

3GPP TSG RAN Rel-18 workshop  
Electronic Meeting, June 28 - July 2, 2021

Source: ZTE, Sanechips  
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RWS-210476

ZTE

Tomorrow never waits

# Rel-18 NR RedCap evolution



# Use cases for RedCap device

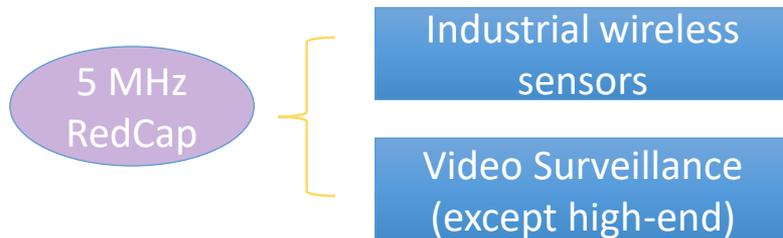
- The bit rate requirement of **industrial wireless sensors** is much lower than wearables.

Use cases	Reference bit rate	Latency	Reliability	Battery life
Industrial wireless sensors	2 Mbps	100 ms 5-10 ms	99.99%	few years
Video Surveillance	Economic: 2-4 Mbps High end: 7.5-25 Mbps	500 ms	99%-99.99%	-
Wearables	10-50 Mbps in DL > 5 Mbps in UL	-	-	up to 1-2 weeks

# FR1 RedCap UE with 5 MHz bandwidth

- The DL and UL peak data rate for 5 MHz channel bandwidth (15 kHz SCS) is around **20** Mbps. It can meet data rate requirement of industrial wireless sensors and some of the low-end video surveillance applications.

Maximum UE bandwidth (MHz)	Number of MIMO layers	Maximum modulation order	DL peak data rate (Mbps)	UL peak data rate (Mbps)
<b>5</b>	1	64QAM	<b>20</b>	<b>21</b>
10			42	44
20			85	90
40			172	183



- Further reducing FR1 RedCap UE maximum bandwidth from 20 MHz to 5 MHz can significantly reduce UE cost (**about 20%**).

# FR1 RedCap UE with 5 MHz bandwidth

- **Potential impacts**

- Small coverage impact due to reduced frequency diversity
- Minor degradation on network capacity and spectral efficiency due to the loss in frequency selective scheduling gain
- Restrictions on SSB and CORESET #0 configuration
  - SSB with 15 kHz SCS
  - CORESET #0 with 24 RB for 15 kHz SCS
- Scheduling restrictions on SIB1, other SIB, RAR and Msg4 if size of legacy CORESET #0 configuration is wider than 5 MHz
- Increased PDCCH blocking rate

SCS {SSB, CORESET0}	CORESET0 RB number
<b>{15, 15}</b>	<b>{24, 48, 96}</b>
{15, 30}	{24, 48}
{30, 15}	{48, 96}
{30, 30}	{24, 48}

# RedCap evolution – Other enhancements

RedCap  
positioning

MBS for RedCap

RedCap power  
saving

Improvements to  
co-existence with  
non-RedCap UEs

# Scope of Rel-18 NR RedCap

- **FR1 RedCap UE with 5 MHz bandwidth**
  - Study and specify FR1 RedCap UE with 5 MHz bandwidth solutions
- **Enhanced power saving for RedCap UEs**
  - Study and evaluate whether enhanced power saving solutions are needed for RedCap
- **Positioning for RedCap UEs**
  - Define positioning requirement/capability for RedCap
  - Evaluate positioning performance for RedCap and study whether new positioning solution is needed
- **Broadcast/Multicast services for RedCap UEs**
  - Study how to effectively support broadcast/multicast IoT applications for RedCap
- **Improvements to co-existence with non-RedCap UEs**
  - e.g., reduce the negative impacts on non-RedCap UEs



# Thank you

Tomorrow never waits

