**3GPP TSG RAN WG1 #107bis-e R1-2200xxx**

**e-Meeting, Jan 17th – 25th, 2022**

**Agenda Item: 8.12.1**

**Source: Moderator (Huawei)**

**Title: FL summary#2 on** **MBS broadcast reception on SCell and non-serving cell**

**Document for: Discussion and Decision**

# Introduction

[107bis-e-R17-MBS-04] Email discussion on feasibility check of MBS broadcast reception on SCell and non-serving cell by January 25 - Jinhuan (Huawei)

* For response to RAN2 LS in [R1-2200009](file:///D%3A%5CDocuments%5C3GPP%20documents%5CRAN1%5CTSGR1_107b-e%5CDocs%5CR1-2200009.zip).

The discussion in this summary targets to respond to RAN2 LS in R1-220009.

# Views from submitted papers

Papers submitted in AI5:

|  |  |
| --- | --- |
| **Company** | **Proposals** |
| **vivo** | **Observation 1: For broadcast reception, only self-carrier scheduling is supported.****Observation 2: To support MBS broadcast reception on SCell for RRC\_CONNECTED UEs, the UEs have to get the configuration of SIBx and MCCH.****Observation 3: If MBS broadcast reception on SCell for RRC\_CONNECTED UEs is supported, it should be discussed whether the SCell can be deactivated when UE is receiving broadcast on the SCell and whether UE can receive broadcast on the SCell when the SCell is deactivated.****Proposal 1: It can be a separate UE capability to support MBS broadcast reception on SCell for RRC\_CONNECTED UEs.****Proposal 2: It can be a separate UE capability to support MBS broadcast reception on non-serving for RRC\_CONNECTED UEs.** |
| **ZTE** | * **From RAN1 perspective, UE can receive MBS broadcast reception on SCell assuming that RAN2 provides the necessary signalling support.**
* **If UE doesn’t require the network to guarantee the scheduling doesn’t exceed UE’s capability on the serving cell, then receiving MBS broadcast service from non-serving cell (in intra-PLMN case) is agnostic to network. Otherwise, UE may need to indicate some necessary information (e.g., UE capability sharing information) for network.**
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| **CATT** | **Proposal 1: It is feasibility of MBS broadcast reception on SCell and non-serving cell, and two new UE capabilities may be needed:** * **Receiving SIBx for acquiring MCCH/MTCH configuration of SCell and non-serving cell**
* **The capability of monitoring the Type0 or Type0B CSS on SCell and non-serving cell**
 |
| **Spreadtrum** | **Proposal 1: For UEs in connected state, MBS broadcast reception from Scell in intra-PLMN is feasible.*** **It is one optional UE capability;**
* **CSS Type-0B also can be configured in Scell.**

**Proposal 2: For UEs in connected state, MBS broadcast reception from non-serving cell in intra-PLMN is feasible.*** **It is one optional UE capability.**
* **It is only applicable for intra-frequency case.**
* **It is only applicable for the case where the numerology, e.g., SCS, of the non-serving cell is the same as serving cell.**
 |
| **OPPO** | **Observation 1: When a UE in RRC\_CONNECTED with CA capability, it is feasible to receive MBS broadcast services from SCell in intra-PLMN case and with a separate UE capability.****Observation 2: Without having any impact to operation on serving cell(s), it is feasible to receive MBS broadcast services from non-serving cell in intra-PLMN case for UEs in RRC\_CONNECTED state.****Proposal 1: UE capabilities of reception on SCell and non-serving cell can be defined into two independent items which are separated from the basic capability of MBS broadcast reception.** |
| **Xiaomi** | **For broadcast reception on SCell, RAN1 confirm the feasibility and necessity. Considering MBS broadcast is received by multiple MBS UEs which typically have different serving cell configuration, allowing MBS broadcast reception on SCell is useful for flexible deployment.** **For broadcast reception on non-serving cell, RAN1 think it is feasible as the relevant configuration for MBS broadcast is configured via broadcast information, i.e. configuring information carried by MCCH. There is no impacts to operation on serving cells.****Regarding whether separate UE capability is needed or not for supporting MBS broadcast reception on SCell and non-serving cell respectively, the same mechanism as LTE MBMS can be considered, i.e. separate UE capability for MBS broadcast reception on SCell and MBS broadcast reception on non-serving cell can be defined respectively. In addition, MBS multicast reception on SCell is also feasible and necessary, which can be a separate UE capability.** |
| **MediaTek** | *Observation 1: MBS broadcast reception on Scell and non-serving cell is out of the scope of Rel-17 MBS objective.**Observation 2: Rel-17 MBS as a first release for supporting 5G NR multicast broadcast services only focus on the basic function to fast commercial deployment.**Observation 3: The RF glitch issue about MBS broadcast reception on Scell and non-serving cell need RAN4 discussion and workload.**Observation 4: From RAN1 perspective, Rel-17 NR\_MBS with RAN1 objectives have been completed.**Observation 5:* *MBS broadcast reception on Scell and non-serving cell has been included in the scope of Rel-18 MBS objective.**Proposal 1: Broadcast reception on Scell and non-serving cell is not supported in Rel-17 MBS.* |
| **CMCC** | **Observation 1. RAN1 spec has already supported broadcast service reception on SCell and non-serving cell, except for removing the restriction of configuring MCCH/MTCH search space on PCell only in TS 38.213 and adding the reception type of broadcast service in TS 38.202.****Proposal 1. Reply to RAN2 that RAN1 confirms the MBS broadcast reception can be on SCell and non-serving cell.** |
| **Huawei** | **Proposal 1: Reply LS to RAN2 to confirm that MBS broadcast on SCell and non-serving cell are both feasible.****Proposal 2: Support separate UE capabilities for UEs supporting MBS broadcast on SCell and for UEs supporting MBS broadcast on non-serving cell, respectively. The UE capabilities can be defined by RAN2.**  |

Papers submitted to AI 8.12.1/8.12.3:

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| --- | --- |
| **Company** | **Proposals** |
| **Qualcomm** | **Proposal 10: For RRC\_CONNECTED UEs,*** **It is up to UE implementation to receive MBS broadcast service from non-serving cell in intra-PLMN case, with no spec impact.**
* **It is subject a separate UE capability to receive the MBS broadcast service from SCell in intra-PLMN case, in a similar way as that of the MBS multicast service from Scell in intra-PLMN case with self-scheduling.**
	+ **The RRC\_CONNOECTED UE, if capable of receiving MBS in Scell, can be configured to monitor the CSS configured for broadcast/multicast DCI formats in Scell via unicast RRC signaling.**
	+ **Notes:**
		- **The UE is not required to monitor DCI formats associated with SI-RNTI, P-RNTI, RA-RNTI in Scell.**
		- **Overbooking for Scell is not supported.**
 |
| **Intel** | 1. **Broadcast reception on Scell can be supported only for RRC\_CONNECTED UEs only with self-scheduling i.e., no support of cross-carrier scheduling.**
2. **Broadcast reception from non-serving cell is not supported in Rel-17 since impact to serving cell operation for unicast needs to be further clarified.**
 |
| **LGE** | **Proposal 19: UE configured with Scell can support reception of broadcast transmission on Scell depending on UE capability** |
| **CMCC** | **Proposal 1. Support broadcast reception on Scell and the TP suggestion for TS 38.213 section 10.1 is as the following:****<**Unchanged text is omitted>- a Type0B-PDCCH CSS set configured by *searchSpaceBroadcast* in *pdcch-Config-MCCH* and *pdcch-Config-MTCH* for a DCI format with CRC scrambled by a MCCH-RNTI or a G-RNTI~~, on the primary cell of the MCG~~**<**Unchanged text is omitted> |
| **Huawei** | * + ***Proposal 4: Adopt the following text proposal to TS 38.213 to support PDCCH monitoring for broadcast in SCell in addition to PCell***

----------------------------------------------------Text proposal starts-------------------------------10.1 UE procedure for determining physical downlink control channel assignment A set of PDCCH candidates for a UE to monitor is defined in terms of PDCCH search space sets. A search space set can be a CSS set or a USS set. A UE monitors PDCCH candidates in one or more of the following search spaces sets a Type0-PDCCH CSS set configured by *pdcch-ConfigSIB1* in *MIB* or by *searchSpaceSIB1* in *PDCCH-ConfigCommon* or by *searchSpaceZero* in *PDCCH-ConfigCommon* for a DCI format 1\_0 with CRC scrambled by a SI-RNTI, on the primary cell of the MCG, or by *searchSpaceZero* in *PDCCH-ConfigCommon* when *pdcch-Config-MCCH* or *pdcch-Config-MCCH* is not provided, for a DCI format with CRC scrambled by a MCCH-RNTI or a G-RNTI,- a Type0A-PDCCH CSS set configured by *searchSpaceOtherSystemInformation* in *PDCCH-ConfigCommon* for a DCI format 1\_0 with CRC scrambled by a SI-RNTI on the primary cell of the MCG- a Type0B-PDCCH CSS set configured by *searchSpaceBroadcast* in *pdcch-Config-MCCH* and *pdcch-Config-MTCH* for a DCI format with CRC scrambled by a MCCH-RNTI or a G-RNTI< Unchanged parts are omitted >----------------------------------------------------Text proposal ends---------------------------- |
| **ZTE** | * ***Proposal 2****: Reply RAN2 LS [3] R1-2200009 with the following response.*
	+ *From RAN1 perspective, UE can receive MBS broadcast reception on SCell assuming that RAN2 provides the necessary signalling support.*
	+ *If UE doesn’t require the network to guarantee the scheduling doesn’t exceed UE’s capability on the serving cell, then receiving MBS broadcast service from non-serving cell (in intra-PLMN case) is agnostic to network. Otherwise, UE may need to indicate some necessary information (e.g., UE capability sharing information) for network.*
 |

# Discussion

Incoming LS (R1-2200009/ R2-2111625) on MBS broadcast reception on SCell and non-serving cell was sent from RAN2 to ask RAN1 to check the feasibility of MBS broadcast reception on SCell and non-serving cell considering the following agreement achieved in RAN2:

* *From RAN2 point of view, the UE may receive MBS broadcast service from SCell in intra-PLMN case and if supported this may be a separate UE capability. Send an LS to RAN1 to ask to check the feasibility of MBS broadcast reception on SCell.*
* *From RAN2 point of view, the connected UE may if supported receive MBS broadcast service from non-serving cell in intra-PLMN case, under the condition this does not have any impact to operation on serving cell(s). This may be a separate UE capability. Send an LS to RAN1 to ask to check the feasibility.*

The discussion focuses on the question RAN2 asked whether it is feasible to receive MBS broadcast on SCell and non-serving cell. The specification impact if any to support MBS broadcast reception on SCell and non-serving cell can be handled by RAN1 separately.

Some Tdocs expressed that some RAN1 specification support is missing, some restrictions are needed, or some configurations from RAN2 should be assumed for the support. From moderator’s perspective, these aspects are not related to feasibility, as long as UE has such capabilities.

Regarding UE capability, the related issues are whether additional UE capability(ies) is(are) assumed in addition to UE’s CA capability for receiving unicast and whether there should be separate UE capabilities for MBS broadcast reception on SCell and non-serving cell.

## Round-1 (closed)

This round of discussion aims to collect concerns for FL’s proposals. The draft LS reply will be prepared later when the proposals are stable/agreeable.

***FL’s proposals****:*

#### Proposal 3.1-1

From RAN1 perspective, it is feasible for UE in RRC\_CONNECTED state to receive MBS broadcast on SCell as long as UE has such capability.

**Collect concerns**:

|  |  |
| --- | --- |
| **Company** | **Comments**  |
| ZTE | From our perspective, it is feasible for UE RRC\_CONNECTED state to receive MBS broadcast on SCell as long as UE has such capability and it does NOT impact the ongoing transmission/reception on other serving cell. |
| MediaTek | Not supportAs we described in our contribution, we don’t support that broadcast reception on Scell/non-serving cell in Rel-17 MBS. The reasons are listed as following:1. In the objective of Rel-17 MBS WID, there is no any statement to support Scell/non-serving cell on broadcast reception. Therefore, supporting Scell/non-serving cell is out of the Rel-17 MBS scope.
2. Instead, the Rel-17 MBS is targeting to design basic function and has a restriction that UE implementation should be limited to fast facilitate implementation commercial deployment. We suggest that Rel-17 MBS as a first release for supporting 5G NR multicast broadcast services only focus on the basic function to fast commercial deployment. In other words, we think the Rel-17 MBS can be workable even if broadcast reception on Scell/non-serving is not supported.
3. Besides, if Scell is supported for broadcast reception, the Scell activation/deactivation and Scell addition/removal mechanisms are needed to further be discussed, e.g., how and when the UE to adjust its RF bandwidth to cover Pcell and Scell for MBS? And how to specify the RF glitch issues caused by Scell activation/ deactivation or addition/removal? These questions need more RAN4 discussion and workload.
4. From R1 chair’s report to RAN#94-e meeting, we can see that RNA1 has thought that “from RAN1 perspective, all NR SI/WIs (include Rel-17 NR\_MBS) led by other WGs with RAN1 objectives have been completed”. Thus, we think it is further confirmed that supporting MBS reception on Scell/non-serving cell is out of Rel-17 scope.
5. Besides, according to the latest approved Rel-18 MBS WID, from our understanding, it already has included the broadcast reception on Scell and non-serving cell as copied following:

|  |
| --- |
| This Work Item is to further enhance the NR Multicast/Broadcast functions based on Rel-17 MBS. The objectives for Rel-18 include:* …………
* Specify Uu signalling enhancements to allow a UE to use shared processing for MBS broadcast and unicast reception, i.e., ‎including UE capability and related assistance information reporting regarding simultaneous unicast reception in RRC\_CONNECTED and MBS broadcast reception from the same or different operators [RAN2]
* ………….
 |

To sum up, considering the above reasons and especially for Rel-17 MBS can be fast commercial deployment, we don’t support broadcast reception on Scell/non-serving cell in Rel-17. |
| vivo | We should note that for broadcast on PCell, UE needs to get MIB, SIBI, SIBx and MCCH on PCell, and the change of SIB on PCell is notified by paging. But for broadcast on SCell, we suppose paging on SCell is not expected. That is, UE does not monitor SIB on SCell or the change of SIB on SCell is notified by dedicated RRC signalling. From our perspective, it is feasible for UE RRC\_CONNECTED state to receive MBS broadcast on SCell as long as UE has such capability, but paging on SCell is not expected. |
| Xiaomi | We are fine with the proposal. |
| CATT | Support.  |
| Nokia, NSB | Support proposal. |
| **Moderator** | **To address the comments from MediaTek,** **I think all the comments bullets 1/2/4/5 are arguable/debatable, different companies may have different views,** **Regarding the technical concern from bullet 4, I don’t see the difference from SCell for unicast. From network perspective, if UE supports the SCell for broadcast, then NW will add/activate SCell for this UE if UE is interested in this SCell for broadcast and otherwise NW has to handover this UE by changing UE’s PCell if UE wants to receive broadcast. This is how RAN2 expects to use the capability UE reports on broadcast reception on SCell. From UE perspective, the procedure of adding/activating a SCell is legacy procedure. There seems no difference.** |
| OPPO | OK with the proposal. |
| Spreadtrum | Support |
| Lenovo, Motorola Mobility | From RAN1 point of view, it is feasible for UE in RRC\_CONNECTED state to receive MBS broadcast on SCell as long as UE has such capability. Since broadcast reception is best effort, it should not impact on unicast reception and multicast reception. Hence, we would like to emphasize this in the proposal by adding a bullet like below: From RAN1 perspective, it is feasible for UE in RRC\_CONNECTED state to receive MBS broadcast on SCell as long as UE has such capability.* Broadcast reception on SCell should not impact on unicast reception and multicast reception.
 |
| LG Electronics | We are fine with this proposal. |
| Samsung | Neutral/no support.The ‘letter’ of the proposal is OK (yes, it is feasible) but the ‘spirit’ of the proposal is not OK. Unlike multicast, the use case to have broadcast on SCell for RRC\_CONNECTED UEs is unclear. The proposal should be conditioned on no additional RAN1 specification impact beyond the corresponding one to support multicast on SCell.  |
| Qualcomm | The wording ‘such UE capability’ needs more clarification. From our understanding, it should be a new UE capability separate from CA and it is band/carrier-dependent, not a ‘per UE’ feature. The number of SCells that UE can monitor MBS PDCCH should also be included in the UE capability. |
| Intel | OK to support based on new UE capability as pointed out by QC. Additionally, only self-scheduling on such SCells should be supported. We do not support cross-carrier scheduling for broadcast reception on SCell.  |
| NTT DOCOMO | We are fine with the proposal. |
| CMCC | Support |
| TD Tech, Chengdu TD Tech | ok |

#### Proposal 3.1-2

From RAN1 perspective, it is feasible for UE in RRC\_CONNECTED state to receive MBS broadcast on non-serving cell as long as UE has such capability.

* It is assumed in RAN1 that UE receiving MBS broadcast on non-serving cell does not have any impact to operation on serving cell(s), e.g., does not require UE to obtain the related configuration from the serving cell, does not require the network to guarantee the scheduling doesn’t exceed UE’s capability, etc.

**Collect concerns**:

|  |  |
| --- | --- |
| **Company** | **Comments**  |
| ZTE | We agree with this proposal. |
| MediaTek | Not support.Please see our comments in **Proposal 3.1-1** |
| vivo | Support the proposal. |
| Xiaomi | We are fine with the proposal. |
| CATT | Support the proposal. |
| Nokia, NSB | Support proposal. |
| OPPO | OK. |
| Spreadtrum | Generally we are fine.We have one question for clarification:In the sub-bullet, for the sentence ‘does not require the network to guarantee the scheduling doesn’t exceed UE’s capability’, in our understanding it means that even if UE report capability, gNB still could schedule beyond UE’s capability, and it is up to UE’s implementation. So, we are very curious about why UE capability is needed. Maybe it could provide some help for gNB’s scheduling? |
| Lenovo, Motorola Mobility | OK |
| LG Electronics | We are fine with this proposal. |
| Samsung | Do not support.The sub-bullet requires further discussion – at least the total number of PDCCH candidates/CCEs per scheduling cell (e.g. $M\_{PDCCH}^{total,slot,μ}$/$C\_{PDCCH}^{total,slot,μ}$) can be affected. In general, further discussion is needed on how receiving MBS broadcast on non-serving cell “does not require UE to obtain related configuration from the serving cell, does not require the network to guarantee the scheduling doesn’t exceed UE’s capability, etc.”Agree with MTK that the proposal is out of scope for the Rel-17 WID – the WID is very clear on the requirements and limitations. |
| Qualcomm | The subbullet is based on the RAN2 agreement. Under the agreement as it is, it means that the UE capability doesn’t have any impact on the network. So, this is subject to UE implementation and transparent to the network. Note that there is a dedicated item in Rel-18 MBS to solve the “simultaneous reception”, we can consider any improvement if any under that item.Therefore, we should clarify the main bullet asProposal 3.1-2From RAN1 perspective, it is feasible for UE in RRC\_CONNECTED state to receive MBS broadcast on non-serving cell as long as UE has such capability, which is up to UE implementation and transparent to the network.* It is assumed in RAN1 that UE receiving MBS broadcast on non-serving cell does not have any impact to operation on serving cell(s), e.g., does not require UE to obtain the related configuration from the serving cell, does not require the network to guarantee the scheduling doesn’t exceed UE’s capability, etc.
 |
| Intel | MBS reception on non-serving cell may not be supported in Rel-18. In case this is based on implementation, then no further specification impact is necessary. We are not sure about “*under the condition this does not have any impact to operation on serving cell(s)”.* In our understanding, there may be some impact to unicast on serving cell, since simultaneous reception from serving and non-serving cell is not straightforward. This topic has also been debated in feMIMO inter-cell beam management and from TCI activation perspective reception from only single serving or non-serving cell is allowed.  |
| NTT DOCOMO | We are fine with the proposal. |
| CMCC | Support. |
| TD Tech, Chengdu TD Tech | ok |

#### Proposal 3.1-3

Support separate UE capabilities for UEs supporting MBS broadcast reception on Scell and for Ues supporting MBS broadcast reception on non-serving cell, respectively. The UE capabilities are expected to be defined by RAN2.

**Collect concerns**:

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| --- | --- |
| **Company** | **Comments**  |
| ZTE | We agree with this proposal. |
| MediaTek | Suggest to defer the discussion until we make a conclusion whether supporting broadcast reception on Scell/non-serving cell. |
| vivo | We support the proposal. it is the same as that in LTE. |
| Xiaomi | Agree with the proposal. |
| CATT | Support the proposal. |
| Nokia, NSB | Support the proposal. |
| OPPO | Support it. |
| Spreadtrum | Support the proposal |
| Lenovo, Motorola Mobility | OK |
| LG Electronics | We are fine with this proposal. |
| Samsung | This can be concluded quickly after the previous two proposals are concluded.  |
| Qualcomm | Can be deferred after the discussion of Proposal 3.1-1 and 3.1-2. |
| Intel | This is subject to agreements made on previous proposals. In our opinion MBS from non-serving cell should not be supported in Rel-17.  |
| NTT DOCOMO | We are fine with the proposal. |
| CMCC | Support |
| TD Tech, Chengdu TD Tech | ok |

#### Questions for RAN1 spec impact

Potential RAN1 impact and additional clarifications to support MBS broadcast reception on SCell and non-serving cell includes:

* Configuring the search space on SCell for PDCCH monitoring.
* The UE is not required to monitor DCI formats associated with SI-RNTI, P-RNTI, RA-RNTI in SCell.
* Overbooking for SCell is not supported.
* Broadcast reception on SCell can be supported only for RRC\_CONNECTED UEs only with self-scheduling.
* No spec impact for MBS broadcast reception on non-serving cell.

**Collect comments on the potential RAN1 spec impact**:

|  |  |
| --- | --- |
| **Company** | **Comments**  |
| ZTE | We are ok to clarify all these bullets. All these bullets are trying to say that MBS broadcast reception on SCell and non-serving cell should not impact the ongoing operation on serving cells. |
| MediaTek | Suggest to defer the discussion until we make a conclusion whether supporting broadcast reception on Scell/non-serving cell. |
| vivo | We are fine with the proposals. |
| Xiaomi | We are fine with the proposal. Actually only the fourth sub-bullet is needed as all the others are legacy behaviour.  |
| CATT | Fine with the clarifications |
| Nokia, NSB | Fine with these clarifications. |
| OPPO | Answer to this question is Yes, we are OK to clarify this aspects. |
| Spreadtrum | Fine |
| Lenovo, Motorola Mobility | We are fine with above proposals.In addition, we are wondering how to manage the HARQ process for broadcast reception on SCell.  |
| LG Electronics | We are fine with all of the bullet points. |
| Samsung | As previously mentioned, the “No [RAN1] spec impact for MBS broadcast reception on non-serving cell” should be discussed. NR and LTE do not use a same framework for PDCCH monitoring.  |
| Qualcomm | The first bullet needs to be clarified as* Configuring the search space on SCell for PDCCH monitoring of MBS DCI formats via unicast RRC signalling

We support other bullets. |
| Intel  | OK with clarification from QC. |
| NTT DOCOMO | We are fine with the clarifications. |
| CMCC | Fine with the clarifications |
| TD Tech, Chengdu TD Tech | ok |

## Round-2 (closed)

Most of comments from Round-1 were actually reflected by asking the questions whether companies agree the potential RAN1 impact and additional clarifications to support MBS broadcast reception on SCell and non-serving cell.

Discussing the three proposals with update of adding some clarifications/notes under the proposals seems more agreeable to most of companies.

For MBS broadcast on SCell, now the proposal is updated by adding some clarifications from RAN1 perspective based on the comments from Round-1.

For MBS broadcast on non-serving, RAN2 agreements clearly state the support is *under the condition this does not have any impact to operation on serving cell(s).* Therefore, RAN1 does not need to specify/optimize the potential impact. It is up to up to UE implementation and transparent to the network.

***FL’s proposals****:*

#### Proposal 3.2-1

From RAN1 perspective, it is feasible for UE in RRC\_CONNECTED state to receive MBS broadcast on SCell as long as UE has capability of supporting MBS broadcast on SCell. From RAN1 perspective,

* The capability of supporting MBS broadcast on SCell is separate capability from the one of CA for unicast.
* The UE is not required to monitor DCI formats associated with SI-RNTI, P-RNTI, RA-RNTI in SCell.
* Overbooking for SCell is not supported.
* Broadcast reception on SCell can be supported only for RRC\_CONNECTED UEs only with self-scheduling.
* Configuring the search space on SCell for PDCCH monitoring of MBS DCI formats is via unicast RRC signaling.

#### Proposal 3.2-2

From RAN1 perspective, it is feasible for UE in RRC\_CONNECTED state to receive MBS broadcast on non-serving cell as long as UE has such capability, which is up to UE implementation and transparent to the network.

* It is assumed in RAN1 that UE receiving MBS broadcast on non-serving cell does not have any impact to operation on serving cell(s), e.g., does not require UE to obtain the related configuration from the serving cell, does not require the network to guarantee the scheduling doesn’t exceed UE’s capability on serving cell, etc.
* No RAN1 spec impact for MBS broadcast reception on non-serving cell.

#### Proposal 3.2-3

Support separate UE capabilities for UEs supporting MBS broadcast reception on Scell and for Ues supporting MBS broadcast reception on non-serving cell, respectively. The UE capabilities are expected to be defined by RAN2.

**Collect concerns to the above proposals**:

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| --- | --- |
| **Company** | **Comments**  |
| TD Tech, Chengdu TD Tech | ok |
|  |  |

## Round-3 (after GTW)

As guided by VC on GTW, we will continue the discussion and focus on the question RAN2 asked whether it is feasible from RAN1 perspective.

Assuming UE will report the capabilities of receiving MBS broadcast on SCell or non-serving cell if UE supports, according to RAN2’s discussion, how RAN2 will use the capabilities is:

* If UE supports MBS broadcast reception on SCell, by this capability reporting, network can add the Cell as SCell and activate it for UE to receive broadcast. Otherwise, network will change UE’s PCell for UE’s to receive broadcast.
* If UE supports MBS broadcast reception on non-serving cell, by this capability reporting, network does not need to anything and assume UE will be able to receive broadcast on non-serving cell.
* From RAN2 perspective, it is entirely up to UE implementation whether UE can receive MBS broadcast on SCell or non-serving cell.

Regarding the comments brought up on GTW for the case where the non-serving cell is not in the same band as serving cell, or if broadcast is transmitted on FR2, or that there may be some impact to unicast on serving cell, etc, there might be some room to do optimization for different cases but it was not clear from the discussion whether any RAN1 impact is actually necessary for supporting the feature from RAN2 for broadcast reception on non-serving cell. If reception of broadcast on SCell or non-serving cell would affect UE receiving services on serving cell, UE just does not need to report it has capability of receiving MBS broadcast on SCell or non-serving Cell. It is also why the sub-bullets were added to clarify what the capabilities meant if UE reports.

The proposals are not updated in this round because no concerns were received in Round-2 email discussion but companies are still provided a chance to comment on these proposals. However, I added one more question for discussion in this round based on the points raised on the GTW. Please provide your views to the proposals and to the question.

***FL’s proposals****:*

#### Proposal 3.3-1

From RAN1 perspective, it is feasible for UE in RRC\_CONNECTED state to receive MBS broadcast on SCell as long as UE has capability of supporting MBS broadcast on SCell. From RAN1 perspective,

* The capability of supporting MBS broadcast on SCell is separate capability from the one of CA for unicast.
* The UE is not required to monitor DCI formats associated with SI-RNTI, P-RNTI, RA-RNTI in SCell.
* Overbooking for SCell is not supported.
* Broadcast reception on SCell can be supported only for RRC\_CONNECTED UEs only with self-scheduling.
* Configuring the search space on SCell for PDCCH monitoring of MBS DCI formats is via unicast RRC signaling.

#### Proposal 3.3-2

From RAN1 perspective, it is feasible for UE in RRC\_CONNECTED state to receive MBS broadcast on non-serving cell as long as UE has such capability, which is up to UE implementation and transparent to the network.

* It is assumed in RAN1 that UE receiving MBS broadcast on non-serving cell does not have any impact to operation on serving cell(s), e.g., does not require UE to obtain the related configuration from the serving cell, does not require the network to guarantee the scheduling doesn’t exceed UE’s capability on serving cell, etc.
* No RAN1 spec impact for MBS broadcast reception on non-serving cell.

#### Proposal 3.3-3

Support separate UE capabilities for UEs supporting MBS broadcast reception on Scell and for Ues supporting MBS broadcast reception on non-serving cell, respectively. The UE capabilities are expected to be defined by RAN2.

#### Question:

Do you think the configurations provided by SIB(x) and MCCH are sufficient for a UE to receive broadcast on a non-serving cell, and if not what is the missing specification impact?

**Collect views**:

|  |  |
| --- | --- |
| **Company** | **Comments**  |
|  |  |
|  |  |

# References

1. R1-2200009 LS on MBS broadcast reception on SCell and non-serving cell RAN2, Huawei
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13. [R1-2200648](file:///C%3A%5CUsers%5Cyouns%5COneDrive%5CDocuments%5C3GPP%5CRAN1%20tdocs%5CTSGR1_107b-e%5CDocs%5CR1-2200648.zip) DRAFT LS reply to MBS broadcast reception on SCell and non-serving cell Huawei, HiSilicon