

Android AntiTheft / AntiShutdown App – Technical Summary

■ Objective

Build a non-root Android app that intercepts shutdown attempts using ACTION_CLOSE_SYSTEM_DIALOGS and ACTION_SHUTDOWN. It uses voice authentication, delays shutdown if verification fails, captures photo+GPS evidence, and notifies emergency contacts. Complies with Google Play policies.

■ Core Features

- Intercepts shutdown triggers.
- Voice authentication (ECAPA-TDNN), fallback to PIN/biometric/SMS.
- Delay FSM (2–15 mins), progressive delays.
- Capture: CameraX + GPS, encrypted with AES-GCM.
- Relay: HTTPS/FCM, optional SMS via backend.
- Privacy-first with consent, foreground disclosure.
- Post-shutdown: queue flush on reboot/network.

■ Architecture

Mobile (Kotlin): ForegroundInterceptService, AuthEngine, EvidenceCapture, Uploader, RelayClient. **Backend (FastAPI/Node.js):** Auth, Evidence API, Relay, SMS adapter, deployed via Docker Compose. **Data Flow:** Detect → Auth → Delay FSM → Capture → Relay → Persist → Flush.

■ Permissions (Min)

FOREGROUND_SERVICE, CAMERA, RECORD_AUDIO, LOCATION (fine & background), SYSTEM_ALERT_WINDOW, BOOT_COMPLETED, POST_NOTIFICATIONS. Optional: CALL_PHONE, SEND_SMS.

■ Shutdown Flow

Power button → BroadcastReceiver → ForegroundInterceptService → Auth UI → Failure → Capture → Delay FSM → Notify → Shutdown → Reboot → Upload queue flush.

■ Voice Auth

- On-device ECAPA-TDNN via ONNX or TFLite. - ASR: Vosk/Whisper (on-device), or cloud fallback. - Anti-spoof: random challenge, SNR check, pitch analysis.

■ ■ Tech Stack

****Android:**** Kotlin, CameraX, WorkManager, BiometricPrompt. ****Voice:**** ECAPA-TDNN, ONNX/TFLite, Vosk/Whisper JNI. ****Backend:**** FastAPI/Node, PostgreSQL, Redis, Nginx, FCM. ****Security:**** AES-GCM, JWT, TLS1.2+, cert pinning.

■ MVP Roadmap (5 Weeks)

1. Service setup, shutdown receivers. 2. Voice auth, CameraX, GPS. 3. Delay FSM, uploader. 4. Contact relay, privacy UI. 5. QA, Play Store prep.

■ ■ Constraints

Cannot block hardware shutdown or factory reset. Must not record without disclosure. Emergency calls only if opt-in and legal. Focus on best-effort capture, not total prevention.

■ Deliverables

Architecture diagrams, Kotlin snippets, backend scaffold, permissions manifest, test vectors, README + CI, legal/privacy notices.