MARLINK

SLOT 1

Marlink Group
Introduction

DIGITAL TECHNOLOGIES

Cloud & IT

Cyber security

IIoT / OT

MANAGED NETWORKS

Satcoms (GEO, MEO, LEO) & terrestrial (4G/5G, Wi-Fi, cloud)

SD-WAN orchestration

Device management

NETWORK EXPERTISE

Resilient network infrastructure

ICT engineering know-how

STRONG SHAREHOLDERS

Strengthen our digital ambitions

PROVIDENCE EQUITY PARTNERS

apax
by seven2

SOLID FOUNDATIONS

1500 Employees

30 Countries

$800 m Revenues

GLOBAL DELIVERY & OPERATIONS

24/7/365 multi-lingual global & regional support

Global field service

Global warehouses

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Marlink Group
Leadership across segments

SHIPPING

ENERGY & MINING

HUMANITARIAN & AID

CRUISE

YACHTING

GOVERNMENT

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Portfolio at a glance

Connectivity

Satellite
- GEO
- MEO
- LEO

Terrestrial
- Cellular
- Wireless

Network

WAN Management
- SD-WAN
- SASE
- Bandwidth mgmt

LAN Management
- NaaS
- LAN design, deployment & mgmt
- Network access

Cloud & IT

IT Management
- Assets monitoring
- Standardisation & automation
- IT modernisation

Cloud Management
- Hybrid cloud migration & integration
- Cloud usage optimisation

IIOT & Apps

IOT / OT
- Real-time visibility & reporting
- Performance optimisation
- Remote operations

Application services
- Welfare & Media
- SaaS

Cyber security

Assess & Protect
- Audit services
- Identity & access management
- Infrastructure security

Defend
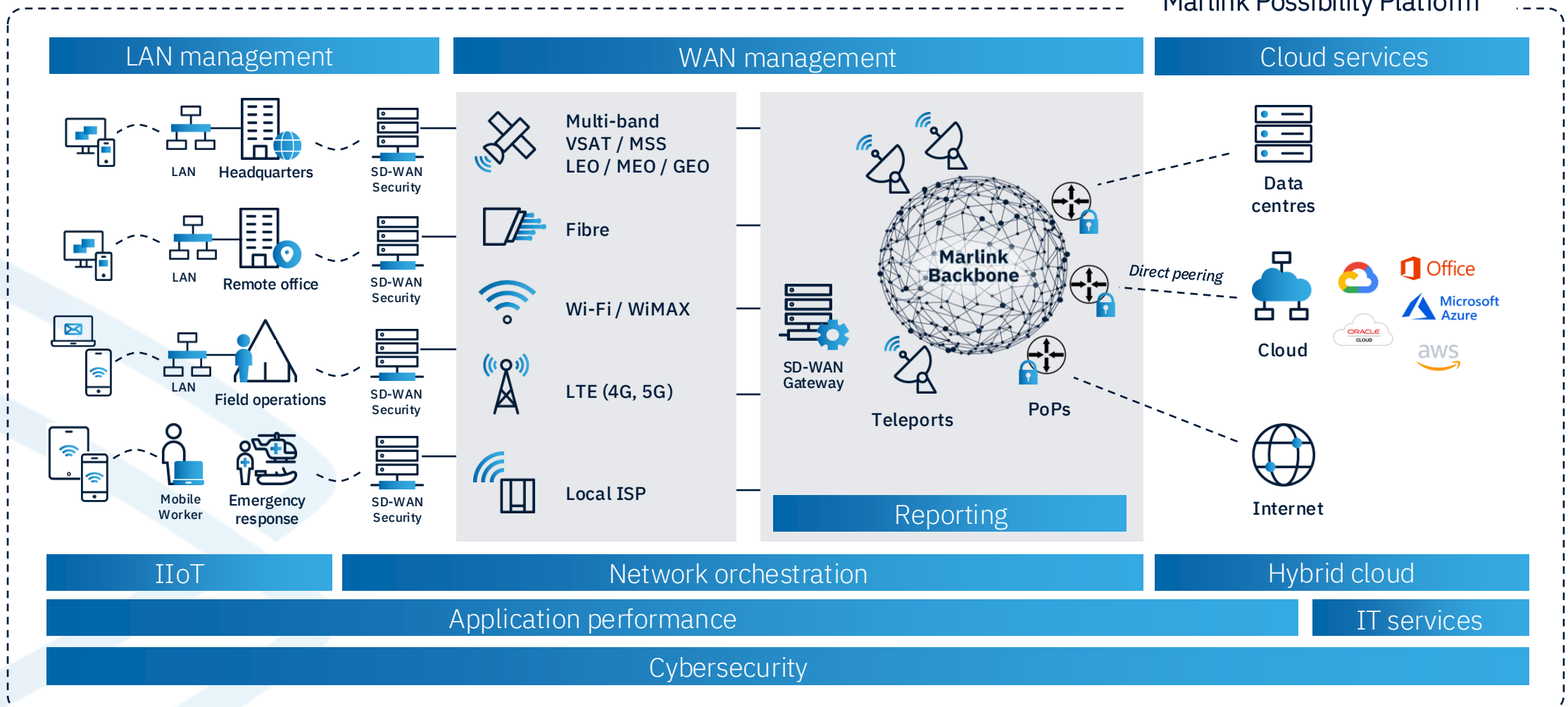- Managed detection & response
- Digital risk protection

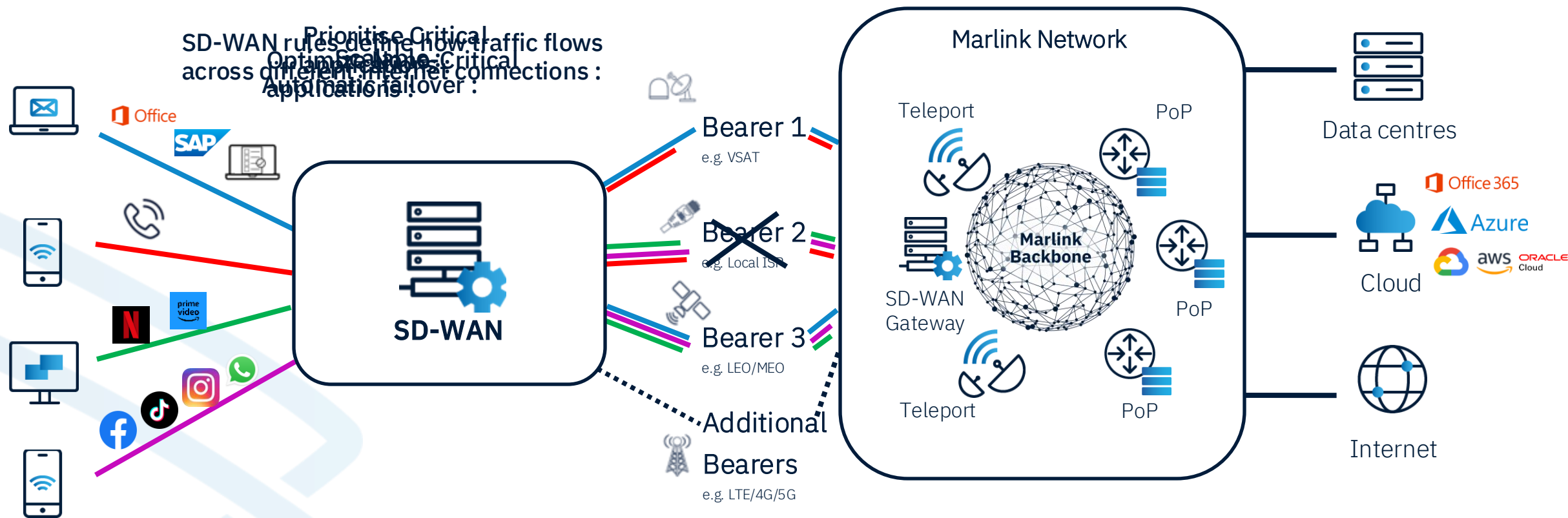## Managed & Professional Services

Possibility Platform

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Network as a service
The combination that makes the difference

Marlink Possibility Platform

LAN management

LAN | Headquarters | SD-WAN Security
LAN | Remote office | SD-WAN Security
LAN | Field operations | SD-WAN Security
Mobile Worker | Emergency response | SD-WAN Security

WAN management

Multi-band VSAT / MSS LEO / MEO / GEO

Fibre

Wi-Fi / WiMAX

LTE (4G, 5G)

Local ISP

SD-WAN Gateway

Marlink Backbone

Teleports

PoPs

Reporting

Cloud services

Data centres

Direct peering

Cloud

Internet

Office
Microsoft Azure
ORACLE CLOUD
aws

IIoT

Network orchestration

Hybrid cloud

Application performance

IT services

Cybersecurity

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Secure SD-WAN

WAN management for enhancing network end-to-end performance

SD-WAN rules define how traffic flows across different internet connections :

Prioritise Critical Applications :

Optimise Non-Critical Applications :

Seamless Critical Automatic failover :

Bearer 1
e.g. VSAT

Bearer 2
e.g. Local ISP

Bearer 3
e.g. LEO/MEO

Additional Bearers
e.g. LTE/4G/5G

SD-WAN

Marlink Network

Teleport

PoP

SD-WAN Gateway

Marlink Backbone

PoP

Teleport

PoP

Data centres

Cloud

Internet

SD-WAN consistently **prioritises critical traffic** and optimizes overall network performance, leading to a **better user experience.**

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Secure SD-WAN
Key advantages

Redundant bearers

Load balancing

Application steering

Seamless bearer handover

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Cloud access
Improving your performance

MARLINK ⟷ Office 365 Azure aws salesforce Google Cloud

Improve security
- Reduce threats through private peering
- Remove data from public internet

Reduce latency
- Direct access to cloud providers
- Faster data transfer to improve performance

Bandwidth scalability
- Control bandwidth allocations
- Adapt your network as data increases

Compliance
- Control where and how data is routed
- Easily comply with regulatory requirements

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Cyber by Marlink solution
Full range of cyber security services

Assess

- Audit services
- Vulnerability assessment and penetration testing

Protect

- Network, systems, endpoint & applications security
- Privileged access management

Defend

- Incident response plan
- Digital risk protection

PERIMETER SECURITY

NETWORK SECURITY

ENDPOINT SECURITY

APPLICATION SECURITY

DATA SECURITY

MISSION CRITICAL ASSETS

(PROACTIVE) POLICY MANAGEMENT

(REACTIVE) MONITORING+RESPONSE
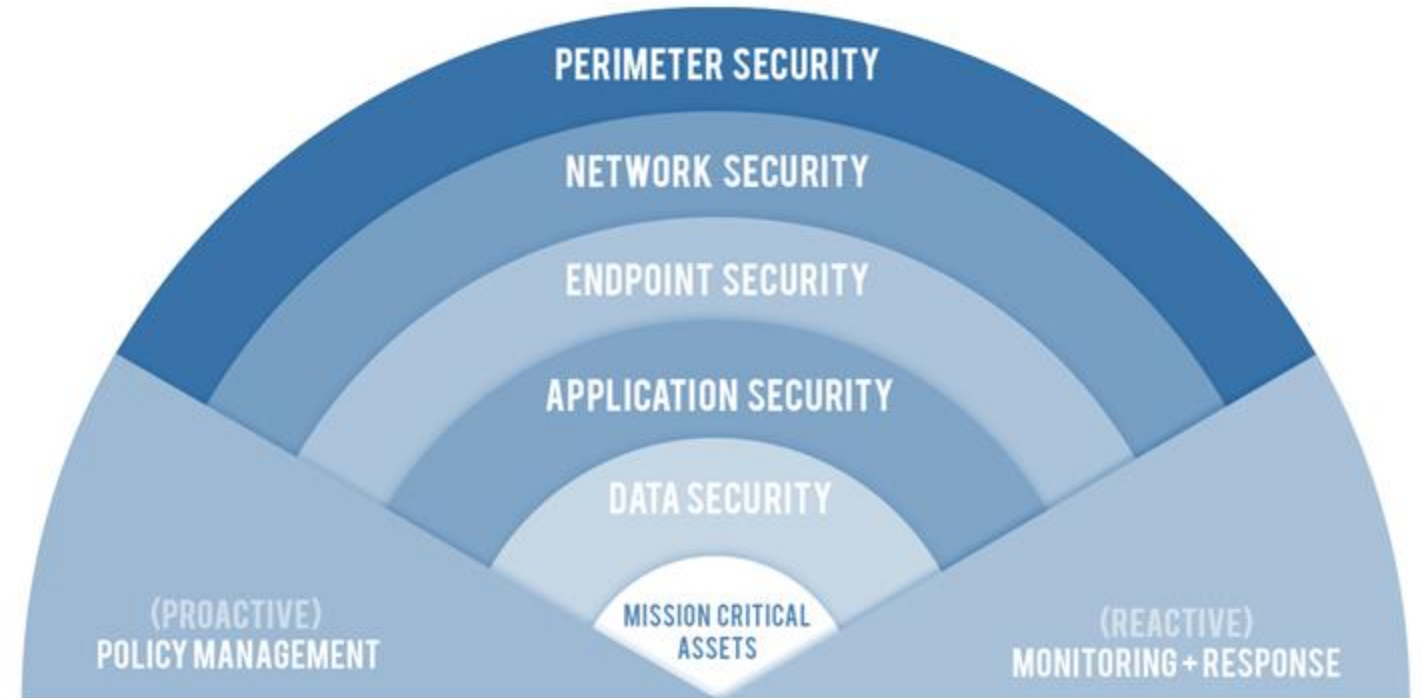
Assess   **Protect**   **Defend**

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Managed services
Experts to manage customer solution

Seamless operations and enhanced productivity with Marlink's comprehensive **managed services**

- **Network management:** Expert team in the Network Operations Centre

- **Managed cyber security:** Cyber security experts

- **Services management :** Dedicated teams to support our customers in their day-to-day operations

- **Customer support**: **24/7/365**: Global customer support in strategic regional locations with multilingual staff for immediate assistance

- **Maintenance :** Dedicated team of Field Service Engineers
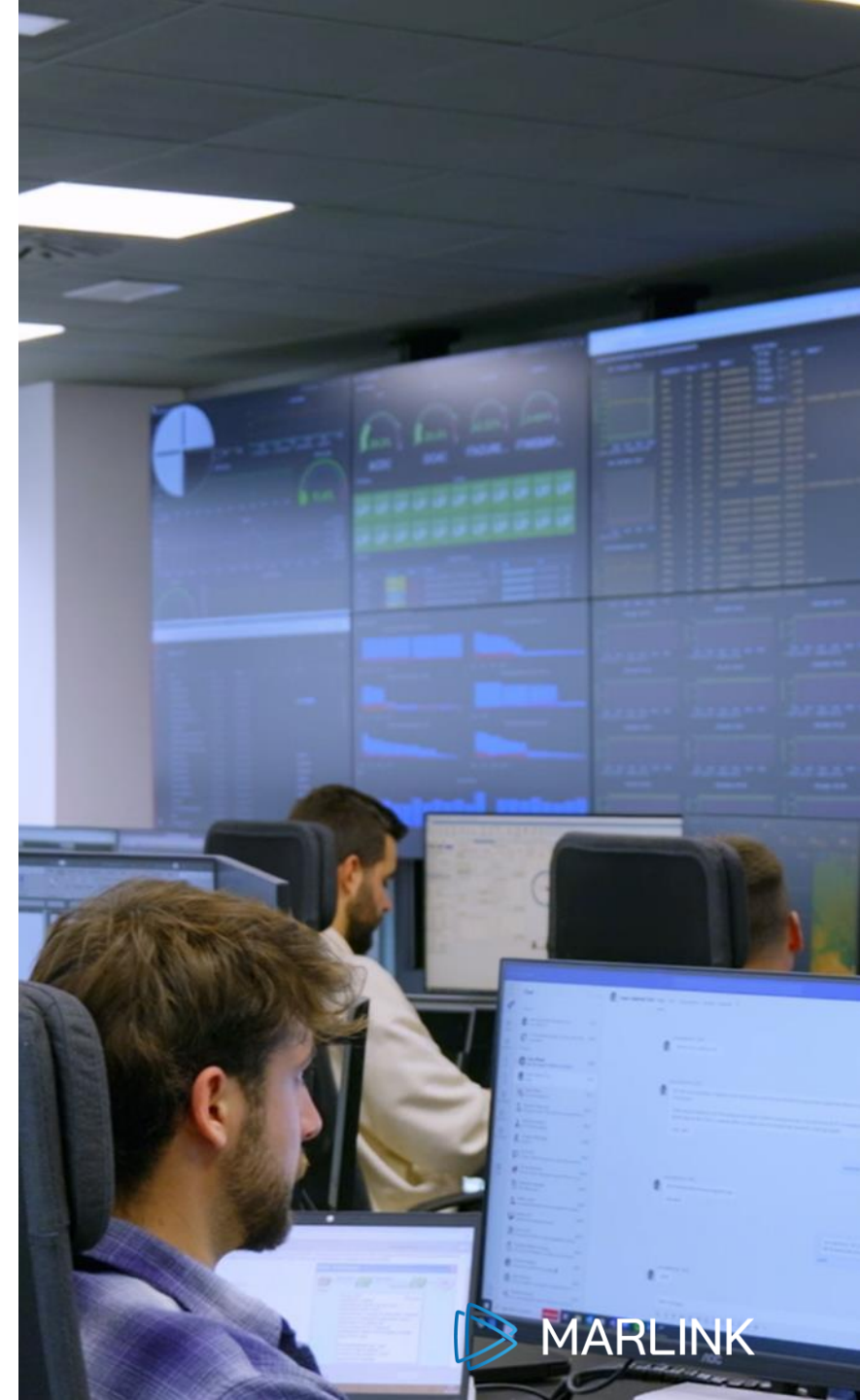
Specialist for connecting government operations
For more efficient and flexible mission-critical communications

Global end-to-end solutions

- Secure, reliable **satellite communications and hybrid network** solutions

- Seamlessly integrated solutions to **complement** sovereign capabilities of government and specific requirements across diverse operational scenarios

- Dedicated stock management, maintenance & repair services,

- Customised solutions from individual systems to fully managed networks for diverse operations **on land, at sea and in the air**

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Go hybrid!

Go beyond the reach

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Comparing satellite orbits

GEO   MEO   LEO

O3b **mPOWER**

STARLINK

eutelsat ONEWEB
eutelsat group
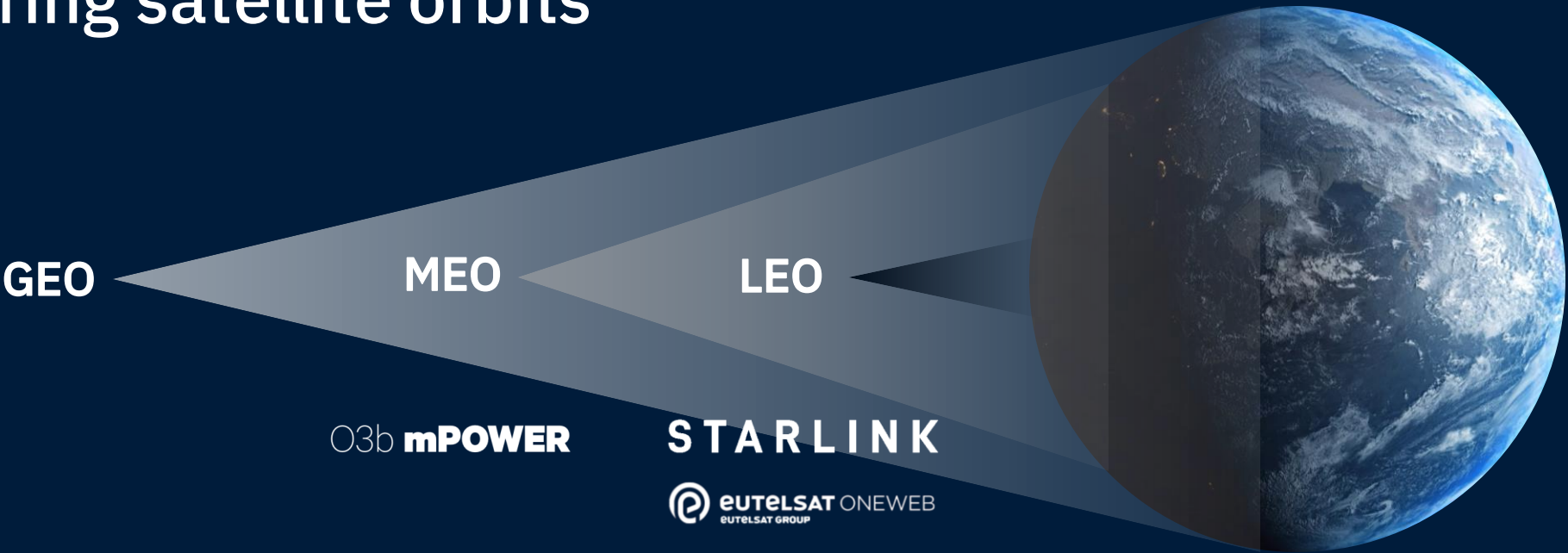
GEO – 36,000km	**NGSO MEO ~ 8,000km**	**NGSO LEO ~ 1,000km**
High latency (~700 msec)	Low latency (~150 msec)	Very low latency (~50 msec)*
Very large Earth view	Large Earth view	Small Earth view
Continental gateways	Regional gateways	Many local gateways
Stationary antennas (3 satellites for global coverage)	1-hour tracking (6 satellites for coverage)	10-minute tracking (100's-1,000's needed for coverage)
100s Mbps per terminal	Multiple Gbps per terminal	100s Mbps per terminal

* Gateway distance, ISL & ground network dependent

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Non-GeoStationary Orbit (NGSO) satellite providers
Existing & future options
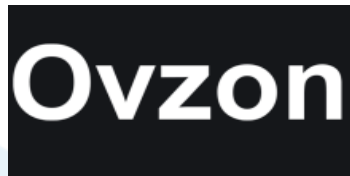
Not all initiatives may succeed or become reality!

Technical Development

Sustainable Cost Base

Frequency & Orbital Priority

Regulatory Approval & Market Access

Funding

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NGSO services
Available today

Available tomorrow

STARLINK

eutelsat ONEWEB
eutelsat group

O3b mPOWER

amazon | project kuiper

Evolution of Services

Community Gateway
- Aggregate up to 10GB

Direct to Cell - 6 (21) Satellites
- 4G connectivity (SMS only), audio calls and Data, IoT expected in 2025

Global Service H1 2025

50° LAT North end 2021

- 588 in Polar orbit
- 12 planes
- 60 spares (5 spares/plane)
- Limited throughput to 125/25Mbps (CIR/MIR)
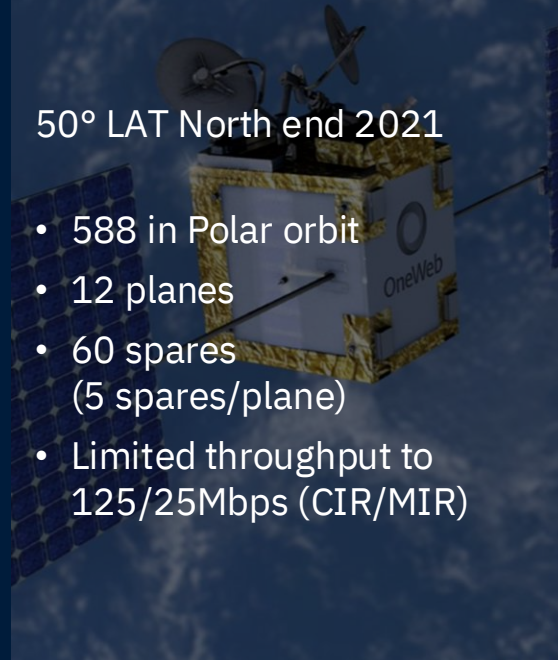
Global Service - H2 2024

- Limited coverage LAT 50°N-50°S
- From 50Mbps to multi-Gbps
- Up to 100% CIR
- Bandwidth Pool/ Portability
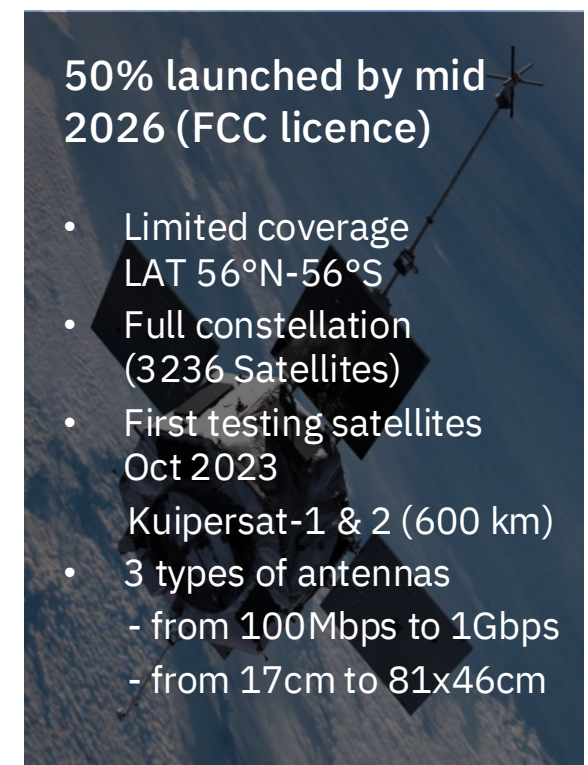- Fiber back-up
- In country Custom Gateways
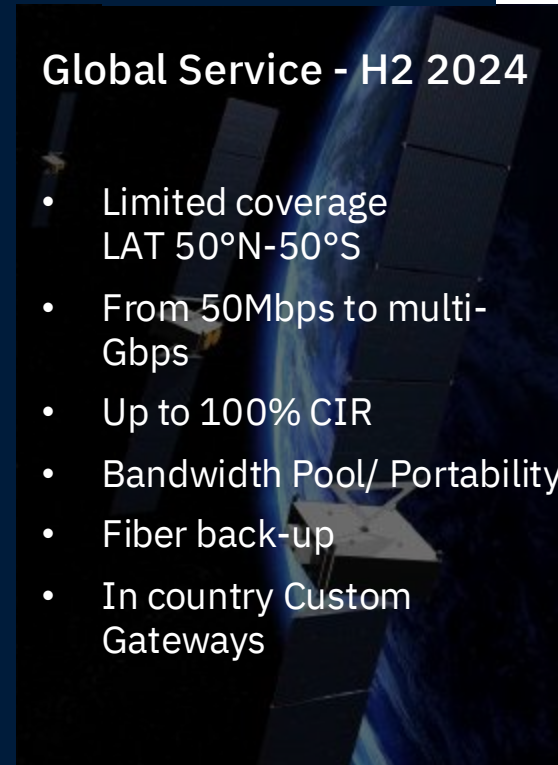
50% launched by mid 2026 (FCC licence)

- Limited coverage LAT 56°N-56°S
- Full constellation (3236 Satellites)
- First testing satellites Oct 2023 Kuipersat-1 & 2 (600 km)
- 3 types of antennas
  - from 100Mbps to 1Gbps
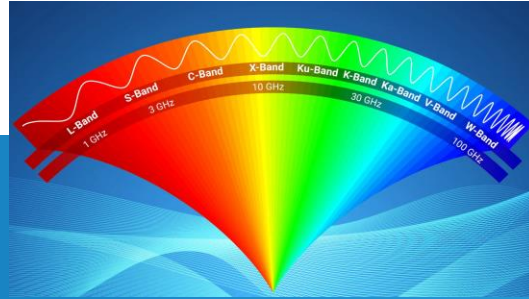 - from 17cm to 81x46cm

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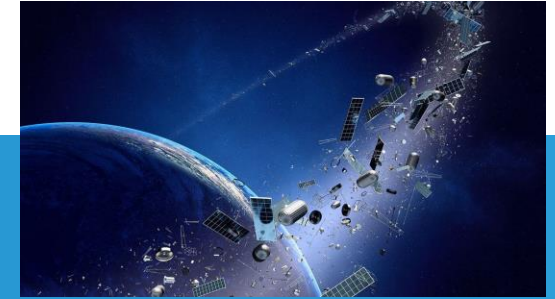
NGSO services
Considerations and challenges

User terminal
Proprietary systems
Available real estate
Operational area
Units (size/costs)
Service requirement/capabilities

Frequency spectrum
14+ years process for a NGSO Ku, Ka or Q/V and soon E-band

In 2022, 322 new NGSO filings submitted – only 12 notified USA (+filings)/ Rwanda (+satellites)

Kessler syndrome
Risk of chain reaction collisions which could make LEO unusable
SpaceX – collision avoidance
2019 – 25k in 6 months
2024 – 50k in 6 months
Forecast 2027 – 100k in 6 months

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Secure LEO by Marlink
Tailored to fit both critical and casual communication needs

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LEO by Marlink
Use cases

ONEWEB

Crew Welfare

Maintain high troop and crew morale by keeping them connected with family, friends, and daily news through high-speed internet access.

- Standard encryption over public internet
- MIR only
- No SLA

Critical Communication

Deploy a secure and reliable communication for mission critical operations with committed information rate.
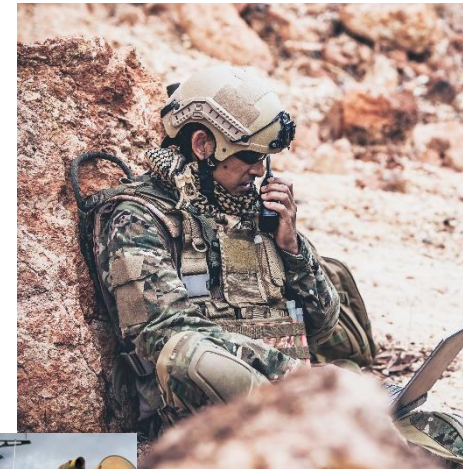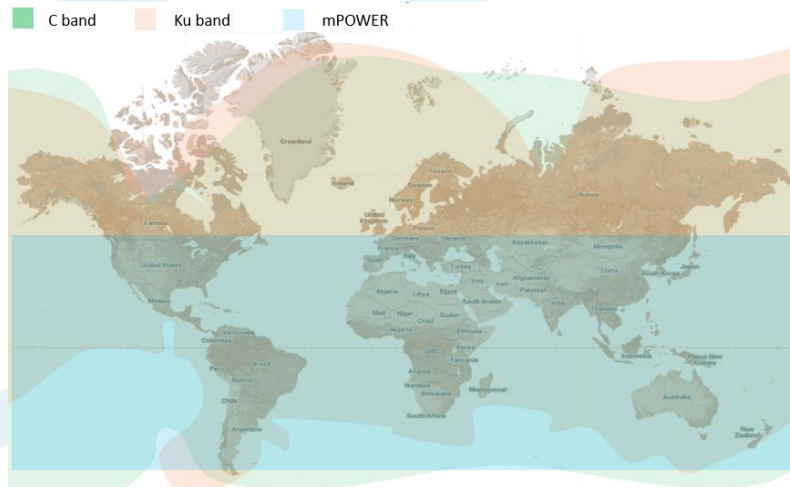
- End-to-end secure network through VPN backhauling
- CIR available
- SLA available

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Satcom complementarity

- Combined worldwide coverage
- CIR & MIR solutions
- Unlimited/limited data volume
- Redundancy & path diversity
- SD-WAN ready
- High adaptability & scalability
- Out-of-Band management

Satcoms	C/Ku-band VSAT	O3B mPower	Starlink	OneWeb	Inmarsat G2X	MSS
Orbit	GEO 36,000 km	MEO 8,000 km	LEO 550 km	LEO 1,200 km	GEO 36,000 km	GEO 36,000 km
Coverage	-70° / +70°	-50° / +50°	Global	Global	Global	Global
Frequency	C-band Ku-band	Ka-band	Ku-band	Ku-band	Ka-band	L-Band
Application	Mission-critical Welfare	Mission-critical Welfare	Welfare	Welfare	Mission-critical Welfare	Mission-critical
Monthly data volume	Unlimited	Unlimited	1 - 5 TB	Dual	Unlimited	Low
RTT ms	600 ms	180 ms	40 ms	70 ms	600 ms	600 ms
CIR Down/Up	125/25 Mbps	1 000/600 Mbps	n/a	12/6 Mbps	4/2 Mbps	704/352 Kbp
MIR Down/Up	125/25 Mbps	1 000/600 Mbps	220/25 Mbps	75/15 Mbps	8/4 Mbps	n/a
SLA Service Availability	99.90%	99.50%	n/a	99%	up to 99.50%	99,99%
On-demand BW	Y	N	N	N	N	n/a

- Combined worldwide coverage
- Latency-sensitive applications
- Jitter-sensitive applications
- Packet-loss sensitive applications
- Recreative traffic

C band   Ku band   mPOWER

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Hybrid networks
Designed to elevate operations

	LEO (Starlink, OneWeb, Kuiper)	MEO (mPOWER)	GEO (VSAT)	Hybrid (Multi-Orbit)
Coverage				
Resilience / availability				
Latency				
Link speed (MIR)				
Link speed (CIR)				
Capacity pool				
Ease of installation				
Dedicated 24/7 support				

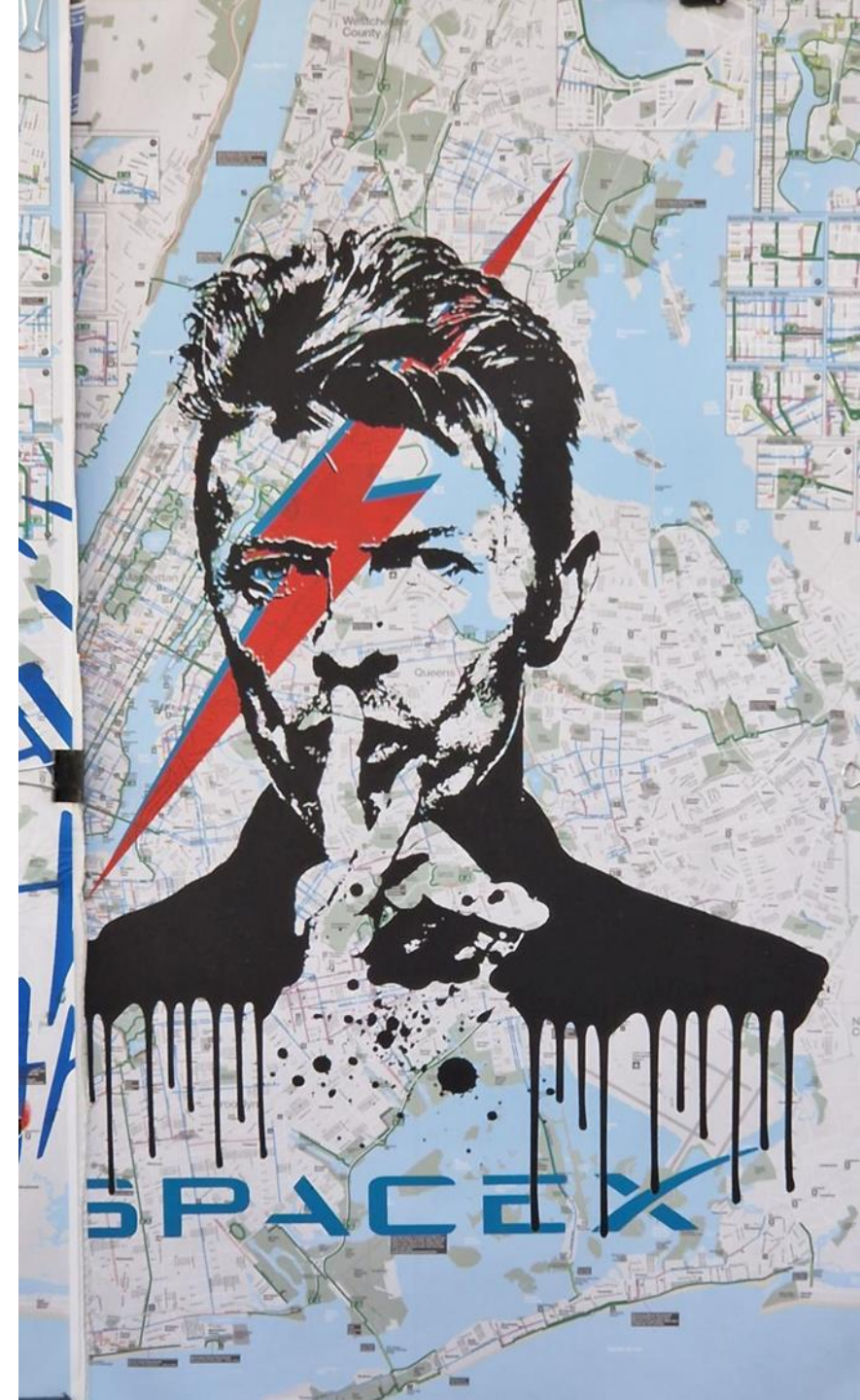Low performance · Provider dependant · High performance

Marlink Confidential and Proprietary

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.... Space Oddity?

"Technology doesn't have to be sexy, shiny or expensive. It has to work."

Patrick Meier – WeRobotics co-founder

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SLOT 2
MSS

MSS at MARLINK

- MSS for Mobile Satellite Service operates primarily in the L-band, which is less susceptible to rain fade compared to other frequencies

- L-band spectrum allocated for MSS is between 1.5 and 2.5 GHz

- Services Offered:
  - voice,
  - data,
  - video,
  - tracking monitoring services (machine to machine, IoT)

- MSS covers all kind of usage: Land, Maritime & Aero

- Marlink is a leader of MSS for over 25 years

MSS services portfolio

Handheld
Voice & Low-speed Data

Broadband
Mid & High-speed Data

Dedicated
Voice, Tactical, PTT & Data

• Networks: Iridium, Viasat Ent. & Thuraya	• Networks: Iridium, Viasat Ent. & Thuraya	• Networks: Iridium & Viasat Ent.
• Main usage: Voice	• Main usage: Data from 22kbps to 650kbps	• Usage: all
• Data: limited, ~2.4kbps Circuit switched	• Voice possible	• Data from 2.4kbps to 18mbps
• Postpaid & Prepaid plans	• Postpaid & Prepaid plans	• Dedicated plans
• Pool plans possible	• Pool plans possible	• Lease possible

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Iridium solutions

iridium®

Iridium coverage

- 66 low-earth orbiting (LEO), cross-linked satellites (Iridium NEXT) constellation
- 48 spot beams per satellite
- Fully meshed network in six orbital planes, at about 781 kilometers above the earth's surface
- 3 primary SAS stations are located in New York, Hawaii, and Tempe

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Iridium Push-to-Talk service

MOBILE: Small devices with lower power speed needs
FAST: LEO & build for speed
GLOBAL: Worldwide coverage
AFFORTABLE: Both devices and service
FLEXIBLE: Able to be reconfigured in seconds by end customer

What do you need?
- ✓ A device (handset)
- ✓ A Talkgroup

What do you do?
- ✓ Choose your required Talkgroup size
- ✓ Assign the device to a Talkgroup and any handset within that 'Talkgroup'
 can communicate at the 'push' of a button to ALL the other uses

PTT Command Center

- Intuitive web-based interface
- Use the dynamic drag and drop interface to easily configure:
  - ✓ Talkgroups
  - ✓ Regions
- Manage communications on the ground quickly, remotely, and reliably
- Experience easy access to the heart of operations and unparalleled control of devices used in the field
- Selecting regions within your Talkgroup
  - ✓ Circular or Square/Rectangular shaped coverage areas are created within the online Command Center by placing on to Google maps & choosing your required size. Each shape is known as a 'region'.
  - ✓ A Talkgroup can consist of one large region or a maximum of 10 smaller regions

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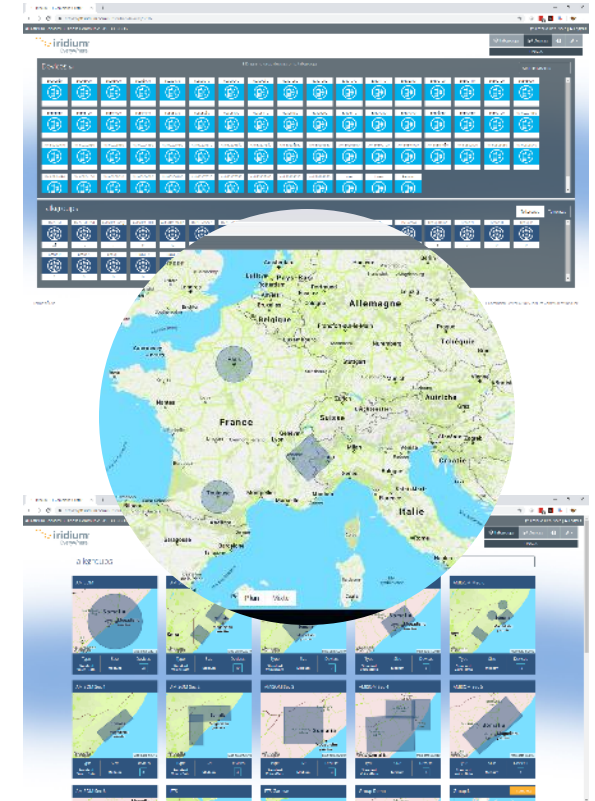
PTT Talkgroups

- Unlimited number of Talkgroups

- Unlimited number of devices per Talkgroup

- Provision Talkgroups over the air

- You decide the number of Talkgroups you need and the number of devices in each Talkgroup

- Define the region for each Talkgroup

- Each Talkgroup can have up to 10 regions located across the globe – connecting teams close and far away

- Each device can be in up to 15 Talkgroups

- View Talkgroups graphically (map tiles) or display in a list format

- Easily create new Talkgroups with templates

- Share Talkgroups with other organizations to streamline global communications
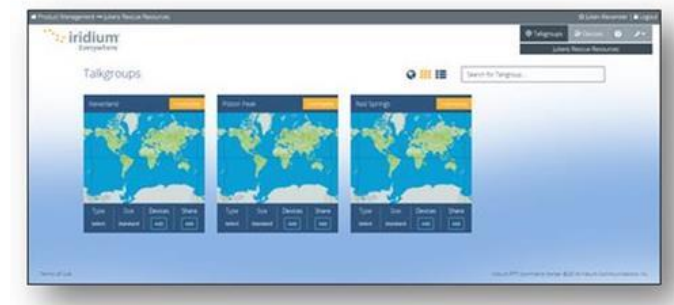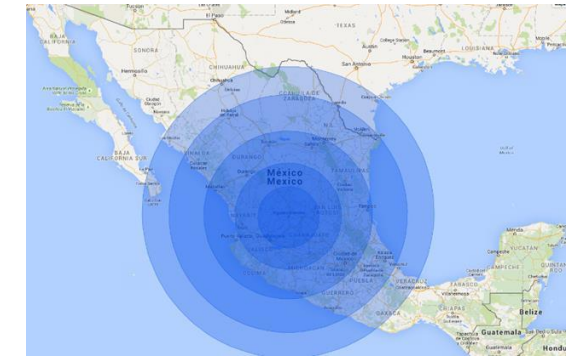
Iridium PTT terminals

Iridium Extreme PTT

- PTT and Voice over Satellite (dual mode)
- Same base as Iridium Extreme 9575
- Rugged (IP65), high-capacity battery

ICOM SAT-100

- PTT mode only
- Rugged & Waterproof (IP67)
- High Quality Audio (1500mW)

QinetiQ Bracer

- PTT mode only
- Rugged & Waterproof
- Military Encryption (under conditions)

ICOM SAT-100M

- PTT mode only
- Rugged & Waterproof (IP67)
- High Quality Audio (1500mW)
- Interoperability with VE-PG4
- Voice Recording function
- Built-in Bluetooth® capability

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Iridium PTT – price structure

Device plans	Global Long term	Global Short term	Middle East
Minimum duration	12 months	3 months	3 months
Device Monthly Recurring Charge	$	$$	$$
Device Early Termination Fee	6 months	2 months	2 months

Talkgroup plans	Global		Middle East
	Rule of 5	Less than 5	
Small (up to 100 000 km²)	Free	$	$$$
Medium (up to 300 000 km²)	$		$$$$
Large (up to 750 000 km²)	$$$		$$$$$
X-Large (up to 1 500 000 km²)	$$$$		$$$$$$
Jumbo (up to 2 500 000 km²)	$$$$$		$$$$$$

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Iridium GO! exec

- 2 high-quality voice lines with built-in speaker and micro
- Dual USB-C, Ethernet and external antenna ports (Iridium & GPS)
- 22/88 Kbps speeds with connection manager
- Dimensions: 203x203x25mm, weight: 1,2 kg
- Battery: 6h talk/data time, 24h standby
- Ingress Protection: IP65 (All Port Covers Closed)

- **New plans dedicated for GO! exec™, focused on multi-service**
- Accessories:
  - ✓ Fixed Installation Kit
  - ✓ Lite Installation Kit
  - ✓ Carry Case & Accessories Box

Iridium GO! exec™ price structure

	5LM Promo*	25LM	50LM	125LM	250LM	600LM	1000LM	Unlimited**
Commitment	1 month	1 month	1 month	1 month	1 month	1 month	1 month	1/12 months
Data Allowance	5MB/month	25MB/month	50MB/month	125MB/month	250MB/month	600MB/year	1000MB/year	Unlimited
Voice Allowance	5min/month	25min / month	50min/month	125min/month	250min/month	600min/year	1000min/year	50min/month
Small Iridium Chat App message	No	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
Large Iridium Chat App message	No	25msg/month	50msg/month	125msg/month	250msg/month	600msg/year	1000msg/year	Unlimited

* This plan is expected to be open for activations through 31 October 2025. Subscribers that are activated on the plan will continue to maintain the value of the GO! exec 5MB Promo Plan after the end of the open activation period unless notified otherwise by Iridium.

** For 12-month commitment option, an activation credit of two hundred dollars ($200) will be earned upon activation on the GO! exec Unlimited. The activation credit will be provided within one or two bill cycles after activation as a Credit Note.

Iridium GO! exec plans are not allowed for Commercial Maritime purposes, Iridium Voice plans are not activable on Iridium GO! exec,

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Iridium Satellite Time & Location

- **Iridium now offers Iridium Satellite Time and Location® (Iridium STL®):** a Positioning, Navigation, and Timing (PNT) service that improves the resiliency and survivability of critical infrastructure when Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) signals are absent or disrupted

- **The Complement to GPS/GNSS:** the Iridium STL signal is about 1,000 times stronger than GPS or GNSS, allowing it to penetrate buildings and other hard-to-reach areas with only a receiver and small antenna.

- **Built to address vulnerabilities and limitations faced by GPS and GNSS:** with a time and location capability that secures PNT-dependent applications against disruption and manipulation
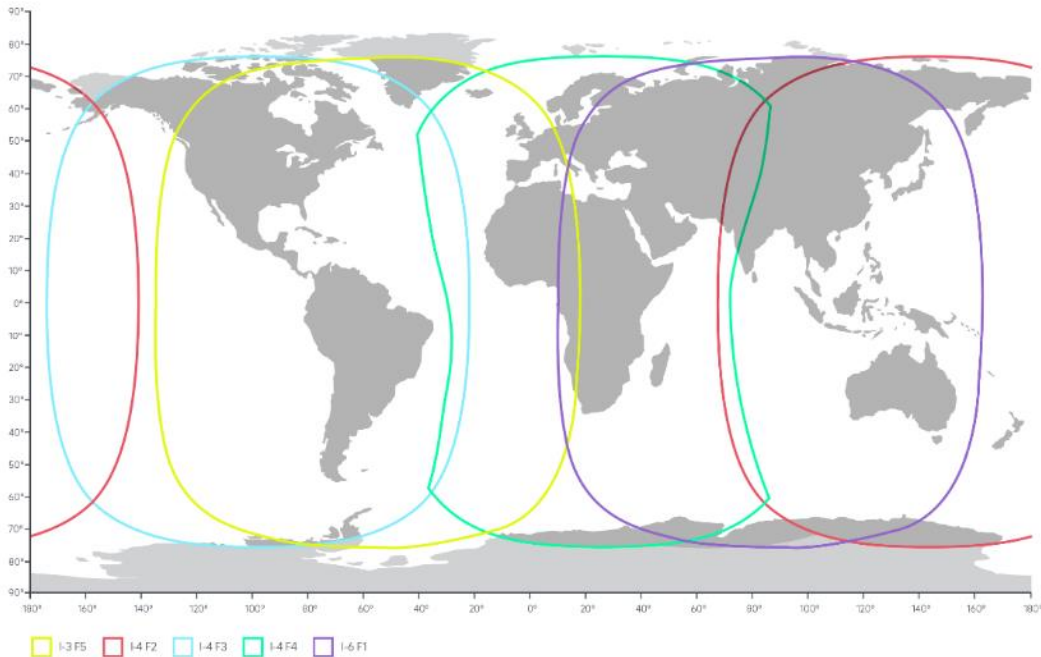
GNSS comparison

Constellation Name	Country	Number of satellites	Altitude of satellites
GPS	USA	31	20 200 km
Glonass	Russia	24	19 100 km
Beidou	China	30	21 500 km
Galileo	EU	24	23 222 km
Iridium STL	USA	66	781 km

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Viasat solutions

Viasat coverage

- 5 geostationary satellites, at about 35 784 kilometers above the earth's surface

- 32 Satellite Access Stations (SAS) at strategic locations through the world that are all privately interconnected

- 6 primary SAS stations are located in Burum (NL), Paumalu (USA), Fucino (IT), Beijing (CN), Moscow (RU) and Auckland (NZ)

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L-TAC

- **Affordable UHF TACSAT alternative**
- **Use of existing tactical radios with end user encryption**
- **Voice and data Beyond Line of Sight**

- Direct L-L connectivity for mobile terminals
- No Sim Card – Telemetry Service
- Global connectivity
- Interoperability: VHF-C / VHF-M / UHF-M
- Man pack, Vehicular, Maritime, Aero & Ops Room unit

- Omnidirectional antenna: no need to pause and point antenna to the satellite
- Extremely simple to use, limited training (2hrs)
- Flexible leases (minimum 2 weeks, requested 5 working days in front)

L-TAC terminals
Two manufacturers
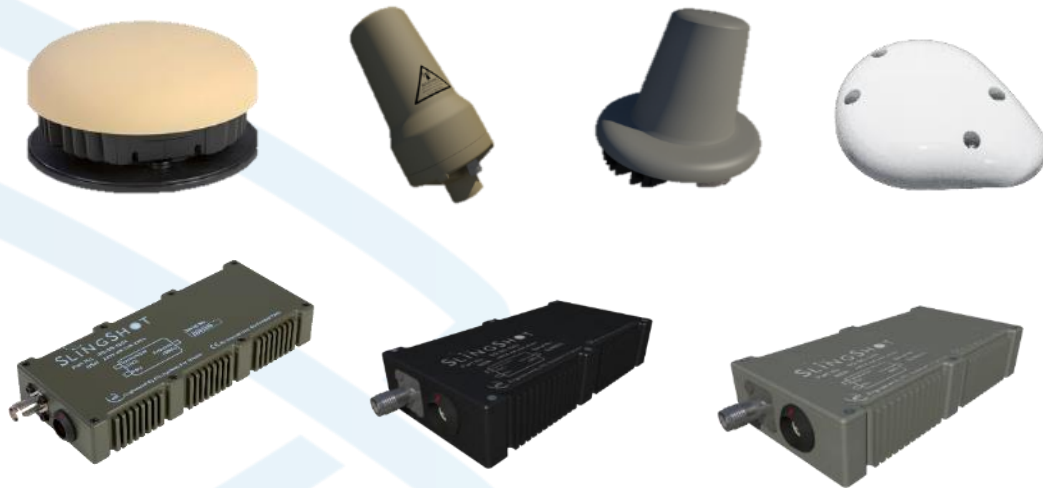
Made in UK - $$$$

Made in Israel - $$$$

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BGAN PATROL

- Light and compact

- Rugged and durable IP65 rating (water resistant)

- Omnidirectional satcom antenna

- 3-pole segment with flexible 'gooseneck'

- Built-in Wi-Fi

- Up to 200 Kbps On-The-Move

Interfaces

- Ethernet connection (RJ45)

- 802.11b/g/n WLAN

1m pole with flexible gooseneck top section to ensure antenna can be stowed quickly when required

Three-Pole Segment

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BGAN PATROL use cases

End user devices, such as Android Tactical devices, can be connected to the BGAN Patrol terminal to provide **data on-the-move** to applications vital to gaining an operational advantage over adversaries in the field.

- Enablement of **Battle Management System** (BMS), such as TAK and SitaWare
- Bridging of Mobile Ad-hoc Network (MANET) and **Beyond Line of Sight (BLOS) radio** networks
- **Blue Force Tracking** (BFT) of allied forces on live maps
- Laser range finder data to provide an exact distance to long range targets for snipers, artillery, and air support
- Situational Awareness gathering and reception to maximize co-ordination
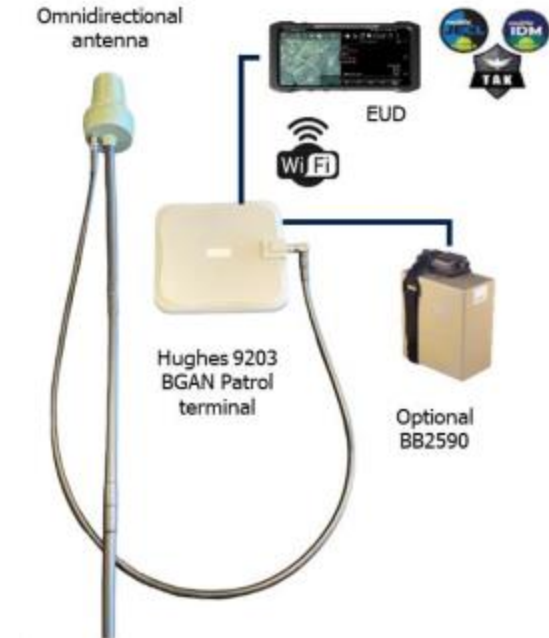- Calling for **Casualty Medical Evacuation** (MedEvac)
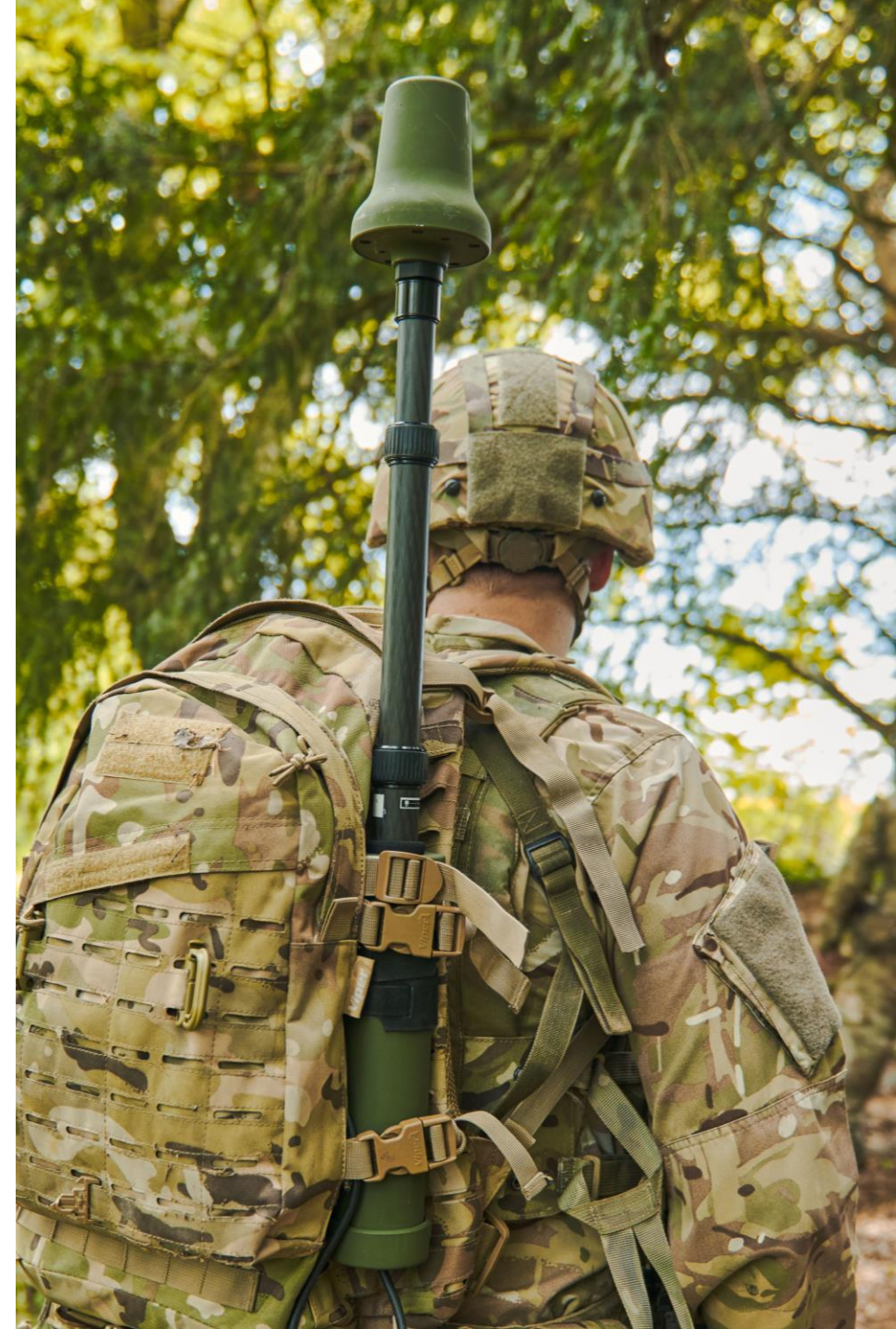
L-TAC vs BGAN PATROL

Push-To-Talk (FM) & Data on-the-move (< 35 kbps)
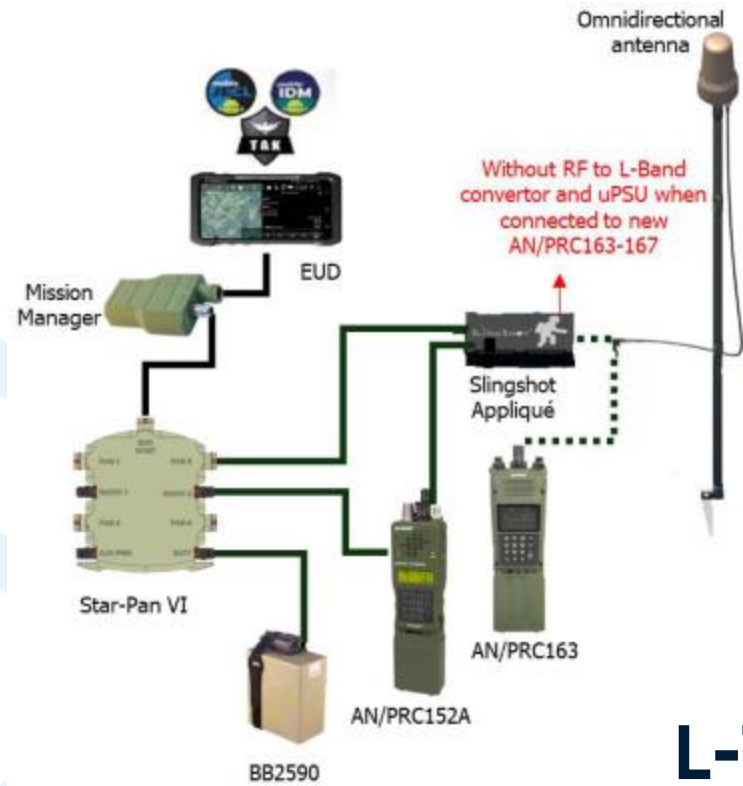
Data on-the-move (< 200 kbps)

L-TAC

BGAN PATROL

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Viasat GX LITE

- BGAN Like terminal
  - ✓ 9,7 Kg, 42,2 x 29,2 x 8,4 cm
  - ✓ Up to 8x4 Mbps globaly

- Wideband alternative to BGAN
- Runs on batteries for up to 3 hours

- Dedicated new GX plans expected:
  - ✓ Usaged-based: data allowance plans (10, 50, 100 & 300 GB)
  - ✓ Unlimited models with 8 x 3 Mbps MIR

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Coming soon: BGAN OMNI

- 99.9% network availability
- Extend terrestrial and cellular connectivity to the edge
- Secure BGAN network
- BGAN M2M, BGAN & BGAN Link airtime plans

- Potential usage:
  - Vehicular: analysis data, tracking, sensors
  - Utilities: data transfer, sensors, cash dispenser
  - Gov: IP radio, elections, Tactical data

- **Target Commercial Launch: Q1 2025**

Dimensions:	Height: Diameter: Weight:	83mm 145mm 430g	
Power (typical):	Network idle: Receive: 20kbps TX data rate: 100% data rate -Class 4: 100% data rate - Class 16:	0.65W 3.7W 5.7W 27.5W 17.8W	
Temperature:	-40°C to +55°C (with baseplate maintained below 80°C)		
Vibration:	DO-160 section 8 standard vibration (category S)		
Weather & ingress protection:	IP67 rating		
Antenna:	G/T with satellite elevation	20° to 90°: >10°: >0°:	≥20dB/K ≥24dB/K ≥26.3dB/K
	EIRP with satellite elevation	20° to 90°: >10°: >0°:	10dBW ≥7.5dBW ≥6dBW
BGAN Class:	Class 4 (to 200kbps) between 20° & 90° elevation Class 16 (to 130kbps) between 5° & 90° elevation		
Power supply	Baseline: Suitable for operation directly from 6s and 8s LiPo battery packs or regulated 28V avionics supply		
	Build option: Internal supply bypass enabling power efficient use with externally regulated RPAS and avionics PSUs		
	Build option: Separation of processor supplies enabling efficient implementation of external power supply 'hold up' circuits		
RPAS interface	Power and control: 25 pin D Sub connector		

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Thank you!
Any questions?