

R19 Enhancements to AI/ML for NG-RAN

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Rel-19 Enhancements to AI/ML NG-RAN Proposal Overview

Objective: Extend Rel-19 AI/ML for NG-RAN Work Item to include mobile IAB, NTN and TN coexistence, and mobile AI/ML processing centers

Proposal	Benefits
AI/ML processing at mobile IAB node to assess and mitigate interference	Spectrum efficient coexistence of mobile IAB cells when they move within NG-RAN
AI/ML support for NTN and TN coexistence	Efficient spectrum usage and seamless connectivity between NTN and TN
Distributed mobile AI/ML processing centers	Efficient spectrum coexistence between NG-RAN, sidelink and non-3GPP networks and systems

AI/ML Support for NTN and TN Coexistence

• Scenario description

- WID¹ on NTN enhancement addresses coexistence of NTN and TN in non-overlapping bands above 10 GHz
- NTN and TN services are currently deployed or planned² to operate in overlapping bands
 - In the above 10 GHz bands, space and terrestrial networks are primary services in large common parts of the spectrum
- Because of cost efficiencies, there is a market need to use NTN services to supplement gaps in TN coverage
- AI/ML processing techniques provide useful tools for spectrum coexistence

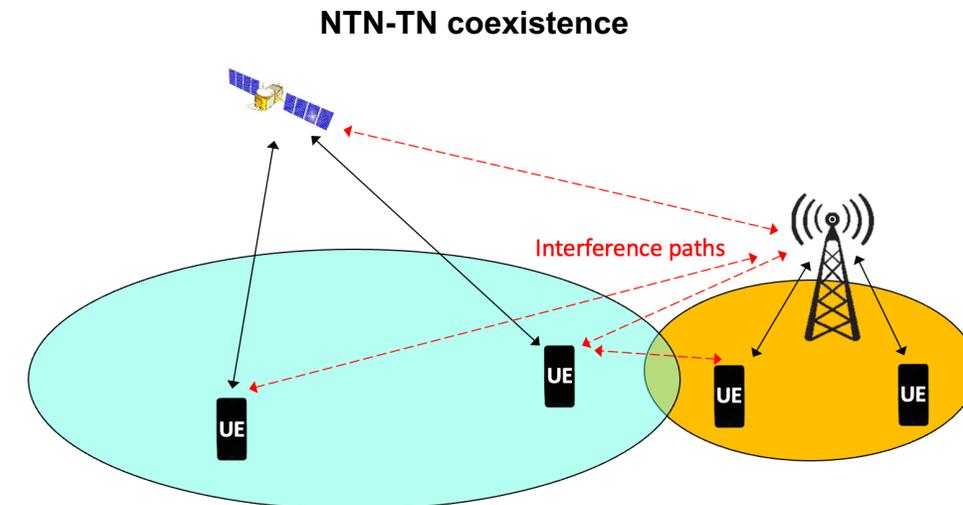
• Proposed enhancement

- Extend current AI/ML for NG-RAN WID on signaling, architectural, and data collection work to include the NTN nodes

• Benefits

- Efficient spectrum use of TN and NTN spectrum, support regulations on spectrum coexistence, seamless connectivity between TN and NTN, cost-effective means of using the spectrum in coverage gaps

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Distributed mobile AI/ML processing centers	Efficient spectrum coexistence between NG-RAN, sidelink and non-3GPP networks and systems



¹ Thales, "NR NTN (Non-Terrestrial Networks) enhancements," 3GPP TSG RAN Meeting #99, RP-230728.

² FCC, "Single Network Future: Supplemental Coverage from Space," Notice of Proposed Rule Making. GN Docket No. 23-65, IB Docket No. 22-271. March 17, 2023.

Distributed Mobile AI/ML Processing Centers

• Scenario description

- The AI/ML processor according to the current WID¹ on AI/ML for NG-RAN is located at a stationary gNB
- These AI/ML processors in NG-RAN may not be available in some scenarios including in disaster areas, smart cities/factories/homes and autonomous vehicles/drones
 - In such scenarios, it is useful to locate the AI/ML processor at a mobile processing center
 - Distributed mobile processing centers can be connected via sidelink, mobile IAB, NTN, or other connection
- Distributed AI/ML processors can mitigate interference from 3GPP systems to incumbent systems such as radar² and space services
 - Market need for opportunistic access to currently unavailable spectrum bands

• Proposed enhancement

- Support distributed mobile AI/ML processing centers

• Benefits

- Provide services in disaster areas; access spectrum information from sidelink networks; spectrum coexistence and opportunistic spectrum access between NG-RAN and non-3GPP systems such as satellite systems, radar systems, space services.

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Example: distributed mobile AI/ML processing center



¹ CMCC, Ericsson, "Revised WID: Artificial Intelligence (AI)/Machine Learning (ML) for NG-RAN," RP-220635. 3GPP TSG RAN Meeting #95e. March 17 – 23, 2022.

² FCC. "[3.5 GHz Band Overview](#)." Last accessed 31 May 2023.



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