

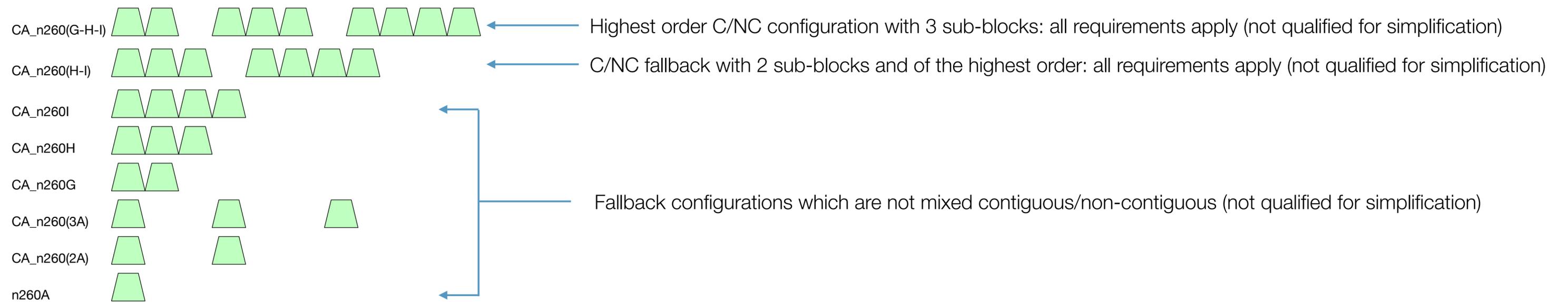


# Motivation for the simplification of handling of fallbacks for FR2 CA

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Apple Inc.

# Overview



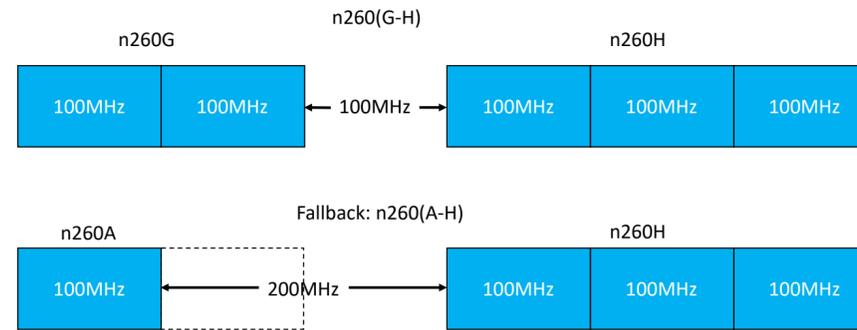
## ■ Background

- RAN4 approved not to support fallbacks of combined contiguous/non-contiguous FR2 DC/CA combinations back in August 2019 and lost alignment with RAN2 specs
- Trying to resolve this RAN2 proposed a new signaling, but it was finally not agreed in the June RP.
- The issue has been under discussion in RAN since that time

## ■ Motivation

- Development effort to support the thousands of fallbacks of contiguous/non-contiguous combinations specified in 38.101-2/38.101-3 is very large, since all fallback combinations will have additional RX and TX requirements relative to the highest order configuration, and this is not necessary
- Figure illustrates an example with CA\_n260(G-H-I)
  - Configurations for which all requirements in 38.101-2 and 38.101-3 are applicable are shown
  - Fallback configurations which qualify for requirement simplification (i.e. qualified fallbacks) are:
    - Mixed contiguous and non-contiguous
    - Have the same number of sub-blocks as the highest-order not qualified configuration

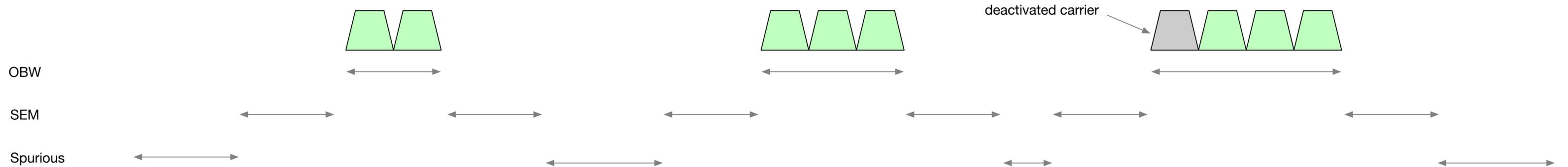
# Simplification of RX requirements for qualified fallbacks



## ■ Analysis of RX requirements

- For RX requirements (ACS, in-band blocking, REFSENS) for the mixed C/NC fallbacks, an additional requirement for the removed carrier in the gap and accordingly another test with an interferer on that empty channel.
- With the change that no additional requirements apply, the fallback combination will need to fulfill the same requirement inside and outside the gap as the higher order combination, so no additional requirement on the removed carrier

# Simplification of TX requirements for qualified fallbacks



## ■ Analysis of Tx requirements

- TX requirements which are defined per CC (such as MOP, min/OFF output power, TPC, transient mask, frequency error, EVM, carrier leakage) are already fulfilled by the highest order configuration, since the only difference is the removal of carrier(s) from the highest order configuration. we can consider to exclude this requirement from the list of exempt requirements for qualified FR2 fallbacks. However, a discussion on conformance test case reduction for these requirements could be useful
  - Occupied bandwidth, Spectral emission mask, ACLR, spurious emissions: our understanding is that for mixed C/NC configurations only 1 operator in the US has requested them, which implies that all regulatory requirements for these configurations outside of the operator's license block are met with the highest order configuration. Thus, the in-gap Tx requirements for the fallbacks are not regulatory facing and can be considered in the list of exempt requirements
  - IBE: “the IBE requirement has been instituted merely to enable co-existence of UEs that are FDM’ed on the same beam. It has no regulatory exposure” [R4-1909927, Qualcomm]. As reasoned above, it is not necessary to specify these requirements for the lower order mixed C/NC fallbacks. We propose to include these requirements in the list of exempt requirements for qualified FR2 fallbacks.
- In our understanding, these observations hold only if such CA combinations are limited to a single operator in a regional deployment

# Summary

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- The proposals described in this contribution are implemented as company CRs to the RF specifications as follows:
  - RP-202575: CR to 38.101-2 on handling of fallbacks for FR2 CA (Rel-15 category F CR)
  - RP-202576: CR to 38.101-2 on handling of fallbacks for FR2 CA (Rel-16 category A CR)
  - RP-202577: CR to 38.101-3 on handling of fallbacks for FR2 CA (Rel-15 category F CR)
  - RP-202578: CR to 38.101-3 on handling of fallbacks for FR2 CA (Rel-16 category A CR)

