



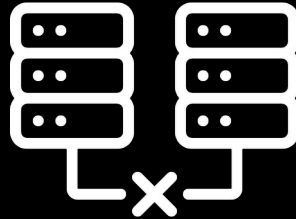
[PIXPATCH]

An encrypted and resilient
dispatch system

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Problem

- In conflict zones, traditional networks are centralized points of failure, making communication unreliable and dangerous.
- While flood networking offers a solution, existing implementations lack the robust security required when lives are on the line.
- This is especially critical for broadcast messages like disaster warnings or emergency rescue calls.



Why existing solutions fail

- Satellite phones: Expensive, requires clear sky view, limited bandwidth, traceable location.
- WhatsApp/Signal: Requires internet infrastructure, centralized servers can be blocked, not topology-agnostic.
- Military tactical radios: Some static infrastructure is still present. Need to blindly trust the relayers and routing is involved.
- Ham radio: Not encrypted, no spam resistance, easy to trace.



Solution

- Pixpatch is a resilient dispatch system built on a novel, zero-trust encrypted flood protocol.
- It leverages a modern crypto stack to provide untraceable peer-to-peer messaging, even when all other infrastructure has failed.
- Its topology-agnostic design, combined with features like perfect forward secrecy and spam resistance, makes it a lifeline for secure communication.
- It can also be used in inter-satellite communication which presents similar requirements.



How it works

- A unicast message is flooded through the network, but only the intended recipient possesses the key to decrypt it.
- The protocol is designed to hide metadata, making it computationally infeasible for an observer to determine the sender or receiver.
- It is built to resist common attacks: ephemeral keys provide forward secrecy against future key theft, and Proof-of-Work hashes mitigate spam.
- Replay attacks are countered with max age, PoW hashes and can be further mitigated with higher layer methods like message counters etc.
- The entire system is written in performant C, using the industry-standard, audited Monocypher library for all cryptographic operations.

Key features

- Zero infrastructure dependency: Works without any central servers or internet.
- Topology-agnostic: Adapts to any network structure automatically.
- End-to-end encrypted: Modern encryption stack using X25519 and ChaCha20-Poly1305.
- Untraceable: Impossible to determine sender or recipient from network traffic.
- Spam resistant: Built-in proof-of-work prevents message flooding.
- Perfect forward secrecy: Compromising one message doesn't compromise others.
- High performance: Written in C with industry-standard Monocypher library.

Use cases

- Military operations: Secure command and control in degraded networks. Cannot be jammed, intercepted, or traced to source.
- War correspondents: Send reports from areas without infrastructure. Source protection and censorship resistance.
- Humanitarian aid: Coordinate relief efforts in disaster zones. Works when cellular towers are down.
- Emergency broadcasts: Disaster warnings, rescue calls, public alerts spread rapidly through all connected devices.
- Whistleblowers & activists: Censorship-resistant communication with complete anonymity.
- Space & research: Inter-satellite or remote research station communication where central servers are infeasible.

Demo

PIXPATCH v0.1.0 - Resilient Dispatch System

DISPATCH

DISPATCH: MEDIVAC in sector GAMMA

[SENT] ENCRYPTED PACKET: 01007e092c18486da3221f4a5a2a3a30cd22d7f4631b938c8e727ec866f02c23...

DISPATCH: AMBUSH on ROUTE 6

[SENT] ENCRYPTED PACKET: 0100bb4549a0c6374d64f8bf79a678e61df41ea2ba99a98409235a94fc144609...

DISPATCH: ABORT OPERATION KINGCAPE

[SENT] ENCRYPTED PACKET: 0100c252aa5a287ee843263bd174ad4dc7506885d9629f94690f0c1f7bdf2a67...

DISPATCH: JADE SKY ROSE GLASS MOTH THORN LIGHT JILL

[SENT] ENCRYPTED PACKET: 0100b50a004900c9620c6a1eab0f9d09412bc3abe02d7315abc5117cdac7c07a...

DISPATCH:

PIXPATCH v0.1.0 - Resilient Dispatch System

RELAY

[RELAY] RELAYING PACKET: 01007e092c18486da3221f4a5a2a3a30cd22d7f4631b938c8e727ec866f02c23...

[RELAY] RELAYING PACKET: 0100bb4549a0c6374d64f8bf79a678e61df41ea2ba99a98409235a94fc144609...

[RELAY] RELAYING PACKET: 0100c252aa5a287ee843263bd174ad4dc7506885d9629f94690f0c1f7bdf2a67...

[RELAY] RELAYING PACKET: 0100b50a004900c9620c6a1eab0f9d09412bc3abe02d7315abc5117cdac7c07a...

PIXPATCH v0.1.0 - Resilient Dispatch System

AGENT

[RECEIVED] MEDIVAC in sector GAMMA

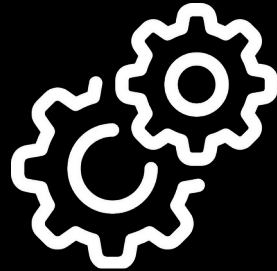
[RECEIVED] AMBUSH on ROUTE 6

[RECEIVED] ABORT OPERATION KINGCAPE

[RECEIVED] JADE SKY ROSE GLASS MOTH THORN LIGHT JILL

Future work

- Making the setup process easier for a non-technical person to setup and use.
- Using it with radio comm hardware for wireless and geography-free communication.
- Mobile application for easier deployment in the field.
- Develop more advanced user interface





[PIXPATCH]

Thank you