsson | Yes | Any alternative seems ok |  |
| Sharp | Yes | Any alternative seems ok | Agree with Qualcomm that some quite low values may not be useful. |
| Huawei, HiSilicon | Yes | Either Alt2 or Alt2a is ok | Alt1 may introduce lots of values, and thus the signalling overhead is significant. In addition, if T310/T312/T304 is to be extended in the future, more threshold values may also be needed. |
| OPPO | Yes | Any alternative ok | Agree with Qualcomm |
| Lenovo | Yes with comments | Alt1 or Alt2. | Regarding Alt2a, network cannot configure the separate value for T310/T312/T304, respectively.  At least for T310/T312, Alt1 or Alt2 is fine.  For T304, we have not agreed if it is also configured by source. If we agree that T304 is configured by source, Alt1 or Alt2 is fine. |
| Nokia | Yes | Alt 1 | In principle all alternatives are fine, but perhaps we should target an option with minimal signalling overhead. Thus, maybe one value could be also considered |
| Samsung | Yes | Alt 1 or Alt 2 | In Alt 2, 100% should be added? |
| NTTDOCOMO | Yes | Alt1 | Generally, all options are fine. Since there is no big signalling overhead difference between options, prefer to straightforwardly indicate the threshold with an explicit value. |
| CATT | Yes | Either Alt2 or Alt2a | Percentage is used can reduce the signalling overheaded. |
| NEC | Yes | Slightly prefer Alt 2 | Any alternative seems ok, and slightly prefer Alt 2 as it has less signalling overhead. |
| ZTE | Yes | Alt2 | Alt2 is more flexible since NW can configure differently for different timers, while alt2a implies the same value for different timers. Compared to alt1, one of the advantages of alt2 is that we don;t need to discuss new values is added for T312/310. |
| ITRI | Yes | Either Alt2 or Alt2a is fine to us | Using percentages introduces less signalling overhead then using explicit values. Also, the explicit values need to be extended while the percentages may not in case T310/T312/T304 is extended in the future. |

**Summary:**

Alt 1: 8 (Qualcomm, Ericsson, Sharp, OPPO, Lenovo, Nokia, Samsung, NTTDOCOMO)

Alt 2: 11 (vivo, Qualcomm, Ericsson, Sharp, Huawei, OPPO, Lenovo, Samsung, CATT, NEC, ZTE)

Alt 2a: 7 (vivo, Qualcomm, Ericsson, Sharp, Huawei, OPPO, CATT)

Alt 2 has more supports than Alt 1 and Alt 2a, so it is suggested to go with Alt 2. Currently the percentage values are {20%, 40%, 60%, 80%}, 2 companies prefer to remove 20% because it seems quite low. In addition, 1 company asks whether 100% should be added. From rapporteur’s point of view, the value 100% seems not needed, because when the timers expire, RLF will happen and then it is not a successful handover. As pointed out by some companies, too low and too high threshold values are not good. So the value 100% may not be needed.

With above analysis, proposal 1 is changed into the following one:

**Proposal 1: Define separate thresholds for T310/T312/T304, and the percentage values are 40%, 60%, 80%. The percentage is to indicate the ratio of the threshold value (unit: ms) over the signalled T310/T312/T304 value (unit: ms).**

### 3 Conclusion

The agreeable proposals are:

**Proposal 1: Define separate thresholds for T310/T312/T304, and the percentage values are 40%, 60%, 80%. The percentage is to indicate the ratio of the threshold value (unit: ms) over the signalled T310/T312/T304 value (unit: ms).**

**Proposal 2: For the thresholds of T310/T312 in the source cell, the source cell configures the values.**

**Proposal 3: Introduce a UE capability indication for SHR.**

**Proposal 4: The UE may discard the SHR, i.e. release the UE variable VarSuccHO-Report, 48 hours after the SHR is stored.**

### 4 References

[1] R2-2108564 Report of [Post114-e][851][SONMDT] Procedures and Modeling of successful HO report (Huawei) Huawei discussion

### 5 Draft changes for the thresholds of T310/T312/T304

The ASN.1 definition is as below:

Alt1: explicit values

Here is an example:

ReportConfigSuccHO-Report-r17 ::= SEQUENCE {

t310\_threshold-r17 ENUMERATED {value1, value2} OPTIONAL,

t312\_threshold-r17 ENUMERATED {value1, value2} OPTIONAL,

t304\_threshold-r17 ENUMERATED {value1, value2} OPTIONAL

}

|  |
| --- |
| ***t310\_threshold***  The T310\_threshold is to indicate the threshold value. |
| ***the above field descriptions can be applied for other fields***  To be added |

Alt2: percentages

Here is an example:

ReportConfigSuccHO-Report-r17 ::= SEQUENCE {

t310\_threshold\_ratio-r17 ENUMERATED {20%, 40%, 60%, 80%} OPTIONAL,

t312\_threshold\_ratio-r17 ENUMERATED {20%, 40%, 60%, 80%} OPTIONAL,

t304\_threshold\_ratio-r17 ENUMERATED {20%, 40%, 60%, 80%} OPTIONAL

}

|  |
| --- |
| ***t310\_threshold\_ratio***  The T310\_threshold\_ratio is to indicate the ratio of the threshold value over the siganlled T310 value. For example, if the signalled T310 value is ms100, and T310\_threshold\_ratio is 40%, the T310 theshold for the successful handover report is 40ms. |
| ***the above field descriptions can be applied for other fields***  To be added |

Alt2a: a common set of percentages + a flag indicating the corresponding event

Here is an example:

ReportConfigSuccHO-Report-r17 ::= SEQUENCE {

shr\_threshold\_ratio-r17 ENUMERATED {20%, 40%, 60%, 80%} OPTIONAL,

shr\_t310\_flag-r17 ENUMERATED {true} OPTIONAL,

shr\_t312\_flag-r17 ENUMERATED {true} OPTIONAL,

shr\_t304\_flag-r17 ENUMERATED {true} OPTIONAL

}

|  |
| --- |
| ***shr\_threshold\_ratio***  The shr\_threshold\_ratio is to indicate the ratio of the threshold value over the siganlled timer value. For example, if the signalled T310 value is ms100, and T310\_threshold\_ratio is 40%, the T310 theshold for the successful handover report is 40ms. |
| ***shr\_t310\_flag***  The presence of the field indicates that the threshold ratio for triggering the successful HO report applies to T310. |
| ***the above field descriptions can be applied for other fields***  ***To be added*** |