

3GPP TSG RAN Meeting #98-e
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Discussion on WID for Rel-18 Network Energy Saving Techniques

Agenda Item: 9.1.1
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Conclusion from the SI on NW Energy Save

- TR38.864 Provides an executive summary and some recommendations for WI.

7 Conclusions

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Based on the study and summary, from time and frequency domain,

- Technique A-4 of adaptation of DTX/DRX, including the alignment of Cell DTX/DRX with UE DRX, is beneficial for network energy savings.
- Adaptation/reduction/elimination of common channels/signals (UE WUS can also be considered) in single or multi-carrier operation are beneficial for network energy savings.

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Based on the study, at least a technique based on C-1 is beneficial for network energy savings, and can be recommended. Technique C-2 also has the potential to provide large network energy saving gain.

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Based on the study, at least a technique based on D-1 is beneficial for network energy savings.

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It is recommended that the normative phase includes not only energy saving techniques (the necessary enhancements would need to be further identified during the normative phase) but also the mitigation of their impacts when network applies network energy savings technique(s).

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Discussion on Potential Techniques for WID (1/2)

- While benefits from potential power saving is the most important aspect for selection of techniques for WI, it is equally important to holistically consider specification work (that can be managed and completed in next 9 Months), potential impact to legacy devices (including limitation of operations in specific cells and various KPIs such as throughput).
- For time domain,
 - Other than what is recommended, technique #A-4 adaptation of cell DTX/DRX (for both connected and idle modes), enhancements to paging and RACH (sub category of technique #A-1) seem prime candidates for consideration for WID.
 - Enhancements to paging and RACH (sub category of technique #A-1) can be done in such way that support all legacy devices in the cell, does not have significant identified impact to user data throughput, and show promising power saving gains in low to light loads.
 - We suggest to consider supporting technique #A-4 adaptation of cell DTX/DRX including upper layer impact identified by RAN2, #A-1 paging enhancements, and #A-1 RACH enhancements.
- For frequency domain,
 - Do not pursue for Rel-18.
 - No clear power saving gains were observed.

Discussion on Potential Techniques for WID (2/2)

- For spatial and power domain,
 - Recommended technique #C-1 and #D-1 share same configuration architecture in the current specification, and therefore enhancements for spatial elements, #C-1, is likely going to be also applicable for enhancements power domain, #D-1.
 - Both #C-1 and #D-1 can be done such that it does not have any impact to legacy devices, the impact to performance KPI, e.g., throughput, can be controlled by gNB based on trade-off between power consumption and performance KPIs. The specification work is expected to be reasonable.
 - We suggest to consider jointly supporting technique #C-1 adaptation of spatial elements, #D-1 adaptation of power.
- For identified NW energy saving techniques from upper layers,
 - Recommend to support CHO enhancement taking into consideration of NES state of source and target cell

Recommendation/Proposal

- Recommend to standardize the following NW energy saving technique WI:
 - Technique #A-4 adaptation of cell DTX/DRX (RAN1, RAN2, RAN3)
 - Including impact to higher layers (RAN2, RAN3)
 - Technique #A-1 enhancements to paging (RAN2, RAN1)
 - Technique #A-1 enhancements to RACH (RAN1, RAN2)
 - Technique #C-1 and D-1 adaptation of spatial elements and transmit power. (RAN1)
 - Other identified NW energy saving techniques in RAN2, CHO enhancement taking into consideration of NES state of source and target cell (RAN2)

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