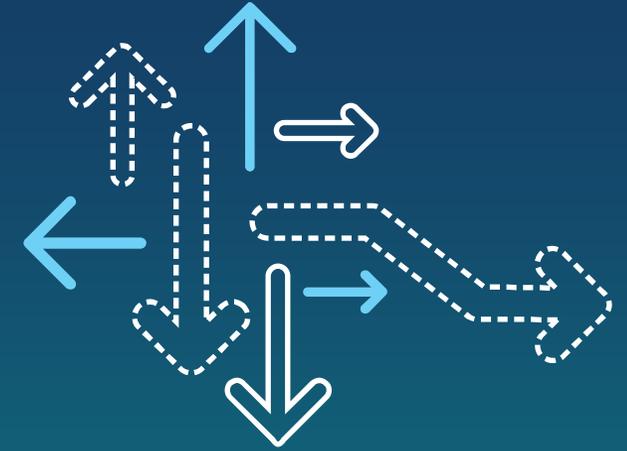


RP-190537

3GPP RAN #83  
Shenzhen, China  
March 18-21, 2019



---

# LTE Gapless Measurement on FR2

---

Qualcomm Incorporated, Verizon, AT&T

# FR2 Measurement in LTE Standalone (SA)

## Scenario:

UE is served by a LTE SA cell and is requested to perform IRAT measurement on FR2

## Current supported options in 3GPP Rel. 15:

### Option#1: Per-UE measurement gap

- UE has to tune away from LTE when performing measurement on FR2

### Challenges

- *Throughput degradation*, as UE will not be served during gap
- *Gap-SSB alignment*: NW has to align the gap on LTE, for all NR capable UEs, with the SSB window

### Option#2: Per-FR measurement gap

- Gapless measurement on FR2 could be performed

Challenges: need for *multiple / significant concurrency requirements* to be supported, to list few:

- LTE to FR2 gapless search
- FR1 to FR2 gapless search
- EN-DC (LTE+FR1) to FR2 gapless search
- Gap search with independent gaps for multiple RAT combos
- ...

# FR2 Gapless Measurement in LTE SA

UE may have the ability to support FR2 gapless measurement in limited cases

- There can be sets of devices that:
  - Support FR2 gapless measurement while the UE is served by LTE serving cells (only)
  - But do not support all FR2 gapless measurements, and independent gaps, required by “per-FR” gap
    1. LTE to FR2 gapless measurement
    - ~~2. FR1 to FR2 gapless measurement~~
    - ~~3. EN-DC (LTE+FR1) to FR2 gapless measurement~~
    - ~~4. Gap based measurement with independent gap pattern for multiple combination of RATs~~
- Such devices can overcome the challenges raised earlier, while still providing the benefits of gapless measurements on FR2.
- Such UE capability is not supported by current signalling options

# Proposal

## FR2 Gapless Measurement in LTE SA (only)

- **Proposal:** Support an optional capability for FR2 Gapless measurement in LTE standalone
  - “Per-UE” Boolean flag, irrespective of the FR2 band, e.g. (pseudo RRC/ASN1 text):

---

```
IRAT-ParametersNR-v15xy ::= SEQUENCE {  
    MeasFR2-WithoutGap-r15    ENUMERATED {supported}  
    OPTIONAL}
```

---

***MeasFR2-WithoutGap:***

Indicates whether the UE supports gapless FR2 measurement for NR, while the UE is served by only E-UTRA serving cell(s).

---

- No interoperability issues
  - *Optional, with UE capability signaling*
- Spec changes: minor
  - *36.331 (UE capability signalling) & 36.306 (UE capability definition)*

---

# Annex

## RAN2 Background

- The proposal described above was submitted and discussed at RAN2#105 (Feb 2019)
  - See R2-1902688 (summary of offline discussion)
    - Large support (10-12 companies)
    - Few concerns (1-2 companies)
- No agreement
  - *“RAN2 could not conclude on the addition of this new capability”*