CamUtil System Role

CamUtil is the StrangeLab cockpit application. It performs discovery, evidence intake, operator curation, and report generation. It is NOT the long-term storage system. All long-term evidence integrity is handled by the Pi Vault.

Three-Tier Data Flow

1. Inbox (Mac): Short-lived intake cache of all raw scan artifacts.
2. Workspace (Mac): Operator-selected case artifacts (pinned devices).
3. Reports (Mac): Human-readable + raw paired reports for delivery.
All three are automatically shipped to the Pi Vault.

Mac Retention Policy

Inbox is limited by age and size to protect Mac disk space.
Workspace and Reports are never auto-deleted.
Inbox artifacts referenced by Workspace cases are protected.

Pi Vault Role

The Pi Vault is append-only long-term storage.
It receives shipped artifacts from the Mac via SSH/rsync.
It never modifies or deletes evidence.
It is the authoritative forensic archive.

Vault Shipping Guarantees

All artifacts are shipped with SHA256 hashing.
A local manifest prevents duplicate sends.
Failures do not mark artifacts as shipped.
Shipping is automatic but manually triggerable.

Evidence Philosophy

Raw data is immutable.
Readable data is explanatory.
Readable reports always reference raw filenames.
BLE identifiers are treated as claims, not facts.
Behavior over time defines confidence.

BLE Decoding Enhancements

Local Bluetooth SIG tables are used:
- Company IDs
- Assigned Numbers
UUIDs are normalized to full 128-bit form for readability.
Unknown UUIDs are preserved and tracked behaviorally.

UI & Operator Workflow

Mac UI is fully resizable with scroll-safe panels.
Actions are consolidated into popup selectors.
If data is known, it is auto-filled everywhere.
Logs, devices, BLE, and probes are cross-linked.

Hard Probe Behavior

Hard Probe runs VLC diagnostics only when allowed.
It always writes a status JSON, even if blocked.
Logs and artifacts are preserved and shippable.

Future Expansion Compatibility

Architecture supports:
- Additional sensor nodes
- Additional Pi ingest sources
- A separate forensic analysis/graphing Mac app
- Replacement of any node without data loss