

Orange view on co-existence between NR-U and Wi-Fi

ORANGE

Orange perspectives for Wi-Fi and NR-U deployment

- Orange is a convergent operator with both fixed and mobile networks
- Wi-Fi is being used and operated by Orange primarily in the following context:
 - Home: for wireless connectivity, based on an in-house modem (called “Livebox”)
 - B2B: for WLAN deployments, primarily for offices indoors
- Orange, as a Fixed / Wi-Fi operator, is therefore sensitive to minimising the impact of NR-U introduction on existing and future Wi-Fi operations
- Orange believes a sub-optimal NR-U – Wi-Fi coexistence would be detrimental mainly to NR-U deployments:
 - Wi-Fi is seen as the primary connectivity for both homes & offices for years to come
 - NR-U is seen as a complementary technology, aimed at additional use cases (e.g. 5G eMBB, 5G verticals,...)
 - NR-U is therefore seen as “a new entrant” and should not disrupt legacy Wi-Fi services
 - If legacy services are affected, the customers would probably request Orange for the problem to be fixed (i.e. no interference). In the worst case, the NR-U deployment may be blocked by the customer.

Context

- Coexistence between NR-U and other RAT technologies (WiFi or NR-U) may rely on 2 main mechanisms:
 - Clear Channel Assessment - **Energy Detection** (CCA-ED, or simply “ED”)
 - Clear Channel Assessment - **Preamble Detection** (CCA-PD, or simply “PD”) which may be a Wi-Fi preamble or a new preamble specified for NR-U
- Wi-Fi technologies rely primarily on a combination of PD and ED, typically based on the following thresholds:
 - PD = - 82 dBm
 - ED = - 62 dBm
- LTE LAA has been specified without Preamble Detection, relying solely on Energy Detection:
 - ED = - 72 dBm

ED: Energy Detection
PD: Preamble Detection
LBT: Listen Before Talk

CCA: Clear Channel Assessment
CCA-ED: CCA-Energy Detection
CCA-PD: CCA-Preamble Detection

Orange view for NR-U co-existence with Wi-Fi

- For NR-U, Orange is in favour of the introduction of a Wi-Fi preamble
- ED-only (at -72 dBm) is not optimum since an NR-U Base Station or UE would not detect Wi-Fi or NR-U at levels below -72 dBm and would potentially generate interferences.
- Orange main concern is the **potential degradation of performance on existing WLAN infrastructure** when NR-U is deployed in the same location (e.g. office / factory)
- Ideally, Orange would also wish these **thresholds to be tunable**, to have the operational tool to reduce interferences in the field
- Orange prefers a **standardised mechanism** to ensure smooth interoperability between BS and UEs

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CCA: Clear Channel Assessment
CCA-ED: CCA-Energy Detection
CCA-PD: CCA-Preamble Detection

Orange view for 6 GHz

- As stated in the revised NR-U WI (3GPP document RP-191575), the 6 GHz band considered for Europe for unlicensed use is 5.925 – 6.425 GHz.
- No decision on the licensing regime has been made in CEPT on the upper part of the band, i.e. 6.425 – 7.125 GHz, therefore the decisions made on co-existence between Wi-Fi and NR-U should not apply to the 6.425 – 7.125 GHz range for Europe