

China Academy of Telecommunication Technology -

3GPP TSG RAN Meeting #93-e

Electronic Meeting, September 13th - 17th, 2021

RP-212258

Views on Rel-18 RedCap evolution

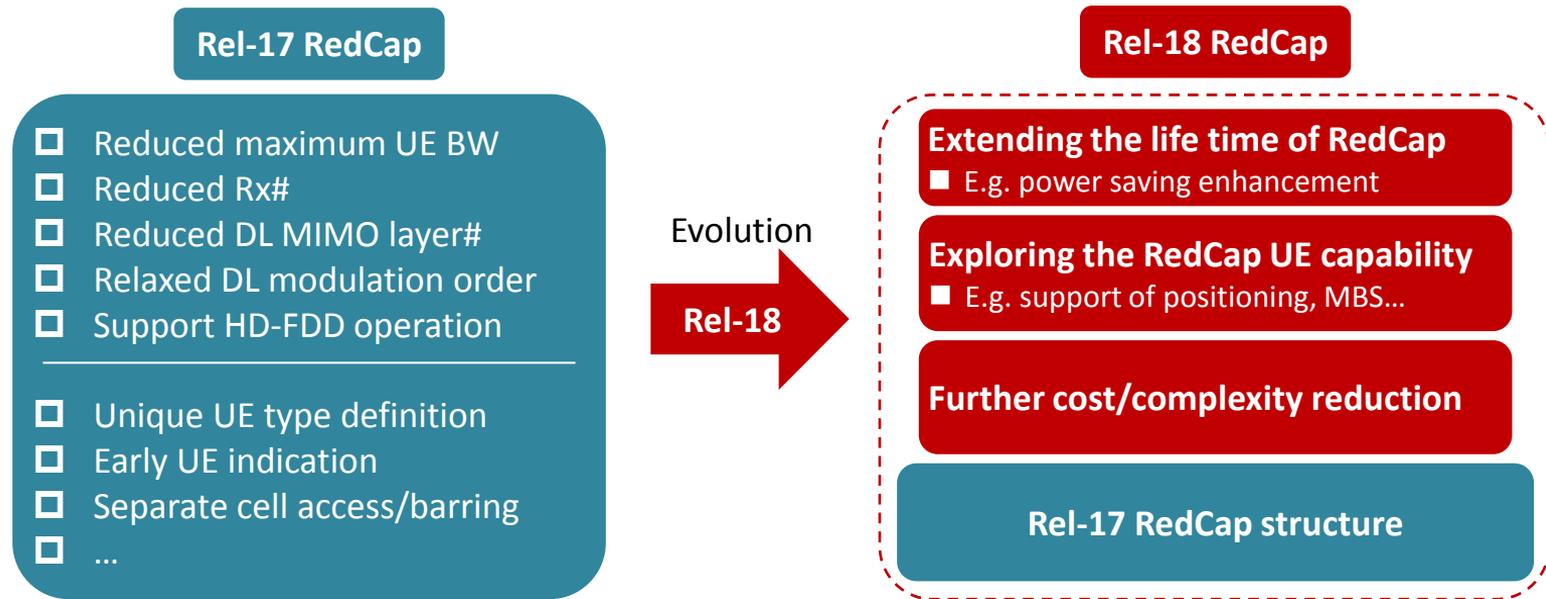
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Background

The following summary was proposed after pre-RANP#93e NWM discussion (removing the Editorial Notes)

- Main goal: further embrace new use cases, especially requiring low-cost devices and low energy consumption
- Study low power wake-up receiver / wake-up signal (WUR/WUS)
 - Objectives:
 - Study use cases, evaluation methodology & KPIs, and compatibility with other UE power saving solutions
 - Study and evaluate low-power wake-up receiver architectures
 - Study and evaluate wake-up signal designs to support wake-up receivers
 - Study and evaluate protocol changes needed to support wake-up receivers
 - Study potential system impact, such as network and other UE's power consumption, coexistence with R17 RedCap and non-RedCap UEs, network coverage
- Power saving/energy efficiency enhancements
 - Enhanced DRX in RRC_INACTIVE (>10.24s) (if not completed in R17)
 - Identify use cases and study corresponding protocol enhancements to support operation on intermittently available energy harvested from the environment
 - Note that how the devices harvest and store energy is outside the scope of 3GPP
- Complexity/cost reduction
 - Study further reduced UE bandwidth of 5MHz, especially considering
 - expected UE complexity/cost reduction based on Rel-17 evaluation methodology
 - network impact, compatibility with Rel-17, coexistence of RedCap and non-RedCap UEs, UE impact, specification impact
 - other solutions for reducing the UE peak data rates
 - Support for lower UE power class
 - Considering NW impact, e.g. coverage aspects

General views on RedCap evolution in Rel-18



In Rel-17, 3GPP deliberated the architecture of RedCap, and obtained a good **balance between backward compatibility and UE cost/complexity reduction**.

Rel-18 RedCap evolution should enrich the RedCap UE capability based on Rel-17 RedCap structure. It is **important to guarantee the economic scale and backward compatibility continuously in Rel-18**.

Low power WUR/WUS

- Support studying low power WUR/WUS for both RedCap and non-RedCap UEs
 - More details can be found in [RP-212254](#).
- Main concerns in the current skeleton
 - Wake-up receiver (WUR) may be important as a reference architecture, but anyway it is up to implementation and will never be specified in 3GPP.
 - Objectives of this item shall disassociate the receiver-related part as much as possible. A note can be added to explain the scope of 3GPP work.

- Proposed modification:

- Study low power wake-up receiver / wake-up signal (WUR/WUS)

- Objectives:

- Study use cases, evaluation methodology & KPIs, and compatibility with other UE power saving solutions
- ~~Study and evaluate low power wake-up receiver architectures~~
- Study and evaluate wake-up signal designs ~~to support wake-up receivers~~
- Study and evaluate protocol changes needed to support wake-up ~~signal receivers~~
- Study potential system impact, such as network and other UE's power consumption, coexistence with R17 RedCap and non-RedCap UEs, network coverage
- Note that a corresponding wake-up receiver may be investigated for reference, but will not be specified within 3GPP.

Power saving/energy efficiency enhancements

- Power saving is important to RedCap UE as always
- Main concerns in the current skeleton
 - This is the first time 3GPP tries to accommodate with energy harvesting techniques, where the workload for normative work is unknown.
 - Suggest targeting at limited number of use cases (i.e. energy source from the environment) to generate a reasonable size of scope. One or two use cases are preferred.

- Proposed modification:

- Power saving/energy efficiency enhancements

- Enhanced DRX in RRC_INACTIVE (>10.24s) (if not completed in R17)
- Identify use cases and study corresponding protocol enhancements to support operation on intermittently available energy harvested from the environment
 - Targeting one or two most typical use cases (i.e. energy sources from the environment)
 - Note that how the devices harvest and store energy is outside the scope of 3GPP

Complexity/cost reduction

- Further complexity reduction, if specified, should not cause compatibility issue to Rel-17 network
 - It is foreseen that UE BW = 5MHz will cause huge impact on network compatibility.
- Main concerns in the current skeleton
 - Some techniques were discussed in Rel-17 SI, but not included in Rel-17 WI because unworthy trade-off of performance and cost. It is not preferred to re-open similar discussion.
 - Lower UE power class can only be considered when the coverage is not an issue, e.g. deploying static UE near the gNB. Any additional coverage enhancement technique will increase the complexity and power consumption.
- Proposed modification:

- Complexity/cost reduction

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 - other solutions for reducing the UE peak data rates
 - **Note: The Rel-17 candidate techniques not included in Rel-17 WI are deprioritized.**
- Support for lower UE power class
 - ~~Considering NW impact, e.g. coverage aspects~~ **Note that coverage enhancement is not motivated by lower UE power class**

Proposed modification to the skeleton

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