# FROM SEA TO SPACE

## Satellites as a Backup for Undersea Cables

**Presented by**
Fabio ROMANO
Senior Manager EU and NATO, SES Space and Defence

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SES
SES HQ
Betzdorf, Luxemburg

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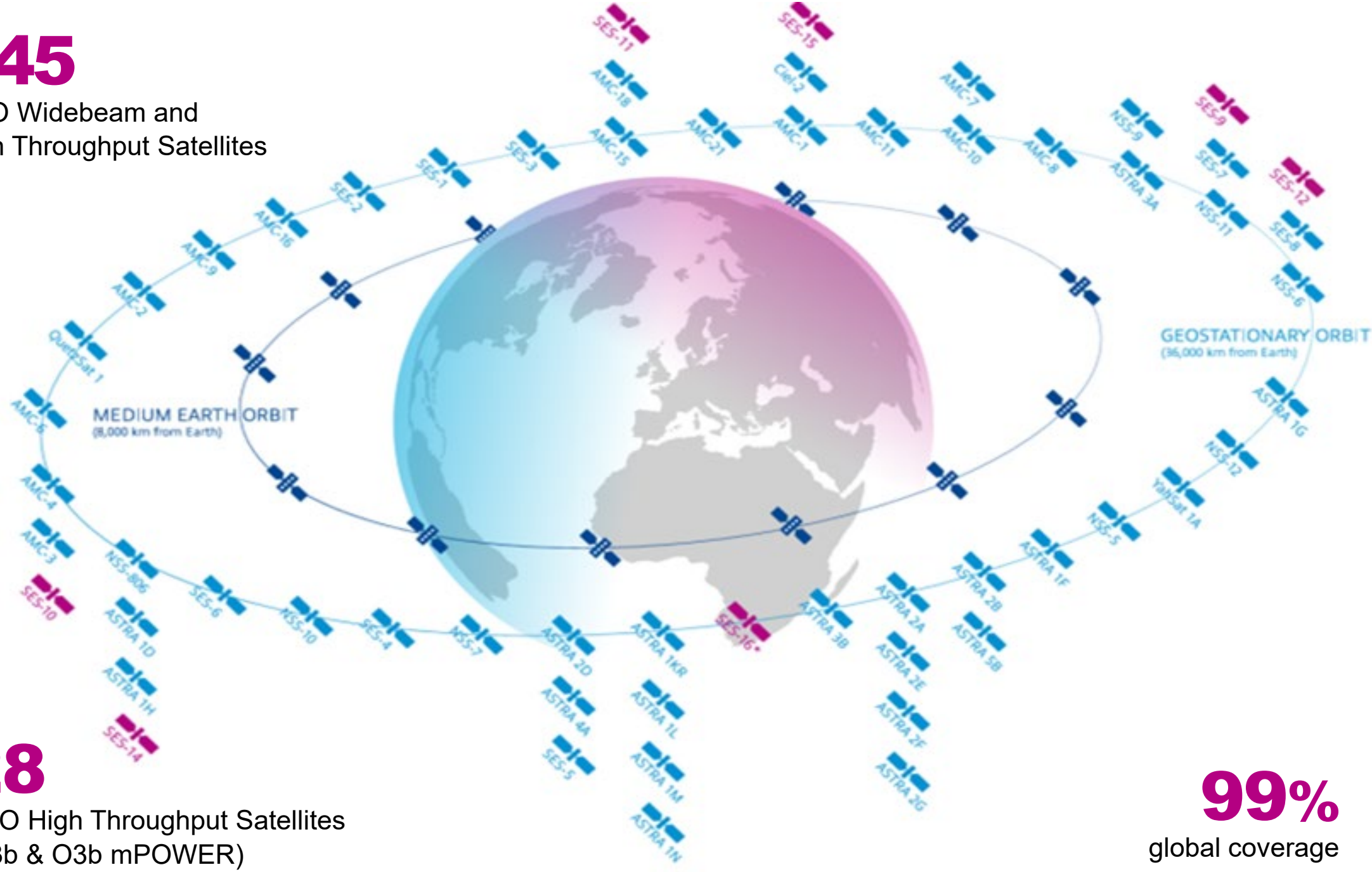
GEO Widebeam and
High Throughput Satellites

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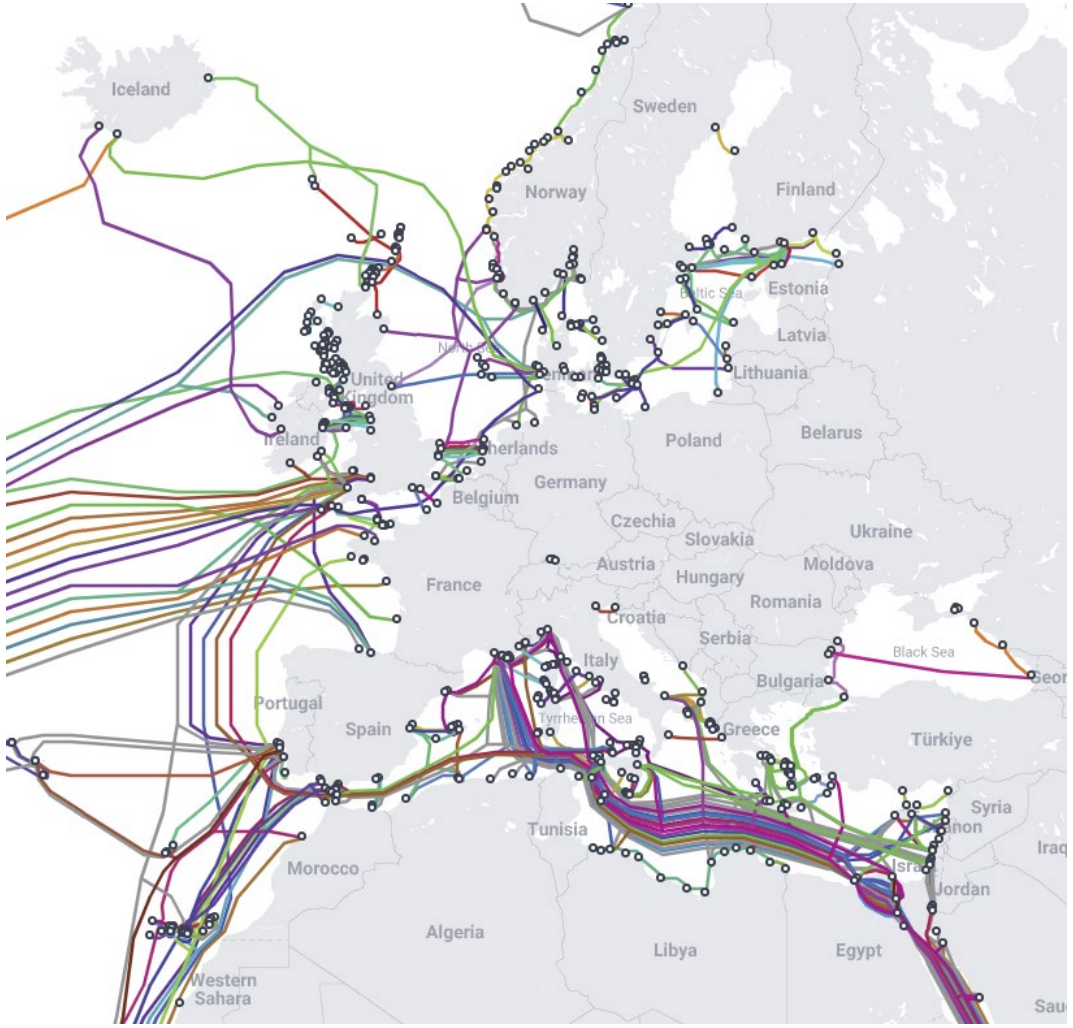
MEO High Throughput Satellites
(O3b & O3b mPOWER)

**99%**

global coverage

# Context

- The internet has become vital to our societies
- The vast majority of traffic is carried by undersea cables
- There are increasing attacks on undersea infrastructure
- The sheer amount and geographical distances involved make surveillance and defence very hard
- Backup plans are needed



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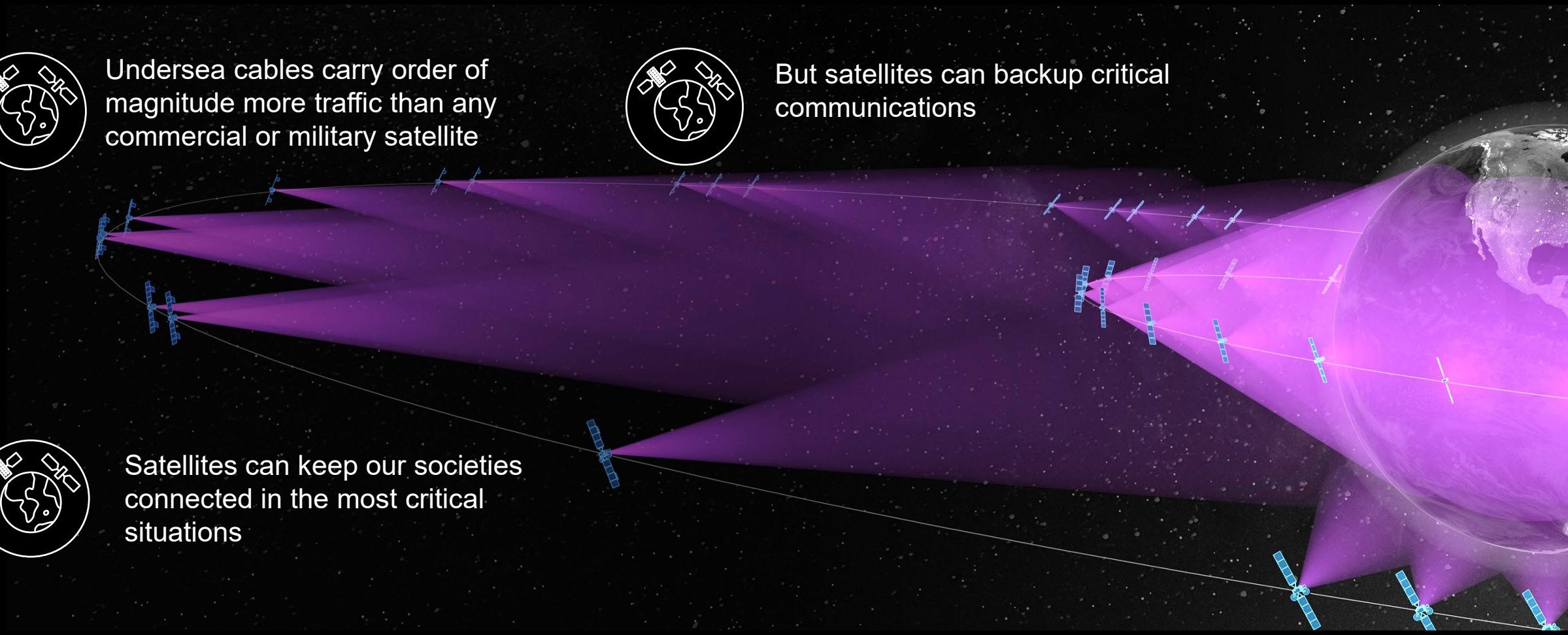
# Can Satellites Replace Undersea Cables?

Undersea cables carry order of magnitude more traffic than any commercial or military satellite

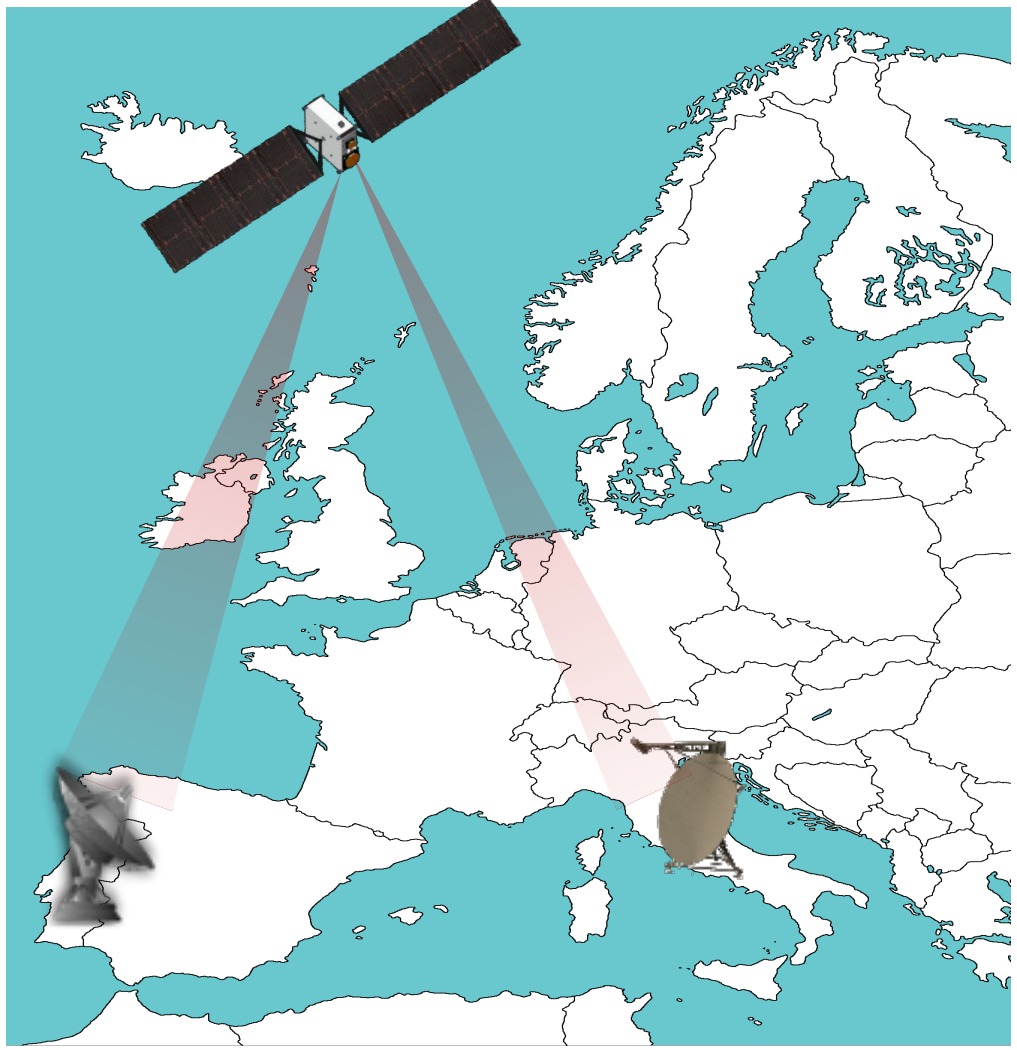
But satellites can backup critical communications

Satellites can keep our societies connected in the most critical situations

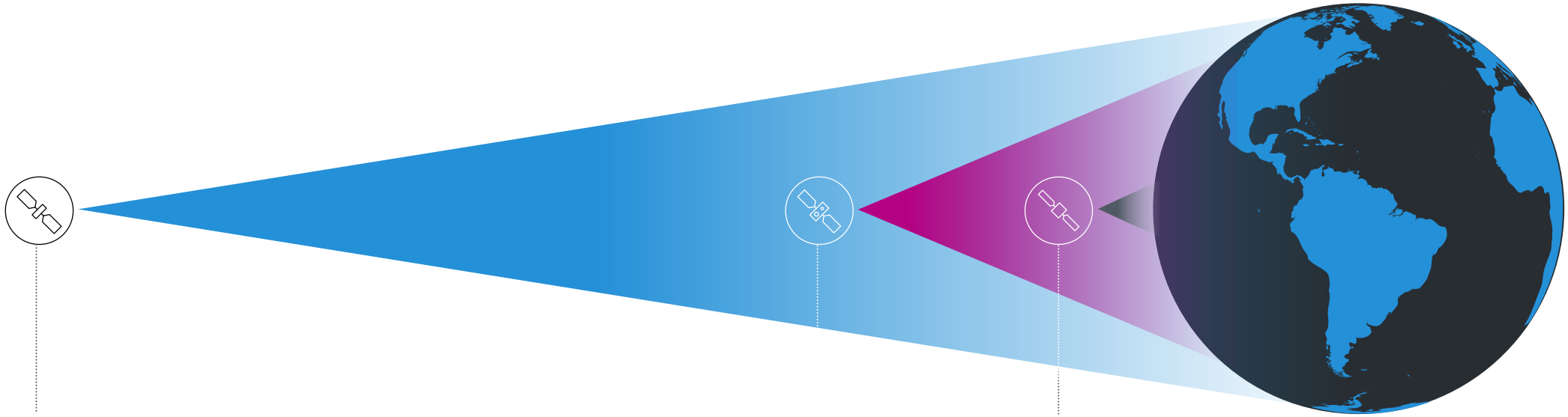


# From Sea to Space

- Can a satellite backup an undersea cable
- How Satellite Communication Work
- How Orbits Work
- Security
- Committed Information Rate
- What Satellites Have in Common with Hotels
- Recommendations

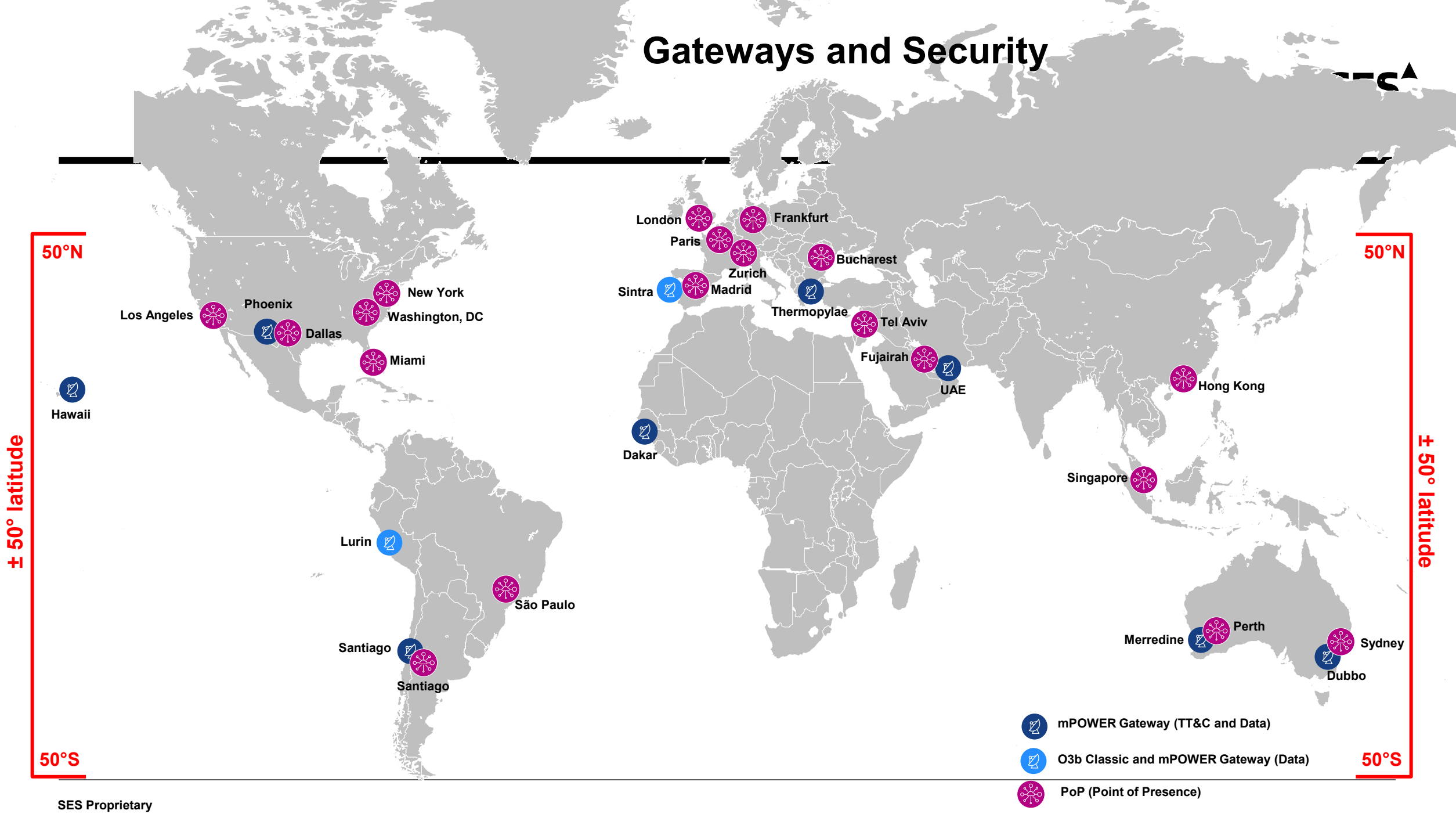


# Orbits at a Glance



| GEO | MEO | LEO |
|---|---|---|
| 36,000km | ~ 8,000km | ~ 1,000km |
| E.g., Wideband global system | 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 |

# Gateways and Security

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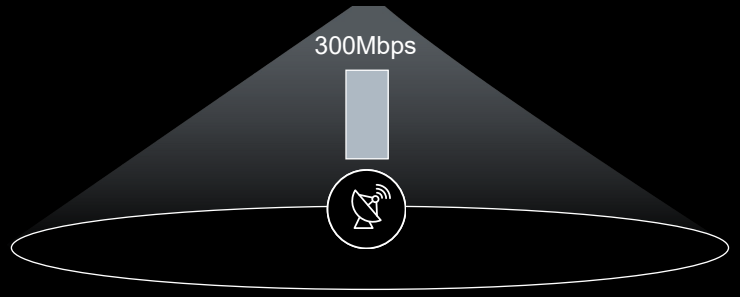
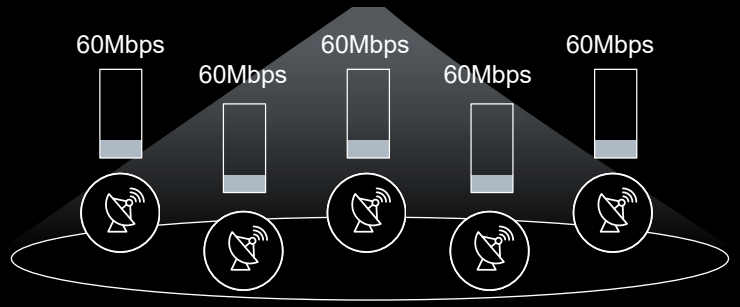
# WHEN BANDWIDTH MATTERS, CONTENTION MATTERS

## Public Contention



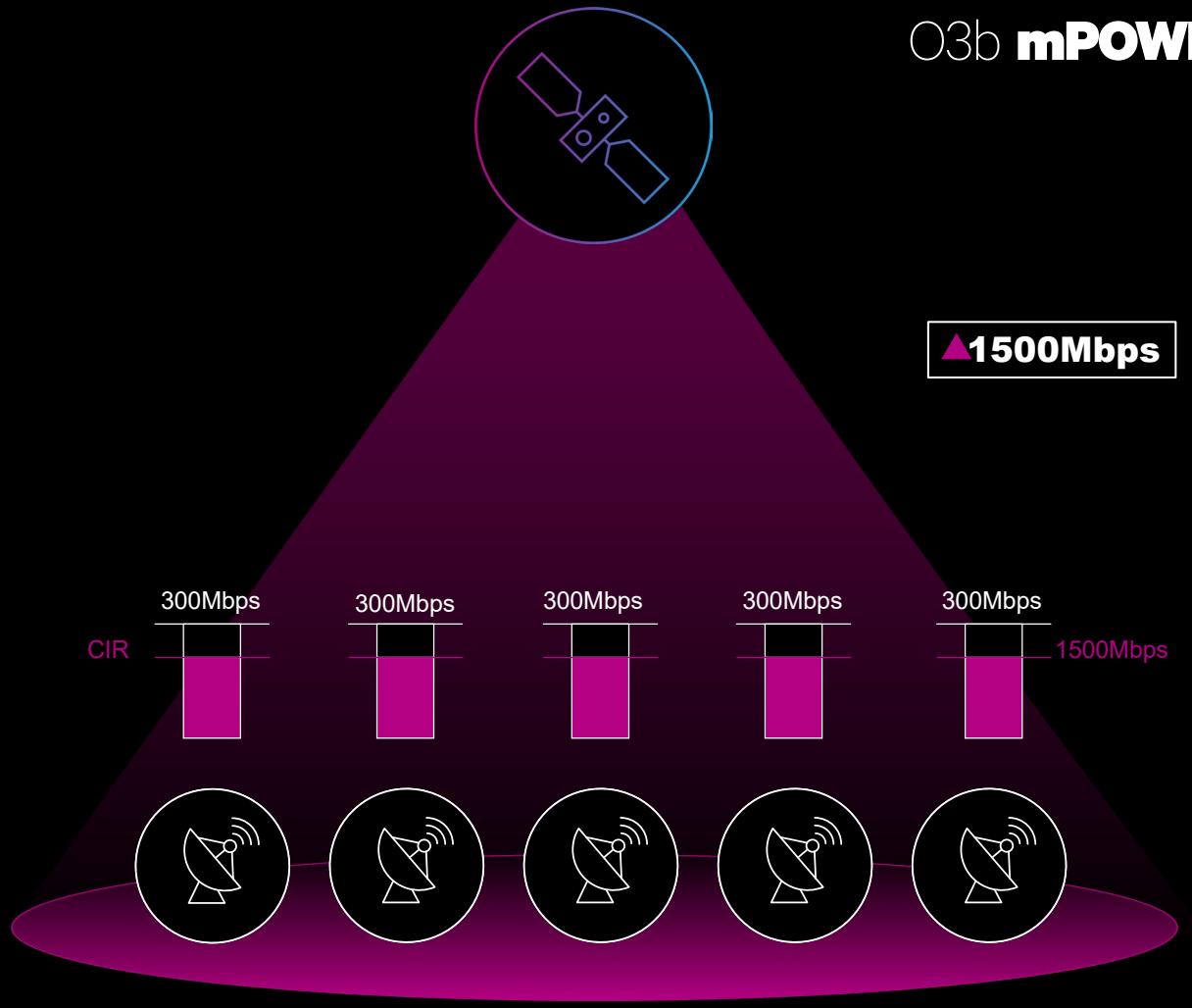

**300Mbps**

Public Contention without a Committed Information Rate (CIR) means if you're the first customer in the service area, you receive the advertised throughput.




**300Mbps**

But, when other terminals are provisioned in the same beam, the available throughput is shared among all sites, with no guaranteed minimum throughput.



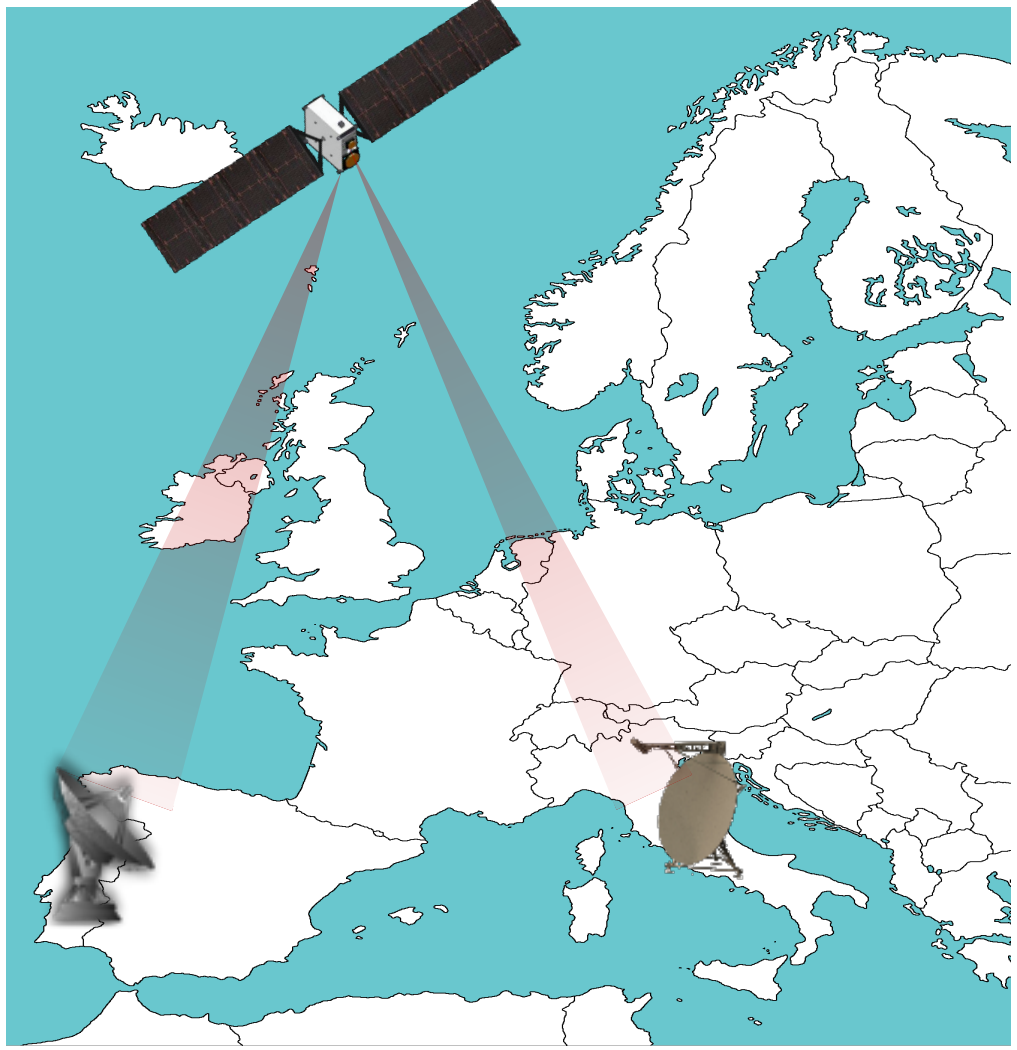

Connectivity to backup undersea cables should come with **Committed Information Rate**, a guaranteed minimum throughput.
Even with many terminals, the satellite should adjust the total throughput accordingly.

# A Satellite is like… a Hotel

- Room on the satellite can be limited
  - (Try to estimate the amount of your critical data)
- They may not be available on short notice
  - (Have a Satellite backup strategy)
- You should find the most appropriate location
  - (Know the best orbit for your use case)
- Some neighbourhoods are better than others
  - (Control where your traffic is landing)
- Would you like to share your room?
  - (Make sure to have dedicated bandwidth)

# Recommendations

- Hope for the best, prepare for the worse
- Define your requirements as precisely as possible
- Loose requirements will lead to the cheapest option, not the best
- Make sure the connectivity is there when you need it
- Align IT, Security and Procurement
- Think flexibly: combine multiple partners



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