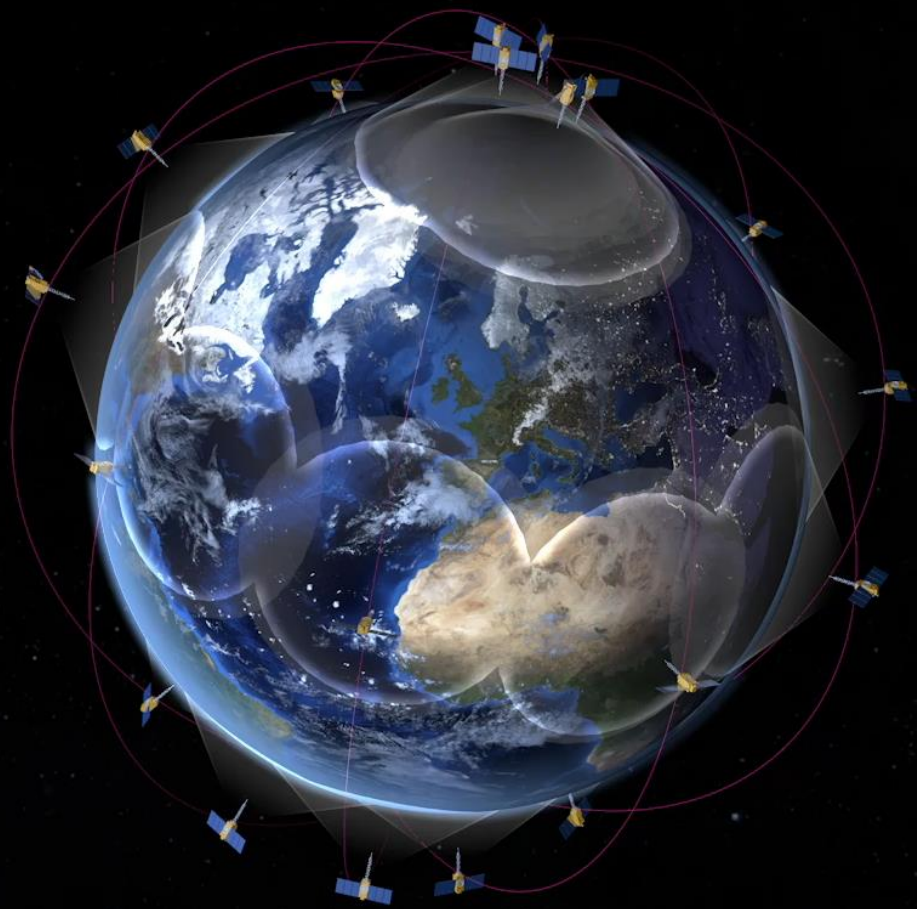
IoT, the spearhead of 5G NTN

NTN Days – October 2025

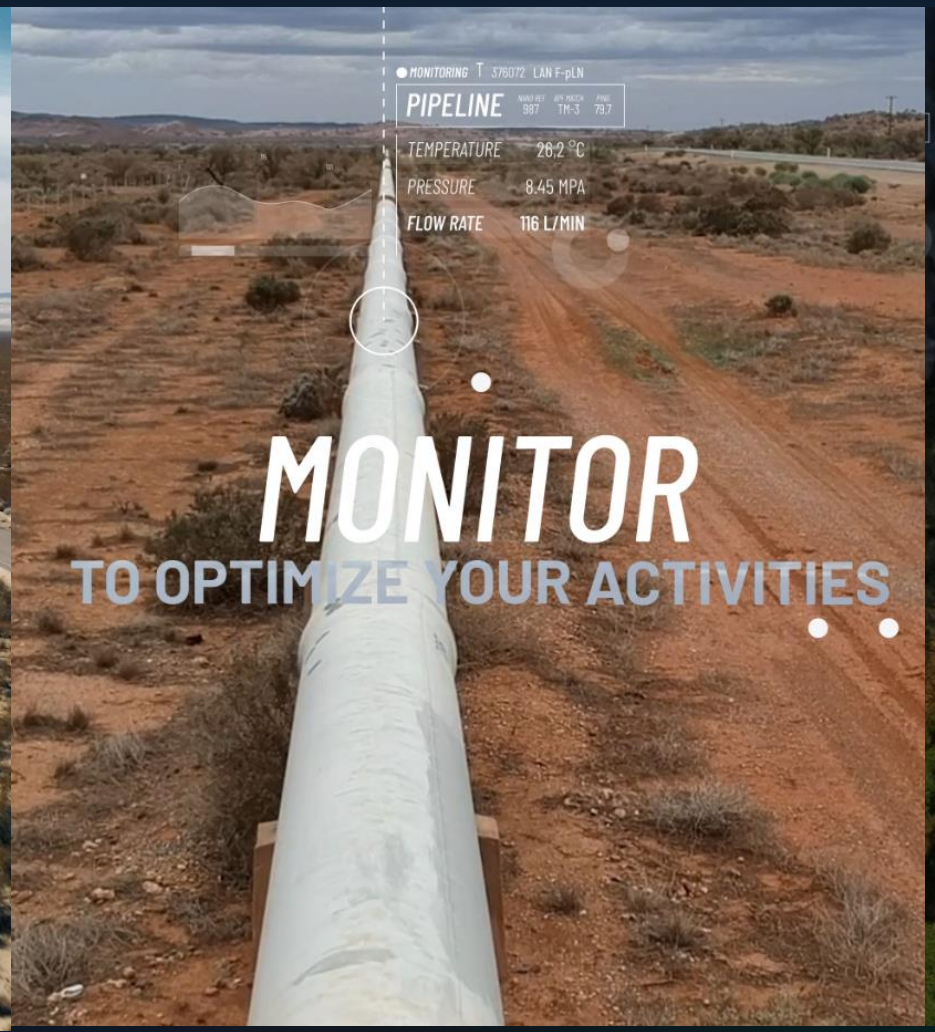
Vincent Deslandes

Kinéis connect 100% of the planet

25 satellites perfectly distributed for **global coverage**



Delivers the information you need



Facts & Figures

Kineis is a sovereign European MSS satcom operator dedicated to IoT

2025 - June — ***Service opening***

2024/25 — ***5 Launches & a full operational constellation***

2022/23 — ***International deployments***

2020 — ***100M€***
Fundraising from public and private investors

2018 — ***Kinéis Creation***

60 experts' staff

200 mobilized individuals

1 European-made constellation dedicated to the Internet of Things

25 cutting-edge microsatellites

40 years' experience in data collection

20 ground stations located around the world

1 global coverage

20 000 connected devices

kinéis

Non-Terrestrial Networks (NTN) – a few definitions

- **NTN is defined as**
  - NTN is a communication network where access nodes are in space (satellites) or airborne (HAPS/UAVs), integrated with terrestrial mobile networks to extend coverage & capacity or provide resiliency.
  - From 3GPP: **"Networks, or segments of networks, using an airborne or space-borne vehicle to embark a transmission equipment relay node or base station."**
  - … more or less any satcom network, according to the considered level of integration with TN. Main difference is that for the first time in history, terrestrial telecommunication industry was driven into the topic through 3GPP standardisation

- **Mobile (MSS) vs Fixed (FSS) Services**
  - MSS : proprietary-techno services likely to migrate to 3GPP D2D and Nb-IoT in FR1. Alternative approach of Starlink D2C
  - FSS : fixed or moving platform services, mostly proprietary-techno based services (even Starlink). IRIS^2 based on 5G NTN

- **D2D vs D2C**
  - **Direct-to-device (D2D)** services = Mobile Satellite Services (MSS)
    - Voice, SMS and/or data services delivered to **mass market mobile handsets & devices.**
    - 3 main verticals: **smartphone (B2C), automotive, IoT**
    - **Can be 3GPP standard NTN based or Proprietary technology** (e.g. Apple phone with Globalstar)
  - **Direct-to-Cell (D2C)** services or Supplemental Coverage from Space (SCS)
    - Same as D2D, but in **terrestrial mobile bands**, which allows operation with **unmodified user equipment.**
    - Hence service and system performances are reduced compared to D2D services (compensation at base station only)
    - Complex cross-border interference management and out-of-band level control
    - **Starlink only, commercially available in US**

50 shades of NTN

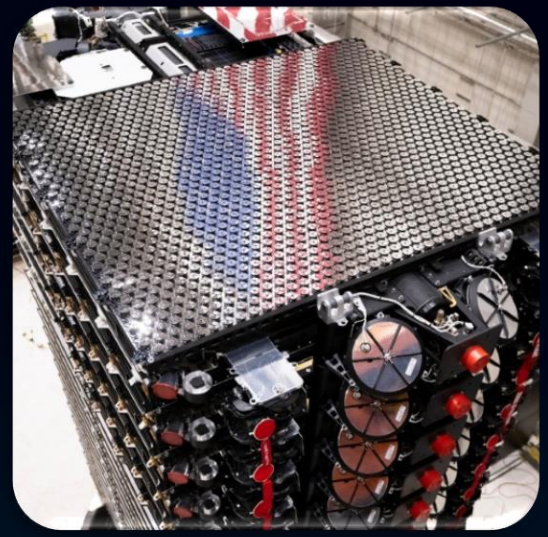
Service	Mobile Services				Fixed / Moving Platforms Services	
	Legacy MSS (D2D)	**Legacy IoT (D2D)**	**3GPP D2D (Nb-IoT)**	**D2C / SCS**	**Legacy FSS**	**3GPP FSS**
Frequencies	L/S	UHF / L / S	L / S (FR1)	TN: 700 - 1900 MHz	Ku / Ka	Ku / Ka (FR2)
Applications	Satphone/smartphone, land mobile, aero, maritime, IoT	IoT: Monitoring, tracking, alerting (uplink mainly)	IoT Smartphone emergency Automotive (TBC)	Smartphone voice (?), messaging	Consumer & B2B Internet, Maritime, Land mobile	B2B/B2G Internet, Maritime, Land mobile
Traffic	Voice, Messaging, Data real time	Messaging	Messaging	Voice, messaging, data realtime	Broadband data real time	Broadband data real time
Data rate	1 - 500 kbit/s	< 1 kbit/s	< 1 kbit/s	< 100 kbit/s	< 200 Mbit/s	~100 Mbit/s
Signal penetration	Very light	Light indoor	Light indoor	Light indoor	None	None
Commercial Systems e.g.	*GEO: Inmarsat, Ligado* *LEO: Iridium, Globalstar (+Apple)*	*LEO: Iridium SBD, Orbcomm, Kineis* *GEO: Echostar*	*GEO:* ***Skylo****, Inmarsat* *LEO: Iridium (2026)*	***Starlink gen2***	*LEO :* ***Starlink****, OneWeb* *GEO/MEO: Eutelsat, SES, Viasat, Intelsat*	*OneWeb / O3B gen2 (IRIS²)*
User devices	"Satphones", Apple phone, Legacy IoT devices, small routers	Legacy IoT devices	**3GPP r17+** Google Pixel, Samsung phones / IoT devices	**Unmodified 4G phone**	Router + Dish or Flat planel antenna	Router + Flat planel antenna
Active terminals	< 3 millions (+ Apple phones)	< 2 millions	< 100 000	-	**5 millions** (Starlink only)	-
System Cost	$3 - 6 billions	<$200 millions	**100 M$** (ground segment only)	several **$ billions**	**$20 billions**	$15 billions
Price	0.01 $ / kbyte	0.5 $ / kbyte	**0.5 $ / kbyte** **"free" for smartphone** (inc. in phone price)	**10$ / month**	**1 $ / GByte**	-

Market Analysis

- For the **B2C**/mass market, **Starlink is leading** the market and innovation from far
  - Both in fixed (proprietary) and mobile services (standard)
  - With tremendous investments and questionable RoI ($17B invest to buy Echostar mobile spectrum/licence rights)
  - Most of their development is done in **closed eco-system**

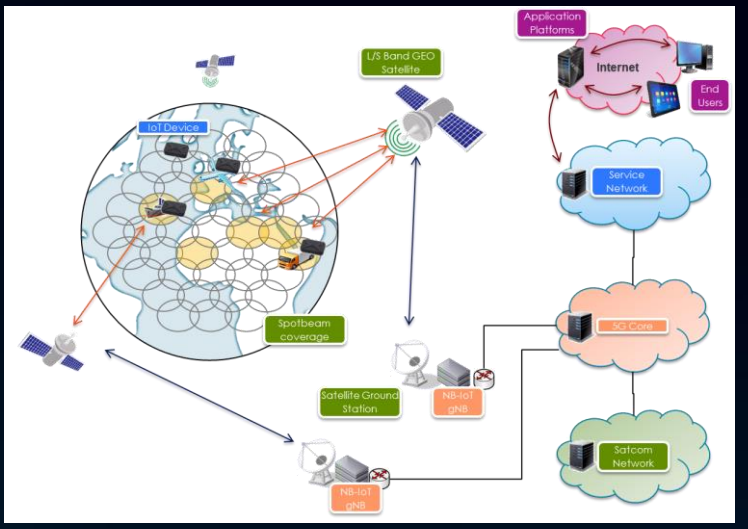
- **Historical players** trying to catch up but **lack of investments**
  - GEO MSS operators focus on niche markets or lease capacity for Nb-IoT services
  - LEO MSS Iridium & Globalstar moving to Nb-IoT
  - FSS operators ostracized by Starlink
  - IRIS^2 in Europe, likely to move on heavily

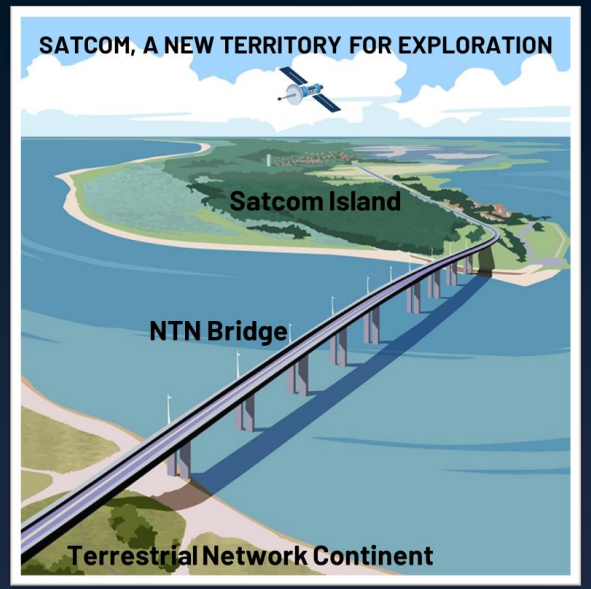
- Drivers of success
  - **Size matters**: Starlink owns more than half of satellites in orbit (8500) more than 10x One Web (650) their main competitor
  - Technology efficiency is one thing, but simple, brute force approaches prove to be successful: **make it work and iterate**
  - Operator/Manufacturer **verticalization** is the best way to assume huge technical and industrial risks



IoT, spearhead of NTN

- GEO NTN-IoT is the only 3GPP r17 compatible service commercially available (from 2023)
  - Much easier technically : Base Station is on ground, channelization (180 kHz) compatible with existing GEO satellites
  - QoS targets much less challenging (in terms of throughput, latency and capacity) than NR, but still can provide appealing value added services (messaging, voice over Nb-IoT)
  - RoI much easier and initial CAPEX lower, as long as the use cases are pulled off
- Overall system cost, complexity and risks is much lower
  - User Equipment & base stations (on ground or on board) are almost COTS
  - Lab testing is extremely facilitated with 3GPP NTN, in orbit testing can be set up in a few months
  - NTN Nb-IoT is still a very complicated technology and there is still a lot of room for optimization
- Kinéis, as a satcom operator, is at a central place to define, and explore R&D topics linked to NTN IoT
  - First operator to verticalize IoT network development and operation to this extent
  - At the front of sat-IoT use case deployment and R&D
  - Many projects on going on critical topics
- Scientific community is needed to deal with all challenges to be raised to make NTN a reality (efficient)
  - NTN on heterogeneous system with various topologies
  - Extremely complex radio engineering optimization
  - Protocol stack integration on board LEO satellite constellations





Thanks!

kinéis

Satcom IoT Operator

DO YOU HAVE
ANY QUESTIONS?

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