

**MEDIATEK**

# Temporary Capability Restriction for Thermal Mitigation

# UE Overheating – Temporary Capability Restriction [1/2]

- UE Overheating issue arises as data rates increase
  - Issue raised by a number of companies in RAN2 (see e.g. MediaTek input to [R2-1811393](#))
- Two potential solutions exist today in E-UTRA RRC spec and EPS+5GS NAS specs – NOT NR RRC spec
  - a) E-UTRA RRC: *UEAssistanceInformation* message for temporary restriction of UE DL and/or UL category or nr of secondary CC.  
Timer-controlled  
(note: works as an on/off switch)  
  
Applicable with EN-DC ✓
  - b) EPS and 5GS NAS: Change of UE Radio Capabilities without detach/reattach, using TAU/MRU
- Observations
  - a) Best suited to address overheat (transient) (not seen by NAS)
  - b) Not recommended due to NAS signalling surge

# UE Overheating – Temporary Capability Restriction [2/2]

- Problem

- No AS solution exists for NR SA in RRC (38.331) at the moment but is indicated as required in TS38.300  
We expect RAN2 will conclude in Q4
- Overheating problem is serious for UEs supporting NR (ENDC, NR SA) – NR SA solution is required
- (Other scenarios can also prompt for temporary restriction of capabilities e.g. hardware sharing, interference)

- Observations

- NR is more optimized to wider bandwidth processing which can lead to better UE power efficiency (J/bit)
- But overheating may still happen with continuous transmission, i.e. need for emergency brake.
- Support of UE Temporary Capability Restriction is a fundamental requirement

# UE Overheating – Summary

- Temporary capability restriction is fundamental for NR
- The mechanism should not cause unwanted radio interface signaling surge – i.e. shall be network controlled and e.g. Timer-protected
- Temporary capability restriction shall remain transparent to NAS
- Standardization is required, network deployment is essential
- **Proposal**
  - Signaling support for UE Temporary Capability Restriction shall be supported in NR RRC in Rel-15
  - RAN2 should conclude the work in Q4 2018
  - RAN5 shall specify TC accordingly