

Pervasive 6G via NTN

Dr. Reuben George Stephen

Technical Manager, MediaTek Singapore

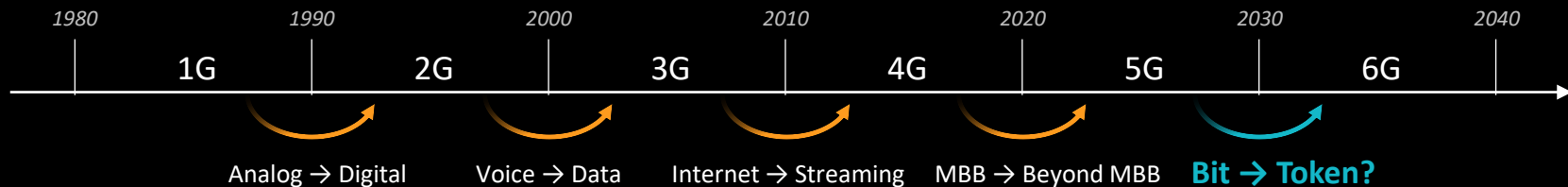
Advancing Towards 6G

**Sustainable, Ultra-Low Energy Consumption
with Optimized End-to-End and TCO**

**Intelligence-Driven User Experience
Powered by Edge Cloud, Hybrid Compute
& Distributed DoE**

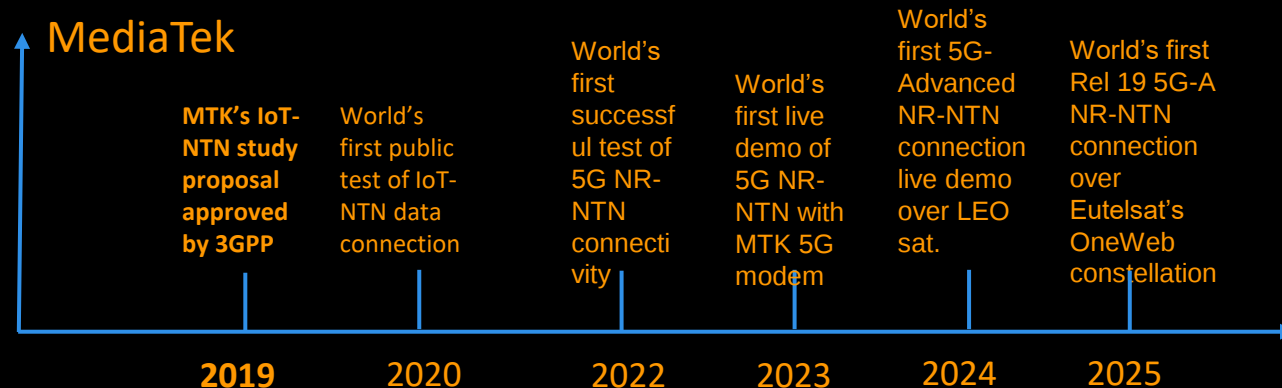
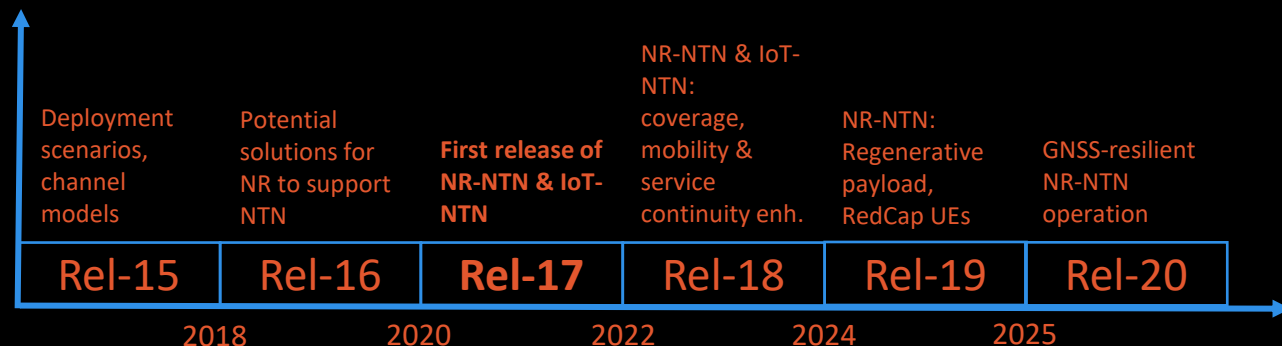
**Pervasive Services Anywhere and
Anytime with Seamless NTN +
Terrestrial Coverage**

Paradigm shift of mobile industry

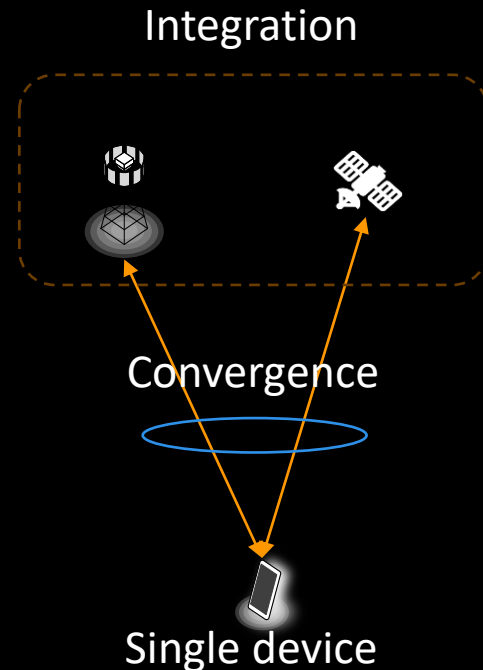


NTN Evolution

3GPP TSG RAN



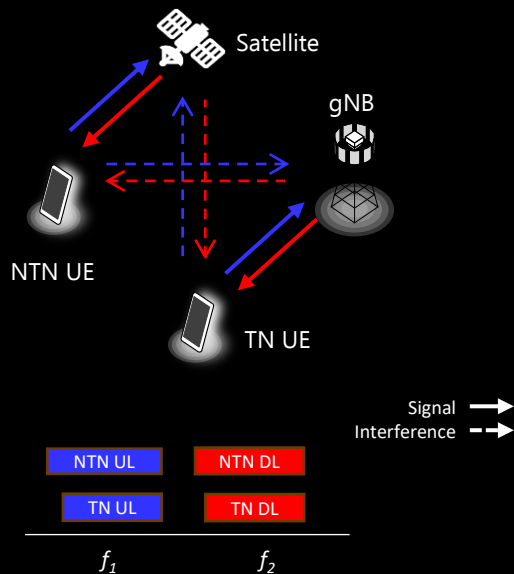
6G NTN



Pervasive 6G: NTN/TN Spectrum Sharing

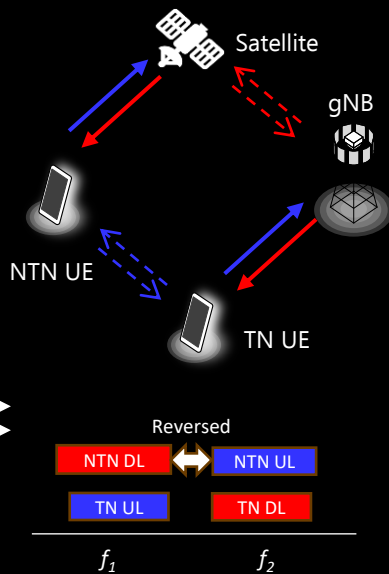
NTN/TN Spectrum Sharing

D2C Config. – Normal Pairing



NTN/TN Spectrum Sharing

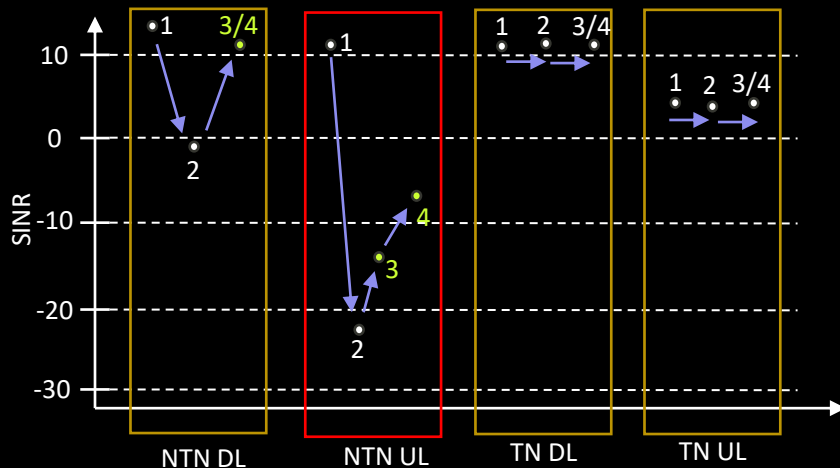
Proposed 6G Config. – “Reverse” Pairing



NTN/TN Interference Mitigation for Spectrum Sharing

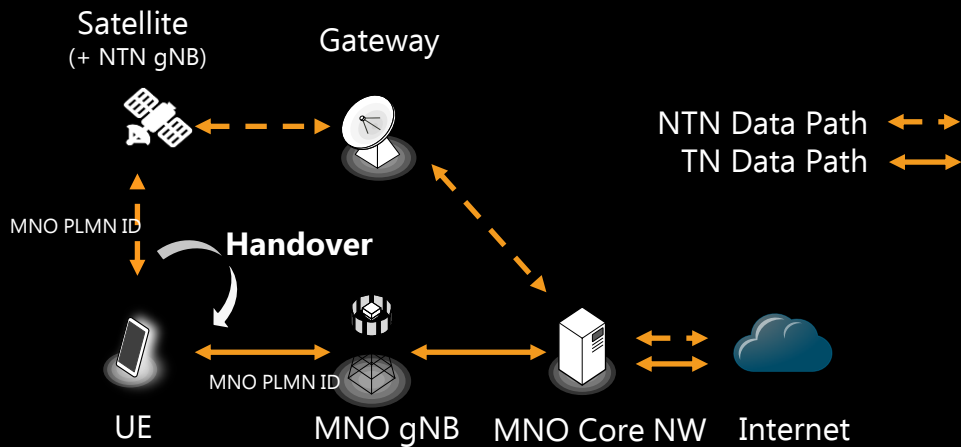
System Level Simulation Scenarios:

1. No Sharing
2. Co-Channel Sharing – w Normal Pairing
3. Co-Channel Sharing – w **Reverse Pairing**
4. Co-Channel Sharing – w **Reverse Pairing** + [1,2] Freq. Reuse (Beam Footprint based)



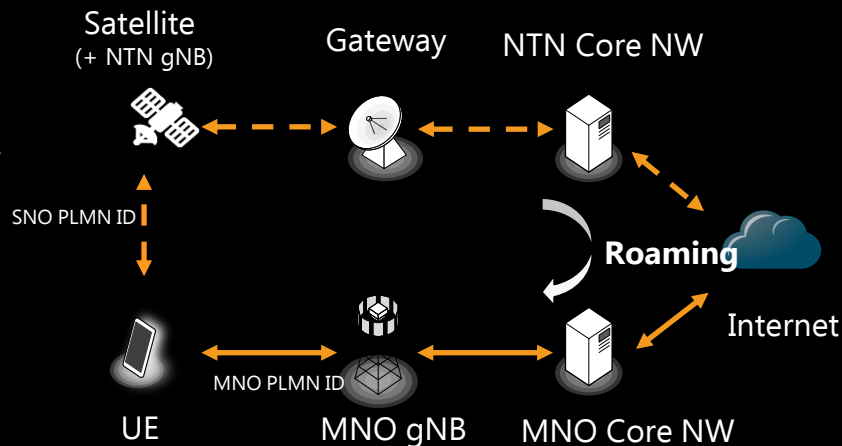
Pervasive 6G: TN/NTN Service Continuity

- NW Arch.#1: Shared NTN Core
 - Preferred by Mobile Operator (MNO)
 - **TN RAN also need upgrade**
 - Handover procedure for short interruption



- NW Arch.#2: Standalone NTN Core
 - Preferred by Satellite Operator (SNO)
 - No need to upgrade TN RAN
 - **Roaming procedure w long interruption**

Area to improve by 6G NTN



MediaTek Proprietary and Confidential

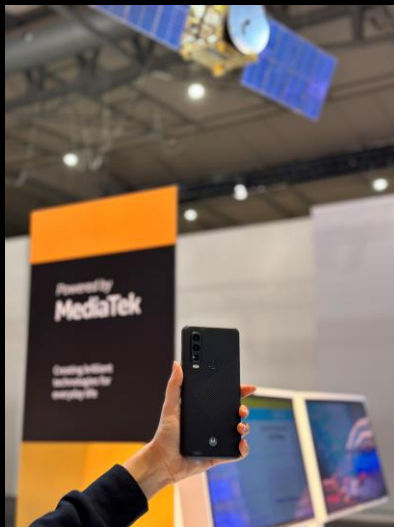
© MediaTek Inc. All rights reserved. The term “MediaTek” refers to MediaTek Inc. and/or its affiliates.

This document has been prepared solely for informational purposes. The content herein is made available to a restricted number of clients or partners, for internal use, pursuant to a license agreement or any other applicable agreement and subject to this notice. THIS DOCUMENT AND ANY ORAL INFORMATION PROVIDED BY MEDIATEK IN CONNECTION WITH THIS DOCUMENT (COLLECTIVELY THIS “DOCUMENT”), IF ANY, ARE PROVIDED “AS IS” WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE. MEDIATEK DOES NOT WARRANT OR MAKE ANY REPRESENTATIONS OR GUARANTEE REGARDING THE USE OR THE RESULT OF THE USE OF THIS DOCUMENT IN TERMS OF CORRECTNESS, ACCURACY, TIMELINESS, RELIABILITY, OR OTHERWISE. MediaTek specifically disclaims all warranties of merchantability, non-infringement and fitness for a particular purpose and any warranties arising out of course of performance, course of dealing or usage of trade. This Document must be held in strict confidence and may not be communicated, reproduced, distributed or disclosed to any third party or to any other person, or being referred to publicly, in whole or in part at any time except with MediaTek’s prior written consent, which MediaTek reserves the right to deny for any reason. You agree to indemnify MediaTek for any loss or damages suffered by MediaTek for your unauthorized use or disclosure of this Document, in whole or in part. If you are not the intended recipient of this document, please delete and destroy all copies immediately.

MEDIATEK

World's 1st 5G NTN Smart Phone

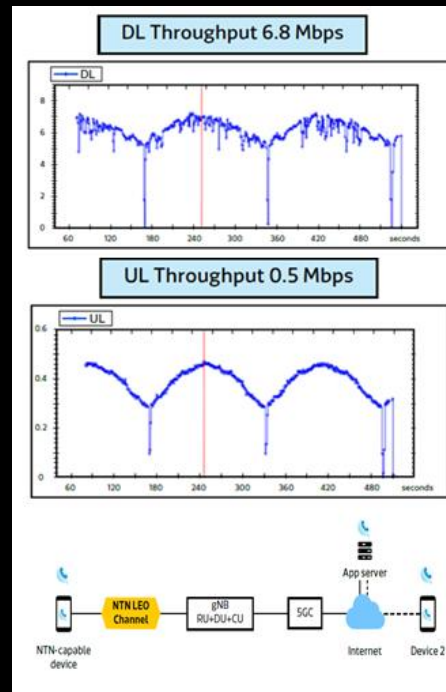
3GPP Rel-17 IoT NTN (Narrowband)



GSMA 2023 Global Mobile Awards in MWC

R17 IOT NTN	
WAVEFORM	NB IoT
BANDWIDTH	200KHz
FREQUENCY BAND	L-Band (255)/S-Band (256)
DATA RATE	~Kbps

3GPP Rel-17 NR NTN (Wideband)

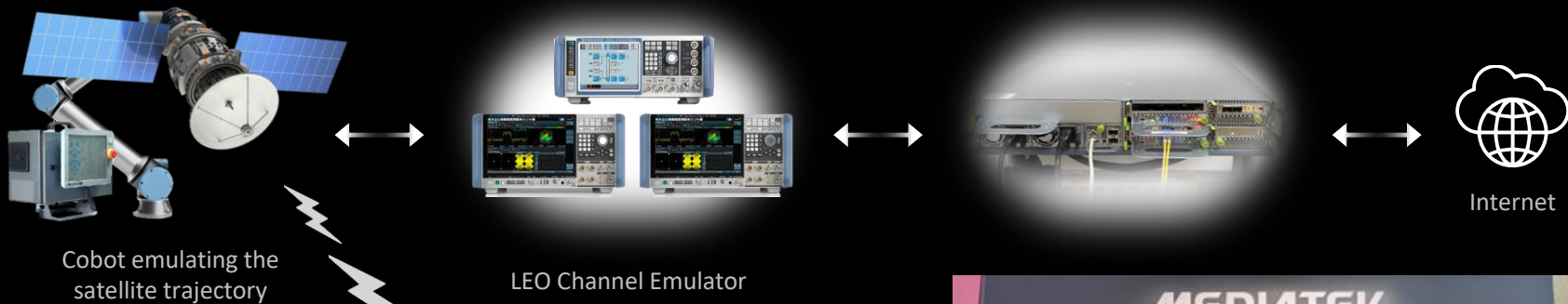


MediaTek Conduct World's First Public Test of 5G Satellite IoT Data Connection with Inmarsat, Aug 19, 2020

<https://corp.mediatek.com/news-events/press-releases/mediatek-conduct-worlds-first-public-test-of-5g-satellite-iot-data-connection-with-inmarsat>

World's 1st 5G NTN Broadband for Automotive

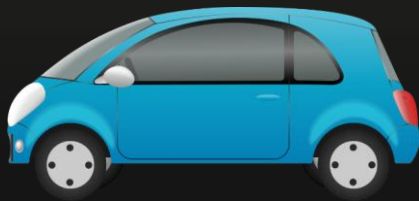
Pre 3GPP Rel-19 Ku-band NR NTN



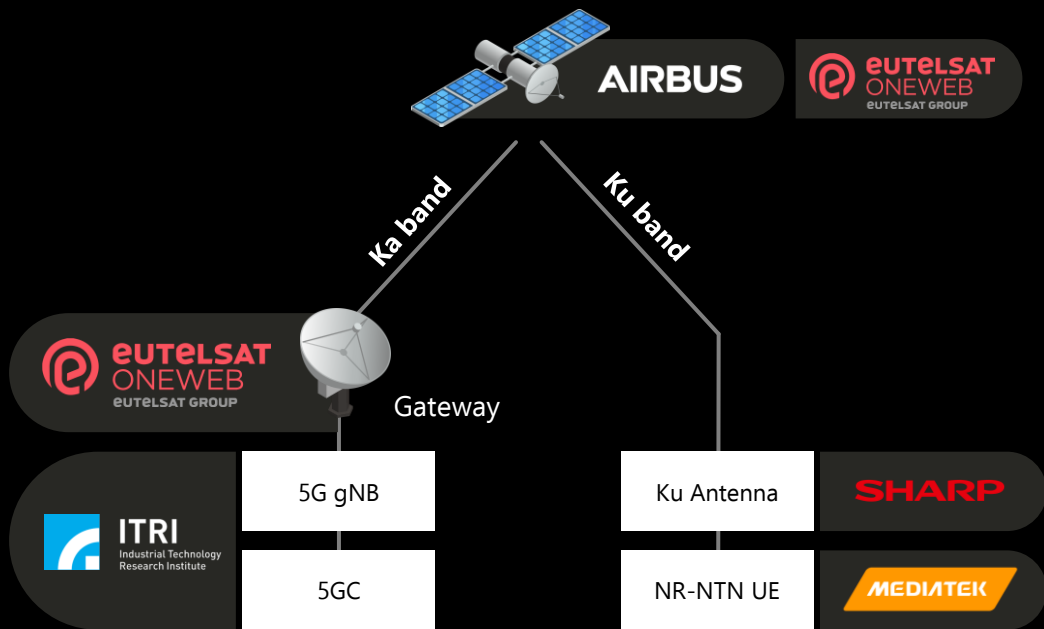
DL Streaming
over Satellite
Broadband



MediaTek 5G-Adv NTN
platform integrated
onto a vehicle

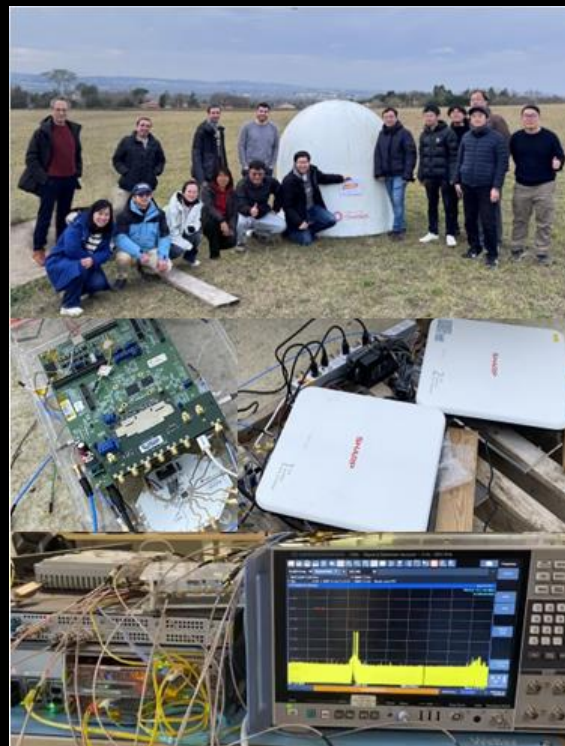


World's 1st 5G NR-NTN Live Connection Success over In-Orbit Commercial LEO Satellites



ROHDE & SCHWARZ

Lab tests & measurement devices



World's 1st Rel-19 5G-Adv. NR-NTN Live Connection Success

over In-Orbit Commercial LEO Satellites



Source: ESA

<https://connectivity.esa.int/news/esa-eutelsat-airbus-mediatek-and-partners-successfully-test-5gadvanced-nrntn-connection-over-oneweb-leo-satellites-conditional-handover>