Project Alpha — Final System Design (v2)

1. USER BLOCK

Acts as the interface for the person using the application. Takes all commands, inputs, and browsing requests from the device. Each request includes user details (ID, MAC address, device ID), domain or URL being accessed, and timestamp. Passes the request to the Request Validator.

2. REQUEST VALIDATOR

A lightweight pre-filter layer ensuring requests are legitimate and properly formatted. Detects VPN/proxy use early and checks the local cache for previously classified domains. Cached results are sent immediately; others go to the Filter Engine.

3. FILTER ENGINE

The core logic hub that classifies each request into one of three categories using internal submodules: Domain Classifier (matches database entries), Content Analyzer (scans for restricted content), and Action Manager (executes allow, alert, or block).

4. CATEGORY SYSTEM

Category A: Fully unrestricted domains — complete access. Category B: Partially restricted domains — restricted segments trigger email alerts to the host/admin and log entries in the Alert Table and Admin Dashboard. Category C: Fully blocked domains — access is barred instantly, logged, and marked as a security event.

5. ALERT MANAGER

Handles alert-related processes asynchronously. Sends email notifications to the admin or host and logs events into the Alert Table and System Log Table. Prevents request slowdowns during alert generation.

6. ADMIN DASHBOARD

Displays all logged activities and alerts, showing website access history, filtering results, VPN/proxy detection attempts, and risky or blocked access events. Pulls data directly from the Alert Manager and Log Database.

7. SECURITY LAYER

Enforces MAC binding and local encryption for log data. All communications between modules are secured via HTTPS/IPC tunnels. Implements Role-Based Access Control (RBAC) for admins and sub-admins.

8. SYSTEM FLOW SUMMARY

USER BLOCK → REQUEST VALIDATOR → FILTER ENGINE → {Category A: Allow, Category B: Alert+Log, Category C: Block+Log} → ALERT MANAGER → ADMIN DASHBOARD (Monitoring & Control)