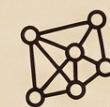




ROBOT HEART – DISASTER-READY COMMUNICATION FOR BURNING MAN



THE CHALLENGE: Zero cellular coverage, 70,000+ attendees stranded during rainstorms.



OUR SOLUTION: 4-layer resilient mesh network (Meshtastic) that works 100% offline.



REAL-WORLD VALIDATION: Proven in Hurricane Helene response and Burning Mesh 2025.



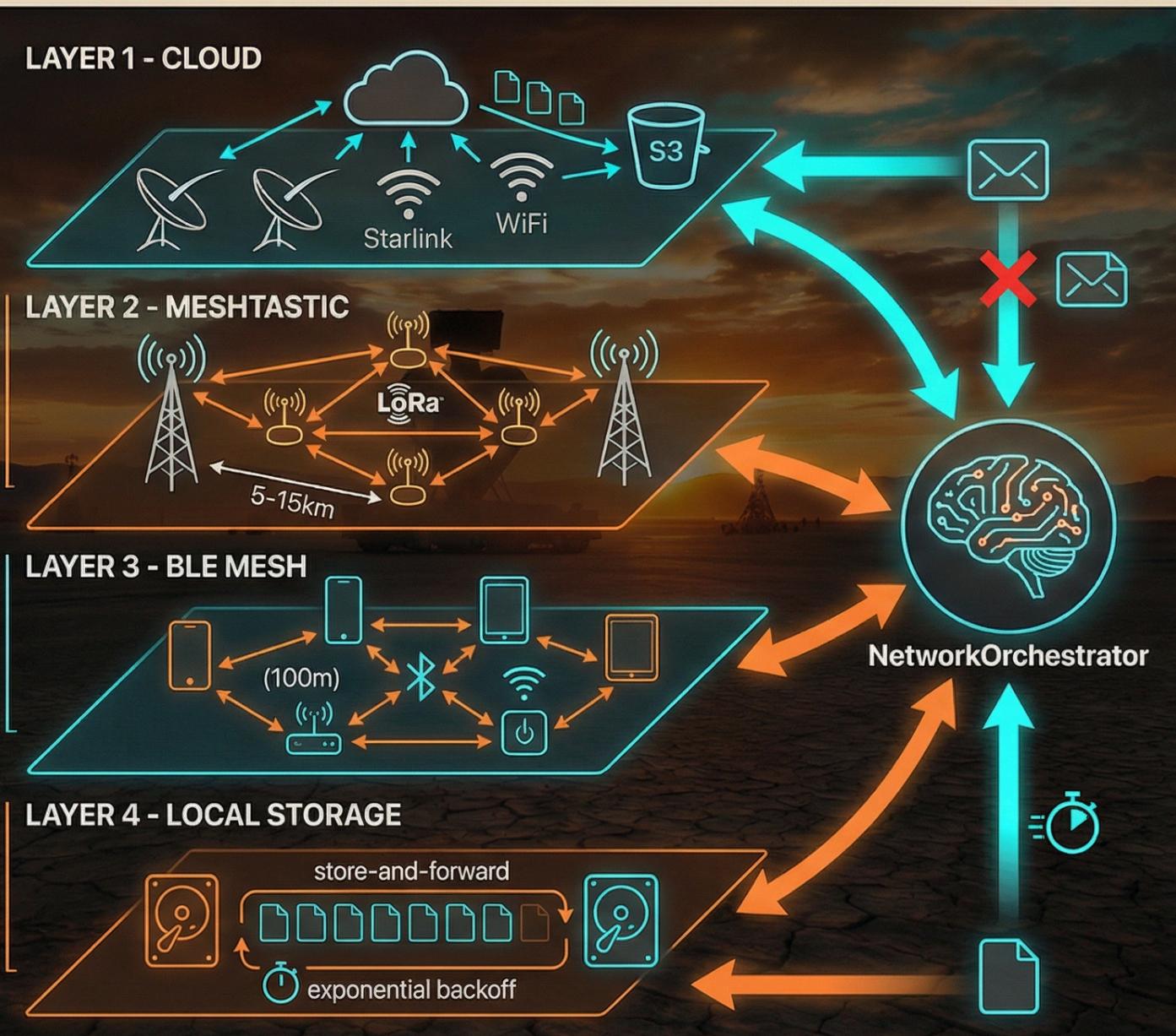
YEAR-ROUND UTILITY: Works anywhere infrastructure fails (festivals, disasters, off-grid).



OPEN SOURCE: Community-driven project combining tech with real-world impact.



4-Layer Network Architecture - Intelligence That Routes Around Failure



- Layer 1 - Cloud: Instant sync via S3 when internet (Starlink/WiFi) is available.
- Layer 2 - Meshtastic: Long-range (5-15km) LoRa mesh for offline communication.
- Layer 3 - BLE Mesh: Short-range (100m) for presence and local coordination.
- Layer 4 - Local Storage: Offline queue with store-and-forward and exponential backoff.
- NetworkOrchestrator: Automatically selects optimal layer (Cloud → LoRa → BLE → Local).





QR CODE SYSTEM – INSTANT ONBOARDING

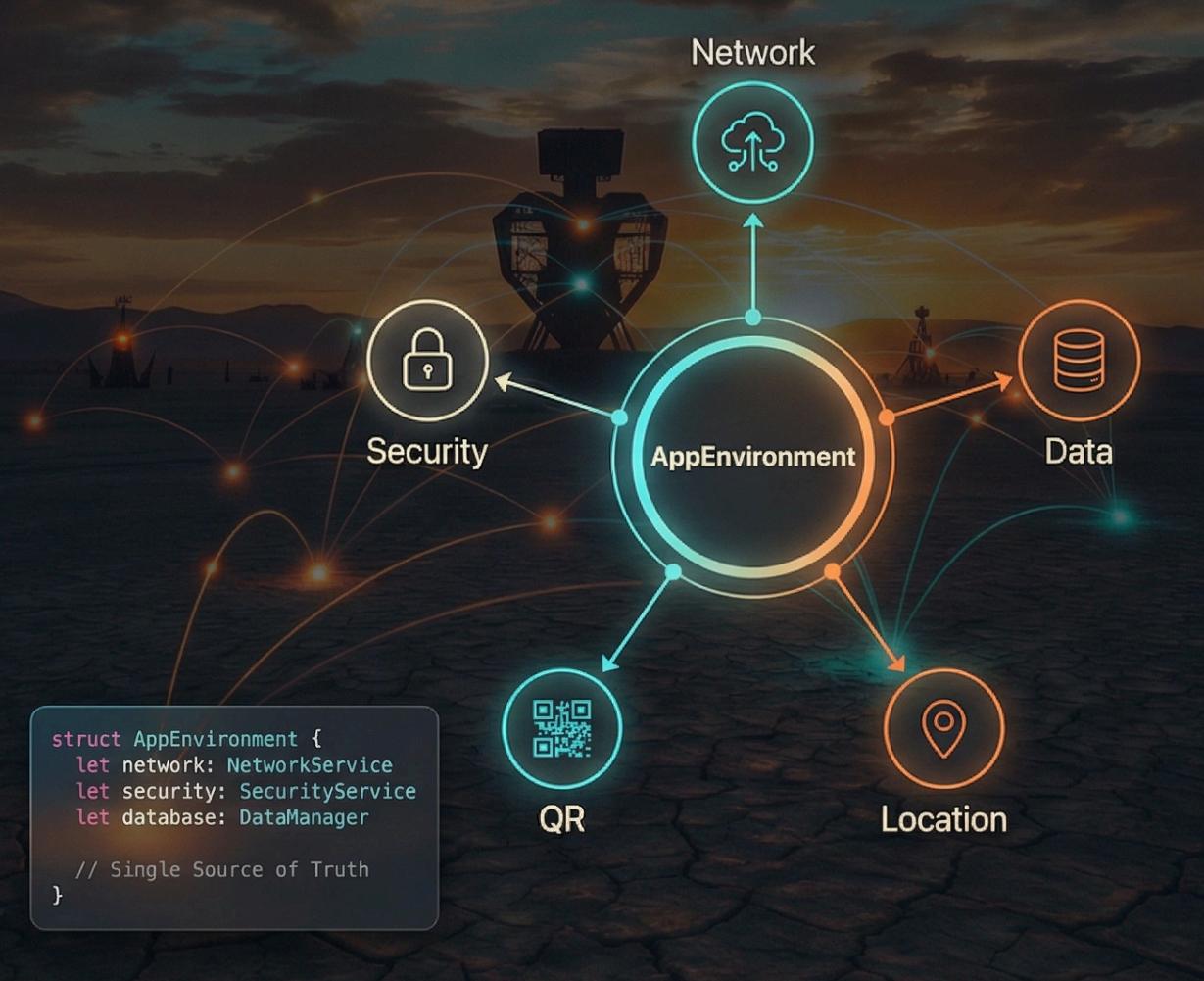
Scan to Connect - No Configuration,
No Internet Required

- **THREE QR TYPES:** Contact, Mesh Node, and Camp Invite codes.
- **AVFOUNDATION SCANNER:** Real-time detection with haptic feedback.
- **INSTANT INTEGRATION:** Scanned nodes immediately join the mesh network.
- **ZERO-FRICTION:** No phone numbers or accounts needed.
- **OFFLINE-FIRST:** All data encoded in QR JSON - works with zero internet.



Technical Architecture & Security

Built on Modern iOS Patterns with Security and Extensibility



AppEnvironment Pattern: Centralized dependency injection replaces 22 individual manager injections. Single source of truth.



Security-First Design: KeychainService for secure S3 keys, AWSV4Signer for auth, Biometric Auth support.



Service Decomposition: Breaking monolithic managers into focused services (e.g., MeshtasticConnectionService).



SwiftUI + Combine: Reactive UI with declarative syntax and async/await.



Comprehensive Documentation: 13 detailed guides covering architecture, protocols, and security.



Get Involved - Open Contributions & Roadmap

Join a Project That Combines Cutting-Edge Tech with Real-World Impact

Immediate Priorities (P1)

- Field Testing with T1000-E hardware
- S3 Configuration (Digital Ocean)
- Camera Permissions for QR scanner

Short-Term Roadmap (P2)

- Complete Service Decomposition
- SwiftProtobuf Integration
- QR Enhancements

Medium-Term Vision (P3)

- UI/UX Refinement
- Calendar View
- Camp-to-Camp Sharing

How to Contribute

Repository



<https://github.com/designdream/robot-heart-ios>

Documentation: [PROJECT_PLAN.md](#) | [TODO.md](#)

Tech Stack:

SwiftUI, Combine, Meshtastic

Community: Robot Heart & Burning Man

Impact Statement

This isn't just an app—it's a communication platform that could save lives in emergencies and enable connection where traditional systems fail.