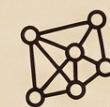




ROBOT HEART – DISASTER-READY COMMUNICATION FOR BURNING MAN



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.



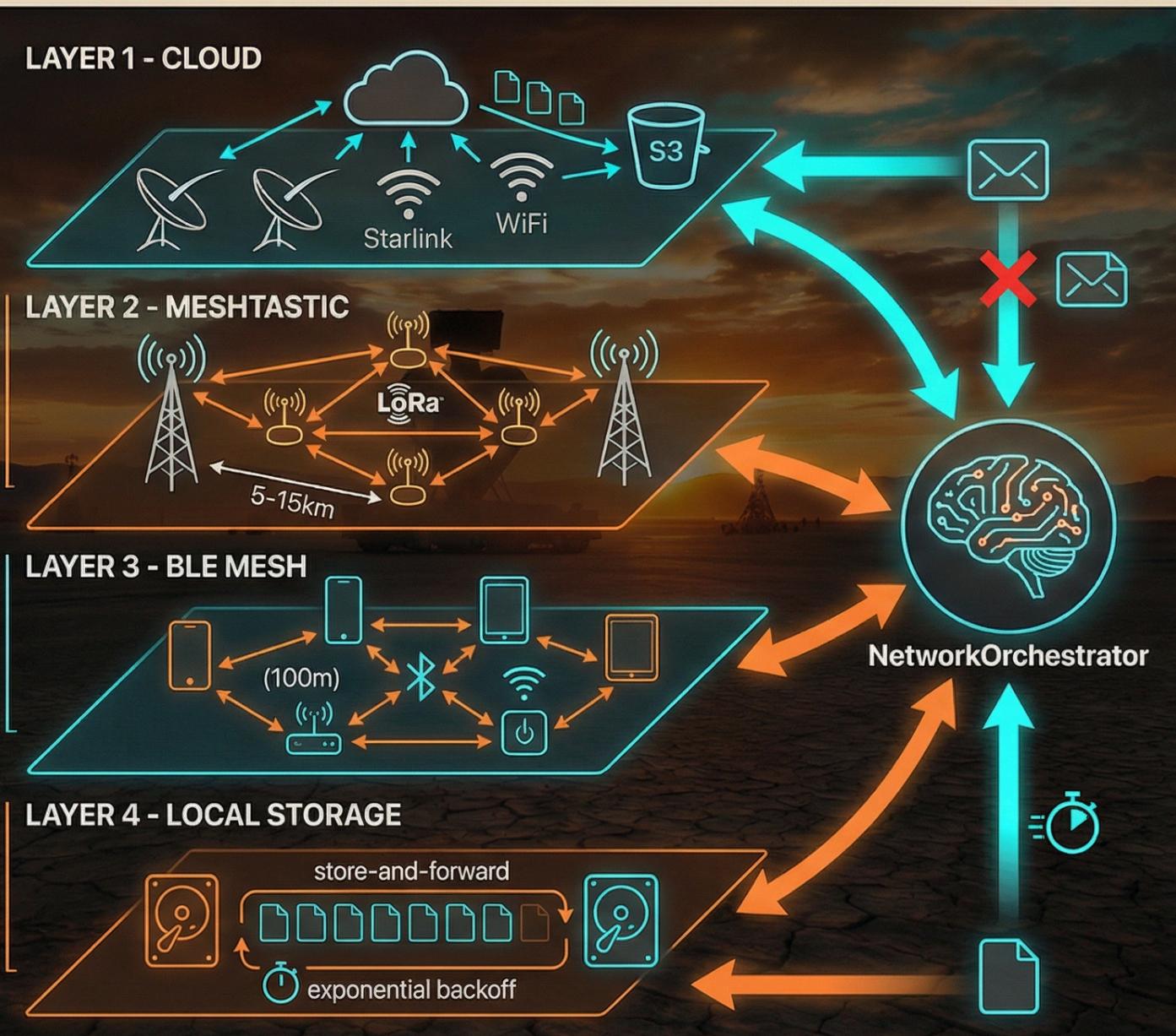
YEAR-ROUND UTILITY: Works anywhere infrastructure fails (festivals, disasters, off-grid).



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

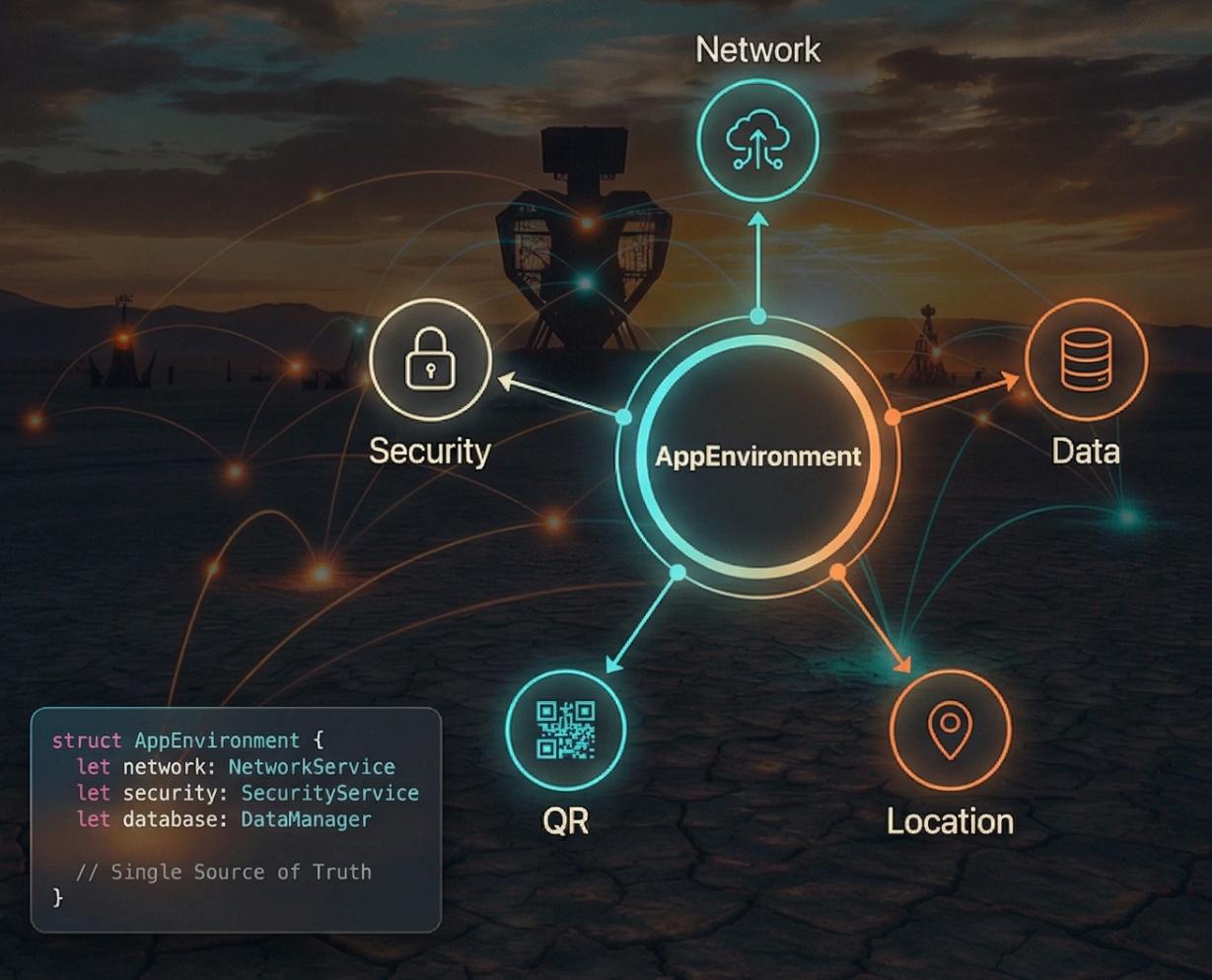
Scan to Connect - No Configuration,
No Internet Required

- **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 - Roadmap & Contribution

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

Immediate (P1)

- Field Testing (T1000-E)
- S3 Config
- Camera Permissions

Short-Term (P2)

- Service Decomposition
- SwiftProtobuf
- QR Enhancements

Medium-Term (P3)

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

How to Contribute

Repo: [github.com/Art-Technology-Holdings/robot-heart-ios →](https://github.com/Art-Technology-Holdings/robot-heart-ios)

Stack: SwiftUI, Combine, Meshtastic, AWS S3