ITUEvents

ITU in service of space

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SES

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www.itu.int/go/ITU-R/ITU-in-Service-of-Space

SES

ITU

HORIZON

Where Sustainable Space
Meets Sustainable Earth

We're doing the extraordinary in space to address some of the world's most pressing sustainable development challenges, in collaboration with customers, partners, and governments.

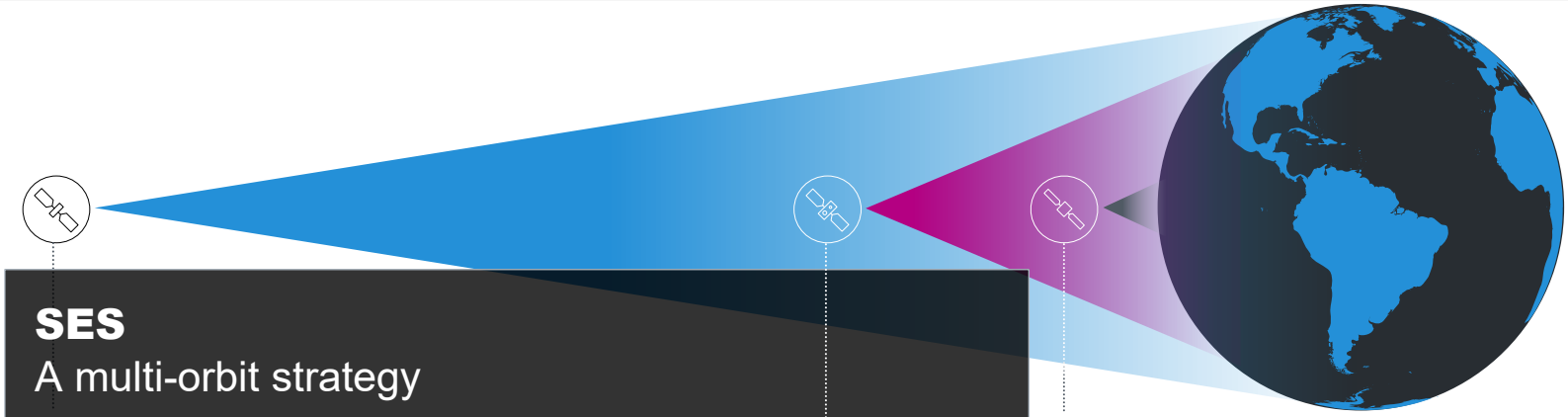
	Responsibility	Opportunity
SUSTAINABLE SPACE Lead, collaborate, and innovate for sustainable space.	Innovate to reduce our footprint from launch to decommissioning	Advocate best practice approaches to ensuring industry-wide responsible use of space.
CLIMATE ACTION Take bold climate action by setting targets and innovating for the planet.	Reduce GHG emissions across operations and our supply chain.	Provide solutions to combat environmental challenges through satellite connectivity.
DIVERSITY & INCLUSION Make the space industry more diverse and inclusive, starting with SES.	Build a more diverse and inclusive workforce across all levels of our business.	Increase diversity and inclusion in the space industry through targeted actions and investments.
CRITICAL HUMAN NEEDS Empower communities to thrive with services to support critical human needs.	Develop partnerships and innovate to increase access to education, health, and information services.	Expand reliable access to content and connectivity to build sustainable communities.

Be future-proof, powered by sustainable growth & innovation

SES

SUSTAINABLE DEVELOPMENT GOALS

Multi-orbit, multi-frequency for evolving connectivity needs



SES
A multi-orbit strategy

GEO	MEO	LEO
36,000km	~ 8,000km	~ 1,000km
e.g. **SES-17 (VHTS)**	e.g. O3b **mPOWER**	E.g., Starlink
Broad coverage—3 satellites	Extended reach—6 satellites, scalable	Limited view—hundreds of satellites
High latency—operationally simple	Low latency—operationally simple	Low latency—operationally complex
Expansive coverage	High throughput, high flexibility, high performance	Low, contended bandwidth, requires operator's nearest gateway

Space Assets: Multiple Orbits, Frequencies and Applications

GEO WIDE BEAM

- Over 50 satellite constellation
- Reaching 369 million TV HHs worldwide
- Broad coverage in less dense areas
- Well-suited for applications such as content multicasting, enterprise connectivity in remote regions
- Serving multiple data applications and customers
- **Using C, Ku, Ka band spectrum**

GEO (V)HTS

- Four GEO (V)HTS satellites, more to come
- Enhanced downstream connectivity for video and data transmission
- Reduced cost per MHz, improving value proposition for data applications
- **Using Ku, Ka and Q/V band spectrum**

MEO (V)HTS (O3b & mPOWER)

- 20 MEO HTS satellites plus 4 out of 11 VHTS with launching as of 2022
- Up to 2Gbps per MEO beam with <150ms latency
- Optimal for time sensitive applications such as videoconferencing, direct2cloud, 5G
- **Using Ka and Q/V band spectrum**

Electric propulsion & Digital payload boost GEO HTS

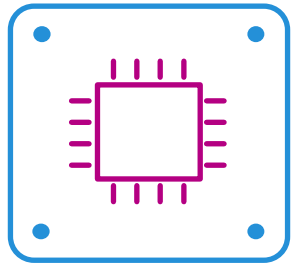
Using FSS Ku (10-15 GHz) and Ka-band (27.7-30.0 GHz) spectrum

Electric Propulsion Benefits

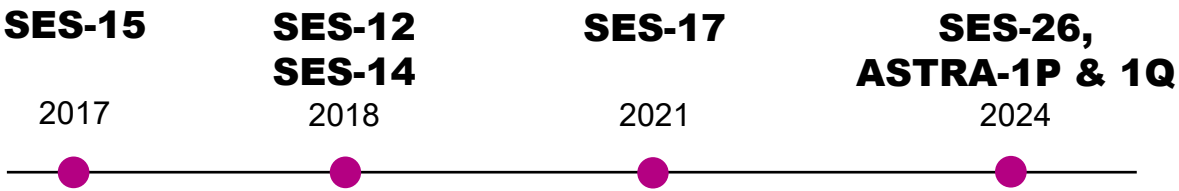
- lowers the cost of launches
- extends the life of a satellite
- lowers the weight of satellites = larger satellites and/or more flexibility

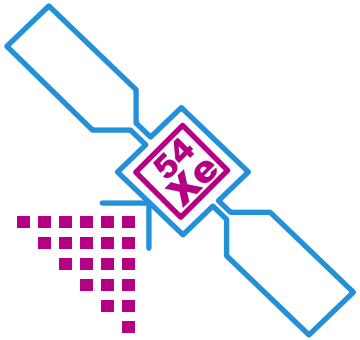
Satellites go Digital & Software-driven

- Smaller size
- Mission flexibility
- Better bandwidth management
- Adapted to network virtualisation (5G)



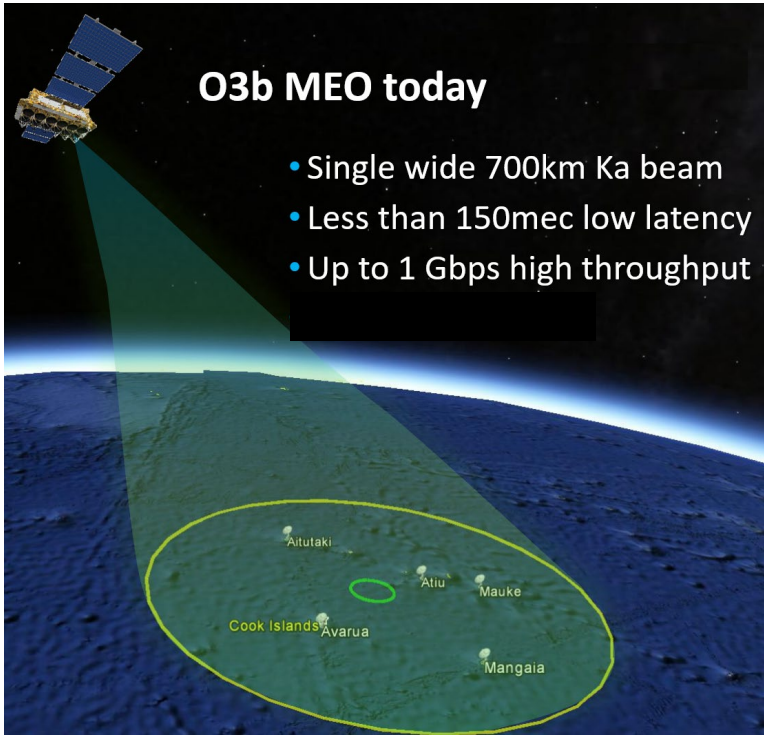
GEO HTS SATELLITES (in Ku/Ka)

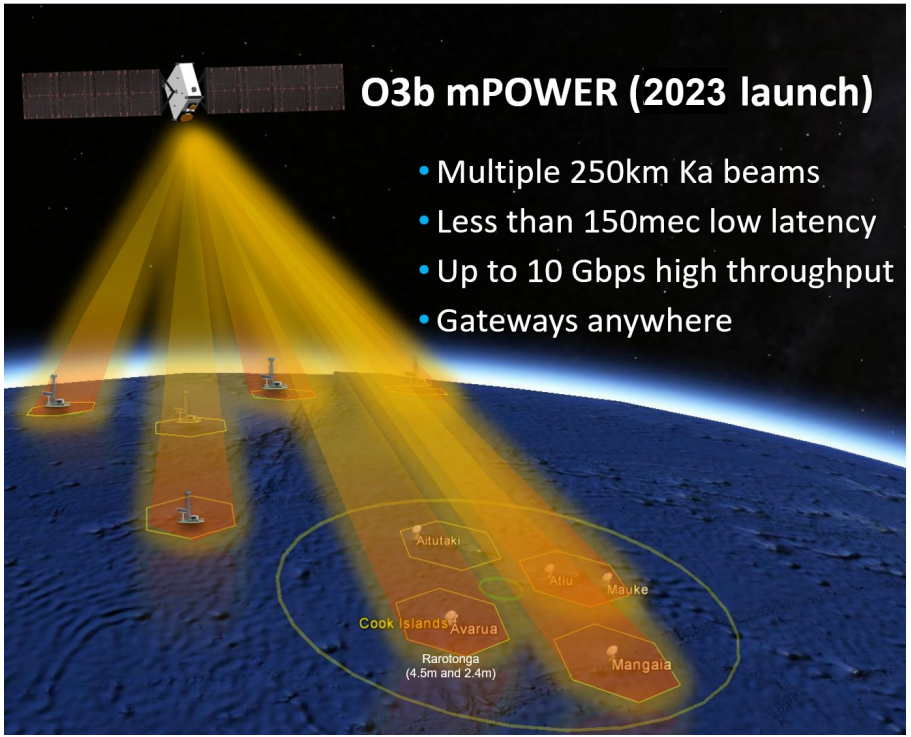




From O3b MEO to O3b mPOWER

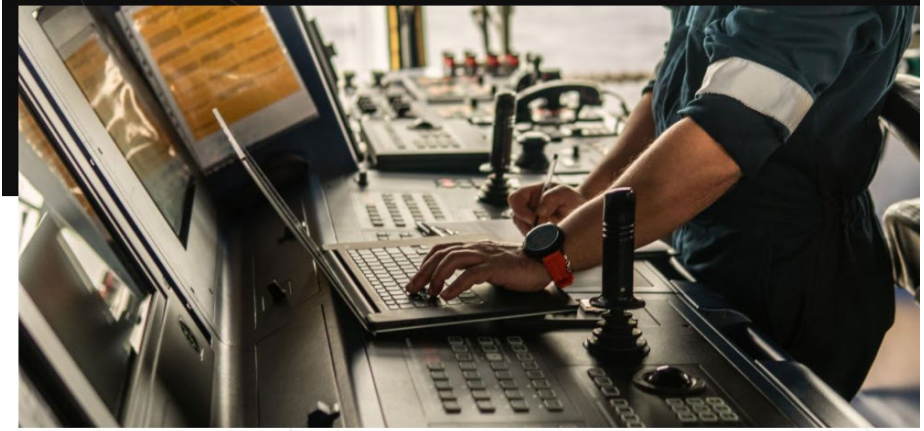
Using full Ka-band 17.7-20.2 & 27.5-30.0 GHz spectrum





GSO & NGSO ESIM for Cruise and Ferries
AIs 1.15 & 1.16 are critical

SES helps commercial maritime industry navigate their digitalisation journeys



Blog | 21 Jun 2021 | 2 min read

Demand for reliable and high-performance satellite communications services are greater than ever as shipowners adopt technology to increase efficiency and profitability

The last 15 months have seen a surge in demand for satellite-enabled services in the commercial maritime market. Over the course of 2020 we collectively connected over 1,500 vessels served by players such as Satcom Global, De Boer Marine, Tototeho Maritime, Hellenic Radio Services and K4 Mobility.

Carnival®

Category: Networks

3 MIN READ

Tags: Investor Updates

SHARE

Carnival Corporation's MedallionNet™ to Set Industry Apex for Wi-Fi Bandwidth Capacity at Sea Powered by SES Networks

Written on 26 Feb 2018

Regal Princess set to eclipse 1.5 gigabits per second stream during special event

Staying connected allows guests to share photos and videos, and stream movies, live sporting events and other content onboard Regal Princess and at Princess Cays

Seamless Switching with GSO & NGSO ESIM for In-Flight Connectivity AIs 1.15 & 1.16 are critical

Press Release | 02 Nov 2021 | 2 min read

Isotropic Systems simultaneously connects multiple SES satellites across separate orbits to converge broadband satellite networks and provide industry-leading quality of service and experience

Reading, UK / Luxembourg, 2 November 2021 – Isotropic Systems, the leading developer of transformational multi-link satellite technology, and SES today announced the successful completion of the first-ever simultaneous multi-orbit antenna field tests, a game-changing development empowering a new age of connectivity on land, in the air and at sea for both civil and defense communications.

Isotropic Systems' UK-built multi-link antenna underwent a series of field tests at SES's Manassas, Virginia teleport. The terminal established multiple simultaneous, full-performance link connections with SES satellites – linking to a geostationary (GEO) satellite while simultaneously connected with an O3b satellite in medium earth orbit (MEO).

Category: Technology

THALES
AVIONICS

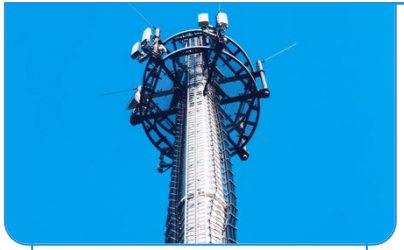
SES and Thales Reach Record Speed and Enhanced Coverage via Integrated GEO/MEO Network

Written on 23 Oct 2019

Interoperable GEO/MEO platform enables seamless switching between GEO and MEO satellite beams, opening the door for O3b connectivity to disrupt the skies as it has the seas

GSO + NGSO
Access to Full Ka-band spectrum is essential

Upgrade to LTE/5G



- 10X backhaul capacity
- Turnkey deployment

Disaster Recovery

- Fast response
- High bandwidth

National Digitalisation

- Landlocked territory (no cable access)
- Limited infrastructure

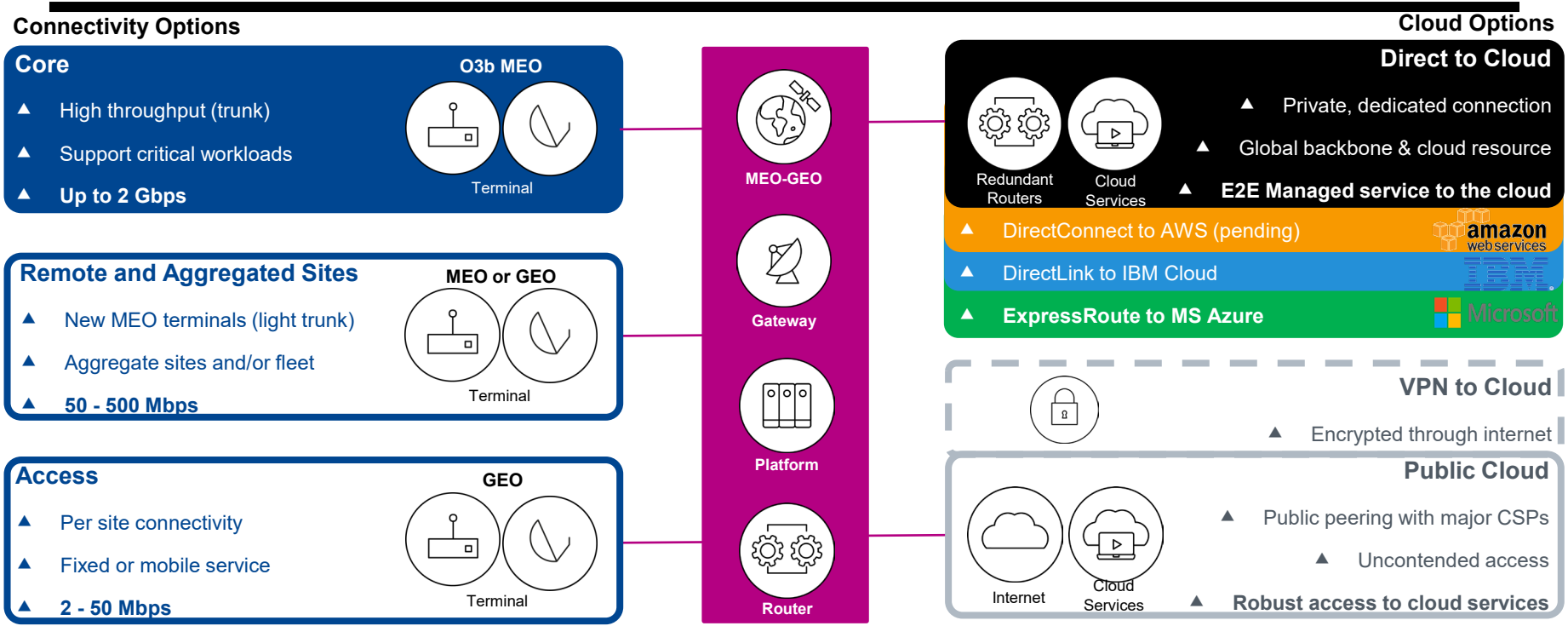
Private LTE/5G for Enterprise

- QoS traffic segregation for “corporate or cloud connect”
- Edge compute

Core Resiliency

- Fail over resiliency
- Congestion relief

A multi-orbit fleet to connect to a multi-cloud world
Access to Full Ka-band spectrum is vital



Ensuring spectrum for Inter-satellite links
AI 1.17 is key

GOALS

- ❑ Satellite-to-satellite links operations to facilitate enhanced services, such as real-time offloading of earth imaging and internet-of-things traffic from NGSO constellations
- ❑ Enable more efficient use of FSS spectrum, with fast implementation via existing assets

Frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz

MEANS

- ✓ Inter-Satellite Service (ISS) allocation together with operations limited to the cone of coverage
- ✓ Rely on existing coordination agreements, and ensure operations similar to the current ones

Joint interest of industry & governments to ensure same level of protection for GSO & NGSO, avoiding constraints & interference

Conclusions

- SES makes **significant investments in new GSO & NGSO satellite, network and service capabilities** to support all opportunities
  - Delivering **valuable services** to a **diverse set of data customers**: expanding 4G/5G coverage, expanding broadband comms, connecting planes & ships
  - Building **collaborative approach** with industry players to develop integrated platforms: MNOs, Cloud actors, 5G Verticals (e.g. in Energy, Transport, Media) which will be essential to achieve future connectivity needs
- Satellite needs **access to radio spectrum in various bands to operate both GSO & NGSO**: **WRC-23** will be an important milestone
- SES fully supports ITU's key role to guarantee **equitable access** to, and **efficient use** of, spectrum and associated orbital resources