3GPP TSG RAN Rel-19 workshop
Taipei, June 15 - 16, 2023
Agenda Item: 4
Document for: Discussion

RWS-230247

Overview on Release 19

NTT DOCOMO, INC.

Background

- **Release 18 (as first release of 5G Advanced) targets "balanced evolution" from following perspectives**
  - Balanced mobile broadband evolution vs. further vertical domain expansion
  - Balanced immediate vs. longer term commercial needs
  - Balanced device evolution vs. network evolution

- **As second release of 5G Advanced, Release 19 should also target such balanced evolution with considering following aspects**
  - In real commercial deployment/operation, "balanced application" has not been sufficiently achieved e.g., for DL vs. **UL**, FR1 vs. **FR2**, etc., and hence further enhancements for solving such situation are essential.
  - As 3GPP did in Releases 12/13/14, study and introduction of advanced features could be good lesson towards initial release of next generation

- **As discussed at RAN#99, timeline for Release 19 is quite important and the Rel-19 package shall fit into the agreed Release 19 timeline according to RP-230050**
  - All (or almost) Release 19 WG meetings are expected to be F2F meeting, i.e., 9 WG (F2F) meetings in 18 months
    - » In Release 18, there are 8 WG meetings (3 e-meetings and 5 F2F meetings) + 2 WG (F2F) meetings for maintenance
  - Available TUs per WG per meeting for Release 19 would be about 20 TUs (for RAN1/2) and 10 TUs (for RAN3)

Summary of NTT DOCOMO's views on Rel-19

Rel-19 high-level target

Remaining essential features for 5G-A + Advanced features for the lesson towards 6G

- **Further enhancements from Rel-18**
  - **MIMO/UL**: RWS-230248
    - » UL enh. including UL dense deployment, BM enh., and CSI enh.
  - **Positioning**: RWS-230257
    - » Higher accuracy, Lower latency, Higher NW efficiency
  - **Multi-carrier enhancements**: RWS-230251
    - » Improvement of FR2 usage including UE power saving, flexible carrier use
  - **UL CovEnh**: RWS-230258
    - » Multi-PRACH w/ different beams, P-MPR reporting for FR1, Msg5 repetitions
  - **NR-NTN**: RWS-230253
    - » Regenerative payload, UL data rate enh., Coverage enh. (at least leftovers)
  - **Mobility**: RWS-230260
    - » Further improvements for low interruption and robustness
  - **XR**: RWS-230254
    - » Improvements for mobility
  - **SON/MDT**: RWS-230259
    - » Enhancements for RAN Slicing, NTN, (mobile) IAB, and LTM
  - **RAN4 package:** RWS-230262
    - » UE RF enhancement
      - – FR1: 3Tx/6Rx for handheld UE (depending on Rel-18 work), power domain enh.
      - – FR2: Intra+Inter UL CA with different frequency bands for PC1/2/3/5, Improving MPR for intra-band CA
    - » Demod: Performance requirements of MMSE-IRC receiver for NR BS
    - » RRM: FR2 RRM delay reduction enhancements, HO with PSCell requirements for new scenarios
    - » 100 km support for HAPS TDD in TN spec
- **Items based on studies in Rel-18**
  - **AI/ML for air interface**: RWS-230256
    - » Frameworks, including performance monitoring, for CSI feedback, BM, positioning, and mobility (w/ study)
  - **Duplexing evolution**: RWS-230249
    - » Sub-band non-overlapping full duplex at gNB, CLI enh.
  - **Low power WUR/WUS**: RWS-230255
    - » Strive for unified design and mechanisms for idle/inactive/connected states
- **New study (+ work) in 5G-A towards 6G**
  - **Wireless sensing (ISAC)**: RWS-230250
    - » At least study on use cases, requirements, architectures and channel model in Rel-19
  - **RIS**: RWS-230261
    - » Study system/channel model, evaluation, spec impact based on Rel-18 NCR
- **Mixed topic for 5G-A and towards 6G for efficient FR2 support**
  - **Femtocell/home gNB:** RWS-230262
    - » Specify related BS RF requirements, especially the appropriate Tx power
  - **Network-controlled AP**: RWS-230252
    - » Study architecture and SON enhancement

Appendix: Initial views on Rel-19 package

	Item	TU per WG			
		1	2	3	4
RAN1-led	**WI: MIMO/UL**	3-4	0.5	-	0.5
	WI: AI/ML for air interface	1.5-2	2	-	0.5
	WI: Duplex evolution	1-2	-	-	0.5
	SI: RIS	1-2	0.5	0.5	0.5
	SI: Channel model for ISAC (after TSG-level SI)	0.5	-	-	-
	WI: Positioning	1.5-2	0.5	0.5	0.5
	WI: LP-WUS/WUR	1.5	0.5	-	0.5
	WI: UL CovEnh	0.5	0.5	-	0.5
	WI: MC enh.	0.5-1	-	-	-
	WI: SL enh.	2-2.5	1	-	1
	WI: NW energy savings	1	0.5	0.25	0.25
	SI: Ambient IoT	1	1	0.5	0.5
	SI: Channel model for FR3	0.25	-	-	-
	SI: Channel model for >100GHz	0.5-1	-	-	-
RAN2-led	**WI: NR-NTN**	1	1	0.5	0.5
	WI: Mobility	0.5	1.5	1	1
	SI/WI: XR	-	1.5	-	0.5

- Others
  - **SI: ISAC (TSG-level SI for use cases/requirements/architectures)**

	Item	TU per WG			
		1	2	3	4
RAN2-led	WI: SL relay enh.	-	1	-	0.5
	WI: TaaS	-	1	0.5	-
	WI: Mobility for UAV	-	1	-	1
RAN3-led	**WI: SON/MDT** • Including SON for NPN	-	1 +0.5	1 +0.5	-
	WI: AI/ML for RAN	-	1	1	-
	WI: QoE enh.	-	1	1	1
	SI: Network-controlled AP	-	-	1	-
RAN4-led	WI: FR2 femtocell/home gNB	-	-	-	0.25
	WI: FR1 RF enh. • 3Tx for handheld UE • 6Rx for handheld UE • Power domain enh.	-	-	-	1
	WI: FR2 RF enh. • CA MPR reduction • UL inter-band CA 28GHz+40GHz	-	-	-	1
	WI: FR2 delay reduction enh.	-	-	-	1
	WI: Performance requirements of MMSE-IRC receiver for NR BS	-	-	-	1
	WI: HO with PSCell requirements for new scenarios	-	-	-	0.5
	Total	17.75-22.75	17.5	8.25	14.5

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