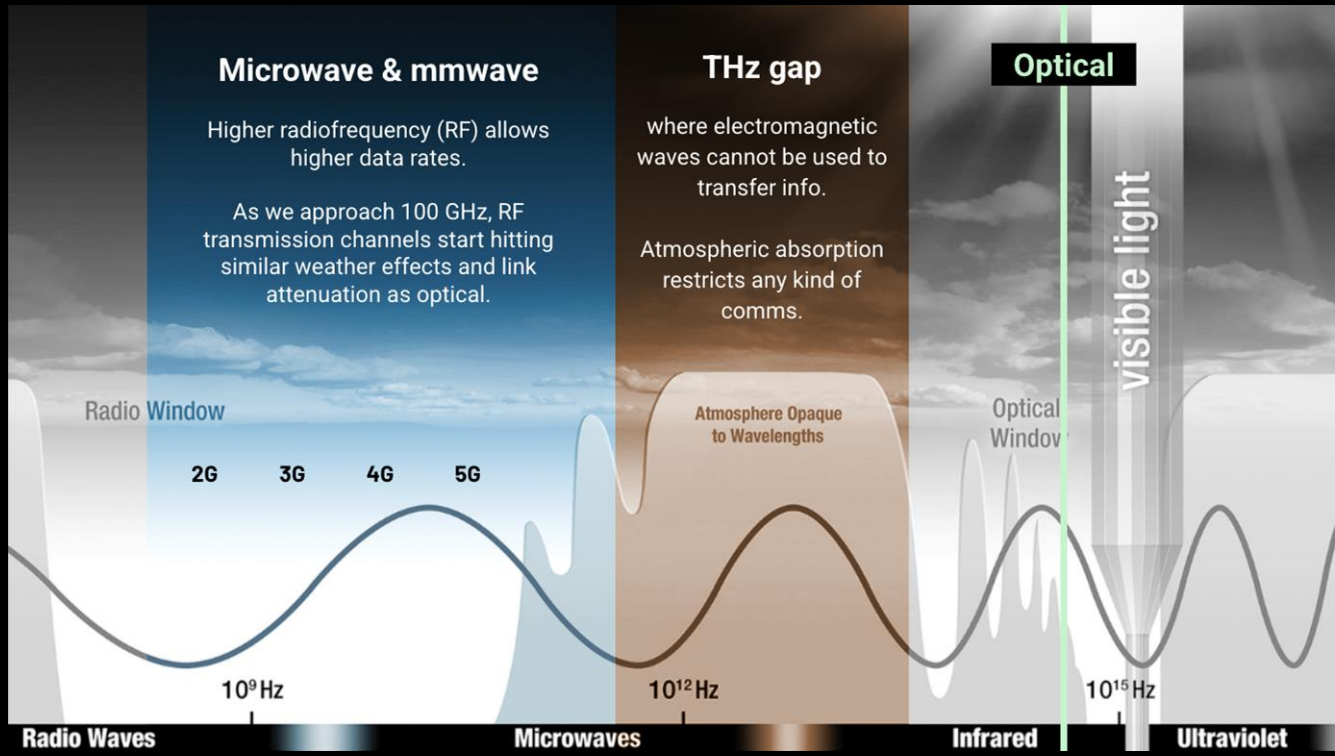
Taara

Delivering abundant and affordable internet with next-generation wireless optical communication technology

Leapfrogging to optical unlocks “infinite” bandwidth

Over the past few decades, from 2G to 5G, the industry has been pacing towards higher frequency in search of faster speeds, more bandwidth.

Wireless optical communication technology operates at 193 THz, delivering future-proof capacity.



Vast spectrum and focused beam allow higher throughput and longer range

from mmWave to optical

Capacity scales linearly with bandwidth,
logarithmically with signal to noise ratio

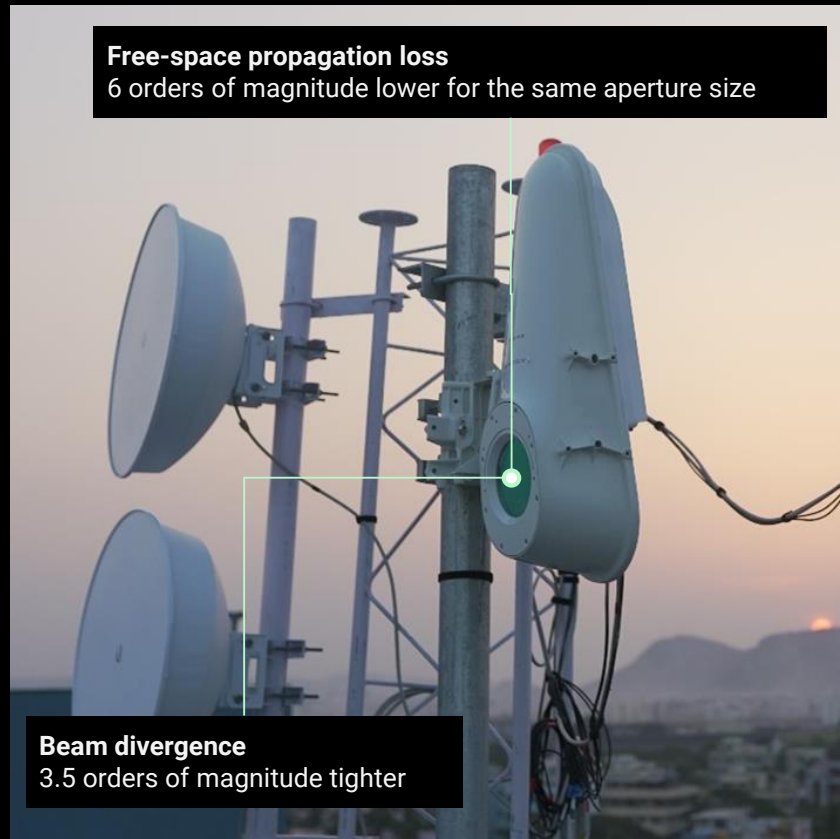
$$C = B \log_2 (1 + \frac{S}{N})$$

Higher frequency boosts power received by f^2

$$P_{rx} \propto \frac{L_{ch} P_{tx} D^4 f^2}{c^2 R^2}$$

Higher frequency reduces beam divergence by f

$$S_{angle} \propto \frac{c}{Df}$$



A point to point wireless optical communication system

Benefits

- No interference
- Rapid deployment
- Low latency
- High security

System specifications

- 2 x 10 Gbps full-duplex
- 20 km with line of sight
- 1535 ~ 1565 nm
- 60 W max power
- Class 1M eye safe laser
- **Zero waste** over beam path

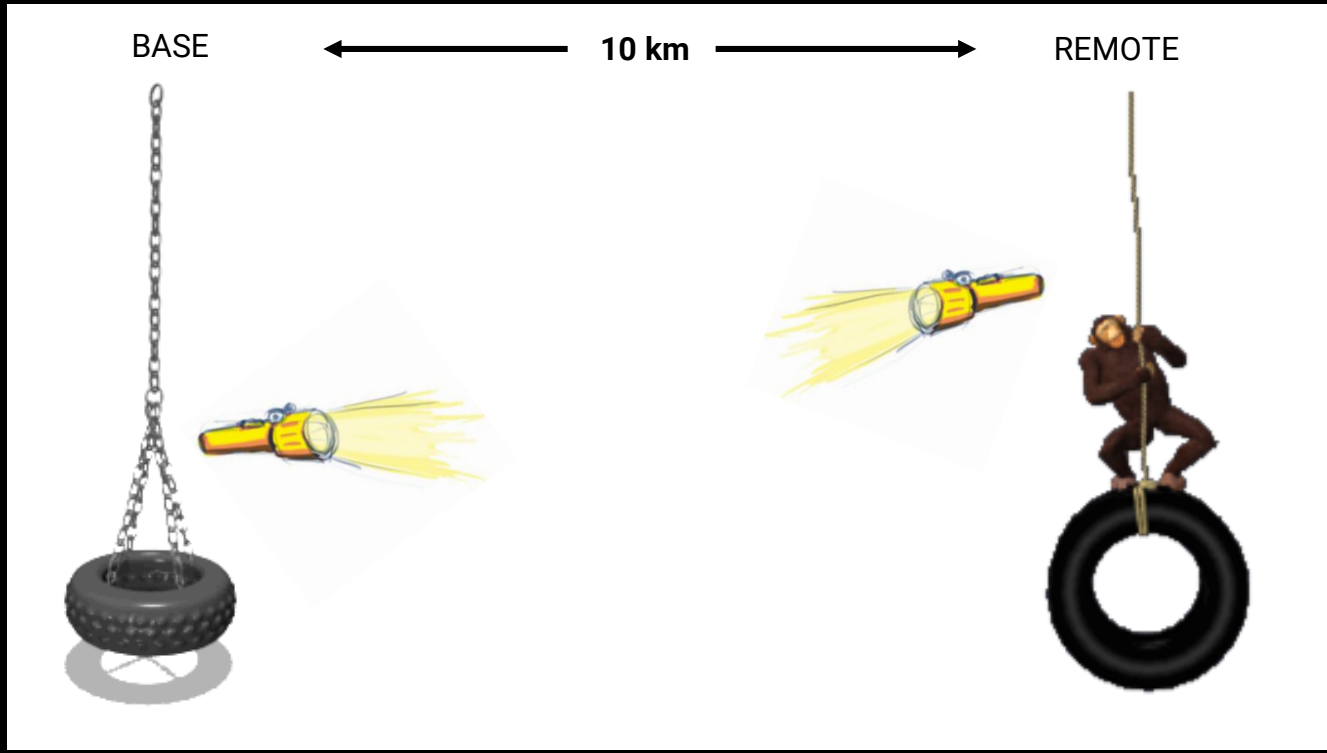
Alignment and continuous active tracking to maintain the beam

Pointing

Imagine pointing an incredibly narrow light beam - less than 0.004 degrees - accurately enough to hit a 5-cm target that's 10 km away.

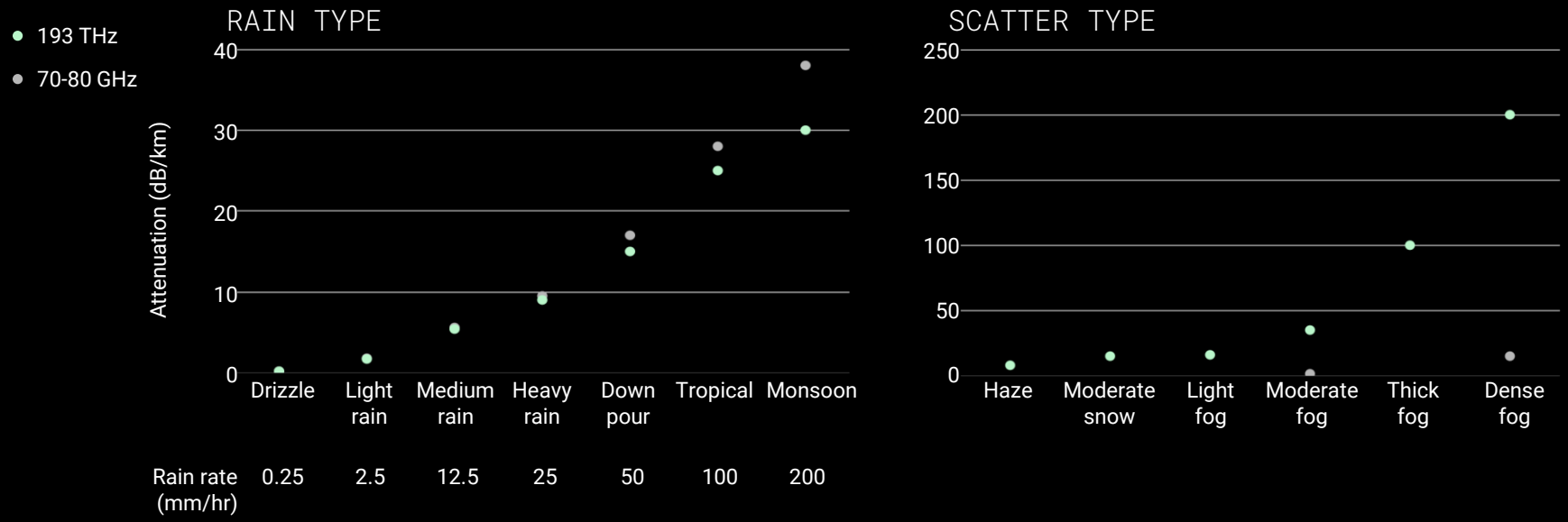
Tracking & acquisition

To ensure the beams stay locked, mirrors work together to compensate for slow-rate changes like tower sway, and rapidly changing atmospheric conditions.

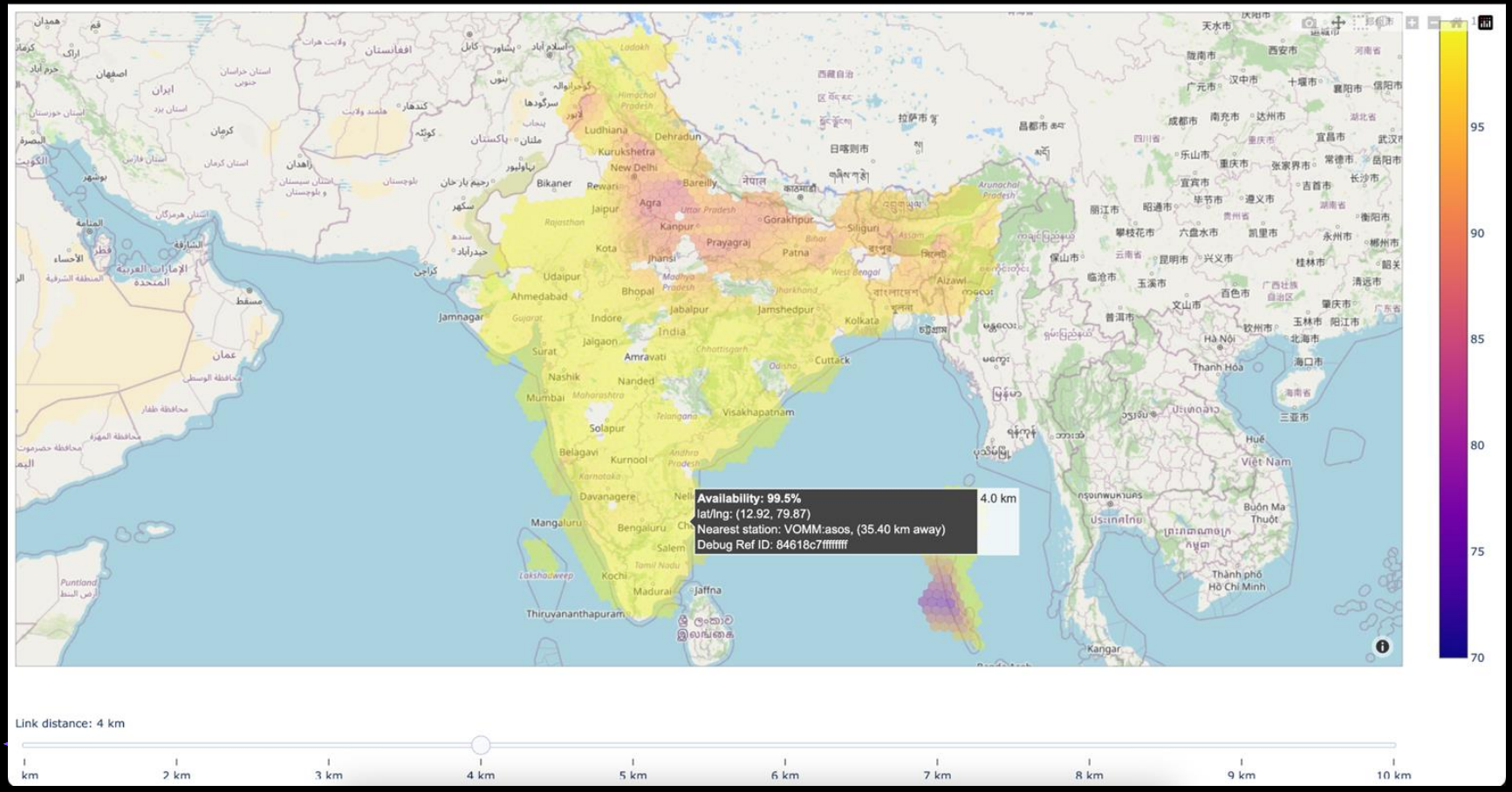


Optical attenuation is similar to E-band in rain, higher in fog

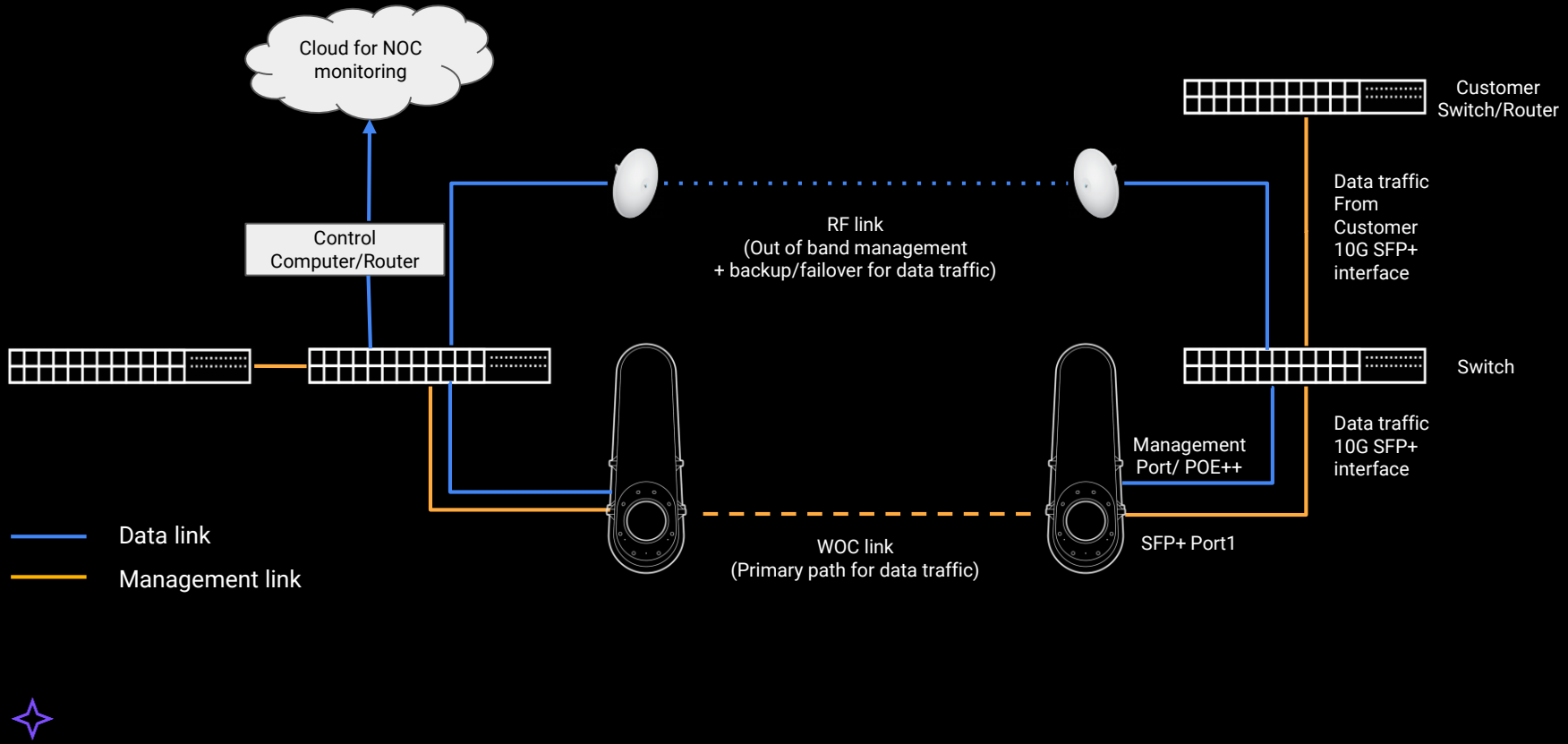
What's important is how often these weather conditions happen, and when they do efficient failover to back up systems across the network



Link planning tool



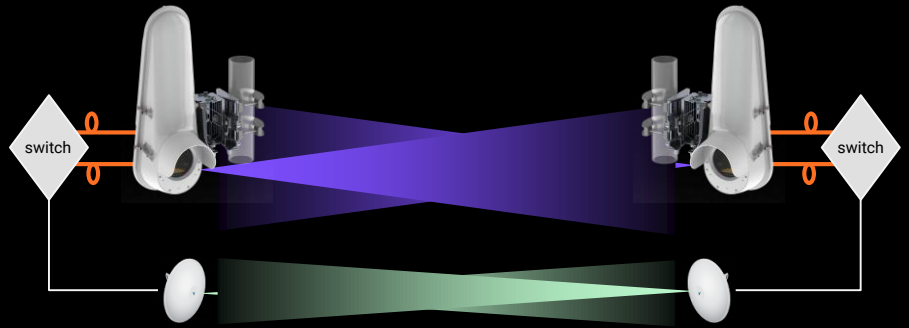
Network diagram

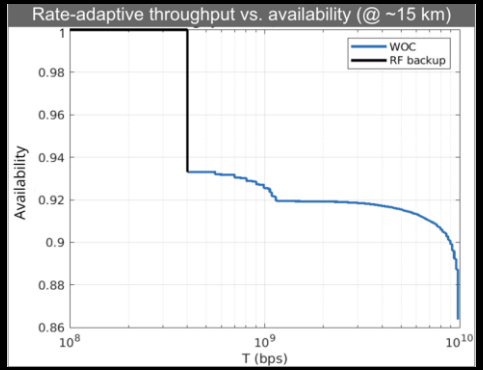


Hybrid link architectures with radio or fiber

Traffic switchover

The switchover can be made agnostic to the radio physical layer as long as it supports ethernet interface and can be done at the switch/router level.



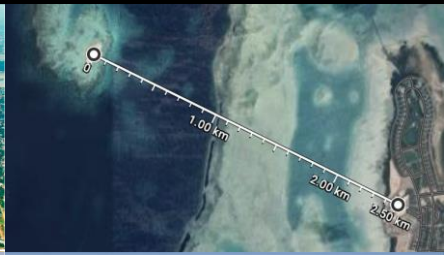


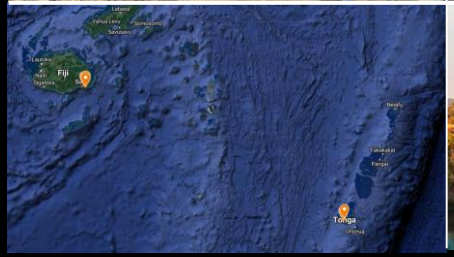
Commercially operating with telcos & ISPs in more than a dozen countries

Use cases

Network operators and service providers often deploy Taara links

- Extend fiber backhaul
- Augment radio backhaul
- Improve network resilience
- Cross challenging terrain
- Relay high capacity backbone
- Provide redundancy path





Congo River

Crossing challenging terrain

Fiji & Tonga

Augmenting microwave backhaul within islands

Anguilla

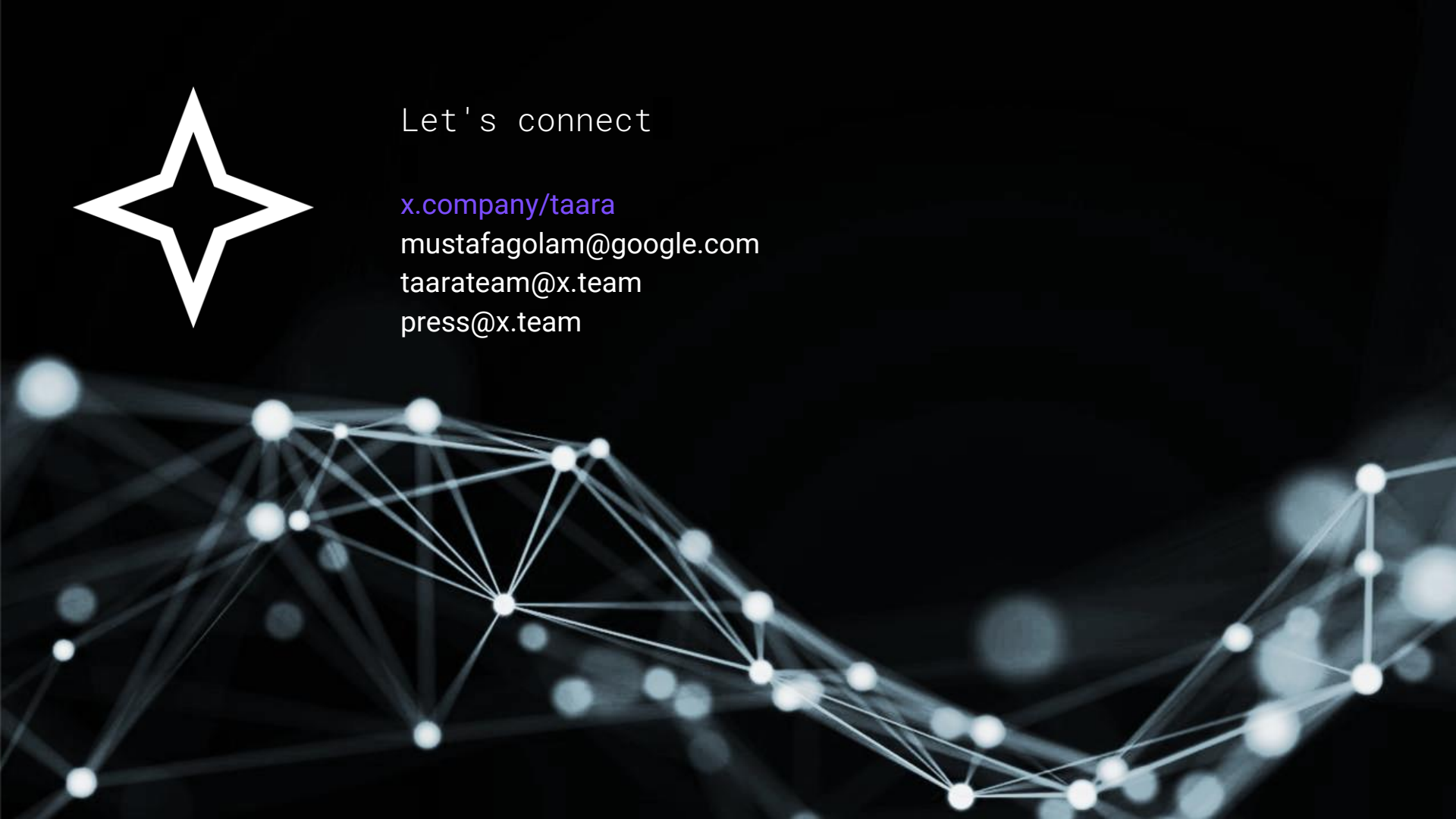
High-capacity connectivity during subsea cable repair

India

Rapid 5G network expansion

India

Backhaul extension to multi dwelling apartments in metro cities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