

GeekSTunnel: React.js Migration Blueprint

1. Executive Summary

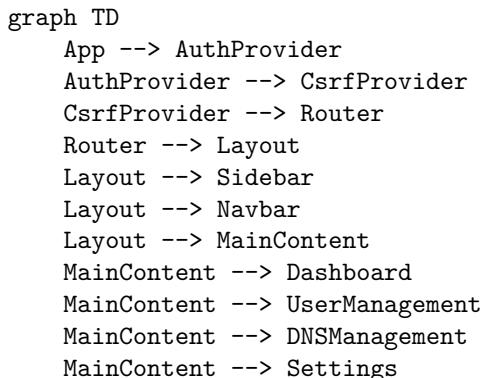
This document outlines the strategic plan for migrating the GeekSTunnel vanilla HTML/JS frontend to a modern React.js architecture. The goal is to enhance maintainability, performance, and developer experience while preserving the “Cyber-Glass Premium” aesthetic and robust security features.

2. Technical Stack

- **Framework:** React 18+ (Functional Components with Hooks)
 - **Build Tool:** Vite (for lightning-fast HMR and optimized builds)
 - **Routing:** React Router v6
 - **State Management:** React Context API (for Auth/CSRF) + Local State
 - **Icons:** Lucide-React (SVG-based, matching current design)
 - **Animations:** Framer Motion (for premium glassmorphism transitions)
 - **HTTP Client:** Axios (with interceptors for CSRF/Auth)
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3. Architecture Overview

3.1 Component Hierarchy



3.2 Key Components

- **GlassCard:** A reusable wrapper component implementing the `backdrop-filter: blur(12px)` and semi-transparent border styles.
- **StatCard:** Specialized card for displaying real-time metrics (CPU, RAM, Bandwidth).
- **UserTable:** Interactive table with sorting, filtering, and bulk actions.
- **DNSManager:** Interface for blacklist management and troubleshooting.

4. Security Implementation

4.1 CSRF Protection

- **Strategy:** Fetch a CSRF token on app initialization and store it in a `CsrfContext`.
- **Injection:** Use an Axios interceptor to automatically add the `X-CSRF-Token` header to all POST, PUT, PATCH, and DELETE requests.

4.2 WebSocket Authentication

- **Mechanism:** The `useWebSocket` hook will establish a connection to `/ws/stats`.
- **Validation:** The backend will validate the session cookie during the WebSocket handshake. If invalid, the connection is closed with code 4001.

4.3 Protected Routes

- Implement a `ProtectedRoute` component that checks the `useAuth` state. If the user is not authenticated, they are redirected to `/login`.
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5. Migration Phases

Phase 1: Foundation

- Initialize Vite project.
- Port global CSS variables and “Cyber-Glass” design system.
- Setup `AuthProvider` and `CsrfProvider`.

Phase 2: Core UI

- Build the Layout (Sidebar/Navbar).
- Implement the Dashboard with live metrics polling/websockets.

Phase 3: Feature Porting

- Port User Management (CRUD operations).
- Port DNS Blacklist management.
- Implement 2FA setup and verification flows.

Phase 4: Optimization & Security

- Implement HSTS and CSP headers via Nginx.
- Enable production-grade rate limiting.
- Final UI/UX polish.

6. Deployment Strategy

1. **Build:** Run `npm run build` to generate the `dist` folder.
 2. **Nginx Integration:** Update `nginx-ssl.conf` to serve the `dist` folder as the root.
 3. **Fallback:** Ensure Nginx handles SPA routing by redirecting all non-file requests to `index.html`.
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