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RP-233787
Agenda Item: 9.1.1.5 Network Energy Savings

Views on 5G Advanced Rel-19 NES

RAN#102, 11-15 Dec 2023, Edinburgh, Scotland

Rel-19 Network Energy Savings

Motivations

- NES is essential first to reduce the environmental impact of 5G networks, and second for operational cost savings
- A NES SI was started **in Rel-18** and continued as a WI focusing on
  - SSB-less SCell operation for inter-band CA (FR1 and co-located cells)
  - Cell DTX/DRX (RRC_CONNECTED) aligning cell DTX/DRX and UE DRX
    - **RAN2 Rel-18 leftovers recommended to be treated in Rel-19**
  - adaptation of spatial elements and power offset values
  - preventing legacy UEs camping on cells adopting Rel-18 NES
- For **Rel-19** further promising techniques to significantly save energy and reduce QoS impact on users are
  - allow BS to transit into deep sleep mode, e.g. using on demand SSB / SIB1 transmissions
  - Improve efficiency of Cell DTX/DRX for UEs in connected modes to mitigate possible high delay impacting the User's experience and increased energy consumption as UEs may need to quit Cell DTX/DRX too early and too often

Potential Objectives and their priority

1. On-demand SIB1 transmissions
2. Efficiency / QoS enhancements on Cell DTX/DRX for UEs in connected mode
   - Support of multiple DTX/DRX patterns in the same serving cell
   - Efficient handling of traffic bursts without Cell DTX/DRX de-activation
3. Common Signals Adaptation (idle/inactive Cell DTX/DRX)
   - Including Backward compatible SSB period adaptation
4. On-demand SSB on SCell

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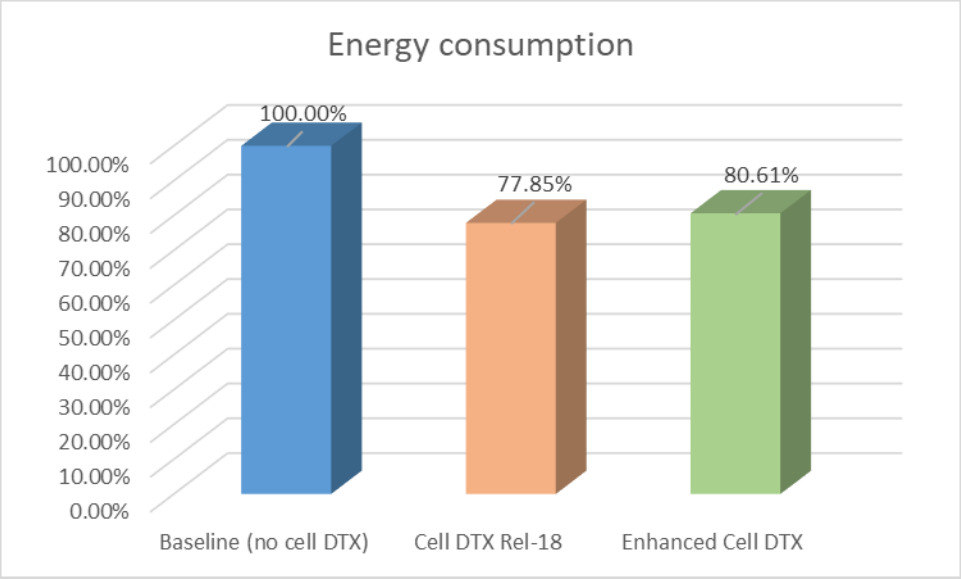
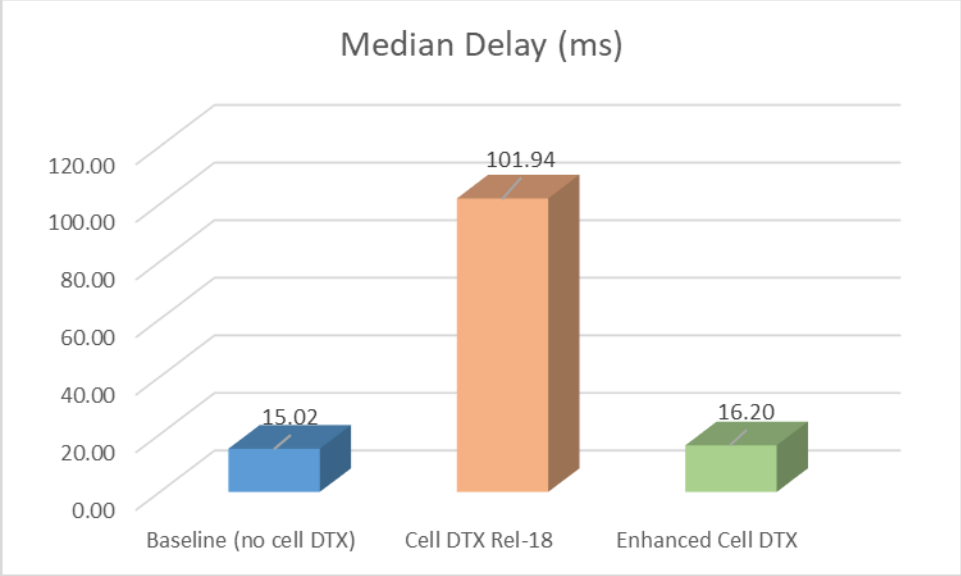
Why Efficient Handling of Traffic Burst in Cell DTX/DRX is Needed?

Same energy saving , less delay → spend more time in Cell DTX/DRX

Cell DTX on Rel-18 saves energy at the price of high delay. If traffic bursts could be handled without Cell DTX de-activation (Enhanced Cell DTX) , low delay is possible
→ more time with Cell DTX activated and more time saving energy





For technical details – see R2-2313535

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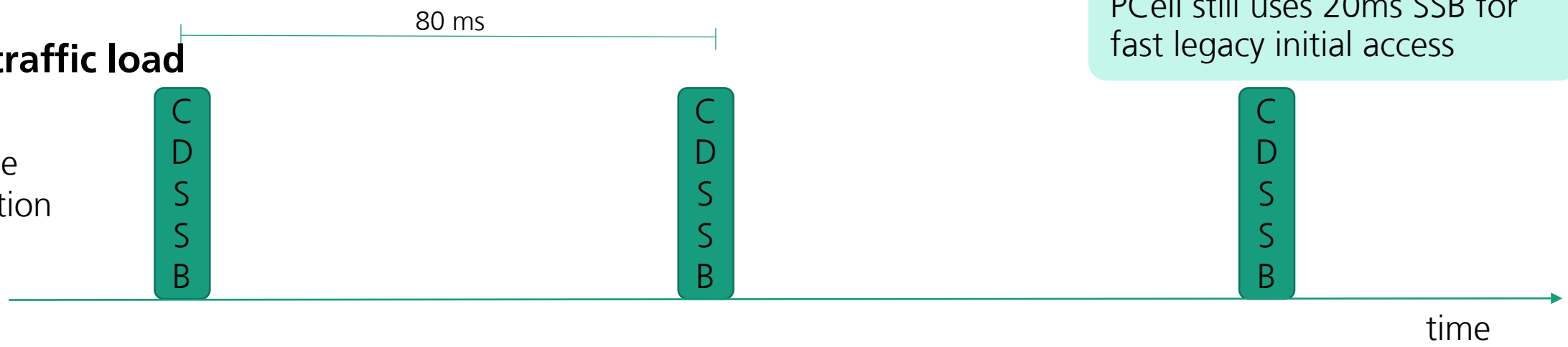
Backward Compatible SSB Period Adaptation

Adding NCD-SSBs (non cell defining-SSBs) on SCells on traffic increase

PCell still uses 20ms SSB for fast legacy initial access

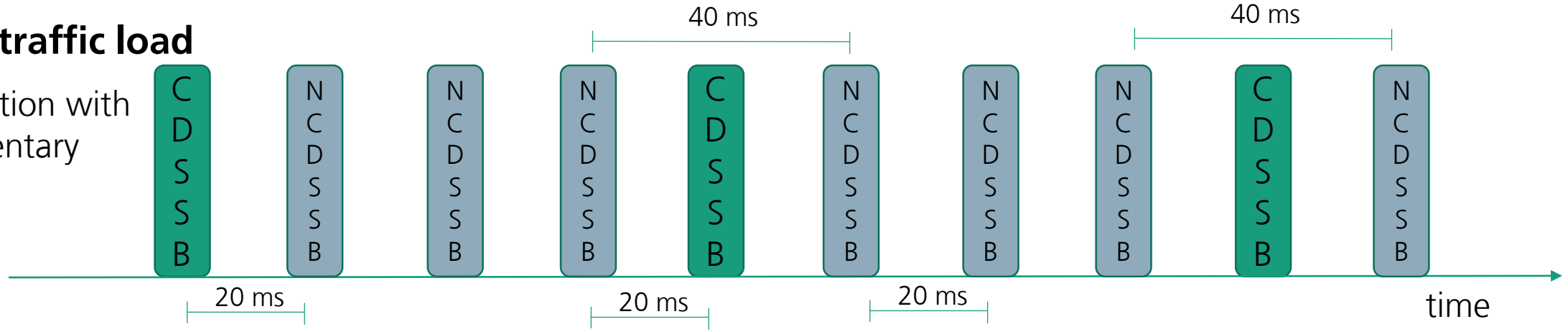
For low traffic load

Backward compatible configuration



For high traffic load

Configuration with complementary NCD-SSB



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