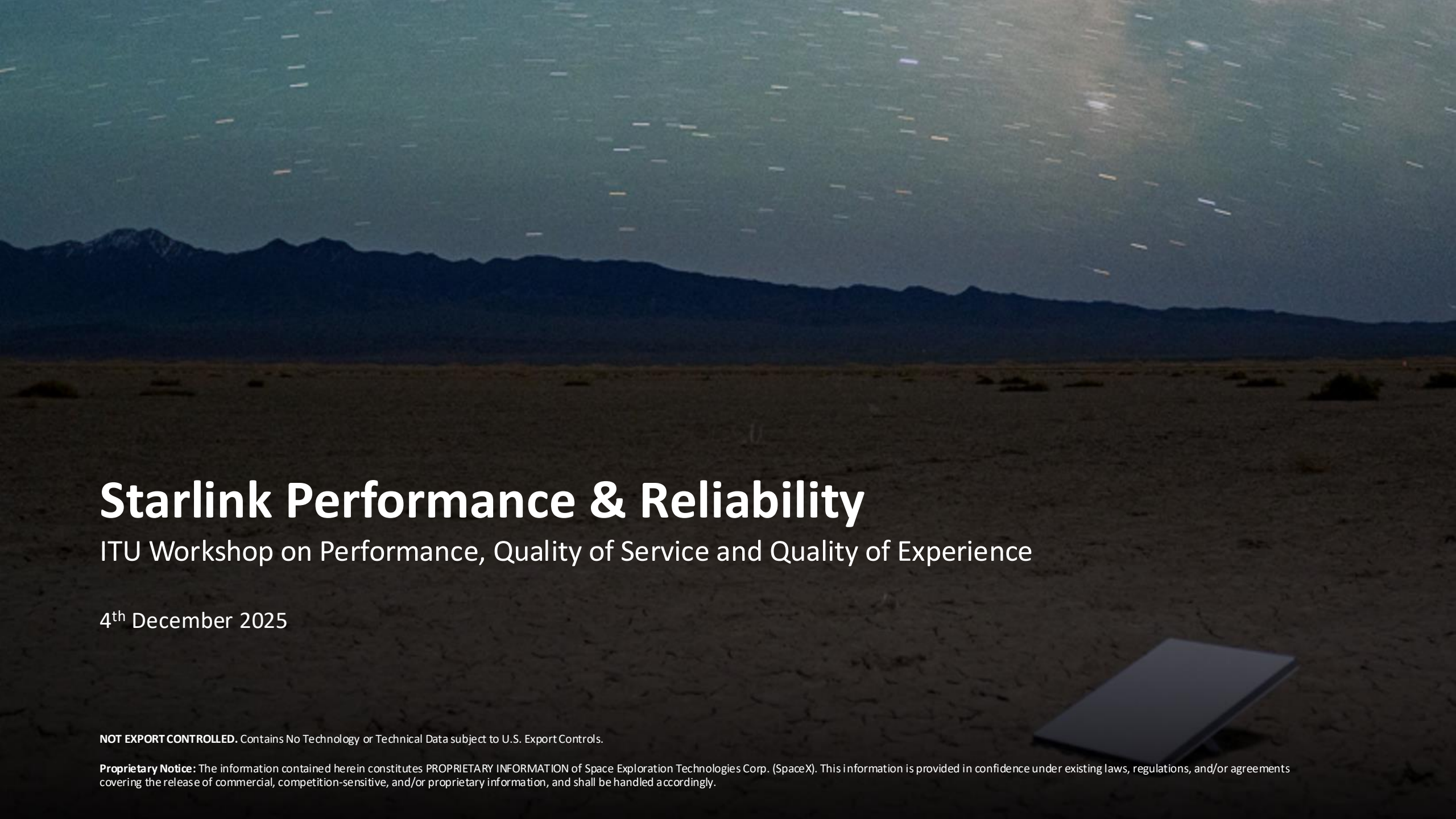
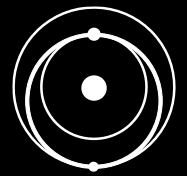


Starlink Performance & Reliability

ITU Workshop on Performance, Quality of Service and Quality of Experience

4th December 2025

THE STARLINK SYSTEM



CUSTOMERS

8M+

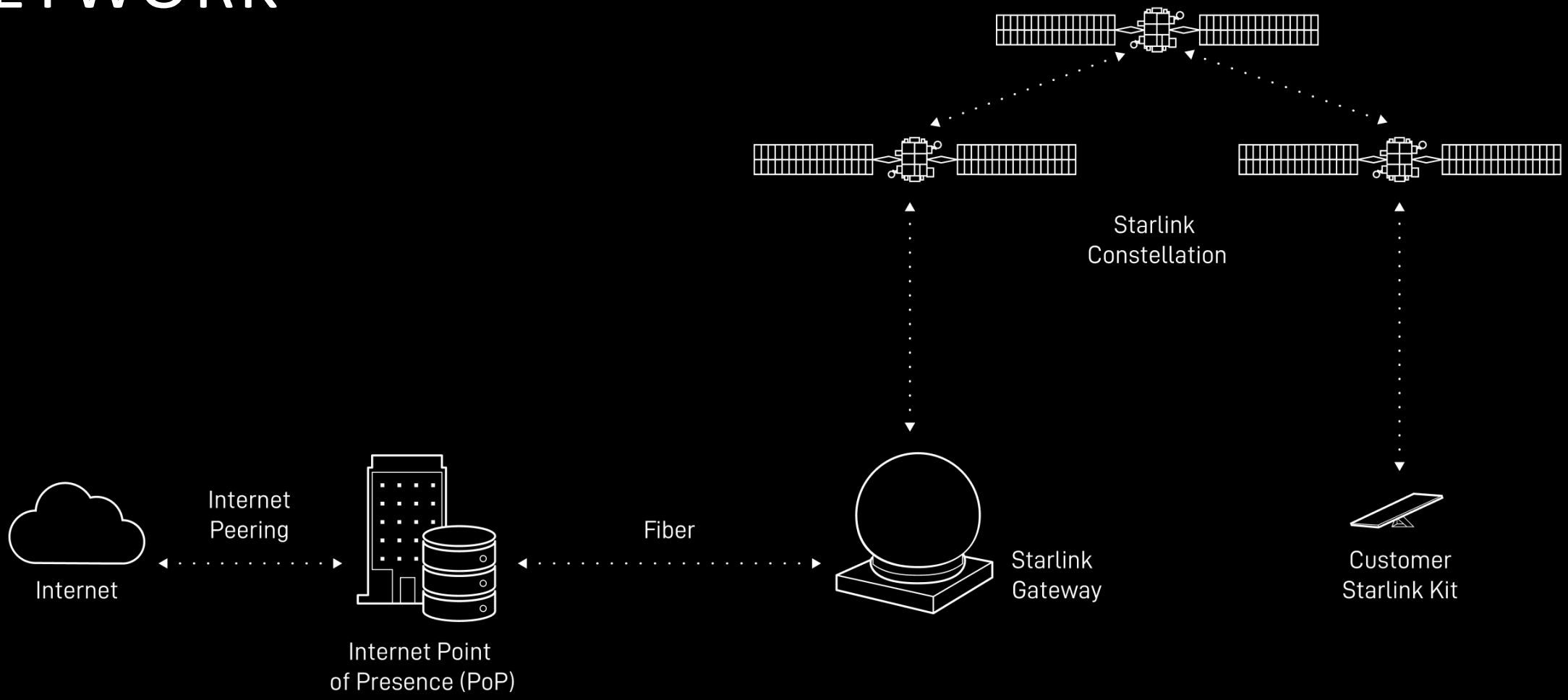
COUNTRIES

150+

CONTINENTS

7

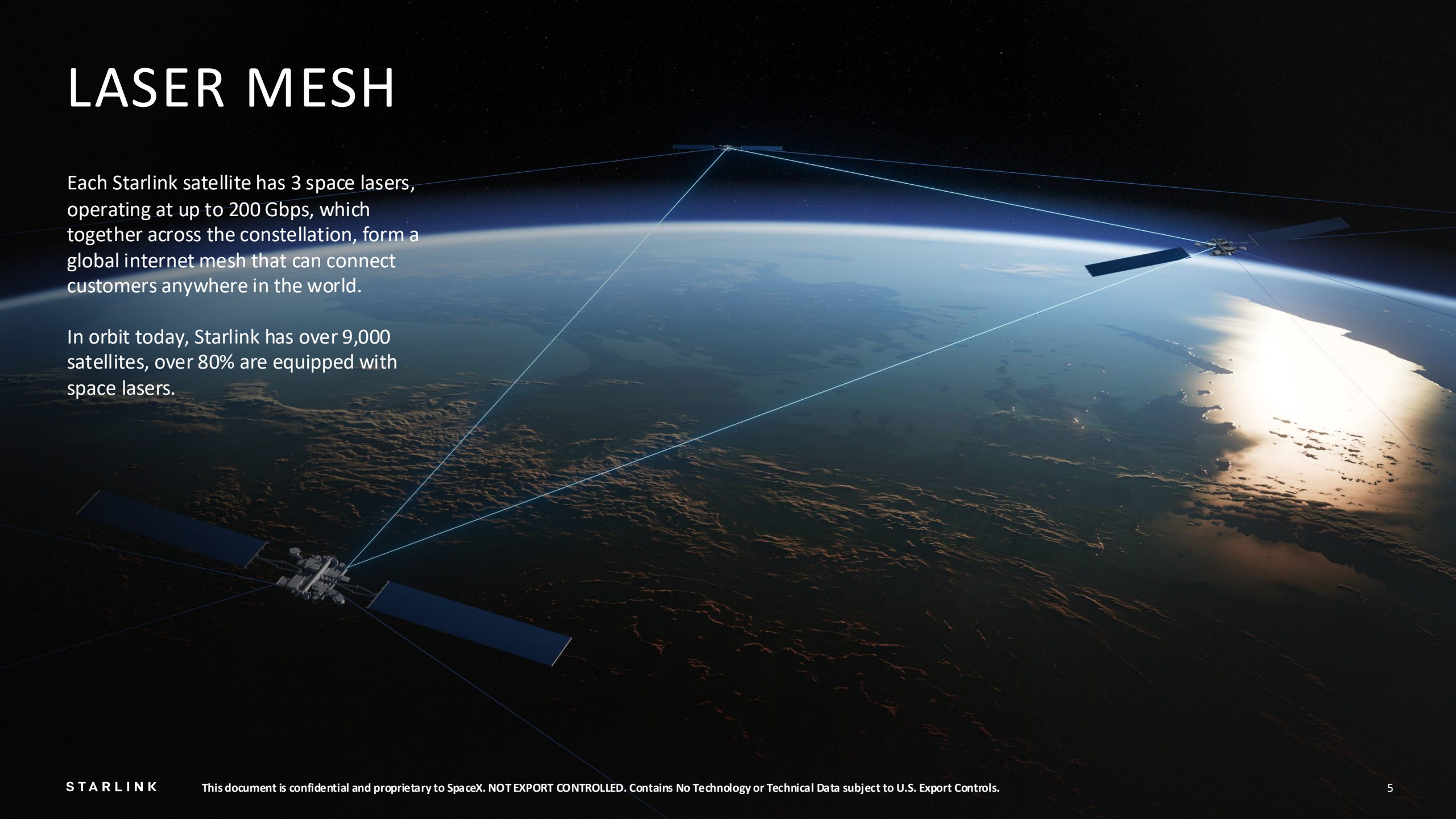
STARLINK NETWORK



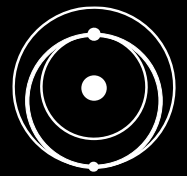
LASER MESH

Each Starlink satellite has 3 space lasers, operating at up to 200 Gbps, which together across the constellation, form a global internet mesh that can connect customers anywhere in the world.

In orbit today, Starlink has over 9,000 satellites, over 80% are equipped with space lasers.



QUALITY OF SERVICE METRICS



QUALITY OF SERVICE: METRICS

HIGH SPEED

LOW LATENCY

TRANSPARENT

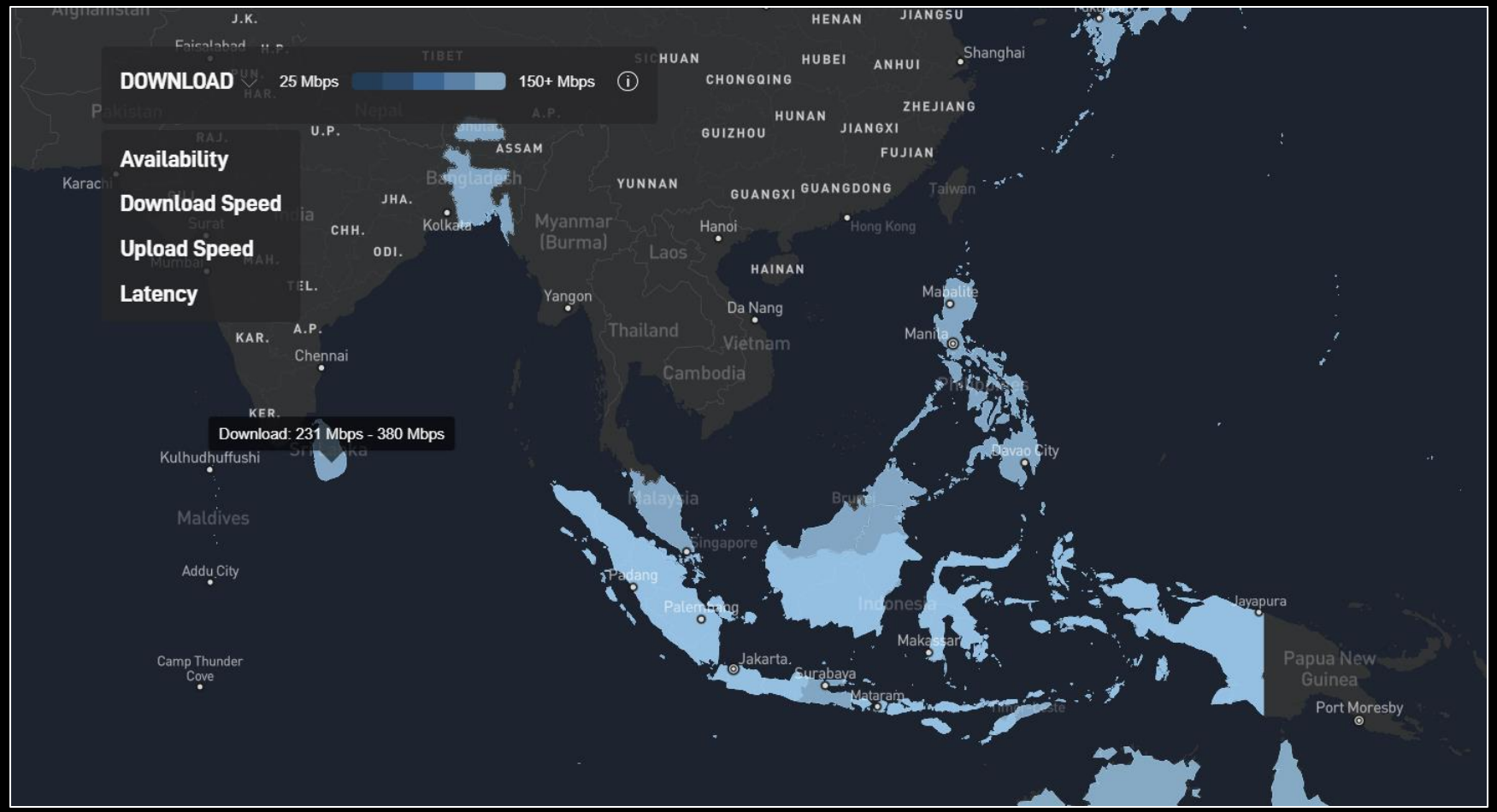
RELIABLE

Starlink collects anonymized measurements from millions of Starlink routers every 15 seconds.

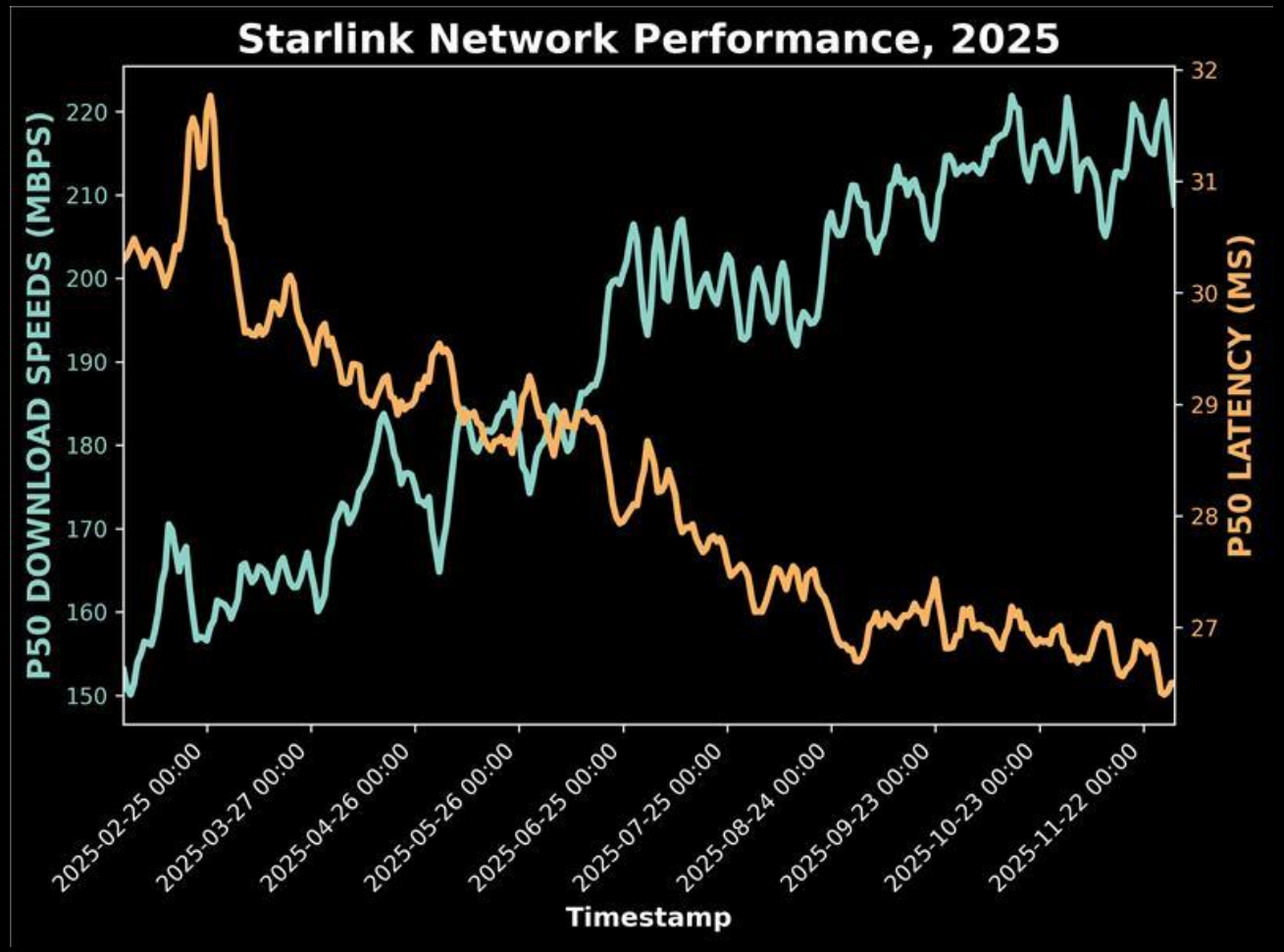
High-frequency automated measurement assures consistent data quality, with minimal sampling bias, interference from Wi-Fi conditions, or bottlenecks from third-party hardware.

QUALITY OF SERVICE: TRANSPARENCY

Starlink publishes network performance across Download Speeds, Upload Speeds, and Latency on its website.



QUALITY OF SERVICE: HIGH SPEED, LOW LATENCY



SPEED

In 2025, median peak-hour, network-wide **speeds increased by over 50%.**

Download Speeds: >200 Mbps

Upload Speeds: >30 Mbps.

LATENCY

Global median latency: ~26 ms

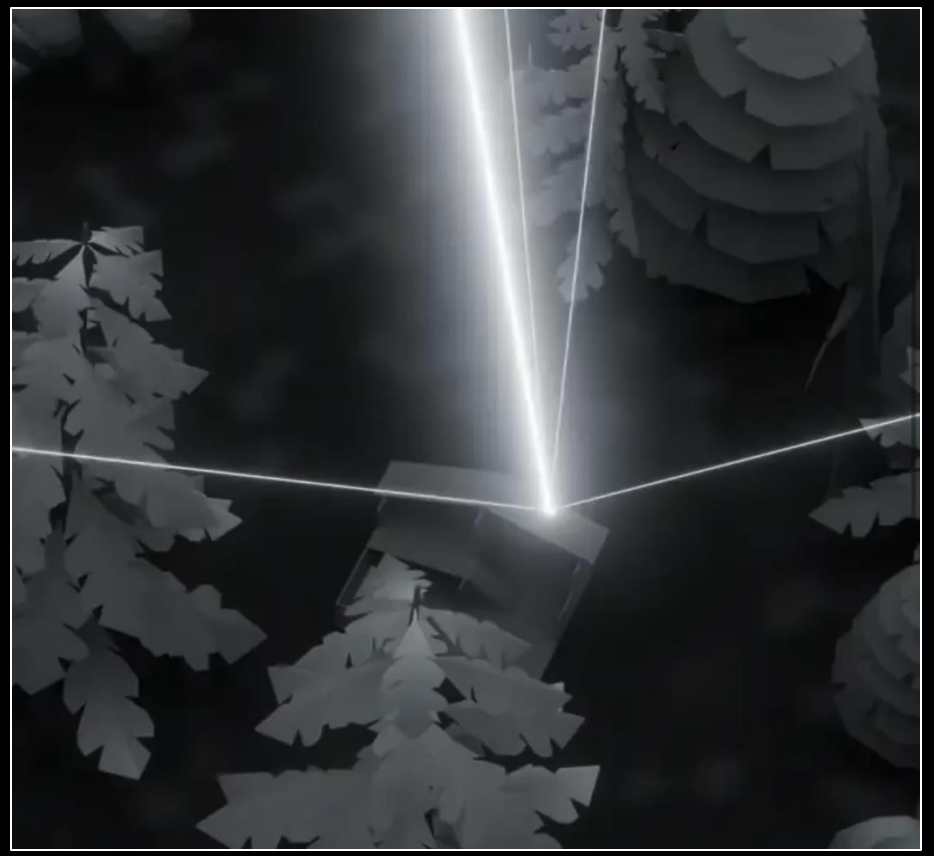
Engineering Goal: 20 ms median latency with minimal packet loss.

QUALITY OF SERVICE: RELIABILITY

Continuously

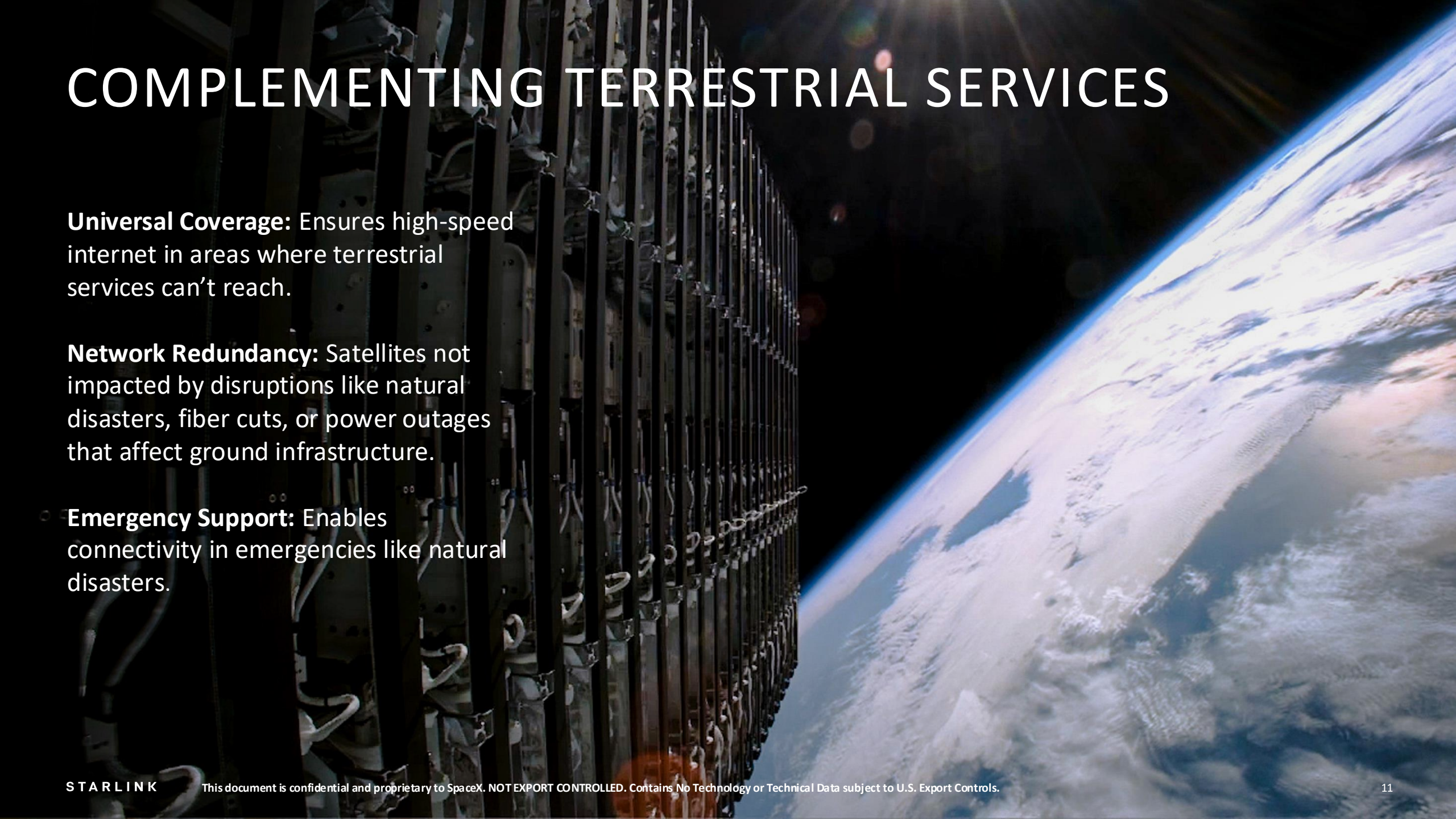
- Increasing satellite deployment
- Expanding the ground network
- Implementing technologies such as beam switching on user devices

Results in **10th percentile uptime is >99.9%**



STARLINK ROUTES AROUND OBSTACLES,
MAKING SERVICE MORE RELIABLE

COMPLEMENTING TERRESTRIAL SERVICES

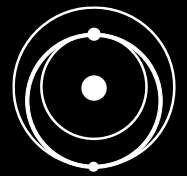


Universal Coverage: Ensures high-speed internet in areas where terrestrial services can't reach.

Network Redundancy: Satellites not impacted by disruptions like natural disasters, fiber cuts, or power outages that affect ground infrastructure.

Emergency Support: Enables connectivity in emergencies like natural disasters.

CASE STUDIES



TONGA

The Hunga Tonga–Hunga Ha'apai volcanic eruption and tsunami in January 2022, severed Tonga's sole undersea submarine cable.

Starlink deployed user terminals to restore connectivity

- Initially planned as a 2-3 month solution
- Starlink service remained in use for 9 months until the submarine cable was fully repaired

Now that Starlink is fully licensed and active in Tonga, a repeat of the 2019 or 2022 fiber cuts would be less impactful.

SPAIN & PORTUGAL

Spain and Portugal faced a near-total power grid failure earlier this year.

- 50 million people were left without connectivity or communications for 10+ hours as terrestrial telecom networks struggled to recover.
- Starlink never went dark – instead, usage surged by 35%.

Starlink service remained functional for the duration of the outage, despite the eventual loss of many terrestrial fiber routes as backup power failed at multiple locations.

HURRICANE MELISSA

SpaceX donated over 1,000 Starlink kits to support Hurricane Melissa relief in the Caribbean, including 900+ kits in Jamaica.

- First responders and humanitarian agencies used the kits for aid distribution, logistics, assessments, emergency medical services, community Wi-Fi, network backhaul, and air-to-ground communication
- Offered free service to all Jamaica and Bahamas residential customers for over a month, enabling 21,000+ accounts to connect at no charge