3GPP TSG-RAN WG2 #112 electronic R2-200xxxx

Electronic Meeting, Nov 2-13, 2020

Agenda Item: 5.4.3

Source: Ericsson

Title: Summary of offline 011 Rel-15 UE caps I

Document for: Discussion, Decision

# 1 Introduction

This contribution summarizes the following discussion:

* [AT112-e][011][NR15] UE caps I (Ericsson)

Treat R2-2010512, R2-2010513, R2-2010238, R2-2009630, R2-2010567, R2-2010568, R2-2010539, R2-2010538, R2-2010517 - R2-2010520, R2-2010084

 Intended outcome: Intermediate: Determine agreeable parts. Final: For agreeable parts, agreed CRs.

 Deadline: Intermediate deadline(s) by Rapporteur, Final: Discussion stop at Wed Nov 11, 1200 UTC

# 2 Discussion

To make it easier to find the correct contact delegate in each company for potential follow-up questions, the rapporteur encourages the delegates who provide input to provide their contact information in this table:

|  |  |
| --- | --- |
| Company | Delegate contact |

|  |  |
| --- | --- |
| Ericsson (Lian) | lian.araujo@ericsson.com |
| Ericsson (Mattias) | mattias.a.bergstrom@ericsson.com |
| Huawei (Yiru) | kuangyiru@huawei.com |
| Nokia | amaanat.ali@nokia.com |
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|  |  |

## 2.1 Part 1: Intended to determine agreeable parts

The proposals listed in this subsection 2.1 are merely extracted from discussion TDocs to facilitate the discussion and follow the numbering of the corresponding TDoc from which they were extracted (i.e. they do not represent actual proposals from this TDoc, which should be listed in subsection 2.2).

### 2.1.1 Band list for redirection and measurement configuration

In [1], the following proposals are made:

**Proposal 1: Ran2 to discuss whether the UE can report the single CC capability for the band that included in the*supportedBandListNR* but outside of the *frequencyBandListFilter.***

**Proposal 2: If the reporting on the Bands outside of the *frequencyBandListFilter* is not allowed by the legacy gNB, this optimization can be introduced from the Rel-16.**

**Q1 Do companies agree to introduce the functionalitly described in Proposal 1 above? If yes, please clarify if this should be introduced for both Rel-15 and Rel-16 or only for Rel-16 (Proposal 2). Companies are also invited to provide their views on the CRs related to this discussion, which are provided in [2] and [3]**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm Incorporated | No | This is non-backward compatible change, and we should stick to the current principle, i.e. the network should be including the NR SA bands in the UE capability filter. We should not change the behaviour for release-16 as well because the network does not even know the UE release at the time it puts together the UE capability filter. |
| Ericsson  | No | Agree with Qualcomm. |
| Apple | No | Agree with Qualcomm and Ericsson. NW should be able to provide the NR SA bands as well. We already have priority in the NW requested filter and these can be of lower priority. |
| MediaTek | No | For Rel-15, it is clear NBC change and not accetable to us.For Rel-16, we don’t see the need to have the CR either. We don’t understand why NW want to handover to band but does not want to set the *frequencyBandListFilter* to include that band. It also preferable to have same behavior as in Rel-15. |
| Intel | No | Our view is that for the redirection case, it should align with the handover i.e. the network should include the bands that it wants to perform redirection in the frequencyBandListFilter. If it does not, it means that the network has no interest of using those bands for redirection. For measurement, network can use supportedBandList |
| Nokia | No | Indeed this is quite NBC to network implementation and changes fundamental principles. One cannot expect the filter to be bypassed. |
| Huawei, HiSilicon | No | It is an NBC change. Besides, for the NR band that can only be configured as SCG in EN-DC, there is no single CC capability, such NR band can only be included in a MR-DC band combination. |
| ZTE | Yes | We want to make sure that at least the single carrier capability was reported for each UE supported band, which would be better for the mobility management from network side. Anyway we can compromise and respect to other companies’ view |
| CATT | No | Agree with much of the concerns from companies.  |
| OPPO | No |  |
| Samsung | No | Too late to discuss NBC change |

If the proposals above cannot be agreed, [1] further discusses other ways forward, which seem to be in line with the proposals discussed in [4], hence the proposals in the latter TDoc are captured below:

**Proposal 1: The network can configure the band that included in *supportedBandListNR* (no matter if such band is included in the *supportedBandCombinationList* of the *RF-Parameters* and/or *RF-ParametersMRDC*) as a redirection target band.**

**Proposal 2: The network can configure the band that included in *supportedBandListNR* (no matter if such band is included in the *supportedBandCombinationList* of the *RF-Parameters* and/or *RF-ParametersMRDC*) as a measurement object.**

**Q2 Do companies agree with the Proposal 1 and 2 above? If yes: please clarify whether you agree with both proposals, only Proposal 1, or only Proposal 2. Companies are also invited to provide their views on the CRs related to this discussion, which are provided in [5] and [6].**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm Incorporated | P1: NoP2: Yes | P1: If a band is not included in supportedBandCombinationList of RF-Parameters and is included in supportedBandCombinationList of RF-ParametersMRDC , it means that the UE supports the NR band only in EN-DC setting. It is not clear what the network expects the UE to do when the UE is redirected to such band. We think the UE behaviour is unspecified in this case. |
| Ericsson | P1: Yes, see comment.P2: Yes | P1:The UE shall accept the Release-message. The UE will not trigger some error.In case the UE is directed to a frequency which the UE cannot support a PCell on, the UE will not go there. This is like when the system information points the UE to a frequency which the UE does not support to have a PCell on. The UE will accept the system information, but will not go there.Of course there is no guarantee to the network that, in this situation, the UE will end up on the indicated frequency, but again, the UE will accept the release-message. |
| Apple | P1:noP2: Ok | Same views as Qualcomm on the redirection for EN-DC only support. |
| MediaTek | Yes | We are ok with with both proposal 1 and proposal 2 in R2-2010238. The CR from [5] and [6] is also fine. However, we don’t really know while CR from [5] and [6] is linked to P1 and P2. It seems not directly related.  |
| Intel | Yes only to Proposal 2 | As explained above, for redirection, network should use the supportedBandCombinationList and not supportedBandListNR. Hence we do not think Proposal 1 aligned with this. |
| Nokia | P1:Yes, butP2:Yes | For P1 we are more aligned to what Qualcomm said. If the band is not a NR SA capable band (but only for EN-DC) then the redirection to it will be useless. Of course, network can signal this to the UE as signalling allows it but then it means that the UE behavior is unpredictable.For P2: YesThe CRs in [5] and [6] are not required as they are non-essential correction and not even related to this discussion. |
| Huawei, HiSilicon (Proponent) | P1: YesP2: Yes | For Proposal 1, as some bands supported by UE may not be reported to the NW due to message size limitation, NW can still try to configure such bands as redirection target. If the UE is not able to camp on such bands, the UE anyway can perform cell re-selection. |
| ZTE | P1: YesP2: Yes | Share the same view as Huawei |
| CATT | Yes for P1 and P2 | We believes these are scenarios for which configuration ‎freedom can be left to the network. ‎After redirection network can acquire ue capabiltiy again, and as pointed out by some even if ue does not support a band it can reselect elsewhere.  |
| OPPO | P1:NoP2: yes with question | If network redirect a band which UE doesn’t support, it is not clear what UE will do and we don’t want to introduce such uncertainty. For P2, any spec impct? Current spec an already can do it. |
| Samsung | Yes with both proposals | If UE indicate it supports a band, it should be possible for network to utilize the capability. It does not make much sense to ignore reported UE capability. |

### 2.1.2 Feature sets and fallback concept

The CRs in [7],[8],[9] and [10] intend to remove the contradiction between 38.331 and 38.306 regarding Featurese Set per CC description by removing from 38.331 the description of the restrictions and rules for FSpUCC/FSpDCC and instead capturing these only in 38.306.

**Q3 Do companies agree with the intention of the CRs above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm Incorporated | Yes |  |
| Ericsson | Yes (Proponent) |  |
| Apple | Ok |  |
| MediaTek | Yes |  |
| Intel | Yes |  |
| Nokia | Yes | Proponent |
| Huawei, HiSilicon | Yes but | Agree with the intention. However, we think the field description in 38.331 can be kept as it is, since it is more related to the signalling structure, and remove the contradiction sentences in 38.306. |
| ZTE | Yes |  |
| CATT | Yes, but | The changes to 306 seems fine. But why do we need that deletion from 331? |
| OPPO | Yes |  |
| Samsung | Yes | It is imortant to keep stage 3 specifications aligned. |

The CRs in [11] and [12] intend to correct the definition of fallback per CC feature set, where there are parameters that are part of the fallback per CC feature set but are not captured in the current definition.

**Q4 Do companies agree with the intention of the CRs above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm Incorporated | Yes |  |
| Ericsson | Yes (Proponent) |  |
| Apple | No | While we agree with the MCS part, there are other parameters that were (getting) added through R16 and so generalization is dangerous. We prefer to add MCS explicitly if needed, as this was the agreement in Rel-15 for fallback. |
| MediaTek | Yes |  |
| Intel | No | Our understanding is that supportedModulationOrderDL in FSPC is used to calculate the max data rate. However the network can use modulation order higher than this based on pdsch-256QAM-FR1 or pdsch-256QAM-FR2. See below from TS38.306:***supportedModulationOrderDL***Indicates the maximum supported modulation order to be applied for downlink in the carrier in the max data rate calculation as defined in 4.1.2. If included, the network may use a modulation order on this serving cell which is higher than the value indicated in this field as long as UE supports the modulation of higher value for downlink. If not included:-             for FR1, the network uses the modulation order signalled in *pdsch-256QAM-FR1*.-             for FR2, the network uses the modulation order signalled per band i.e. *pdsch-256QAM-FR2* if signalled. If not signalled in a given band, the network shall use the modulation order 64QAM.In all the cases, it shall be ensured that the data rate does not exceed the max data rate (*DataRate*) and max data rate per CC (*DataRateCC*) according to TS 38.214 [12]. |
| Nokia | Yes | Proponent |
| Huawei, HiSilicon |  | Agree with Intel that supportedModulationOrderDL in FSPC is used to calculate the max data rate, rather than the real uased modulation order for scheduling, so the correction for Rel-15 is not necessary.But for Rel-16, as more parameters are introduced, generally we think the same logic for fallback per CC feature set can be applied, then some extensions may be needed. Besides, we find that there is a IE *supportFDM-SchemeB-r16 ENUMERATED {supported}*, how to understand the fallback capabiltiy for such IE? |
| ZTE |  | We think the current wording is too general, if needed for the Rel16, the parameters can be explicitly indicated as other companies suggested. |
| CATT |  | Agree with Intel and Huawei that such genearl extension might not be accurate. Maybe we could check case by case when there is real issue observed.  |
| OPPO | Yes with question | Just wonder the wording numerology refer to SCS only or SCS&CP? |
| Samsung | No | Probably case by case check should be performed first  |

### 2.1.3 Inter-node coordination

The discussion in [13] wants to confirm whether the UE capability coordination accounts for the behaviour captured in the proposal below:

**Proposal: RAN2 is requested to confirm that according to current standards MN can include a fallback BC not explicitly signalled within the UE MRDC capabilities (i.e. by setting bandCombinationIndex to a superset BC reported by the UE and by signalling value 0 for some bands indicated by allowedFeatureSetsList)**

**Q5 Do companies agree with the Proposal above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | No | The allowedFeatureSetsList cannot be used to preclude the use of specific bands in a band combination. If we look at the figure in R2-2009308, for instance, the allowedFeatureSetsList actually indicates a row of feature sets across the UE supported bands. Hence, this field can only indicate (for a given band combination) which rows the SN is allowed to take into consideration to generate the SCG configuration, but it cannot preclude a particular column in the Feature Set Combination of a band combination. It could be that the UE have reported fallback band combinations within a Feature Set Combination of a super-set band combination, i.e. some feature set downlinks are set as 0 in some of the rows. Hence, if the MN limits the allowedFeatureSetsList to those rows where feature set downlink ID 0s are present, it could be able to indicate a fallback band combination to the SN, but this would depend on what the UE reports and could not be enforced/guaranteed. |
| Nokia | No | Yes, agree with Ericsson. |
| Huawei, HiSilicon | No | The index in *allowedFeatureSetsList* identifies a position in the *FeatureSetCombination*, if the MN wants to indicate a fallback BC by signalling 0 for some bands, it requires the UE reports such FeatureSetCombination so the MN can refer to it. But the UE dose not report the fallback BC with same capability, so the MN may not be able to find the corresponding index in *FeatureSetCombination* to indicate a fallback BC. In addition, in EN-DC, the MN is invisible to the NR capability, the MN cannot restrict the NR capability (e.g. BW, MIMO) by signalling a specific FeatureSetDownlink/FeatureSetUplink. |
| ZTE |  | We share the same view as Ericsson, but we are not sure whether the [13] wants to express the same thing as Ericsson described.  |
| CATT | No | We agree with the comments from Huawei. As one entry of allowedFeatureSetsList ‎points to the feature set combination, there is no guarantee that unclear how value 0 can indicate exactly the intended FSC for fallback BC. The proposal esentially adds new requirmenet in forming FSC, which hasn’t been agreed.  |
| OPPO | No | We also think the field description of the allowedFeatureSetsList is clear that it only refers to subset of reported featureset combination. |
| Samsung | No | We acknowledge that our proposal was not really correct. We now wonder if RAN2 should discuss whether this limitation is really acceptable.. |

### 2.1.4 Summary of Part 1

According to the feedback for Q1, there is strong concern that the proposed change would be NBC, and no support was shown for the change (except for the proponent). Hence, it is proposed to not pursue this change, note the paper and not agree on the corresponding CRs.

1. Note the paper R2-2009630; the related CRs R2-2010567 and R2-2010568 are not agreed.

According to the feedback for Q2, all companies support the green highlighted proposal below from [4], while there are mixed views on the yellow highlighted proposal:

**Proposal 1: The network can configure the band that included in *supportedBandListNR* (no matter if such band is included in the *supportedBandCombinationList* of the *RF-Parameters* and/or *RF-ParametersMRDC*) as a redirection target band.**

**Proposal 2: The network can configure the band that included in *supportedBandListNR* (no matter if such band is included in the *supportedBandCombinationList* of the *RF-Parameters* and/or *RF-ParametersMRDC*) as a measurement object.**

We suggest to agree on the green highlighted proposal above and further discuss the yellow highlighted proposal in Part 2:

1. The network can configure the band that included in *supportedBandListNR* (no matter if such band is included in the *supportedBandCombinationList* of the *RF-Parameters* and/or *RF-ParametersMRDC*) as a measurement object.
2. Continue the discussion on whether the network can configure the band that included in *supportedBandListNR* (no matter if such band is included in the supportedBandCombinationList of the *RF-Parameters* and/or *RF-ParametersMRDC*) as a redirection target band.

It was also commented by 2 companies in Q2 that the CRs related to the proposal and observation above are not quite related to such discussion, 1 company within those 2 commented also that it would be fine with the CRs, while another company within those 2 commented that the CRs are not essential corrections. It would be good to get feedback from the other companies that also commented on Q2 on those aspects as well, thus it is proposed to further discuss whether the CRs should be agreed.

1. Continue the discussion on whether R2-2010512 and R2-2010513 should be agreed.

From the feedback to Q3, all companies seem to be fine with the intention of the CRs [7],[8],[9] and [10], but it was also commented that it would be sufficient to remove from 38.306 the parts that contradict 38.331 - it is thus proposed to pursue a CR to 38.306 only, taking into consideration this comment.

1. Revise R2-2010517 and R2-2010518 to remove the sentences that contradict 38.331 concerning feature sets per CC and do not agree on the CRs R2-2010519 and R2-2010520.

On Q4, some mixed feedback was received on: how to interpret some parameters in feature set per CC as fallback; whether the change is needed for Rel-15; and also how this should be captured for Rel-16 – those details need further discussion in Part 2.

1. To continue discussing: whether there is any parameter in feature set per CC that may be unclear regarding the definition of fallback of feature set per CC (for both Rel-15 and Rel-16); how to capture any identified parameters into the definition of fallback of feature set per CC.

From the companies that provided input to Q5, there was no support to the interpretation of UE capability coordination suggested in [13], hence the paper can be noted.

1. Note the paper R2-2010084.

## 2.2 Part 2: Intended to progress discussion on agreeable parts

### 2.2.1 Band list for redirection and measurement configuration

As in section 2.1.4, it is required further discussion to conclude whether the network can configure the band that included in supportedBandListNR (no matter if such band is included in the supportedBandCombinationList of the RF-Parameters and/or RF-ParametersMRDC) as a redirection target band. From the feedback in Q2, it seems that the UE behaviour in this particular scenario would be unspecified, even though the UE could accept the Release-message associated to it, it could then be sufficient to capture this aspect in the meeting notes:

**"In case the UE includes a band in supportedBandListNR but not in supportedBandCombinationList (of the RF-Parameters and/or RF-ParametersMRDC), the UE does not necessarily support stand-alone operation on that band. If the UE gets an RRC release message redirecting the UE to such band, the UE behaviour w.r.t. redirection is undefined."**

**Q6 Do companies agree with the statement above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson (Mattias) | Yes |  |
| Huawei, HiSilicon | Yes |  |
| MediaTek | Yes |  |
| Nokia | Yes |  |
| ZTE | Yes |  |
| Samsung | Yes |  |
| Apple | Yes, but | Wondering if and/or is ok in the above proposal… if we look at it from ‚or‘ perspective, then even if the UE reports in RF-Parameters (which should imply NR SA support), the UE actions from getting release message is undefined??Should it be just „and“? |

It was commented in the Part 1 discussion that the CRs provided in [5] and [6] may not be strictly related to the issue above and thus a separate discussion is made – the intention of the CRs is ultimately to avoid future discussions on what the band combination list means and what it means if a certain band is there or not. The particular text indicates that it is only the bands in the band combinations which the NW can configure Serving Cells on for the UE. The NW can only configure an SCell on the band or do handover to a band (which is a means to configure for a UE a serving cell belonging to another gNB) if included in the band combination list.

**Q7 Companies agree with the intention of the CRs above?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson (Mattias) | Yes | Proponent |
| Huawei, HiSilicon | Yes |  |
| MediaTek | Yes | Given that there is related discussion for several meetings. We think it is good to make this clear in the SPEC. |
| Nokia | No | The CRs in [5] and [6] are not required as they are non-essential correction and not even related to this discussion. |
| ZTE | No | We don’t think this CR is necessary, and for the handover scenario, in the last meeting it has been agreed no spec modification is needed. |
| Samsung | No | We don’t think it is essential correction. We also think there is no room for different understanding |
|  |  |  |

### 2.2.2 Feature sets and fallback concept

As indicated in section 2.1.4, the CRs in [11] and [12] need further discussion on whether there is any parameter in feature set per CC that may be unclear regarding the definition of fallback of feature set per CC (for both Rel-15 and Rel-16); and how to capture any identified parameters into the definition of fallback of feature set per CC.

In Rel-15, the following fields are present for FeatureSetDownlinkPerCC and FeatureSetUplinkPerCC:

FeatureSetDownlinkPerCC ::= SEQUENCE {

 supportedSubcarrierSpacingDL SubcarrierSpacing,

 supportedBandwidthDL SupportedBandwidth,

 channelBW-90mhz ENUMERATED {supported} OPTIONAL,

 maxNumberMIMO-LayersPDSCH MIMO-LayersDL OPTIONAL,

 supportedModulationOrderDL ModulationOrder OPTIONAL

}

FeatureSetUplinkPerCC ::= SEQUENCE {

 supportedSubcarrierSpacingUL SubcarrierSpacing,

 supportedBandwidthUL SupportedBandwidth,

 channelBW-90mhz ENUMERATED {supported} OPTIONAL,

 mimo-CB-PUSCH SEQUENCE {

 maxNumberMIMO-LayersCB-PUSCH MIMO-LayersUL OPTIONAL,

 maxNumberSRS-ResourcePerSet INTEGER (1..2)

 } OPTIONAL,

 maxNumberMIMO-LayersNonCB-PUSCH MIMO-LayersUL OPTIONAL,

 supportedModulationOrderUL ModulationOrder OPTIONAL

}

FeatureSetUplinkPerCC-v1540 ::= SEQUENCE {

 mimo-NonCB-PUSCH SEQUENCE {

 maxNumberSRS-ResourcePerSet INTEGER (1..4),

 maxNumberSimultaneousSRS-ResourceTx INTEGER (1..4)

 } OPTIONAL

}

while it was commented in the Part 1 that e.g. for supportedModulationOrder(DL/UL) the network can use modulation order higher than the indicated field based on pdsch-256QAM-FR1 or pdsch-256QAM-FR2, this does not seem to affect the definition of fallback for feature set per CC:

**Fallback per CC feature set:** A feature set per CC that has lower value of UE supported MIMO layers and BW while keeping the numerology and other parameters the same from the reported feature set per CC for a given carrier per band.

As can be seen from the above, the fallback definition indicates which features the UE is supposed to support with lower values. Whether a specific feature is supported with higher values as well seems to be out of the scope of the definition above. Therefore, it seems sufficient to discuss here whether the Rel-15 features are subject to the fallback definition for feature set per CC. Apart from MIMO layers and BW, which are already part of such definition, it remains to discuss whether the fields related to modulation order and SRS resources are also subject to this definition (supportedSubcarrierSpacing(DL/UL) is excluded since it is explicitly described as not subject to fallback).

**Q8 Companies are invited to provide input on whether the features below within Feature Set Per CC in Rel-15 are subject to fallback or not.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Modulation Order (Yes/No)** | **SRS resources (Yes/No)** |
| Ericsson (Lian) | Yes, even if higher values can be adopted for maximum data rate, the point is that smaller values are also supported. | Yes |
| Huawei, HiSilicon | No, supportedModulationOrderDL in FSPC is used to calculate the max data rate, rather than the real used modulation order for scheduling. | Yes |
| Nokia | Agree somewhat with HW’s understanding. | Yes |
| ZTE | Yes, we share the same view as Ericsson. | Yes |
| Samsung | Yes. I think we can agree that if UE support a Modulation order x then UE support modulation order lower than that as well. The question is whether the fallback is applied to modulation order in FSPC or to modulation order in band parameter.  | Yes |
| Apple | We would like to check this with implementaiton, and request to see if we can re-visit this next meeting. | Need time to check |

For Rel-16, the following additional fields are present for FeatureSetDownlinkPerCC (no fields for Rel-16 are currently captured in 38.331 for FeatureSetUplinkPerCC):

FeatureSetDownlinkPerCC-v1620 ::= SEQUENCE {

 -- R1 16-2a: Mulit-DCI based multi-TRP

 multiDCI-MultiTRP-r16 MultiDCI-MultiTRP-r16 OPTIONAL,

 -- R1 16-2b-3: Support of single-DCI based FDMSchemeB

 supportFDM-SchemeB-r16 ENUMERATED {supported} OPTIONAL

}

MultiDCI-MultiTRP-r16 ::= SEQUENCE {

 maxNumberCORESET-r16 ENUMERATED {n2, n3, n4, n5},

 maxNumberCORESETPerPoolIndex-r16 INTEGER (1..3),

 maxNumberUnicastPDSCH-PerPool-r16 ENUMERATED {n1, n2, n3, n4, n7}

}

**Q9 Companies are invited to provide input on whether the features below within Feature Set Per CC in Rel-16 are subject to fallback or not.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Multi-DCI Multi-TRP (Yes/No)** | **FDM Scheme B (Yes/No)** |
| Ericsson (Lian) | Yes | Yes, even though there is no essential meaning of this field as fallback since it is just ENUMERATED {supported}, there is no reason to complicate the fallback definition by having an exception for this case – note that the definition of fallback for feature set is also generic and within feature set we also have such kind of fields. |
| Huawei, HiSilicon | Yes | Yes, exception for this case seems not needed, but try to understand clearly, if the s*upportFDM-SchemeB-r16* is set to “supported“, the fallback capability would be “supported“ or “not supported“. |
| Nokia | No | We need a separate discussion on this one and need time to check this for next meeting. |
| ZTE | FFS, we want to have more time to confirm with RAN1 | FFS we want to have more time to confirm with RAN1 |
| Samsung | Need more time to check | Need more time to check |
| Apple | Same view as ZTE, need time to check | Same view as ZTE, need time to check |

It should also be discussed how to handle the cases identified above in Q8 and Q9 as subject to fallback behaviour. Currently, for Feature Sets a general statement is used for the fallback definition in 38.306:

**Fallback per band feature set:** A feature set per band that has same or lower values than the reported values from the reported feature set per band for a given band.

The same structure could also be adopted for the fallback definition of feature sets per CC. Another possibility would be to add UE features explicitly to the fallback definition.

**Option 1 Make a general fallback definition for feature set per CC;**

**Option 2 Add explicitly to fallback definition for feature set per CC each field that is subject to fallback;**

**Q10 Which option companies prefer?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option 1/ Option 2** | **Comments** |
| Ericsson (Lian) | Option 1 | As more fields are added it may also increase the chance that we miss to include them in this fallback definition. There seems to be no harm to have a general sentence for feature set per CC as it is already done for feature set case. We understand that the SCS is actually the only exception that would be important to be captured in the fallback definition. |
| Huawei, HiSilicon | Option 1 | Option 1 is future-proof, otherwise changes are needed once a new siganlling feature set per CC is introduced. |
| ZTE | FFS | We are a little confusing about the option 1 and option 2. The option 2 is the current way for the feature set per CC definition right? If we take the option 1, how to know which features are subject to the fallback definition for feature set per CC? |
| Samsung | Option 2 | We think this approach is best for ensuring proper interoperability between UE and network.Note that we understand that in option 1 default is that fallback applies to all new features and that we only list exceptions (while in option 2 default is not to support fallback) |
| Apple | Option 2 | Share Samsung’s views. In addition, we think we can re-visit this after checking the open items. |
|  |  |  |

### 2.2.3 Inter-node coordination

Based on further feedback concerning [13], it is requested to discuss whether any problem arises from the fact that, when setting or re-negotiating allowedBCs, the MN and SN cannot indicate a fallback band combination that is not included in UE capabilities.

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson (Lian) | This does not seem to pose any issue, in our understanding this indication was not possible anyway so we think there would be no issues with it. |
| Huawei, HiSilicon | We don’t see any issues if MN cannot indicate a fallback band combination to SN, we understand MN only cares the selected combo for the MCG and does not care much about which fallback combo would be used in SN. |
| Nokia | Agree, there is no need to change anything. |
| Samsung | Suppose UE reports a super-set BCs comprising an MRDC BC e.g. comprising LTE band BL1, BL2 and NR bands BN1, BN2 and BN3With current signaling, it may not be possible for MN to indicate a fallback in which e.g. not including BN2We think RAN2 has so far not really discussed whether this limitation is acceptable. We wonder if there may be use cases that require such fallback to be configured as allowedBC. E.g. because the fallback enables MN to select, without capability renegotiation, another BC only supported with this fallback BC. Indication of a fallback may also be relevant e.g. for overheating or IDC reasons, but this is assumed to be sufficiently covered by other specific internode fields we have introducedWe mainly want to achieve a common understanding whether current signaling limitations are fine |
|  |  |

### 2.1.4 Summary of Part 2

According to the feedback for Q6, companies seem to be fine with the current sentence proposed to be captured in the meeting notes, except for a reference to “RF-Parameters and/or RF-ParametersMRDC” which may be confusing. Thus it is propose to capture the sentence discussed in 2.2.1 without the reference to “RF-Parameters and/or RF-ParametersMRDC”.

1. RAN2 confirms that in case the UE includes a band in supportedBandListNR but not in supportedBandCombinationList, the UE does not necessarily support stand-alone operation on that band. If the UE gets an RRC release message redirecting the UE to such band, the UE behaviour w.r.t. redirection is undefined.

On Q7, a considerable number of companies think the CRs provided in [5] and [6] are not needed, it is proposed to not agree on the CRs.

1. The CRs R2-2010512 and R2-2010513 are not agreed.

The feedback from the companies to Q8, Q9 and Q10 mostly indicate that companies need more time to check mostly whether Rel-16 parameters within Feature set per CC are also subject to fallback definition for feature set per CC. Hence, the CRs in [11] and [12] can be postponed.

1. The CRs R2-2010538 and R2-2010539 are postponed.

No comments were received on the revised versions R2-2011082 and R2-2011083 of the CRs R2-2010517 and R2-2010518, respectively. It seems thus that the current version is acceptable and it is proposed to agree on their final versions.

1. Agree on the CRs R2-2011082 and R2-2011083.

On the discussion on section 2.2.3, most of the companies that provided input did not identify any issue with the fact that when setting or re-negotiating allowedBCs, the MN and SN cannot indicate a fallback band combination that is not included in UE capabilities. If particular issues are later identified they can always be raised via company contribution.

1. It is confirmed that, when setting or re-negotiating allowedBC-ListMRDC, the MN and SN cannot indicate a fallback band combination that is not included in UE capabilities. No issue, related to this behaviour, was identified that requires a solution. If particular issues are later identified they can be discussed via company contribution.

# 3 Conclusion

In the previous sections we made the following observations:

[Observation 1 Continue the discussion on whether the network can configure the band that included in *supportedBandListNR* (no matter if such band is included in the supportedBandCombinationList of the *RF-Parameters* and/or *RF-ParametersMRDC*) as a redirection target band.](#_Toc56017671)

[Observation 2 Continue the discussion on whether R2-2010512 and R2-2010513 should be agreed.](#_Toc56017672)

[Observation 3 To continue discussing: whether there is any parameter in feature set per CC that may be unclear regarding the definition of fallback of feature set per CC (for both Rel-15 and Rel-16); how to capture any identified parameters into the definition of fallback of feature set per CC.](#_Toc56017673)

[Observation 4 It is confirmed that, when setting or re-negotiating allowedBC-ListMRDC, the MN and SN cannot indicate a fallback band combination that is not included in UE capabilities. No issue, related to this behaviour, was identified that requires a solution. If particular issues are later identified they can be discussed via company contribution.](#_Toc56017674)

Based on the discussion in the previous sections we propose the following (Proposal 1 to 4 are discussed in Part 1 and Proposal 5 to 8 are discussed in Part2):

[Proposal 1 Note the paper R2-2009630; the related CRs R2-2010567 and R2-2010568 are not agreed.](#_Toc56017689)

[Proposal 2 The network can configure the band that included in *supportedBandListNR* (no matter if such band is included in the *supportedBandCombinationList* of the *RF-Parameters* and/or *RF-ParametersMRDC*) as a measurement object.](#_Toc56017690)

[Proposal 3 Revise R2-2010517 and R2-2010518 to remove the sentences that contradict 38.331 concerning feature sets per CC and do not agree on the CRs R2-2010519 and R2-2010520.](#_Toc56017691)

[Proposal 4 Note the paper R2-2010084.](#_Toc56017692)

[Proposal 5 RAN2 confirms that in case the UE includes a band in supportedBandListNR but not in supportedBandCombinationList, the UE does not necessarily support stand-alone operation on that band. If the UE gets an RRC release message redirecting the UE to such band, the UE behaviour w.r.t. redirection is undefined.](#_Toc56017693)

[Proposal 6 The CRs R2-2010512 and R2-2010513 are not agreed.](#_Toc56017694)

[Proposal 7 The CRs R2-2010538 and R2-2010539 are postponed.](#_Toc56017695)

[Proposal 8 Agree on the CRs R2-2011082 and R2-2011083.](#_Toc56017696)

# 4 References

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