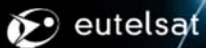




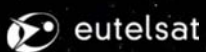
SATELLITE SOLUTIONS FOR IOT

Eutelsat's Complementary Approach to Terrestrial Networks

Dr. Michael Bergmann, CoBCom 2018, July 11th - 13th, 2018, Graz, Austria



WHY SATELLITE FOR IOT?



WHY SATELLITE FOR IOT?

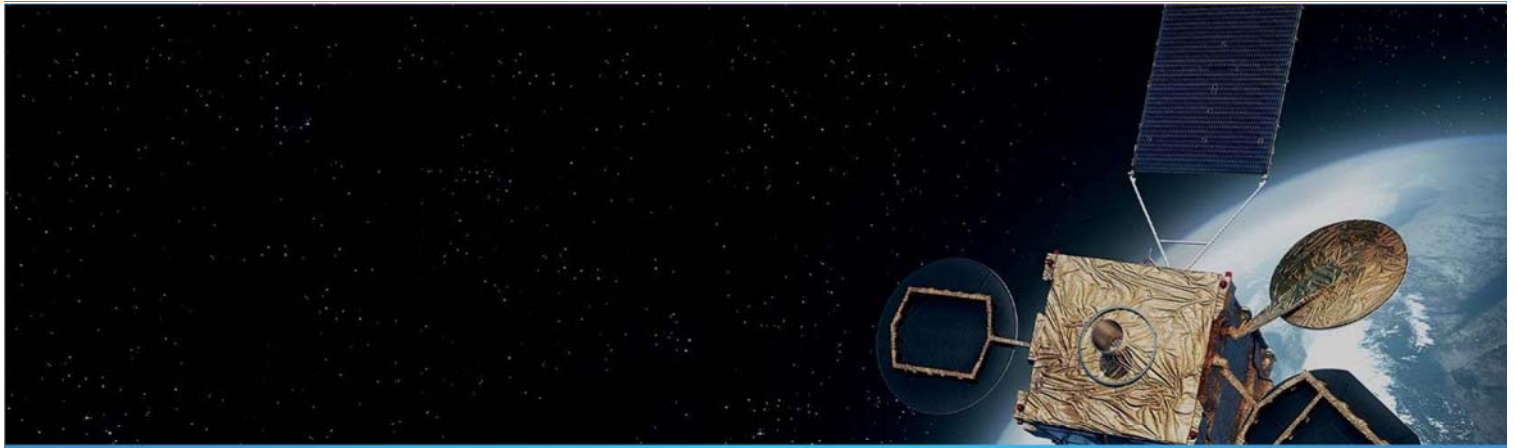
- ✓ Global coverage
- ✓ Immediately available
- ✓ Unified network
- +
- ✓ Uniform installations
- ✓ Real redundant link
- ✓ Guaranteed QoS



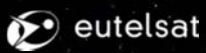
Satellite is an ideal complementary technology to terrestrial networks for IoT connectivity

CONTENTS

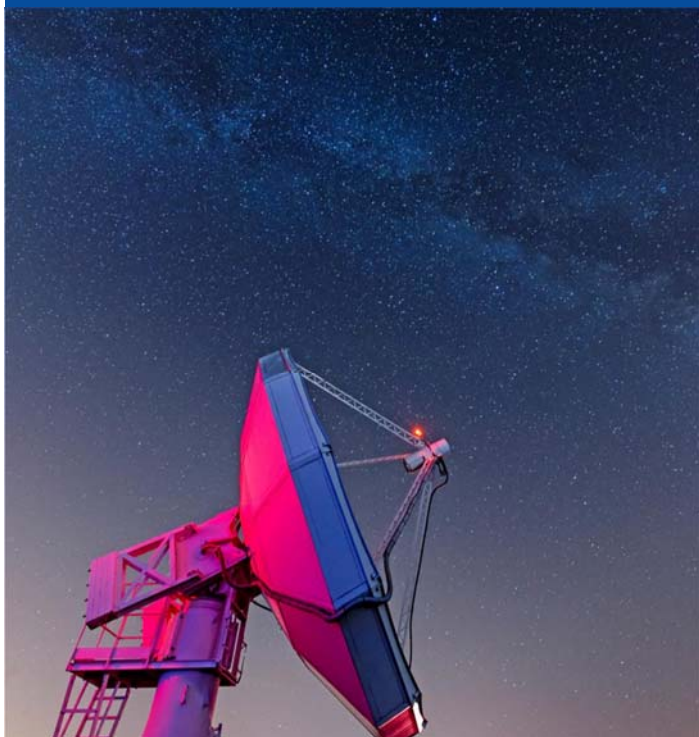
- ✓ Who is EUTELSAT
- ✓ EUTELSAT strategy for IoT
 - Backhauling: SmartLNB
 - Small terminals: SmartIoT
 - Future prospection: LEO satellites



Who is Eutelsat?



A KEY PLAYER IN THE SPACE BUSINESS



Pioneer in space
40 years of experience

38

Satellites
for global coverage



Solid investment programme

5 satellites
to launch

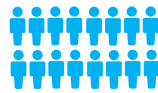
A DIGITAL ENTREPRENEUR



6,810
TV channels



1 billion
TV viewers



1,000
Industry experts



44
Nationalities

Revenues* **€1.48 billion**

* As of 30 June 2017 3

A FLEXIBLE, WORLD-LEADING GLOBAL FLEET

Diversified resources
in C, Ku and Ka bands



THE EUTELSAT FLEET
APRIL 2018

- stable orbit
- inclined orbit
- capacity on third-party satellites

FUTURE SATELLITES: EUTELSAT 7C
EUTELSAT 5 West B
EUTELSAT QUANTUM
KONNECT
KONNECT VHTS

○ EUTELSAT 36A currently under redeployment

SERVICES DRIVING DIGITAL GROWTH

CORE BUSINESS



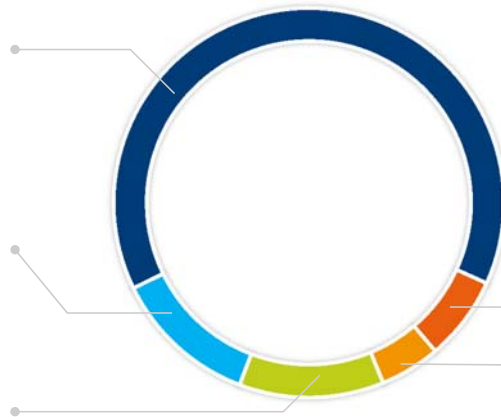
64%
VIDEO



12%
FIXED DATA



12%
GOVERNMENT SERVICES



CONNECTIVITY

7%
FIXED BROADBAND



5%
MOBILE CONNECTIVITY



OWNERSHIP



59.4%
Others, public

26.4%
BPI France Participations

7.5%
Fonds Stratégique de Participations (FSP)

6.7%
China Investment Corporation (CIC)





Eutelsat strategy for IoT

14

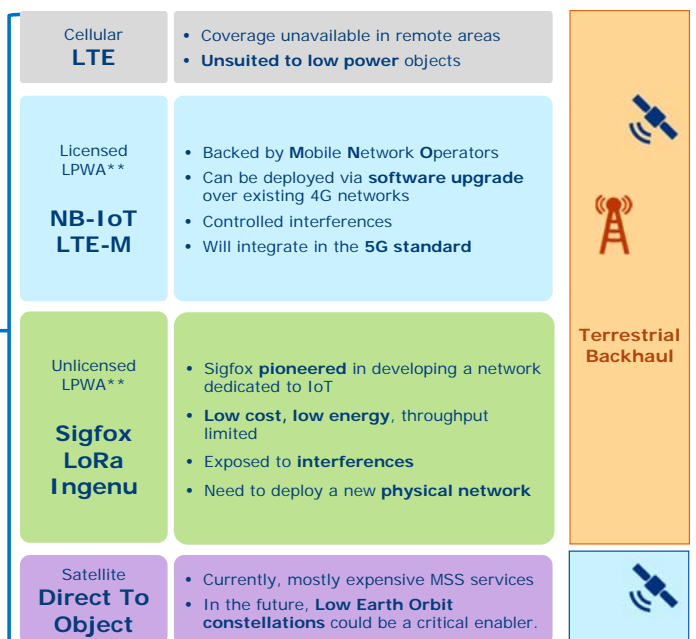
A COMPLEMENTARY APPROACH TO TERRESTRIAL NETWORKS

Satellite can easily:

- **expand the reach of IoT terrestrial networks**
- **provide a redundant link**

In 2025, there will be **8 bn connected objects worldwide***.

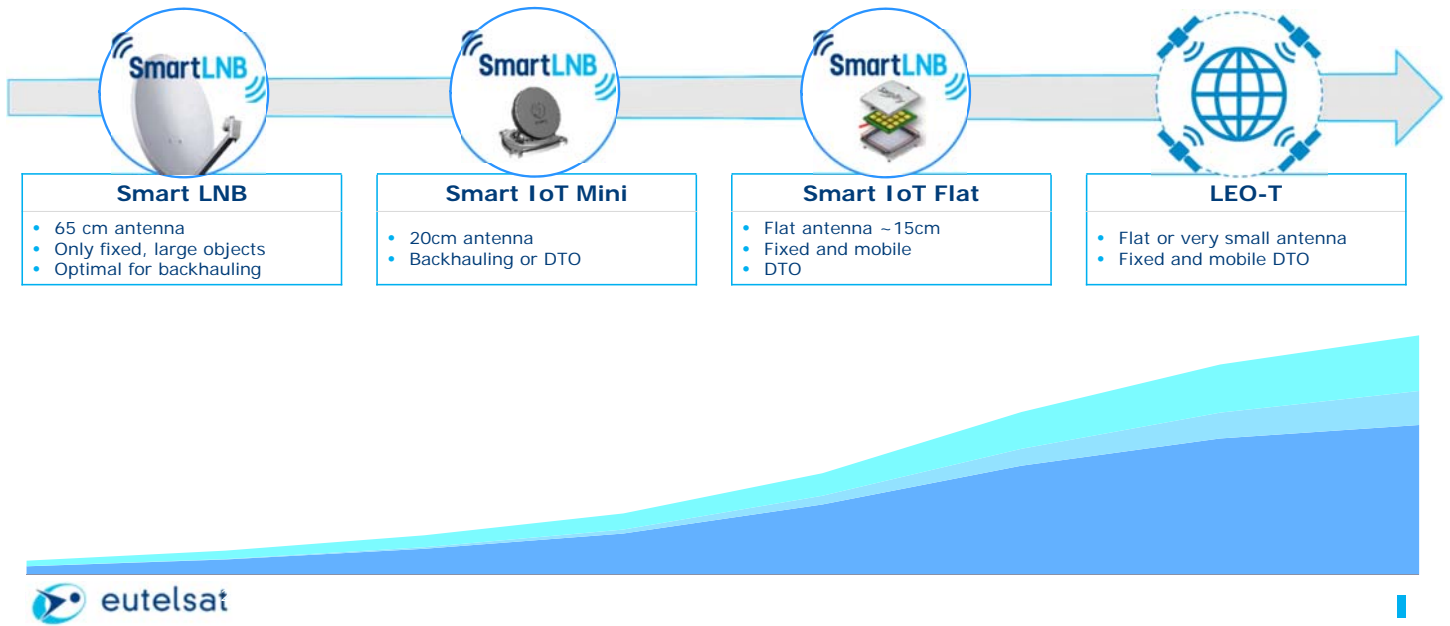
Excluding WiFi/Bluetooth/wired objects, **dedicated technology will be required for 3-5 bn objects**



* Excluding communication devices such as smartphones, tablets, laptops, ...
 ** Low Power Wide Area

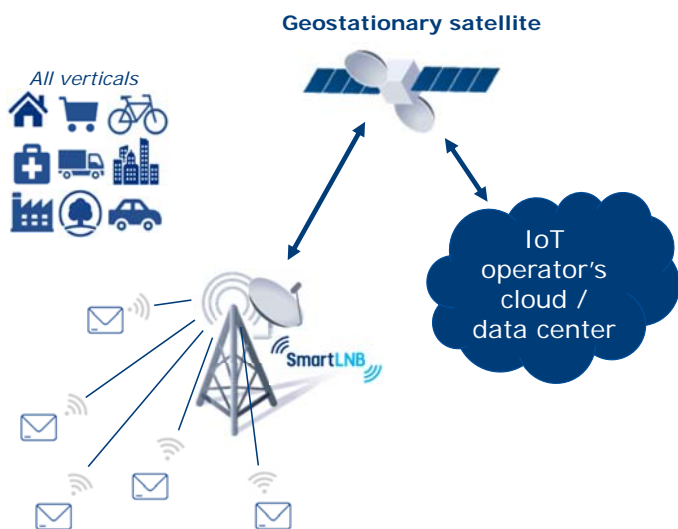
15

OUR ROADMAP



The SmartLNB solution for backhauling

TODAY: USING EUTELSAT TECHNOLOGY TO ACCELERATE THE DEPLOYMENT OF IOT TERRESTRIAL NETWORKS



- **SmartLNB** technology enables **low-cost two-way connectivity**:
 - ✓ Collecting data from the objects (up to 128kbps aggregated)
 - ✓ Multicasting data to the base stations and/or objects (up to 60Mbps)
- **Seamlessly integrates** in the operator's network.
- Relies on Eutelsat's 39-strong geostationary satellite fleet, **covering all continents**.

- IoT network operators can instantly connect any gateway → **quick roll-outs in remote regions**
- Compatible with unlicensed (Sigfox, LoRa) as well as licensed technologies (NB-IoT, LTE-M).
- Eutelsat has already **launched the product with Sigfox**

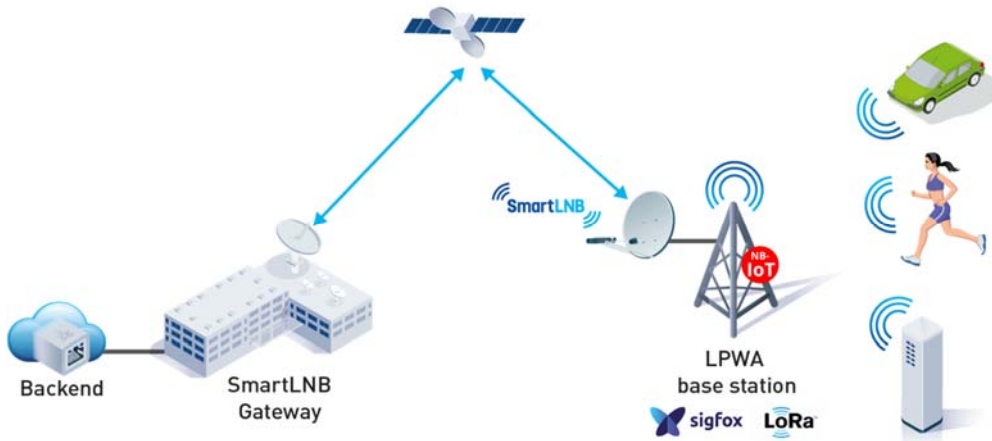
SMARTLNB : ENABLING SATELLITE IOT ANYTIME ANYWHERE

- ➔ A low-cost satellite terminal
- ➔ Optimized for short messages
- ➔ Low service cost
- ➔ Low power consumption
- ➔ Hardware security

- ➔ Ubiquitous coverage
- ➔ Independent network
- ➔ Guaranteed QoS



USE CASE: BACKHAULING FOR IOT GATEWAYS



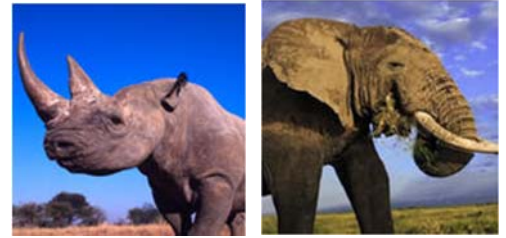
USE CASE EXAMPLE: RURAL BANKING NETWORKS

- ✓ Governments are partnering with the banking industry to build and connect rural banking networks through satellite networks
- ✓ Satellite is the most cost effective and reliable communication medium for remote banking solutions
- ✓ Quick and easy deployment
- ✓ SmartLNB provides a disruptive solution to create, develop and densify ATM infrastructures



USE CASE EXAMPLE: SMART PARKS, WILDLIFE PRESERVATION PROJECTS

- ✓ Coupled with LPWAN infrastructure (Sigfox, Lora) and miniaturised sensors
- ✓ Mitigate the risk of poaching of large groups of endangered mammals such as elephants and rhinoceros
- ✓ Operations/maintenance of natural parks infrastructures and assets
- ✓ Supporting Sigfox Foundation's "Now Rhinos Speak" project in Zimbabwe



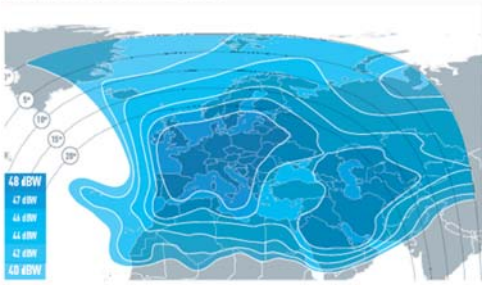
SMARTLNB FOR MARITIME APPLICATIONS

- ✓ Maritime two way access
 - Combining maritime TVRO antenna with SmartLNB
 - Cost much lower than existing VSATs
 - Target market: hundred thousand medium size boats
 - Key applications
 - Connectivity
 - IOT backhauling
 - Remote management of Maritime "drones"



SMARTLNB SERVICE COVERAGE (Q1 2018)

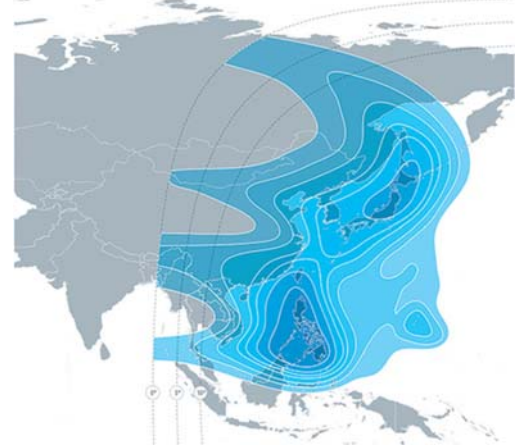
Ku-band Widebeam Downlink Coverage



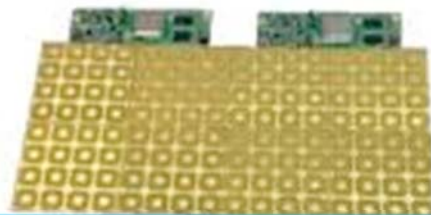
Ku-band Pan-American Downlink Coverage



Future coverage over East Asia



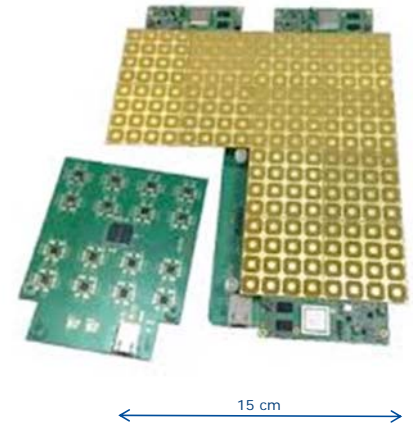
Ku-band Africa Downlink Coverage



IoT solution with small terminals

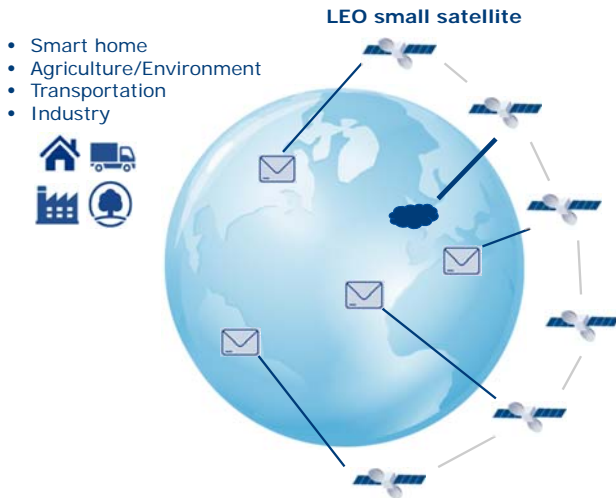
SMALL SIZE TERMINALS WITH INTEGRATED FLAT ANTENNA

- ✓ **Small low-cost flat antenna opens new fields of applications**
- ✓ **Direct connectivity satellite-to-object**
 - Portable IoT terminals
 - Small fixed terminals
- ✓ **Connected cars**
 - Entertainment applications
 - In-car telematics
 - Software upgrades via broadcast
 - Target market: 400M vehicles to be connected
 - Satellite complementary to terrestrial connectivity



Low orbit satellite solutions: the ELO satellite

TOMORROW: ENABLING UBIQUITOUS REACH THROUGH A DEDICATED SATELLITE CONSTELLATION



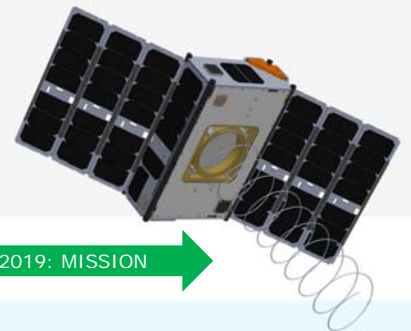
- Eutelsat is considering a **constellation of Low Earth Orbit (LEO) satellites** that will permit **Direct-To-Object connectivity**
 - **Low total cost of ownership**
 - **Seamless integration** into terrestrial IoT networks
 - **Global coverage**, complementing terrestrial coverage in remote areas
- Eutelsat has planned a **test phase on the 'ELO' nano-satellite**

We are open to collaborate with IoT network operators to share the investment in this satellite constellation and create a unified global network for IoT

EUTELSAT JUST ANNOUNCED ITS "ELO" SATELLITE, A LOW EARTH ORBIT SATELLITE FOR IOT

ELO: a test platform to demonstrate feasibility of direct object-to-satellite connectivity.

- Manufactured by **Tyvak International**
- **6U cubesat**
- Dimensions: **30*20 cm** excluding solar panels
- Weight: **12kg**
- Satellite Orbit Average Power = **12 W**
- Orbit: **500-600 km altitude**, sun-synchronous



2018: DESIGN

LAUNCH

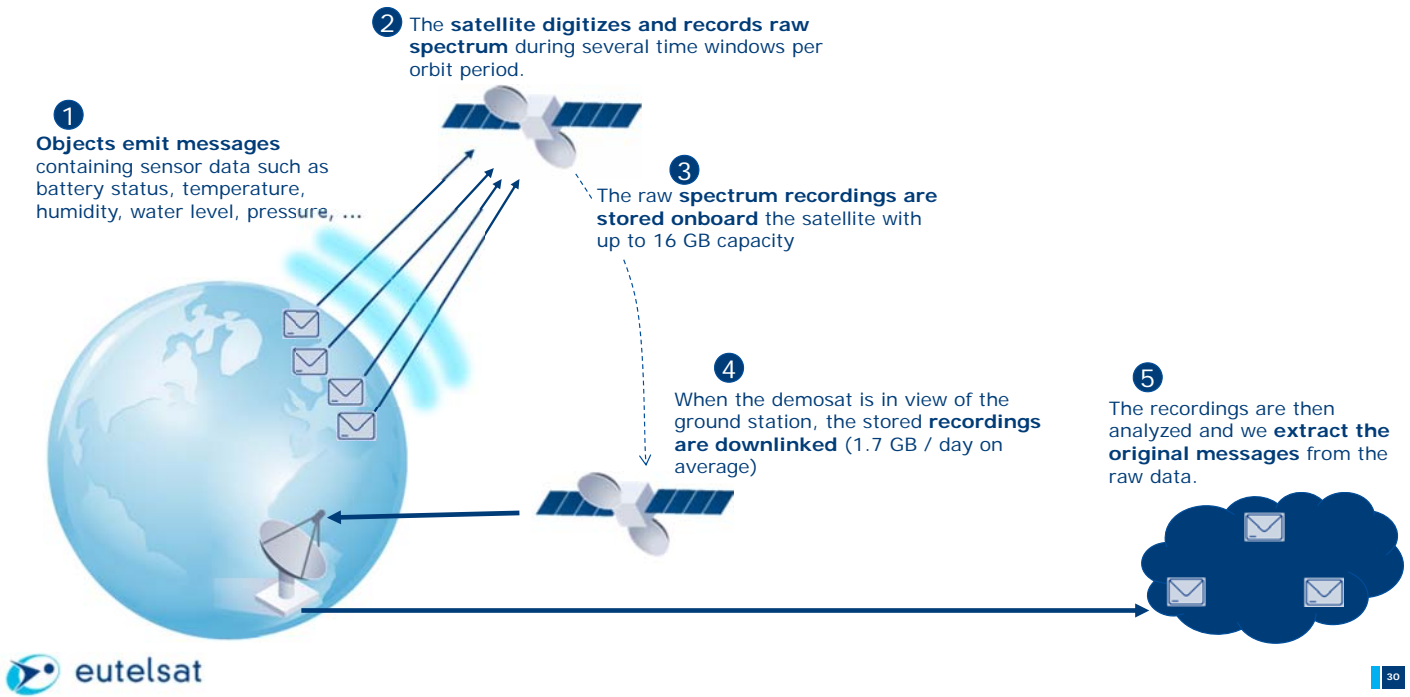
2019: MISSION

ELO Mission:

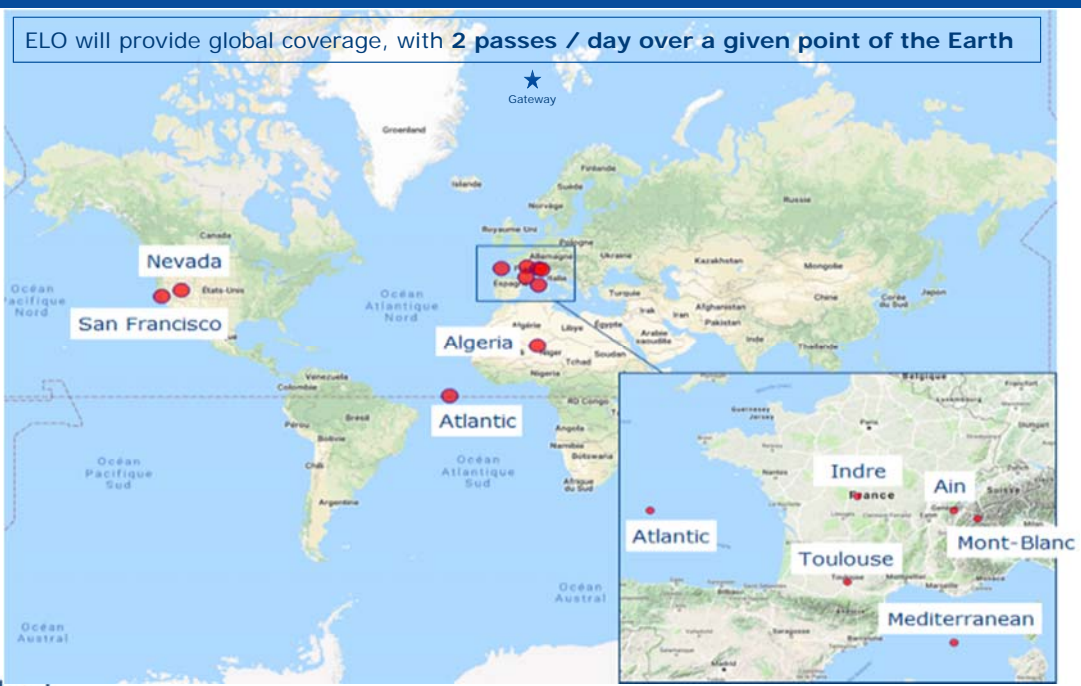
- ✓ **Measure the noise levels across the globe** in unlicensed bands (UHF ISM, 2.4GHz ISM)
- ✓ **Record signals emitted by selected connected objects (e.g. Sigfox)** in order to optimize LPWAN protocols for space.

Eutelsat is open to partner with major IoT technology players for performing tests on ELO

ELO TEST CONCEPT

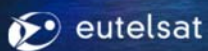


ELO GEOGRAPHICAL COVERAGE





Conclusion



CONCLUSION

- ✓ **Satellite perfect complement to terrestrial networks to provide connectivity required for the Internet of Things**
- ✓ **Innovative solutions are being developed (small antennas, low-Earth orbit satellites...)**
- ✓ **Eutelsat strategy: partner with leading telecom operators and Internet of Things specialists**
- ✓ **Eutelsat uniquely positioned for future growth:**
 - Proprietary SmartLNB and SmartIoT technology
 - ELO satellite
- ✓ **Open to collaborations with partners**
 - 21 offices worldwide
 - Projects already started





THANK YOU

谢谢

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