**3GPP TSG-RAN WG2 Meeting #116 Electronic *R2-210xxxx***

**1 – 12 November 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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|  |
| ***Title:***  | Enhancements in RAN slicing |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** | 2021-08 |
|  |  |  |  |  |
| ***Category:*** |  **C** |  | ***Release:*** |  |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | Introduction of enhancements in slicing support in RAN |
|  |  |
| ***Summary of change:*** | This is the running stage 2 CR. This version captures the conclusions of TR 38.832 and the following agreements from RAN2#113bis and RAN2#114 and RAN2#115: |
|  |  |
| ***Consequences if not approved:*** | Rel-17 slicing enhancments in RAN are not supported |
|  |  |
| ***Clauses affected:*** |  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

*First Modified Subclause*

### 5.3.4 Random access

Random access preamble sequences, of four different lengths are supported. Sequence length 839 is applied with subcarrier spacings of 1.25 and 5 kHz, sequence length 139 is applied with subcarrier spacings of 15, 30, 60 and 120 kHz, and sequence lengths of 571 and 1151 are applied with subcarrier spacings of 30 kHz and 15 kHz respectively. Sequence length 839 supports unrestricted sets and restricted sets of Type A and Type B, while sequence lengths 139, 571, and 1151 support unrestricted sets only. Sequence length 839 is only used for operation with licensed channel access while sequence length 139 can be used for operation with either licensed or shared spectrum channel access. Sequence lengths of 571 and 1151 can be used only for operation with shared spectrum channel access.

Multiple PRACH preamble formats are defined with one or more PRACH OFDM symbols, and different CP and guard time. The PRACH preamble configuration to use is provided to the UE in the system information.

For IAB additional random access configurations are defined. These configurations are obtained by extending the random access configurations defined for UEs via scaling the periodicity and/or offsetting the time domain position of the RACH occasions.

IAB-MTs can be provided with random access configurations (as defined for UEs or after applying the aforementioned scaling/offsetting) different from random access configurations provided to UEs.

The UE calculates the PRACH transmit power for the retransmission of the preamble based on the most recent estimate pathloss and power ramping counter.

The system information provides information for the UE to determine the association between the SSB and the RACH resources. The RSRP threshold for SSB selection for RACH resource association is configurable by network.

Editor's Note: It is FFS if slice specific considerations should be added here over the general RACH enhancements.

*Next Modified Subclause*

#### 9.2.1.2 Cell Reselection

A UE in RRC\_IDLE performs cell reselection. The principles of the procedure are the following:

- Cell reselection is always based on CD-SSBs located on the synchronization raster (see clause 5.2.4).

- The UE makes measurements of attributes of the serving and neighbour cells to enable the reselection process:

- For the search and measurement of inter-frequency neighbouring cells, only the carrier frequencies need to be indicated.

- Cell reselection identifies the cell that the UE should camp on. It is based on cell reselection criteria which involves measurements of the serving and neighbour cells:

- Intra-frequency reselection is based on ranking of cells;

- Inter-frequency reselection is based on absolute priorities where a UE tries to camp on the highest priority frequency available;

- An NCL can be provided by the serving cell to handle specific cases for intra- and inter-frequency neighbouring cells;

- Black lists can be provided to prevent the UE from reselecting to specific intra- and inter-frequency neighbouring cells;

- White lists can be provided to request the UE to reselect to only specific intra- and inter-frequency neighbouring cells;

- Cell reselection can be speed dependent;

- Service specific prioritisation;

- Slice specific cell reselection information can be provided to facilitate the UE to reselect a cell that supportsspecific slices.

In multi-beam operations, the cell quality is derived amongst the beams corresponding to the same cell (see clause 9.2.4).

*Next Modified Subclause*

## 16.3 Network Slicing

### 16.3.1 General Principles and Requirements

In this clause, the general principles and requirements related to the realization of network slicing in the NG-RAN for NR connected to 5GC and for E-UTRA connected to 5GC are given.

A network slice always consists of a RAN part and a CN part. The support of network slicing relies on the principle that traffic for different slices is handled by different PDU sessions. Network can realise the different network slices by scheduling and also by providing different L1/L2 configurations.

Each network slice is uniquely identified by a S-NSSAI, as defined in TS 23.501 [3]. NSSAI (Network Slice Selection Assistance Information) includes one or a list of S-NSSAIs (Single NSSAI) where a S-NSSAI is a combination of:

- mandatory SST (Slice/Service Type) field, which identifies the slice type and consists of 8 bits (with range is 0-255);

- optional SD (Slice Differentiator) field, which differentiates among Slices with same SST field and consist of 24 bits.

The list includes at most 8 S-NSSAI(s).

The UE provides NSSAI (Network Slice Selection Assistance Information) for network slice selection in *RRCSetupComplete*, if it has been provided by NAS (see clause 9.2.1.3). While the network can support large number of slices (hundreds), the UE need not support more than 8 slices simultaneously. A BL UE or a NB-IoT UE supports a maximum of 8 slices simultaneously.

Network Slicing is a concept to allow differentiated treatment depending on each customer requirements. With slicing, it is possible for Mobile Network Operators (MNO) to consider customers as belonging to different tenant types with each having different service requirements that govern in terms of what slice types each tenant is eligible to use based on Service Level Agreement (SLA) and subscriptions.

The following key principles apply for support of Network Slicing in NG-RAN:

**RAN awareness of slices**

- NG-RAN supports a differentiated handling of traffic for different network slices which have been pre-configured. How NG-RAN supports the slice enabling in terms of NG-RAN functions (i.e. the set of network functions that comprise each slice) is implementation dependent.

**Selection of RAN part of the network slice**

- NG-RAN supports the selection of the RAN part of the network slice, by NSSAI provided by the UE or the 5GC which unambiguously identifies one or more of the pre-configured network slices in the PLMN.

**Resource management between slices**

- NG-RAN supports policy enforcement between slices as per service level agreements. It should be possible for a single NG-RAN node to support multiple slices. The NG-RAN should be free to apply the best RRM policy for the SLA in place to each supported slice.

**Support of QoS**

- NG-RAN supports QoS differentiation within a slice, and per Slice-Maximum Bit Rate may be enforced per UE. This UE-Slice-MBR limits the aggregate bit rate that can be expected to be provided across all GBR and Non-GBR QoS Flows corresponding to PDU Sessions of the UE for the same S-NSSAI (see TS 23.501 [3]). How NG-RAN enforces UE-Slice-MBR is up to network implementation.

**RAN selection of CN entity**

- For initial attach, the UE may provide NSSAI to support the selection of an AMF. If available, NG-RAN uses this information for routing the initial NAS to an AMF. If the NG-RAN is unable to select an AMF using this information or the UE does not provide any such information the NG-RAN sends the NAS signalling to one of the default AMFs.

- For subsequent accesses, the UE provides a Temp ID, which is assigned to the UE by the 5GC, to enable the NG-RAN to route the NAS message to the appropriate AMF as long as the Temp ID is valid (NG-RAN is aware of and can reach the AMF which is associated with the Temp ID). Otherwise, the methods for initial attach applies.

**Resource isolation between slices**

- The NG-RAN supports resource isolation between slices. NG-RAN resource isolation may be achieved by means of RRM policies and protection mechanisms that should avoid that shortage of shared resources in one slice breaks the service level agreement for another slice. It should be possible to fully dedicate NG-RAN resources to a certain slice. Some RACH resources can be associated to specific slice(s). Other aspects how NG-RAN supports resource isolation is implementation dependent.

**Access control**

- By means of the unified access control (see clause 7.4), operator-defined access categories can be used to enable differentiated handling for different slices. NG-RAN may broadcast barring control information (i.e. a list of barring parameters associated with operator-defined access categories) to minimize the impact of congested slices.

**Slice Availability**

- Some slices may be available only in part of the network. The NG-RAN supported S-NSSAI(s) is configured by OAM. Awareness in the NG-RAN of the slices supported in the cells of its neighbours may be beneficial for inter-frequency mobility in connected mode. It is assumed that the slice availability does not change within the UE's registration area.

- The NG-RAN and the 5GC are responsible to handle a service request for a slice that may or may not be available in a given area. Admission or rejection of access to a slice may depend by factors such as support for the slice, availability of resources, support of the requested service by NG-RAN.

**Support for UE associating with multiple network slices simultaneously**

- In case a UE is associated with multiple slices simultaneously, only one signalling connection is maintained and for intra-frequency cell reselection, the UE always tries to camp on the best cell. For inter-frequency cell reselection, dedicated priorities can be used to control the frequency on which the UE camps.

**Granularity of slice awareness**

- Slice awareness in NG-RAN is introduced at PDU session level, by indicating the S-NSSAI corresponding to the PDU Session, in all signalling containing PDU session resource information.

**Validation of the UE rights to access a network slice**

- It is the responsibility of the 5GC to validate that the UE has the rights to access a network slice. Prior to receiving the Initial Context Setup Request message, the NG-RAN may be allowed to apply some provisional/local policies, based on awareness of which slice the UE is requesting access to. During the initial context setup, the NG-RAN is informed of the slice for which resources are being requested.

### 16.3.2 AMF and NW Slice Selection

#### 16.3.2.1 CN-RAN interaction and internal RAN aspects

NG-RAN selects AMF based on a Temp ID or NSSAI provided by the UE over RRC. The mechanisms used in the RRC protocol are described in the next clause.

Table 16.3.2.1-1 AMF selection based on Temp ID and NSSAI

|  |  |  |
| --- | --- | --- |
| Temp ID | NSSAI | AMF Selection by NG-RAN |
| not available or invalid | not available | One of the default AMFs is selected (NOTE) |
| not available or invalid | present | Selects AMF which supports UE requested slices |
| valid | not available, or present | Selects AMF per CN identity information in Temp ID |
| NOTE: The set of default AMFs is configured in the NG-RAN nodes via OAM. |

#### 16.3.2.2 Radio Interface Aspects

When triggered by the upper layer, the UE conveys the NSSAI over RRC in the format explicitly indicated by the upper layer.

### 16.3.3 Resource Isolation and Management

Resource isolation enables specialized customization and avoids one slice affecting another slice.

Hardware/software resource isolation is up to implementation. Each slice may be assigned with either shared or dedicated radio resource up to RRM implementation and SLA.

To enable differentiated handling of traffic for network slices with different SLA:

- NG-RAN is configured with a set of different configurations for different network slices by OAM;

- To select the appropriate configuration for the traffic for each network slice, NG-RAN receives relevant information indicating which of the configurations applies for this specific network slice.

RACH resources can be associated to specific slice groups. The details of RACH resource isolation can be found in clause 5.3.4.

Editor's Note: Details of slice grouping and how it is provided to the UE are FFS.

### 16.3.X Slice aware cell reselection

Slice specific cell reselection information can be included in SIB messages and in *RRCRelease* message.

When the UE support slice aware cell reselection, and when slice specific cell reselection information is provided to the UE, then the UE uses the slice specific cell reselection information, but valid cell reselection information provided in *RRCRelease* always has a priority over cell reselection information provided in SIB messages.

Editor's Note: Details of slice grouping and how it is provided to the UE are FFS.

### 16.3.4 Signalling Aspects

#### 16.3.4.1 General

In this clause, signalling flows related to the realization of network slicing in the NG-RAN are given.

#### 16.3.4.2 AMF and NW Slice Selection

RAN selects the AMF based on a Temp ID or NSSAI provided by the UE.



Figure 16.3.4.2-1: AMF selection

In case a Temp ID is not available, the NG-RAN uses the NSSAI provided by the UE at RRC connection establishment to select the appropriate AMF (the information is provided after MSG3 of the random access procedure). If such information is also not available, the NG-RAN routes the UE to one of the configured default AMF(s).

The NG-RAN uses the list of supported S-NSSAI(s) previously received in the NG Setup Response message when selecting the AMF with the NSSAI. This list may be updated via the AMF Configuration Update message.

#### 16.3.4.3 UE Context Handling

Following the initial access, the establishment of the RRC connection and the selection of the correct AMF, the AMF establishes the complete UE context by sending the Initial Context Setup Request message to the NG-RAN over NG-C. The message contains the Allowed NSSAI and additionally contains the S-NSSAI(s) as part of the PDU session(s) resource description when present in the message. Upon successful establishment of the UE context and allocation of PDU session resources to the relevant network slice(s) when present, the NG-RAN responds with the Initial Context Setup Response message.



Figure 16.3.4.3-1: Network Slice-aware Initial Context Setup

#### 16.3.4.4 PDU Session Setup Handling

When new PDU sessions need to be established, the 5GC requests the NG-RAN to allocate/ resources relative to the relevant PDU sessions by means of the PDU Session Resource Setup procedures over NG-C. One S-NSSAI is added per PDU session to be established, so NG-RAN is enabled to apply policies at PDU session level according to the SLA represented by the network slice, while still being able to apply (for example) differentiated QoS within the slice.

NG-RAN confirms the establishment of the resources for a PDU session associated to a certain network slice by responding with the PDU Session Resource Setup Response message over the NG-C interface.



Figure 16.3.4.4-1: Network Slice-aware PDU Session Resource Setup

#### 16.3.4.5 Mobility

To make mobility slice-aware in case of Network Slicing, S-NSSAI is introduced as part of the PDU session information that is transferred during mobility signalling. This enables slice-aware admission and congestion control.

Both NG and Xn handovers are allowed regardless of the slice support of the target NG-RAN node i.e. even if the target NG-RAN node does not support the same slices as the source NG-RAN node. An example for the case of connected mode mobility across different Registration Areas is shown in Figure 16.3.4.5-1 for the case of NG based handover and in Figure 16.3.4.5-2 for the case of Xn based handover.



Figure 16.3.4.5-1: NG based mobility across different Registration Areas



Figure 16.3.4.5-2: Xn based mobility across different Registration Areas

*Next Modified Subclause*

*End of Changes*

# Annex A: RAN2 Agreements (to be removed when the CR is submitted for approval)

## A.1 RAN2#113bis

Agreements

1 RAN2 aligns with SA2 assumption that support of slices in a TA is homogenous also for Rel-17 (i.e. all cells within a TA supports the same slice availability). If SA2 decides to support heterogeneous deployments, RAN2 can revisit this.

2 The criteria for determining the cell reselection priority for inter-frequency cell reselection should not be left to UE implementation, but should be defined in the specification (just like cell reselection priorities currently). The details of slice info and how the UE determines its priority list from slice info is FFS.

2b FFS how to define slice priorities for reselection and how to handle conflicts between different priorities (e.g. broadcast vs. dedicated slice-specific priorities)

5 UE is only configured with either the existing dedicated priority configuration or the slice info in RRC Release.

3 In the case that slice info is also provided to the UE in the RRC Release message while SIB also provides the slice info, UE follows the dedicated slice info from RRC Release while T320-like timer is running and only if it expires that it follows the slice info in the SIB

4 In the case that existing dedicated priority configuration is provided to the UE in the RRC Release message while SIB also provides the slice info, UE follows the dedicated priority configuration while T320 is running as per legacy and only if it expires that it follows the slice info in the SIB

6 For UE supporting slice based cell reselection, the UE should use slice info in the SIB for cell reselection if both slice info and existing cell reselection priority is broadcast in the SIB.

* 1: With regard the main solution for prioritisation for slice based cell reselection, the following topics to be the initial focus for discussion: Details of slice availability in terms of Slice grouping and frequency priority information for broadcast and RRC Release message, usage of “intended slice” (FFS whether we use this term in specification), UE prioritisation of slice when there is more than one intended slice and how UE determines frequency priority for inter-frequency cell reselection based on these.
* 2: Following topics are only considered after some progress on the main solution for prioritisation for slice based cell reselection: which SIB(s) to carry slice availability, whether an LS to SA3 is needed (if SST/SD is agreed for slice info), whether SIB segmentation/on-demand is required (if new SIB is defined).
* 3: Other topics that have some support and could be discussed further depending on companies providing more details on the motivation and level of support: slice based reselection for MO, different RSRP/RSRQ thresholds for inter and intra-frequency slice based cell reselection, need for Validity area in RRC Release

Agreements

1 RAN2 aims to support both RO partition and preambles partition.

2 scalingFactorBI and powerRampingStepHighPriority can be configured at least in SIB (FFS for dedicated RRC signalling).

3 Network can configure slices with 4-step or 2-step (or both) RA resources.

4 Legacy 2-step RA fallback mechanism is supported.

* 2: RAN2 will prioritize the discussion for slice specific RACH for IDLE and INACTIVE mode. And CONNECTED mode is down prioritized and can be considered if time allows.
* 3: Slice specific RACH (including RACH isolation and RACH prioritization) is only applied for CBRA but not for CFRA.
* 4: To ensure the backward compatibility, it is RAN2’s common understanding that common RACH resource should be configured in initial BWP if the slice specific RACH resource is configured in initial BWP.
* 6: RAN2 confirms that the issue of prioritization parameter collision with MPS/MCS need to be resolved. There is UE based solution (option 1, fixed rule) or network based solution (option 2, configurable rule) or both. Discussion on pros and cons can be left to next meeting.
* 5.1: RACH type selection between 2-step slice specific RACH and 4-step slice specific RACH is based on a RSRP threshold.
* FFS to introduce a slice specific threshold or reuse the legacy threshold.
* FFS UE should first select between slice specific RA and common RA or UE should first select RA type between 2-step RA and 4-step RA
* 5.2: The table from [R2-2104322](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2104322.zip) can be used for further discussion.
* Slice specific RACH is only applicable if there is slice information (e.g., slice group or slice related operator defined access category) available for AS layer when access. FFS on details of slice group.

## A.2 RAN2#114

* Can consider documenting SMBR enforcement in Stage-2 as conclusion of the slicing WI.
* Email [250] (Lenovo): Attempt to formulate how the slice priorities could work (i.e. the entire approach, can have multiple options). We will not try to consider Stage-3 details yet or e.g. where priorities come from. Stick to basic principles of slice prioritization.
* 1: Frequency priority mapping for each slice (slice -> frequency(ies) -> absolute priority of each of the frequency) is provided to a UE.

Note: Signaling optimizations are not excluded.

Note: "slice may also mean "slice group"

* 1b: Frequency priority mapping for each of the slice (slice -> frequency(ies) -> absolute priority of each of the frequency) is part of the “slice info” agreed to be provided to the UE using both broadcast and dedicated signaling.
* 2: RAN2 kindly allow one more meeting cycle for understanding the necessity of Slice priority along with the following shortlisted solution directions for Idle mode mobility:

a) Option 4): Slice priority first looping over slice-frequency combination

b) Option 5): Maximize slice support

c) Option 6): Frequency priority of highest priority slice with adjustment based on actually supported slice(s) in best ranked cell, without multiple iterations of cell reselection

d) Option 7): Perform legacy cell reselection mechanism based on slice specific frequency priority

* 3: RAN2 consider a scenario in its work for slice specific cell (re)selection where it is possible that (Suitable) cells on the same frequency belonging to different TAs support different Slice(s).
* 4: Working assumption: The Best cell principle according to absolute priority reselection criteria specified in clause 5.2.4.5 of TS38.304 needs to be met also for slice specific cell (re)selection.
* 6: In addition to proposal 2, following aspects are FFS:

a) Content of “Slice Info” – to what extent the information needs to be and should be provided to support the Principle in proposal 5

b) If used, who provides the “Slice priority” (NAS/ AS, UE/ Network)

c) Can RAN2 continue to use “intended” slice for initial registration and idle-mode mobility

d) How UE in each of the solutions from proposal 2 uses slice info for cell reselection if both slice info and existing cell reselection priority is signaled (in the SIB and/ or dedicated signaling)

* 4: RAN2 confirm for a slice group, separated RO and/or separate preamble can be configured within the existing RACH-ConfigCommon and RACH-ConfigCommonTwoStepRA
* 5: Same as NR Rel-15 conclusion, RAN2 conclude that there is no RA-RNTI collision between slice specific RACH and legacy RACH in shared RO
* 6: Same as NR Rel-15 conclusion, RAN2 conclude that the RA-RNTI collision between slice specific RACH and legacy RACH may happen in separate RO.
* Working assumption: this can be left to network implementation to resolve it (e.g. network configure RO in different time)
* FFS how many slice groups we can have and how they are indicated.

## A.2 RAN2#115

Agreements

* RAN2 needs to check with SA2/ CT1 if it is alright for AS to expect to receive slice list as well as slice priority information from NAS for cell (re)selection. Ask about both slices and slice groups.

Agreements

* 2 Following is taken as the baseline for Solution Option 4:

The “slice info” (for a single slice or slice group) agreed to be provided to the UE in the last RAN2 meeting using both broadcast and dedicated signaling are provided for the serving as well as neighboring frequencies. The following steps are used for slice based cell (re)selection in AS:

Step 0: NAS layer at UE provides slice information to AS layer at UE, including slice priorities.

Step 1: AS sorts slices in priority order starting with highest priority slice.

Step 2: Select slices in priority order starting with the highest priority slice.

Step 3: For the selected slice assign priority to frequencies received from network.

Step 4: Starting with the highest priority frequency, perform measurements (same as legacy).

Step 5: If the highest ranked cell is suitable (as defined in 38.304) and supports the selected slice in step 2 then camp on the cell and exit this sequence of operation; FFS: How the UE determines whether the highest ranked cell supports the selected slice.

Step 6: If there are remaining frequencies then go back to step 4.

Step 7: FFS: If the end of the slice list has not been reached go back to step 2.

Step 8: Perform legacy cell reselection.

* 1: Solution Option 4 is selected for further work i.e., resolve the FFSs, send any required LSs and consequently start to draft specification CRs.

Bulk agreements

* 3 Network based solution is introduced to resolve the issue of prioritization parameter collision with MPS/MCS, i.e., Network indicates whether slice override MPS or MPS override slice.
* 5 For slice based RACH prioritization, RAN2 will stick to the current baseline parameters, i.e., scalingFactorBI and powerRampingStepHighPriority, and no additional parameters for this release.
* 7 Reuse the legacy threshold for the selection between 2-step and 4-step slice initiated RACH
* A new slice grouping mechanism is introduced for RACH configuration. One slice belongs to one and only one slice group. Slice groups are assumed to be only updated when UE does Registration Update.
* 2 Working assumption: The mapping between S-NSSAIs and slice groups should be configured to the UE through NAS signalling. Discuss problems for cell- vs. UE-specific signalling via post-meeting email discussion.
* 4 If no network indication is sent in case of slice prioritization parameter collision with MPS/MCS, it will be left to UE implementation.
* 8 It is RAN2 common understanding that 4-step common RACH needs to always be supported in initial BWP for legacy UE. And whether to configure 2-step slice specific RACH only or 4-step slice specific RACH only or both is left to network configuration.

*For RACH type selection, UE first selects between slice-specific and common RACH, then selects between 2-step and 4-step.*

*9 The following fallback case is supported:*

*– Fallback case 2: Fallback from 2-step slice specific RACH to 4-step common RACH, if 4-step slice specific RACH is not configured.*

*10 The following fallback cases are not supported in this release:*

*– Fallback case 1: Fallback from 4-step slice specific RACH to 4-step common RACH*

*– Fallback case 3: Fallback from 2-step slice specific RACH to 2-step common RACH, if neither 4-step slice specific RACH nor 4-step common RACH is configured.*

* 6, 9, 10 will be aligned to the common RACH partitioning discussion decisions