netMESH for Drone Swarm Operations

GPS-Denied, Infrastructure-Free Swarm Coordination

BLEEDIO TECH
Decentralized Mesh Intelligence

⚠ THE PROBLEM

GPS Denied
GPS fails in contested, indoor, subterranean, and urban canyon environments — swarms lose coordination and missions fail.
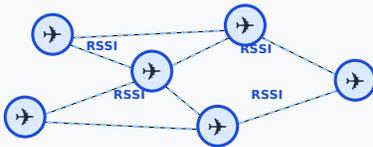
Comms Congestion
DARPA OFFSET documented "*intermittent and unreliable communications*" managing 250+ UAVs in dense RF environments.

Cost Mismatch
DoD targets $5K drones — but military mesh radios cost **$5K-$30K per node.** The radio costs more than the drone.
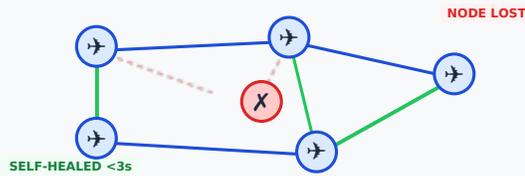
HOW NETMESH SOLVES IT

Relative Positioning

Inter-Drone Mesh Communication

- RSSI trilateration computes relative positions without GPS
- Sensor fusion: RSSI + IMU for enhanced accuracy
- Collaborative positioning via mesh data sharing
- Works indoors, underground, in urban canyons

- Self-healing mesh — reroutes in <3 seconds on node loss
- AES-256 encryption with anti-replay protection
- Dynamic topology adapts as drones move or join
- 40-channel frequency hopping resists jamming

COST & WEIGHT COMPARISON — THE KILLER GAP

Persistent Systems MPU5
1kg+ | 25W | ITAR
$30,000

Silvus StreamCaster
500g | 15W | ITAR
$5K-$15K

BleedIO netMESH ★
<50g | 10–100mW | No ITAR
Sub-$100

Bar length proportional to cost per node | **300x cost advantage**

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Defense Context & Market Opportunity

netMESH Drone Swarm Operations — Market & Technical Analysis

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DARPA PROGRAMS & DEFENSE PRECEDENTS

2019-2023	2019	2018-2021	2023-Present	2025
OFFSET	**CODE**	**SubT Challenge**	**Replicator / DAWG**	**Drone Dominance**
250+ UAVs for urban ops. Documented comms congestion as key failure mode.	GPS-denied autonomous coordination proven at Yuma Proving Ground.	Underground/tunnel navigation without GPS infrastructure.	$1B+ for thousands of autonomous uncrewed systems.	$1B for 30,000 drones at $5K–$2.3K each. 12 vendors.

MARKET OPPORTUNITY

$15.8B	55%	$5.3B	$1B+
Military Drone Market (2025)	Drone Swarm CAGR Through 2030	Navy Unmanned Systems FY2026	Replicator / DAWG Budget

TECHNICAL COMPARISON

Capability	Wi-Fi Mesh	Military MANET	LoRa	netMESH (BLE)
GPS-free operation	✗	~	✗	✓
Self-healing	Limited	✓	✗	✓ <3s
Mesh scale	Poor	Dozens	Varies	32,767 nodes
Energy consumption	100–1000 mW	5–25W	Low	10-100 mW
Cost per node	$50–200	$5K–$30K	$20–100	Sub-$100
Weight	50–200g	300g–1kg+	20–50g	<50g
Attritable at scale	✓	✗	✓	✓
Jam resistance	Low	High	Medium	Medium (40-ch)
Single point of failure	Router	Varies	Gateway	None

⚡ WHY NETMESH FOR DEFENSE

10-100x Less Power
BLE consumes 10–100 mW vs WiFi 100–1,000 mW. Extends mission time for sub-250g drones with 15–30 min flight windows.

300x Less Cost
Sub-$100/node vs $30K military MANET. Compatible with DoD's $5K attritable drone targets at scale.

No ITAR Restrictions
Commercial BLE standard. No export controls. Faster procurement, allied interoperability, broader market access.

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