Introducing a new band number is a well-known technique for RAN4, which has been used to differentiate between different (sub-)bands or portions thereof already in 3G WCDMA specifications..

One technique to address the issue of adding regional sub-bands within an existing 3GPP band is for 3GPP to define a new band or new band number that contains the added sub-bands. 3GPP would pro-forma select a new band number based on regional frequency allocations within an existing 3GPP band, the existing band being referred to as the parent band.

To avoid that a legacy device supporting only the parent band (but not indicating support for the new band or band number) will camp on a cell in the new sub-band, the network shall indicate only the new band or band number on cells in the new sub-band.In this manner the technique of a new band number should prevent UEs which are not compliant to the requirements of the new sub-band from camping on or accessing the cell in such a sub-band. And the gNB sees from UE capabilities the bands that the UE supports and hence the gNB knows if the UE can be handed over to a cell in the new sub-band.

For this technique, the new band or new band number would reference the parent band for RF requirements. Dedicated sub-band hardware for the UE such as RF filters is not assumed to be utilized for the new band or band number. In addition, the new band or new band number should be a collection of a new sub-band and previously introduced sub-band(s) to avoid having inter-band CA within the parent band. To avoid market fragmentation and to support roaming, it should be mandated that the new band or band number can only be supported by a UE which also supports the associated parent band. If a UE including roaming UE is not certified to operate in new band or band number based on regional regulatory certification, the UE shall not advertise the new band or band number in its capabilities nor shall it attempt to connect to a cell broadcasting this new band or band number.

In current practice, adding a new band or band number normally triggers introduction of new band combinations, which would add many new band combinations to the specification and UE capability signalling. To ensure that UE capability signalling is not adversely impacted by the number of supported band combinations, this technique requires that the new band number corresponding to the new sub-band has a reference to the parent band for signalling carrier aggregation (CA) and dual-connectivity (DC) band combinations. Band combinations will only be created for parent bands, not for regional sub-bands.

This technique requires no new signalling and can work for any release UEs, but it does change the semantics of 3GPP frequency bands and 3GPP should clarify the association between a new band or new band number and their parent band in signalling requirements. If the new band or new band number approach is applied, 3GPP RAN4 should:

• Consider accommodations for cases where the UE subset support precludes the possibility to test some MSD exceptions:If the UE supported subset precludes the possibility to test some MSD exceptions, just like with Note 12 for n77 either the MSD configuration can be changed so the MSD is testable in the country that uses the sub-band or a note can be added to waive the MSD.

• Ensure that the number of new band definitions does not exhaust the range of possible band numbers: Rel-17 signaling supports 1024 NR band numbers, or which 104 are assigned in Rel-17. Exhaustion of the range of band numbers is not anticipated to be an issue.

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